

**CITY OF MARSHALLTOWN
COUNCIL AGENDA
CITY HALL COUNCIL CHAMBERS
10 W STATE STREET
MAY 26, 2020, 5:30 PM**

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A. NOTICE TO PUBLIC

The Mayor and City Council welcome comment from the public during discussion of any of the agenda items. You are required to step to the microphone, state your name and address for the record and to limit the time used to present your remarks 3 minutes or less in order that others may be given the opportunity to speak. All speakers shall speak clearly and direct their comments to the Mayor and City Council and not to any Councilor specifically. It is at the discretion of the Mayor and Council to respond to specific questions and comments or to have staff respond during the meeting.

B. CALL TO ORDER

Mayor Joel T.S. Greer

C. PLEDGE OF ALLEGIANCE

D. ROLL CALL

Cahill, Gowdy, Hoop, Isom, Martin, Thompson, Wirin.

E. MAYOR, COUNCIL AND ADMINISTRATOR COMMENTS

F. CONSENT AGENDA

1. Approve May 11, 2020. Minutes And Bill List \$7,497,739.25

Documents:

[2020-05-11_Council Minutes.pdf](#)
[2020-05-26_BillList.pdf](#)

2. Approve April 2020 Financial Statements

Documents:

[April 2020 Financials Memo.pdf](#)
[April 2020 Financial Statements.pdf](#)

3. Approval Of Renewal Liquor Licenses

Wandering Creek 2436 233rd St
Depot Liquor & Grocery 114 N Center St
Kwik Star #706 810 S. 3rd Ave.
Hy-Vee Food & Drugstore 802 S Center
GROCERY STORE Y TORTILLERIA LA VECINDAD 505 N 3RD
AVE
Tremont on Main 22-26 W Main St
Hy-Vee Party Room 802 S Center St.
Mi Ranchito Mexican Grill & Seafood 1010 W Lincoln Way
Zeno's Pizza 109 E Main Street
Tannin Inc. 125 East Main Street
Golden Land 11 E State Street
Friends of the Orpheum Theater 220 East Main Street

4. Approve Renewal State Tobacco Licenses, Through 6/30/2021

FOR APPLICATIONS RECEIVED BEFORE 5/21/2020:

7 Rayos Liquor Store 120 E Main St
Casey's - E Main #3228 916 E Main St
Casey's - Iowa Ave #3508 108 Iowa Avenue W
Casey's - N 3rd Ave #1303 111 N 3rd Ave
Casey's - S 12th Ave #1441 1402 S 12th Ave
Casey's - W Lincoln Way #1564 1009 W Lincoln Way
Family Dollar Store #22186 327 S 3rd Ave
Hy-Vee Drugstore 1706 S Center St
Hy-Vee Food & Drugstore 802 S Center St
Hy-Vee Gas 808 S Center St
Kwik Star #394 - S Center St 2500 S Center St
Kwik Star #607 - S 6th St 814 S 6th St
Kwik Star #706 - S 3rd Ave 810 S 3rd Ave
SHAG 2500 C Center St Spc 1450
Walgreens #03196 5 E Anson St
Wal-Mart Supercenter #581 2802 S Center St

5. RESOLUTION 2020-140 APPROVING A QUOTE FROM ALLIANT
ENERGY TO REPLACE STREET LIGHTS IN THE DOWNTOWN
AREA

Documents:

[Res Approving Downtown Street Light Quote.pdf](#)
[Marshalltown Street Light Estimate.pdf](#)

Memo on Street Lights.pdf

6. RESOLUTION 2020-141 ADOPTING SUPPLEMENT 2018-S2 TO THE CODE OF ORDINANCES OF THE CITY OF MARSHALLTOWN, IOWA, THROUGH ORDINANCE 14994

Documents:

[05-26-2020_2020-141_Res and Supplement 2018-S2 Code update.pdf](#)

7. RESOLUTION 2020-142 DECLARING CERTAIN PROPERTY SURPLUS PROPERTY AND AUTHORIZING SALE AND DISPOSAL THEREOF, 1996 Cat Forklift, Model GC15

Documents:

[GC15 CAT forklift surplus.pdf](#)

8. RESOLUTION 2020-143 ORDERING CONSTRUCTION OF THE 1st STREET PARKING LOT PROJECT PLT19001, SETTING PUBLIC HEARING ON PROPOSED PLANS, SPECIFICATIONS, FORM OF CONTRACT AND ESTIMATED COST AND DIRECTING PUBLICATION OF NOTICE TO BIDDERS

Documents:

[Order Construction.pdf](#)
[PLT19001 Memo to Order Construction.pdf](#)

9. RESOLUTION 2020-144 ORDERING CONSTRUCTION OF THE WASHINGTON STREET EXTENSION PROJECT ECO20001, SETTING PUBLIC HEARING ON PROPOSED PLANS, SPECIFICATIONS, FORM OF CONTRACT AND ESTIMATED COST AND DIRECTING PUBLICATION OF NOTICE TO BIDDERS

<https://www.marshalltown-ia.gov/Bids.aspx?BidID=80>

Documents:

[Order Construction.pdf](#)
[ECO 20001 Timeline PrePlanning Project.pdf](#)
[ECO20001 Engineers_Estimate_Washington_St.pdf](#)
[ECO20001 Memo to Order Construction.pdf](#)
[ECO20001 Washington St Ext Final Plans.pdf](#)
[ECO20001 Washington St Ext Official Hearing - Letting.pdf](#)
[ECO20001 Washington St Ext Specifications.pdf](#)

10. RESOLUTION 2020-145 APPROVING IOWA DOT AGREEMENT 2020-R-005 FOR A RISE GRANT IN THE AMOUNT OF \$1,640,342

Documents:

[Res Approving RISE Grant.pdf](#)
[Marshalltown 2020R005.pdf](#)
[Memo on RISE Agreement.pdf](#)

11. RESOLUTION 2020-146 APPROVING AN AGREEMENT WITH THE MARSHALLTOWN AREA CHAMBER OF COMMERCE FOR TOURISM AND PROMOTIONAL SERVICES

Documents:

[Res for Tourism Promo Agreement Chamber.pdf](#)
[Agreement for Tourism.Promotion 7.1.20.pdf](#)
[Tourism Update.pdf](#)

12. RESOLUTION 2020-147 SUPPORTING AN ARTS PROJECT GRANT APPLICATION TO THE IOWA ARTS COUNCIL FOR PUBLIC ART FOR A DOWNTOWN POCKET PARK

Documents:

[Res Support Arts Project Grant.pdf](#)
[Memo on Arts Grant.pdf](#)

13. RESOLUTION 2020-148 APPROVING POLICY PERSONALLY IDENTIFIABLE INFORMATION AND PROTECTED PERSONALLY IDENTIFIABLE INFORMATION

Documents:

[Resolution Personally Identifiable Information and Protected Personally Identifiable Information Policy.pdf](#)
[Personally Protected Identifiable Information Policy Memo.pdf](#)
[Personally Identifiable Information and Protected Personally Identifiable Information Policy.pdf](#)

14. RESOLUTION 2020-149 APPROVING THE TITLE VI PROGRAM FOR MARSHALLTOWN MUNICIPAL TRANSIT

Documents:

[Title VI Resolution 2020.pdf](#)
[Memo.pdf](#)
[TRANSIT Title VI ATTACHMENTS 2020.pdf](#)

15. RESOLUTION 2020-159 APPROVING CONTRACT FOR ENVIRONMENTAL INVESTIGATION SERVICES WITH IMPACT7G, INC. RELATED TO THE EDGEWOOD STREET EXTENSION PROJECT

Documents:

[CC Memo Impact7G contract_EDA_Phase1.pdf](#)
[Res Approve Contract_Impact7G_EDA_Phase1.pdf](#)
[PSA Phase I Edgewood Street Dev Area 052120.pdf](#)

G. RESOLUTIONS

1. RESOLUTION 2020-150 REJECTING BIDS FOR THE ANSON PARK SHELTER PROJECT IN THE CITY OF MARSHALLTOWN, IOWA BEING PROJECT NO. PRK20001

<https://www.marshalltown-ia.gov/Bids.aspx?BidID=76>

Documents:

[05-26-2020_2020-_PRK20001 Memo on Rejecting Bids for Anson Shelter.pdf](#)

[05-26-2020_2020-_PRK20001 Resolution on Rejecting Bids for Anson Shelter.pdf](#)

[2020-05-20 Anson Park - Bid Tally.pdf](#)

2. RESOLUTION 2020-151 ACCEPTING BID, CONTINGENT UPON THE RECEIPT AND EXECUTION OF GRANT AGREEMENT WITH THE FEDERAL AVIATION ADMINISTRATION FOR THE CONSTRUCTION AIRPORT TERMINAL AND HANGAR IMPROVEMENTS PROJECT AT THE MARSHALLTOWN MUNICIPAL AIRPORT

<https://www.marshalltown-ia.gov/Bids.aspx?BidID=73>

Documents:

[4482-Terminal, Hangar and Site Bid Tabulation.pdf](#)

[4482-Hangar, Terminal and Site-Resolution Accepting Bid and Grant Application Approval.pdf](#)

[Alternatives Discussion for Council 5-20-20.pdf](#)

3. RESOLUTION 2020-152 ACCEPTING BID, CONTINGENT UPON THE RECEIPT AND EXECUTION OF GRANT AGREEMENT WITH THE FEDERAL AVIATION ADMINISTRATION FOR THE CONSTRUCTION OF THE AIRPORT VAULT IMPROVEMENTS PROJECT AT THE MARSHALLTOWN MUNICIPAL AIRPORT

<https://www.marshalltown-ia.gov/Bids.aspx?BidID=73>

Documents:

[4482-Vault Bid Tabulation.pdf](#)

[4482-Vault-Resolution Accepting Bid and Grant Application Approval.pdf](#)

4. RESOLUTION 2020-153 ACCEPTING BID AND AUTHORIZING THE AWARD OF CONTRACT FOR THE S. 6th St & MERLE HIBBS CULVERT REPAIR PROJECT IN THE CITY OF MARSHALLTOWN, IOWA BEING PROJECT NO. SMW19002 IN THE AMOUNT OF \$59,906.00

Documents:

[Res Accept Bid.pdf](#)

[SMW19002 - S. 6th St and W. Merle Hibbs Box Culvert Repair Bid Tabulation .pdf](#)

[SMW19002 Memo Accept Bid Award Contract.pdf](#)

5. RESOLUTION 2020-154 AMENDING THE OFFER TO PURCHASE WITH LANDOVER CORPORATION AND FLINT HILLS HOLDINGS TO EXTEND THE CLOSING AND COMPLETION DATES

Documents:

[Res for Purchase Agreement Amend Flint Hills.pdf](#)

6. RESOLUTION 2020-155 APPROVING A GRANT AGREEMENT WITH MCGREGOR'S FURNITURE FOR EXTERIOR WALL REPAIRS AT 105 WEST MAIN STREET

Documents:

[Res McGregors Shared Wall Grant Agreement.pdf](#)
[McGregors Grant Agreement.pdf](#)

7. RESOLUTION 2020-158 APPROVING A GRANT AGREEMENT WITH WIN KYAW FOR EXTERIOR WALL REPAIRS AT 9-11 EAST STATE STREET

Documents:

[Res Kyaw Shared Wall Grant Agreement.pdf](#)
[Goldenland Grant Agreement.pdf](#)

8. PUBLIC HEARING AND RESOLUTION 2020-156 APPROVING PLANS, SPECIFICATIONS, FORM OF CONTRACT AND COST FOR THE EAST MERLE HIBBS EXTENSION PROJECT NO. ECO19001

<https://www.marshalltown-ia.gov/Bids.aspx?BidID=78>

Documents:

[ECO19001 PROJECT Concept Displays.pdf](#)
[Public Hearing Reso.pdf](#)
[ECO19001 Memo to Order Construction.pdf](#)

9. PUBLIC HEARING AND RESOLUTION 2020-157 APPROVE FLINT HILLS DEVELOPMENT AGREEMENT

Documents:

[Development Agreement FlintHills Holdings Marshalltown422742-36-v1.pdf](#)
[HrgApprvAmendedDevAgmtFlintHillsMarshalltown422742-36-v1.pdf](#)

H. ORDINANCES

1. ORDINANCE 14997 TO AMEND THE CODE OF ORDINANCES, CITY OF MARSHALLTOWN, IOWA BY AMENDING CHAPTER 118, PEDDLERS AND SOLICITORS RELATING TO MOBILE FACILITIES OR VEHICLES, FIRST READING

Documents:

[14997_ORDINANCE TRANSIENT VEHICLE INSPECTION -
FIRE CODE COMPLIANCE.pdf](#)
[14997_MEMO.pdf](#)

2. ORDINANCE 14998 TO AMEND THE CODE OF ORDINANCES,
CITY OF MARSHALLTOWN, IOWA BY AMENDING CHAPTER 72,
PARKING RULES, RELATING TO PARKING PENALTY, FIRST
READING

Documents:

[14998_MEMO PARKING FEE.pdf](#)
[14998_ORDINANCE PARKING PENALTY.pdf](#)

I. DISCUSSION

1. FY21 Budget Update

1. General Fund Budget Update For FY21

Documents:

[Budget FY21 Update to General Fund 001 due to
pandemic.pdf](#)

2. Road Use Tax Fund Update

Documents:

[RUTF CIP Memo.pdf](#)
[Adopted RUT Fund 110.pdf](#)
[RUT Fund 110.pdf](#)

3. Local Option Sales Tax Budget Update

Documents:

[Budget FY21 Update on LOST.pdf](#)
[LOST detail updated May 26 2020.pdf](#)

2. FY21 Proposed Borrowing

1. Review Of Proposed FY21 Bonding

Documents:

[Memo on FY21 Bonding.pdf](#)
[20 Marshalltown Bond Sale Timeline.pdf](#)

2. Refunding Bond Opportunity

Documents:

3. Memo On Coliseum Update And Change Orders

Documents:

5-26-2020 Memo on Coliseum Update on Change
Orders.pdf

4. 2020 Aquatic Center Operations

Documents:

2020 Aquatic Center Memo.pdf
2020 Aquatic Center Procedures.pdf
2020 Daily Staffing Est.pdf
FY20 Aquatic Center Re-Estimate.pdf
FY21 Aquatic Center Re-Estimate.pdf

J. **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 meetings laws.

K. **ADJOURN**

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. www.marshalltown-ia.gov

Council proceedings
May 11, 2020

Senior Council Member Hoop called the meeting to order at 5:30 PM, April 27, 2020, in the Council Chambers at 10 W State Street and led the pledge of allegiance. Roll call- Present: Cahill, Gowdy, Hoop, Isom, Martin, Thompson, Wirin. Cahill, Martin and Wirin fully participated via speakerphone. Due to COVID-19 imposed distancing, the public attended via Go-To-Meeting, and had options to present written comments prior to the meeting, as well as during the meeting via the interactive live-stream meeting. Hoop reminded the citizens to celebrate Police Week.

CONSENT AGENDA:

Thompson moved to adopt the consent agenda, Approve Minutes, April 27, 2020, And Bill List Of \$1,256,693.12; Reappoint Paul Peglow To Civil Service Commission, Term Expires 4/1/2022; Receipt Of April 2020 Building Permit Report; Receipt of Fire Department Annual Report 2019; RESOLUTION 2020-121 APPROVING QUOTE AND AWARD TO NUTRI-JECT SYSTEMS, INC. FOR THE CLEANING AND DISPOSAL OF BIOSOLIDS FOR THE DIGESTER #1 CLEANING PROJECT, IN THE AMOUNT OF \$56,000.00; RESOLUTION 2020-122 DECLARING CERTAIN PROPERTY SURPLUS PROPERTY AND AUTHORIZING SALE AND DISPOSAL THEREOF, 1997 KAWASAKI MULE; RESOLUTION 2020-124 SUPPORTING A FEDERAL BUILD GRANT APPLICATION FOR THE HIGHWAY 14/NORTH 3RD AVENUE RECONSTRUCTION; RESOLUTION 2020-125 ACCEPTING CORONAVIRUS EMERGENCY SUPPLEMENTAL FUNDING PROGRAM FY 2020 BJA FORMULA GRANT AWARD IN THE AMOUNT OF \$60,953.00; RESOLUTION 2020-136 APPROVING CONTRACT CHANGE ORDER #4 FOR THE 2017 MANHOLE AND POINT REPAIR PROJECT # 59016002 AN INCREASE OF \$52,796.00; RESOLUTION 2020-139 APPROVING CONTRACT CHANGE ORDER #18 FOR THE VETERANS MEMORIAL COLISEUM RENOVATION PROJECT, AN INCREASE OF \$ 25,383.57; second by Isom. Motion carried 7-0.

Isom moved to adopt RESOLUTION 2020-123 APPROVING AMENDED ENGINEERING SERVICES AGREEMENT FOR E. MERLE HIBBS ROAD CONSTRUCTION PROJECT ECO19001 FOR MCCLURE ENGINEERING CO. AN INCREASE OF \$27,500.00, second by Martin. Thompson asked for clarification on the connection to Plaza Heights Road. Staff clarified that the project is not predicated on the connection to Plaza Heights Road, with the scope of the extension ending to the drainage way with a dead end for this phase. Thompson moved to table the item for more information, regarding progress of other proposed development, second by Wirin. Motion to table failed 3-4, with Cahill, Hoop, Isom and Martin dissenting. Resolution adopted 4-3, with Thompson, Cahill, Hoop dissenting.

Isom moved to adopt RESOLUTION 2020-126 ORDERING CONSTRUCTION OF THE E. MERLE HIBBS PROJECT ECO19001, SETTING PUBLIC HEARING ON PROPOSED PLANS, SPECIFICATIONS, FORM OF CONTRACT AND ESTIMATED COST AND DIRECTING PUBLICATION OF NOTICE TO BIDDERS, second by Martin. Staff reported the project is not predicated on the connection to Plaza Heights Road, with the scope of the extension ending to the drainage way with a dead end for this phase. Council will provide staff direction at a later date regarding the northern street to connect to Plaza Heights Road, if they so desire. Resolution adopted 5-2, Gowdy and Thompson dissenting.

Isom moved to adopt RESOLUTION 2020-127 SETTING DATE FOR PUBLIC HEARING ON AN AMENDMENT TO A DEVELOPMENT AGREEMENT WITH FLINT HILLS HOLDINGS, TO INCREASE ECONOMIC DEVELOPMENT PAYMENTS TO AN AMOUNT NOT TO EXCEED \$575,000, Hearing date, May 26, 2020, 5:30 PM, second by Cahill. Thompson questioned if the project will be completed and stated his opposition to use of TIF. Resolution adopted 6-1, Thompson dissenting.

MOTIONS:

Thompson moved to approve renewal applications for State of Iowa Retail Cigarette, Tobacco, Nicotine and Vapor Licenses, through 6/30/2021, for the following applications received through 5/4/2020: Golden Land Inc 11 E State St, Dollar General Store 2413 S Center St Dollar General Store 408 S 9th St, Fareway Stores 102 W Anson St, Marshall BWS 11 N 3rd Ave, Marshall Tobacco & Vape Shop 19 W Main St, Yesway 1701 Iowa Avenue W, second by Gowdy. Motion carried 6-1, Hoop dissenting.

RESOLUTIONS:

Isom moved to adopt RESOLUTION 2020-128 ACCEPTING BID AND AUTHORIZING THE AWARD OF CONTRACT FOR THE RIVERVIEW PARK STORM WATER PUMP STATION RETAINING WALL AND PAVING PROJECT IN THE CITY OF MARSHALLTOWN, IOWA BEING PROJECT SMW20001 IN THE AMOUNT OF \$211,700.00, second by Thompson. Resolution adopted 7-0.

Martin moved to adopt RESOLUTION 2020-129 ACCEPTING BID AND AUTHORIZING THE AWARD OF CONTRACT FOR THE TIMBER CREEK PEDESTRIAN BRIDGE RECONSTRUCTION PROJECT IN THE CITY OF MARSHALLTOWN, IOWA BEING PROJECT NO. PRK18001 IN THE AMOUNT OF \$349,910.80, second by Isom. Resolution adopted 7-0.

Isom moved to adopt RESOLUTION 2020-130 REJECTING ALL BIDS FOR THE 2020 STREET MAINTENANCE PROJECT IN THE CITY OF MARSHALLTOWN, IOWA BEING PROJECT NO. STR20001, second by Thompson. Resolution adopted 7-0.

Isom moved to adopt RESOLUTION 2020-131 ACCEPTING BID OF AND AUTHORIZING THE AWARD OF CONTRACT FOR THE NE FEMA STREET REPAIR PROJECT #FEMA18004, IN THE AMOUNT OF \$1,546,167.40, TO CONSTRUCT INC., second by Thompson. Resolution adopted 7-0.

Isom moved to adopt RESOLUTION 2020-132 APPROVING A GRANT AGREEMENT WITH JOEL BOTELLO FOR EXTERIOR WALL REPAIRS AT 27 NORTH CENTER STREET, second by Cahill. Resolution adopted 7-0.

Thompson moved to adopt RESOLUTION 2020-133 ADOPTING A MULTI-HAZARD EMERGENCY OPERATIONS PLAN AND EMERGENCY SUPPORT FUNCTIONS, second by Martin. Resolution adopted 7-0.

Isom moved to adopt RESOLUTION 2020-134 AMENDING A DEVELOPMENT AGREEMENT WITH DANI AND GARRETT GOODMAN FOR A CATALYST BUILDING GRANT TOTALING \$250,000, second by Cahill. Resolution adopted 6-1, Thompson dissenting.

Isom moved to adopt RESOLUTION 2020-135 AMENDING A DEVELOPMENT AGREEMENT WITH FLINT HILLS HOLDINGS FOR A CATALYST BUILDING GRANT TOTALING \$175,000, second by Cahill. Resolution adopted 6-1, Thompson dissenting.

PUBLIC HEARING - project plans and specifications

Senior Council Member Hoop declared the public hearing open for RESOLUTION 2020-137 APPROVING PLANS, SPECIFICATIONS, FORM OF CONTRACT AND COST FOR THE ANSON PARK SHELTER, PROJECT NO. PRK20001 at 6:16 PM. There were no written comments, nor any public comments from the interactive web meeting. Senior Council Member Hoop closed the public hearing at 6:19 PM.

Isom moved to adopt RESOLUTION 2020-137 APPROVING PLANS, SPECIFICATIONS, FORM OF CONTRACT AND COST FOR THE ANSON PARK SHELTER, PROJECT NO. PRK20001, second by Thompson. Resolution adopted 7-0.

PUBLIC HEARING - project plans and specifications

Senior Council Member Hoop declared the public hearing open for . RESOLUTION 2020-138 APPROVING PLANS, SPECIFICATIONS, FORM OF CONTRACT AND COST FOR THE S. 6TH ST & MERLE HIBBS CULVERT REPAIR PROJECT NO. SMW19002 at 6:20 PM. There were no written comments, nor any public comments from the interactive web meeting. Senior Council Member Hoop closed the public hearing at 6:22 PM

Isom moved to adopt RESOLUTION 2020-138 APPROVING PLANS, SPECIFICATIONS, FORM OF CONTRACT AND COST FOR THE S. 6TH ST & MERLE HIBBS CULVERT REPAIR PROJECT NO. SMW19002, second by Thompson. Resolution adopted 7-0.

ORDINANCES:

Isom moved to adopt the first reading of ORDINANCE 14996 TO AMEND CITY CODE OF ORDINANCES RELATING TO DOGS AT LARGE, second by Cahill. First reading adopted 7-0.

Thompson moved to waive the second and third reading of and to adopt ORDINANCE 14996 TO AMEND CITY CODE OF ORDINANCES RELATING TO DOGS AT LARGE, second by Isom. Ordinance adopted 7-0.

DISCUSSION:

FY20 General Fund Budget Update: Finance Director Steiner reported revenues are down at the end of this fiscal year, attributed to people self-quarantining during the COVID-19 pandemic, for the following funds: Road Use Tax, Local Option Sales Tax; Hotel /Motel Tax and general fund collections. In spite of the reduced revenues, the city is sitting OK for fiscal year ending June 30, 2020, due to diligent staff watching the bottom line.

PUBLIC COMMENT

There were no written comments, nor any public comments from the interactive web meeting.

ADJOURNMENT:

Meeting Adjourned at 6:34 PM

Respectfully submitted,

Shari L. Coughenour, CMC, City Clerk

CITY OF MARSHALLTOWN

ATTEST :

Joel T.S. Greer, Mayor

Shari L. Coughenour. CMC, City Clerk

COUNCIL BILL LIST
MAY 26, 2020

Buildings/Improvements		IUPAT.PPME/1	887.42
Hartwig.Plmbg/1	306.00	Teamsters238/2	1,653.08
Menards/1	47.95	Texas.Child.Sup/2	252.57
Mtwn.Aviation/1	41.71	TotalAdmin.Serv/4	8,596.74
Consulting & Professional Fees		Payroll.Net	
AHLERS.COONEY/1	1,443.00	Payroll/1	280,173.11
Bernie.Lowe/2	183.22	Refund/Reimbursed	
Bolton&Menk.Inc/13	30,123.30	Baker.Taylor/9	331.18
Fox.Engrg.Assc/2	31,644.35	Banderas,A/1	31.33
GRIMES.BUCK.SCH/1	1,680.00	BOLIVER,J/1	87.04
GTG.Architects/1	11,876.60	Bryngelson.Corp/1	634.48
Howard.R.Green/1	33,210.73	CARACOZA,T/1	31.33
Impact.7G.Inc/1	253.75	CARTER,A/1	20.00
Stone.Environment/1	3,300.00	CATRON,J/1	31.33
Terracon.Conslt/1	1,079.50	CLARK,P/1	80.00
TOMETICH.ENGR/1	1,200.00	Clawson,J/1	31.33
Contracts		FOX,S/1	50.67
Aramark.Unfrm/1	57.81	HALVERSON,T/1	31.33
Bjelland.Plmbg/5	34,125.65	JIMENEZ,J/1	145.00
Garling.Constr/1	447,598.36	Kelly,D/1	21.76
Hansen,S/2	2,874.00	ORNELAS,N/1	80.00
Impact.7G.Inc/3	15,725.00	OVERDRIVE,INC./1	29.99
Ind.Ag.Services/1	696.64	Perdue,J/1	50.67
Koch.Office/1	1,600.00	STANFIELD,V/1	70.00
Macqueen.Equip/2	5,437.35	ZINK,B/1	50.00
Marsh.Co.Landfi/1	53.90	Service/Repairs	
Menards/1	39,324.33	/0	190.00
Mtwn.Aviation/1	642.00	Advance.Garage./1	195.00
Nutri.Ject.Sys/1	34,067.85	Airgas.U.S.A./3	524.60
Plumb.Supply/1	3,187.50	ARI.PHOENIX.INC/1	1,093.58
POSPISIL.PAINTG/1	37,315.00	Arnold.Motor.Su/1	29.40
Premier.Equip/1	1.07	Blue.Marble.LLC/1	3,000.00
Region.6.Planng/1	108.00	Century.Link/105	1,795.38
SAFETY.KLEEN/1	417.85	Centurylink.Id/6	9.13
Schendel.Pest.C/1	42.50	Construct/2	535,806.85
Schumacher.Elev/2	440.84	Devig,T/17	2,838.00
Servicemaster/1	1,772.00	Gale-Hazen,E/1	75.00
Stericycle.Inc/2	145.46	Gale-Hazen,K/1	90.00
Stone.Sanit/1	115.56	GRIMES.PLIBRARY/1	225.00
Thiesens.Supply/1	22,969.01	Hartwig.Plmbg/3	1,679.00
Woodman.Control/1	1,100.00	Heart.of.Iowa/3	821.64
Xerox.Corp/1	24.00	Hogeland.Auto.P/1	120.00
ZOOBEAN.INC/1	4,128.00	IA.Treasurer/2	13,473.00
Debt Service		LARRY'S.TOWING/1	200.00
UMB.Bank.NA/30	5,500,804.59	LENZ,D/1	505.00
Equipment/Minor		M.Co.Recorder/3	118.00
IA.Pump.Works/1	4,809.81	McAtee.Tire/4	195.00
Library Books		MP.NEXLEVEL,LL/1	29,044.00
Baker.Taylor/10	525.98	Mtwn.Aviation/2	1,836.58
BRODART.CO/1	2,611.73	Mtwn.Wtrwrks/3	8,776.18
Cengage.Learng/5	367.34	Murphy.Tractor./1	2,005.84
MicroMarketing./3	878.88	OVERDRIVE,INC./4	499.85
OVERDRIVE,INC./7	1,254.34	Racom.Corp/2	5,250.00
Medical		Tri.State.Lock/3	160.00
Bernie.Lowe/2	977.12	Verizon.Wireles/10	1,074.26
Medtrak.Service/2	727.40	Weidner.Constr/1	27,548.00
Payroll.Deductions		WW.Grainger/3	171.44
American.Educa./1	64.41	Supplies/Parts	
AXA/1	325.00	Advance.Garage./1	65.00
Collection.Svs./5	1,325.16	Airgas.U.S.A./6	947.67
Colonial.Life/1	435.76	Ames.Libr.Found/1	2,152.00
Entenmann.Rovin/2	290.75	Ann.Alteration/2	48.00
Fidelity.Securt/2	452.73	Arnold.Motor.Su/34	1,750.51
I.R.S./6	78,589.72	Axon.Ent/1	5,737.50
IA.Treasurer/3	16,880.00	Baker.Taylor/5	152.50
ICMA.457/10	13,493.50	Barco.MuniProd/2	1,160.62
		BDH/1	1,869.32

COUNCIL BILL LIST
MAY 26, 2020

Bens.Tire/2	20.00
Bert.Gurney.Asc/1	4,265.32
Bituminous.Mat/4	1,646.74
Browns.Shoe.Fit/1	200.00
Cessford.Constr/1	2,049.80
Cntrl.IA.Distr/6	2,506.60
Cntrl.Srvs.Sppy/1	3,661.50
Concrete/8	1,733.42
Consolidated.Wa/1	1,132.89
Diamond.Vogel/6	8,978.34
Envisionware/2	4,702.50
Ethington.Htg/1	346.00
Fastenal.Co/4	158.41
Galls.LLC/1	109.98
GAYLORD.BROSINC/1	691.36
Gillig.LLC/2	1,161.46
Graymont.Lime/1	4,608.35
Hawkeye.Truck/1	13.30
Hoglund.Bus/1	407.19
HOLTRY,K/2	44.24
IA.Prison.Ind/2	2,130.23
IA.Pump.Works/1	235.13
Impact.7G.Inc/1	4,100.00
Marco.Holdings/1	240.64
Martin.Marietta/1	1,305.61
McAtee.Tire/2	948.95
Menards/8	288.24
Midwest.Safety./1	496.35
Murphy.Tractor./3	4,374.60
Napa.Auto/3	264.19
Norton.Greenhse/2	1,118.00
Nutrien.Ag.Sol/1	107.00
Office.Express/2	191.40
Ohalloran.Inter/1	368.12
OVERDRIVE,INC./1	460.90
QMG.Inc./2	1,455.03
Racom.Corp/3	26,248.50
Sho.Biz Inc/4	117.40
Showcases,Inc/1	140.40
Spahn.Rose.Lmbr/1	24.99
STAPLES/3	115.61
Stop.Stick/1	259.00
Storey.Kenwrthy/2	215.09
Streichers.Inc/1	73.00
TACTICAL.MED.SL/1	75.20
Thiesens.Supply/14	1,493.26
Titan.Machinery/1	59.90
Tri.State.Lock/1	178.00
Vajgrt.R/2	318.88
WARNELL,J/2	45.81
Willco.Inc/1	705.00
WW.Grainger/2	315.34
Utilities	
AlliantEnergy/70	63,997.75
Consumr.Energy/2	387.60
I.R.U.A./1	975.01
Mtn.Wtrwrks/16	1,195.81
WoodRiver.Enrgy/4	2,498.69
Total/645	7,497,739.25

MARSHALLTOWN

— I O W A —

Joel Greer, Mayor
Jessica Kinser, Administrator
Diana Steiner, Finance Director
24 North Center Street
Marshalltown, IA 50158-4911
Tel - (641) 754-5760
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FINANCE DEPARTMENT

May 18, 2020

To: Mayor Joel Greer
Members of the City Council

From: Diana Steiner, Finance Director

Re: April Monthly Financial Statements

Policy Issue: N/A.

Recommendation: Staff recommends approving the April 2020 monthly financial statements.

Background: The Finance department has prepared and reconciled the April 2020 financial statements for your review. The attached reports include the following:

- Fund Balance Report, which includes the beginning balance at 6/30/19, the year-to-date revenues and expenses for 10 months and the ending fund cash balance.
- Cash & Investments Report, which includes current balances and interest rates for all city investments.
- Monthly Budget Report, which reflects monthly and year-to-date revenues and expenses by each fund and then in summary. If the YTD Activity amount is less than the YTD Budget amount, it will show as unfavorable for revenues and favorable for expenses. Please note that the FY20 budget amendment approved in March is now reflected in the report.

Items of interest this month:

*Property tax revenues of \$4.2 million were received.

*FEMA revenues of \$424,802 were received for the remaining federal share of the Citywide debris removal and the 10% state share.

*In fund 383 (Coliseum Remodel) expenses of \$42,906 were paid to the architect and inspection fees.

Budget Impact: N/A

Attachment: April 2020 Financial Statements

cc: Jessica Kinser, City Administrator

Fund	Beginning Balance	Total Revenues	Total Expenses	Ending Balance
001 - GENERAL FUND	1,761,714.82	12,697,584.94	12,908,125.63	1,551,174.13
010 - CASH FLOW RESERVE FUND	2,295,731.37	78,554.60	-	2,374,285.97
030 - CAPITAL RESERVE	237,270.57	423,042.14	444,235.15	216,077.56
031 - CAPITAL RSRV-BLDG MAINT	274,259.88	5,424.01	-	279,683.89
032 - CIP LARGE VEHICLE/EQUIPMENT	212,000.00	106,000.00	-	318,000.00
110 - ROAD USE TAX	6,078,797.75	3,116,633.13	2,984,806.59	6,210,624.29
112 - EMPLOYEE BENEFITS FUND	2,694,901.22	2,381,929.58	1,841,673.98	3,235,156.82
117 - POLICE/FIRE RETIREMENT	510,413.10	1,004,071.18	820,535.57	693,948.71
119 - EMERGENCY FUND	-	209,320.03	138,566.03	70,754.00
121 - LOCAL OPTION SALES TAX	3,741,656.76	3,477,729.80	2,963,664.63	4,255,721.93
125 - TAX INCREMENT FINANCING	518,758.81	735,351.86	331,535.28	922,575.39
126 - TIF-LMI	-	26,554.91	-	26,554.91
130 - CITY TORT LIABILITY	83,777.25	26,696.97	44,736.30	65,737.92
132 - GRANTS-STATE/LOCAL AGENCIES	(49,516.79)	-	290,050.00	(339,566.79)
140 - PARK & REC DONATION FUND	95,747.77	67,279.56	17,330.08	145,697.25
141 - MTOWN TENNIS ASSOC	1,727.92	33.95	-	1,761.87
142 - SOFTBALL ASSOCIATION FUND	13,729.77	15,279.99	27,415.20	1,594.56
144 - LIVE HEALTHY IOWA	3,128.44	-	5,126.33	(1,997.89)
145 - TORNADO GENERAL	600,160.23	1,557,849.66	1,781,252.68	376,757.21
146 - FEMA VALOR	(64,348.56)	9,183.85	-	(55,164.71)
147 - FEMA DEMO	(29,608.21)	30,875.13	55,391.85	(54,124.93)
148 - FEMA-COVID19	-	-	1,889.07	(1,889.07)
150 - COPS FAST GRANTS	(2,818.95)	36,790.98	49,497.60	(15,525.57)
151 - DEPT OF JUSTICE GRANTS	(11,019.59)	27,203.05	20,186.00	(4,002.54)
152 - POLICE UNDESIGNATED GRANTS	1,194.10	75,492.63	87,456.35	(10,769.62)
153 - POLICE DEPT DONATION FUND	94,557.84	11,493.43	25,662.23	80,389.04
156 - FIRE DEPT DONATION FUND	9,053.60	2,095.75	4,688.61	6,460.74
157 - FIRE DEPT GRANTS	4,723.45	1,845.88	-	6,569.33
160 - ECONOMIC DEVELOPMENT GIFT	51,247.83	1,006.89	-	52,254.72
161 - SURETY DEPOSITS/SUBDIVIDER	10,691.60	210.07	-	10,901.67
170 - LIBRARY DONATION FUND	110,317.71	26,267.31	27,075.07	109,509.95
177 - SEIZED ASSETS (POLICE)	42,225.68	1,972.82	7,195.01	37,003.49
179 - OTHER COMM AND ECON DEVELOPMENT	81,277.34	1,523.70	4,985.75	77,815.29
180 - HOUSING GRANTS	26,505.26	856.05	-	27,361.31
182 - #4 HUD LEAD GRANT	334.00	-	334.00	-
183 - FY 08 EDI (ECON DEV INCENTIVE)	(13,029.25)	-	360.00	(13,389.25)
184 - VOUCHERS - 002, 003	126,587.21	840,568.03	947,654.83	19,500.41
189 - #6 HUD LEAD GRANT	(12,834.57)	167,086.00	163,751.19	(9,499.76)
200 - GO BONDS DEBT FUND	146,285.51	3,454,312.26	456,660.50	3,143,937.27
300 - CIP COLLECTION FUND	122,311.52	526,140.62	542,811.86	105,640.28
311 - RISE STREET GRANTS	-	-	47,905.00	(47,905.00)
312 - AIRPORT PROJECT FUND	(22,135.42)	82,181.22	231,896.60	(171,850.80)
320 - SPECIAL ASSESSMENT PROJECTS	(24,083.95)	5,603.00	-	(18,480.95)
340 - BIKE PATH PROJECT FUND	(78,661.75)	17,214.10	108,817.14	(170,264.79)
341 - TREES FOREVER PROJECT	8,186.72	13,869.71	8,692.50	13,363.93
350 - GO BONDS CAPITAL PROJECTS	8,710.07	171.14	-	8,881.21
354 - POLICE & FIRE STATIONS	2,886,834.75	68,815.18	2,286,508.15	669,141.78
355 - 2015 GO BONDS (D&D)	533,217.44	29,865.54	220,063.41	343,019.57
357 - 2018 CY STREET PROJECTS	-	44,388.31	44,388.31	-
360 - 2019 GO BONDS & PROJECTS	-	5,714,818.97	371,740.63	5,343,078.34
361 - LIBRARY BUILDING ADDITION	-	750.00	-	750.00
381 - 2019 CY STREET, SIDEWALK, PARKING PROJECTS	2,331,666.52	47,589.13	586,081.04	1,793,174.61
383 - COLISEUM REMODEL	495,473.00	2,357,801.33	355,575.02	2,497,699.31
391 - TIF DISTRICT II CAP PROJECTS	-	-	-	-
392 - TIF DISTRICT III CAP PROJECTS	7,913.64	155.50	-	8,069.14
393 - TIF DISTRICT IV CAP PROJECTS	107,871.50	-	107,871.50	-
610 - WATER POLLUTION CONTROL	(7,795.76)	11,437,192.13	11,426,713.23	2,683.14
611 - WPCP REVENUE	13,229,747.88	15,565,594.91	11,452,681.35	17,342,661.44
612 - WPCP REVENUE BOND FUND	-	1,198,499.24	1,465,011.12	(266,511.88)
614 - WPCP CAPITAL IMPROVEMENT RSRV	1,037,278.81	27,896.93	-	1,065,175.74
616 - SANITARY SEWER REHAB PROJECT	-	13,122.25	13,122.25	-
617 - SANITARY SEWER NEW CONSTRUCTN	104,843.90	12,728.00	-	117,571.90
618 - TORNADO-WPCP	(2,295.51)	-	-	(2,295.51)
690 - TRANSIT OPERATING	37,700.65	678,901.11	621,223.13	95,378.63
740 - STORM SEWER UTILITY	2,541,393.49	1,206,644.65	1,223,926.87	2,524,111.27
741 - 2016 GO STORM WATER PROJ	1,132,463.68	603,882.53	1,770,388.45	(34,042.24)
742 - TORNADO - STORM/SEWER	(4,140.06)	-	-	(4,140.06)
750 - COMPOSTING FACILITY	184,889.99	53,019.48	65,368.57	172,540.90
751 - TORNADO - COMPOST	(463,058.08)	-	153,380.00	(616,438.08)
760 - P&R CONCESSIONS ENTERPRISE	(14,588.69)	23,186.15	27,814.71	(19,217.25)
881 - OCCUPATIONAL INSURANCE ESCROW	72,836.76	114,836.44	126,825.05	60,848.15
884 - GROUP HEALTH INSURANCE ESCROW	2,309,319.84	2,750,854.28	3,133,230.63	1,926,943.49
886 - WORKMAN'S COMP DEDUCTIBLE FUND	37,287.84	757.17	973.12	37,071.89
910 - POLICE PENSION - T & A	-	8,282.90	9,111.19	(828.29)
913 - 911 COMMISSION	(72,698.73)	802,858.11	859,752.83	(129,593.45)
951 - SALES TAX REIMBURSEMENT	5,713.34	3,910.73	14,585.55	(4,961.48)
952 - SURETY BONDS/DEPOSITS	2,833.61	562.43	-	3,396.04
953 - IA STATE SLEUTH USR GRP	14,971.67	-	14,971.67	-
TOTAL	46,169,609.54	74,030,213.33	63,743,272.39	56,456,550.48

Account	Name	Ending Balance	Interest Rate
BalObject: 0110 - P&R Deposits			
999.0110.100	GWB P&R Deposits	<u>44,101.91</u>	2.00
Total BalObject: 0110 - P&R Deposits :		<u>44,101.91</u>	
BalObject: 0111 - Operating			
999.0111.000	UB&T Operating	13,573.38	0.05
999.0111.100	GWB Operating	<u>49,175,905.41</u>	2.00
Total BalObject: 0111 - Operating:		<u>49,189,478.79</u>	
BalObject: 0112 - COLISEUM			
999.0112.100	GWB COLISEUM	<u>2,434,863.42</u>	2.00
Total BalObject: 0112 - COLISEUM:		<u>2,434,863.42</u>	
BalObject: 0113 - Payroll			
999.0113.100	GWB Payroll	<u>43,829.55</u>	2.00
Total BalObject: 0113 - Payroll:		<u>43,829.55</u>	
BalObject: 0114 - Dev Inspections			
999.0114.100	GWB Dev Inspections	<u>32,096.56</u>	2.00
Total BalObject: 0114 - Dev Inspections:		<u>32,096.56</u>	
BalObject: 0115 - HUD Admin			
999.0115.100	GWB HUD Admin	<u>15,639.09</u>	2.00
Total BalObject: 0115 - HUD Admin:		<u>15,639.09</u>	
BalObject: 0116 - HUD HAP			
999.0116.100	GWB HUD HAP	<u>4,237.85</u>	2.00
Total BalObject: 0116 - HUD HAP:		<u>4,237.85</u>	
BalObject: 0117 - Police			
999.0117.100	GWB Police	<u>36,938.62</u>	2.00
Total BalObject: 0117 - Police:		<u>36,938.62</u>	
BalObject: 0120 - PETTY CASH			
610.0120.000	PETTY CASH	200.00	0.00
750.0120.000	PETTY CASH	<u>200.00</u>	0.00
Total BalObject: 0120 - PETTY CASH:		<u>400.00</u>	
BalObject: 0122 - PETTY CASH-CITY CLERK			
001.0122.000	PETTY CASH-CITY CLERK	<u>200.00</u>	0.00
Total BalObject: 0122 - PETTY CASH-CITY CLERK:		<u>200.00</u>	
BalObject: 0123 - PETTY CASH-LIBRARY			
001.0123.000	PETTY CASH-LIBRARY	<u>100.00</u>	0.00
Total BalObject: 0123 - PETTY CASH-LIBRARY:		<u>100.00</u>	
BalObject: 0125 - PETTY CASH-PARK			
001.0125.000	PETTY CASH-PARK	<u>225.00</u>	0.00
Total BalObject: 0125 - PETTY CASH-PARK:		<u>225.00</u>	
BalObject: 0130 - CASH HELD BY INSUR ADMI			
885.0130.000	CASH HELD BY INSUR ADMI	<u>1.00</u>	0.00
Total BalObject: 0130 - CASH HELD BY INSUR ADMI:		<u>1.00</u>	
BalObject: 0216 - GREAT WESTERN BANK MM			
999.0216.000	GREAT WESTERN BANK MM	<u>4,802.29</u>	0.20
Total BalObject: 0216 - GREAT WESTERN BANK MM:		<u>4,802.29</u>	
BalObject: 0240 - MIDWEST ONE CD (91-365 DAYS)			
611.0240.000	MIDWEST ONE CD (91-365 DAYS)	509,748.22	2.55
999.0240.000	MIDWEST ONE CD (91-365 DAYS)	<u>2,550,182.34</u>	2.37 -- 2.55
Total BalObject: 0240 - MIDWEST ONE CD (91-365 DAYS):		<u>3,059,930.56</u>	
BalObject: 0252 - GNB 365 INV			
884.0252.000	GNB CD (365 DAYS)	505,973.70	2.37
999.0252.000	GNB CD (365 DAYS)	<u>1,011,234.25</u>	2.11 -- 2.37
Total BalObject: 0252 - GNB 365 INV:		<u>1,517,207.95</u>	
BalObject: 0999 - POOLED CASH			
999.0999.000	POOLED CASH	<u>72,497.89</u>	0.00
Total BalObject: 0999 - POOLED CASH:		<u>72,497.89</u>	
		<u><u>56,456,550.48</u></u>	



City of Marshalltown, IA

Monthly Budget Report - Marshalltown

Group Summary

For Fiscal: Current Period Ending: 04/30/2020

Account Typ...	April Activity	YTD Budget	YTD Activity	Variance Favorable (Unfavorable)	Total Budget
Fund: 001 - GENERAL FUND					
Revenue	2,530,439.57	13,409,105.00	12,697,584.94	-711,520.06	16,091,575.67
Expense	1,548,630.73	13,320,894.60	12,908,125.63	412,768.97	15,989,224.32
Total Fund: 001 - GENERAL FUND:	981,808.84	88,210.40	-210,540.69	-298,751.09	102,351.35
Fund: 010 - CASH FLOW RESERVE FUND					
Revenue	4,162.20	43,522.40	78,554.60	35,032.20	52,227.00
Total Fund: 010 - CASH FLOW RESERVE FUND:	4,162.20	43,522.40	78,554.60	35,032.20	52,227.00
Fund: 030 - CAPITAL RESERVE					
Revenue	1,121.45	425,401.60	423,042.14	-2,359.46	510,482.00
Expense	29,558.71	623,110.90	444,235.15	178,875.75	747,752.00
Total Fund: 030 - CAPITAL RESERVE:	-28,437.26	-197,709.30	-21,193.01	176,516.29	-237,270.00
Fund: 031 - CAPITAL RSRV-BLDG MAINT					
Revenue	490.29	69,166.60	5,424.01	-63,742.59	83,000.00
Expense	0.00	77,040.70	0.00	77,040.70	92,455.00
Total Fund: 031 - CAPITAL RSRV-BLDG MAINT:	490.29	-7,874.10	5,424.01	13,298.11	-9,455.00
Fund: 032 - CIP LARGE VEHICLE/EQUIPMENT					
Revenue	0.00	88,333.30	106,000.00	17,666.70	106,000.00
Total Fund: 032 - CIP LARGE VEHICLE/EQUIPMENT:	0.00	88,333.30	106,000.00	17,666.70	106,000.00
Fund: 110 - ROAD USE TAX					
Revenue	320,885.64	2,833,333.30	3,116,633.13	283,299.83	3,400,000.00
Expense	106,812.00	3,719,831.00	2,984,806.59	735,024.41	4,464,797.00
Total Fund: 110 - ROAD USE TAX:	214,073.64	-886,497.70	131,826.54	1,018,324.24	-1,064,797.00
Fund: 112 - EMPLOYEE BENEFITS FUND					
Revenue	803,950.01	2,316,835.70	2,381,929.58	65,093.88	2,780,203.00
Expense	0.00	2,244,990.00	1,841,673.98	403,316.02	2,693,988.00
Total Fund: 112 - EMPLOYEE BENEFITS FUND:	803,950.01	71,845.70	540,255.60	468,409.90	86,215.00
Fund: 117 - POLICE/FIRE RETIREMENT					
Revenue	336,281.69	968,936.50	1,004,071.18	35,134.68	1,162,724.00
Expense	0.00	946,029.90	820,535.57	125,494.33	1,135,685.00
Total Fund: 117 - POLICE/FIRE RETIREMENT:	336,281.69	22,906.60	183,535.61	160,629.01	27,039.00
Fund: 119 - EMERGENCY FUND					
Revenue	70,754.00	203,902.50	209,320.03	5,417.53	244,683.00

Monthly Budget Report - Marshalltown

For Fiscal: Current Period Ending: 04/30/2020

Account Typ...	April Activity	YTD Budget	YTD Activity	Variance Favorable (Unfavorable)	Total Budget
Expense	0.00	203,902.50	138,566.03	65,336.47	244,683.00
Total Fund: 119 - EMERGENCY FUND:	70,754.00	0.00	70,754.00	70,754.00	0.00
Fund: 121 - LOCAL OPTION SALES TAX					
Revenue	274,589.90	3,389,166.60	3,477,729.80	88,563.20	4,067,000.00
Expense	398,324.29	3,047,697.60	2,963,664.63	84,032.97	3,658,471.00
Total Fund: 121 - LOCAL OPTION SALES TAX:	-123,734.39	341,469.00	514,065.17	172,596.17	408,529.00
Fund: 125 - TAX INCREMENT FINANCING					
Revenue	178,199.05	656,806.60	735,351.86	78,545.26	788,171.00
Expense	7,500.00	743,254.80	331,535.28	411,719.52	891,906.00
Total Fund: 125 - TAX INCREMENT FINANCING:	170,699.05	-86,448.20	403,816.58	490,264.78	-103,735.00
Fund: 126 - TIF-LMI					
Revenue	1,323.28	14,626.60	26,554.91	11,928.31	17,552.00
Total Fund: 126 - TIF-LMI:	1,323.28	14,626.60	26,554.91	11,928.31	17,552.00
Fund: 130 - CITY TORT LIABILITY					
Revenue	253.24	25,943.20	26,696.97	753.77	31,140.00
Expense	14,810.29	25,949.60	44,736.30	-18,786.70	31,140.00
Total Fund: 130 - CITY TORT LIABILITY:	-14,557.05	-6.40	-18,039.33	-18,032.93	0.00
Fund: 132 - GRANTS-STATE/LOCAL AGENCIES					
Revenue	0.00	750,024.00	0.00	-750,024.00	900,029.00
Expense	0.00	708,759.90	290,050.00	418,709.90	850,512.00
Total Fund: 132 - GRANTS-STATE/LOCAL AGENCIES:	0.00	41,264.10	-290,050.00	-331,314.10	49,517.00
Fund: 140 - PARK & REC DONATION FUND					
Revenue	168.30	40,833.30	67,279.56	26,446.26	49,000.00
Expense	1,292.95	49,166.50	17,330.08	31,836.42	59,000.00
Total Fund: 140 - PARK & REC DONATION FUND:	-1,124.65	-8,333.20	49,949.48	58,282.68	-10,000.00
Fund: 141 - MTOWN TENNIS ASSOC					
Revenue	3.09	16.60	33.95	17.35	20.00
Total Fund: 141 - MTOWN TENNIS ASSOC:	3.09	16.60	33.95	17.35	20.00
Fund: 142 - SOFTBALL ASSOCIATION FUND					
Revenue	2.80	33,221.60	15,279.99	-17,941.61	39,882.00
Expense	988.18	33,214.30	27,415.20	5,799.10	39,882.00
Total Fund: 142 - SOFTBALL ASSOCIATION FUND:	-985.38	7.30	-12,135.21	-12,142.51	0.00
Fund: 144 - LIVE HEALTHY IOWA					
Revenue	0.00	6,247.50	0.00	-6,247.50	7,500.00
Expense	0.00	6,125.10	5,126.33	998.77	7,351.00
Total Fund: 144 - LIVE HEALTHY IOWA :	0.00	122.40	-5,126.33	-5,248.73	149.00
Fund: 145 - TORNADO GENERAL					
Revenue	424,801.82	939,154.70	1,557,849.66	618,694.96	1,126,986.00
Expense	13,722.10	1,831,969.40	1,781,252.68	50,716.72	2,198,461.00

Monthly Budget Report - Marshalltown

For Fiscal: Current Period Ending: 04/30/2020

Account Typ...	April Activity	YTD Budget	YTD Activity	Variance Favorable (Unfavorable)	Total Budget
Total Fund: 145 - TORNADO GENERAL:	411,079.72	-892,814.70	-223,403.02	669,411.68	-1,071,475.00
Fund: 146 - FEMA VALOR					
Revenue	0.00	6,752.50	9,183.85	2,431.35	8,103.00
Total Fund: 146 - FEMA VALOR:	0.00	6,752.50	9,183.85	2,431.35	8,103.00
Fund: 147 - FEMA DEMO					
Revenue	0.00	25,729.10	30,875.13	5,146.03	30,875.00
Expense	0.00	51,055.40	55,391.85	-4,336.45	61,267.00
Total Fund: 147 - FEMA DEMO:	0.00	-25,326.30	-24,516.72	809.58	-30,392.00
Fund: 148 - FEMA-COVID19					
Expense	1,743.58	0.00	1,889.07	-1,889.07	0.00
Total Fund: 148 - FEMA-COVID19:	1,743.58	0.00	1,889.07	-1,889.07	0.00
Fund: 150 - COPS FAST GRANTS					
Revenue	0.00	45,815.00	36,790.98	-9,024.02	55,000.00
Expense	11,579.77	42,103.70	49,497.60	-7,393.90	50,545.00
Total Fund: 150 - COPS FAST GRANTS:	-11,579.77	3,711.30	-12,706.62	-16,417.92	4,455.00
Fund: 151 - DEPT OF JUSTICE GRANTS					
Revenue	24,668.86	20,029.90	27,203.05	7,173.15	24,045.63
Expense	19,841.50	20,029.90	20,186.00	-156.10	24,045.63
Total Fund: 151 - DEPT OF JUSTICE GRANTS:	4,827.36	0.00	7,017.05	7,017.05	0.00
Fund: 152 - POLICE UNDESIGNATED GRANTS					
Revenue	11,919.40	76,263.60	75,492.63	-770.97	91,553.00
Expense	13,313.52	69,090.90	87,456.35	-18,365.45	82,937.70
Total Fund: 152 - POLICE UNDESIGNATED GRANTS:	-1,394.12	7,172.70	-11,963.72	-19,136.42	8,615.30
Fund: 153 - POLICE DEPT DONATION FUND					
Revenue	140.92	7,247.30	11,493.43	4,246.13	8,700.00
Expense	824.14	16,070.10	25,662.23	-9,592.13	19,291.95
Total Fund: 153 - POLICE DEPT DONATION FUND:	-683.22	-8,822.80	-14,168.80	-5,346.00	-10,591.95
Fund: 156 - FIRE DEPT DONATION FUND					
Revenue	11.33	1,666.60	2,095.75	429.15	2,000.00
Expense	0.00	4,166.60	4,688.61	-522.01	5,000.00
Total Fund: 156 - FIRE DEPT DONATION FUND:	11.33	-2,500.00	-2,592.86	-92.86	-3,000.00
Fund: 157 - FIRE DEPT GRANTS					
Revenue	1,761.52	50.00	1,845.88	1,795.88	60.00
Total Fund: 157 - FIRE DEPT GRANTS:	1,761.52	50.00	1,845.88	1,795.88	60.00
Fund: 160 - ECONOMIC DEVELOPMENT GIFT					
Revenue	91.60	291.60	1,006.89	715.29	350.00
Total Fund: 160 - ECONOMIC DEVELOPMENT GIFT:	91.60	291.60	1,006.89	715.29	350.00

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For Fiscal: Current Period Ending: 04/30/2020

Account Typ...	April Activity	YTD Budget	YTD Activity	Variance Favorable (Unfavorable)	Total Budget
Fund: 161 - SURETY DEPOSITS/SUBDIVIDER					
Revenue	19.11	154.10	210.07	55.97	185.00
Total Fund: 161 - SURETY DEPOSITS/SUBDIVIDER:	19.11	154.10	210.07	55.97	185.00
Fund: 170 - LIBRARY DONATION FUND					
Revenue	2,538.68	18,833.10	26,267.31	7,434.21	22,600.00
Expense	5,147.17	28,249.80	27,075.07	1,174.73	33,900.00
Total Fund: 170 - LIBRARY DONATION FUND:	-2,608.49	-9,416.70	-807.76	8,608.94	-11,300.00
Fund: 177 - SEIZED ASSETS (POLICE)					
Revenue	130.67	1,816.40	1,972.82	156.42	2,180.18
Expense	3,457.97	7,344.20	7,195.01	149.19	8,816.64
Total Fund: 177 - SEIZED ASSETS (POLICE):	-3,327.30	-5,527.80	-5,222.19	305.61	-6,636.46
Fund: 179 - OTHER COMM AND ECON DEVELOPMENT					
Revenue	136.41	333.20	1,523.70	1,190.50	400.00
Expense	0.00	4,152.50	4,985.75	-833.25	4,985.00
Total Fund: 179 - OTHER COMM AND ECON DEVELOPMENT:	136.41	-3,819.30	-3,462.05	357.25	-4,585.00
Fund: 180 - HOUSING GRANTS					
Revenue	47.97	386.60	856.05	469.45	464.00
Total Fund: 180 - HOUSING GRANTS:	47.97	386.60	856.05	469.45	464.00
Fund: 182 - #4 HUD LEAD GRANT					
Expense	0.00	278.20	334.00	-55.80	334.00
Total Fund: 182 - #4 HUD LEAD GRANT:	0.00	278.20	334.00	-55.80	334.00
Fund: 183 - FY 08 EDI (ECON DEV INCENTIVE)					
Expense	0.00	533.10	360.00	173.10	640.00
Total Fund: 183 - FY 08 EDI (ECON DEV INCENTIVE):	0.00	533.10	360.00	173.10	640.00
Fund: 184 - VOUCHERS - 002, 003					
Revenue	98,338.15	898,556.60	840,568.03	-57,988.57	1,078,630.00
Expense	102,095.05	953,256.80	947,654.83	5,601.97	1,144,351.00
Total Fund: 184 - VOUCHERS - 002, 003:	-3,756.90	-54,700.20	-107,086.80	-52,386.60	-65,721.00
Fund: 189 - #6 HUD LEAD GRANT					
Revenue	31,332.60	1,321,835.80	167,086.00	-1,154,749.80	1,586,203.00
Expense	21,441.26	1,314,228.90	163,751.19	1,150,477.71	1,577,703.00
Total Fund: 189 - #6 HUD LEAD GRANT:	9,891.34	7,606.90	3,334.81	-4,272.09	8,500.00
Fund: 200 - GO BONDS DEBT FUND					
Revenue	671,023.39	3,510,792.80	3,454,312.26	-56,480.54	4,213,098.00
Expense	14,243.00	3,526,485.40	456,660.50	3,069,824.90	4,233,126.00
Total Fund: 200 - GO BONDS DEBT FUND:	656,780.39	-15,692.60	2,997,651.76	3,013,344.36	-20,028.00
Fund: 300 - CIP COLLECTION FUND					
Revenue	176,882.61	509,361.50	526,140.62	16,779.12	611,234.00
Expense	0.00	512,068.30	542,811.86	-30,743.56	614,482.00

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Account Typ...	April Activity	YTD Budget	YTD Activity	Variance Favorable (Unfavorable)	Total Budget
Total Fund: 300 - CIP COLLECTION FUND:	176,882.61	-2,706.80	-16,671.24	-13,964.44	-3,248.00
Fund: 311 - RISE STREET GRANTS					
Expense	15,683.50	3,333.30	47,905.00	-44,571.70	4,000.00
Total Fund: 311 - RISE STREET GRANTS:	15,683.50	3,333.30	47,905.00	-44,571.70	4,000.00
Fund: 312 - AIRPORT PROJECT FUND					
Revenue	0.00	68,695.80	82,181.22	13,485.42	82,435.00
Expense	143,739.94	50,250.00	231,896.60	-181,646.60	60,300.00
Total Fund: 312 - AIRPORT PROJECT FUND:	-143,739.94	18,445.80	-149,715.38	-168,161.18	22,135.00
Fund: 320 - SPECIAL ASSESSMENT PROJECTS					
Revenue	0.00	4,166.60	5,603.00	1,436.40	5,000.00
Total Fund: 320 - SPECIAL ASSESSMENT PROJECTS:	0.00	4,166.60	5,603.00	1,436.40	5,000.00
Fund: 340 - BIKE PATH PROJECT FUND					
Revenue	0.00	117,785.40	17,214.10	-100,571.30	141,385.00
Expense	2,082.80	117,820.70	108,817.14	9,003.56	141,385.00
Total Fund: 340 - BIKE PATH PROJECT FUND:	-2,082.80	-35.30	-91,603.04	-91,567.74	0.00
Fund: 341 - TREES FOREVER PROJECT					
Revenue	5,023.43	8,333.30	13,869.71	5,536.41	10,000.00
Expense	0.00	8,333.30	8,692.50	-359.20	10,000.00
Total Fund: 341 - TREES FOREVER PROJECT:	5,023.43	0.00	5,177.21	5,177.21	0.00
Fund: 350 - GO BONDS CAPITAL PROJECTS					
Revenue	15.57	41.60	171.14	129.54	50.00
Total Fund: 350 - GO BONDS CAPITAL PROJECTS:	15.57	41.60	171.14	129.54	50.00
Fund: 354 - POLICE & FIRE STATIONS					
Revenue	1,173.03	48,155.10	68,815.18	20,660.08	57,801.33
Expense	39,938.80	2,451,974.20	2,286,508.15	165,466.05	2,944,636.08
Total Fund: 354 - POLICE & FIRE STATIONS:	-38,765.77	-2,403,819.10	-2,217,692.97	186,126.13	-2,886,834.75
Fund: 355 - 2015 GO BONDS (D&D)					
Revenue	2,101.32	18,021.70	29,865.54	11,843.84	21,634.00
Expense	9,449.30	236,226.50	220,063.41	16,163.09	283,475.00
Total Fund: 355 - 2015 GO BONDS (D&D):	-7,347.98	-218,204.80	-190,197.87	28,006.93	-261,841.00
Fund: 357 - 2018 CY STREET PROJECTS					
Revenue	0.00	78,659.90	44,388.31	-34,271.59	94,392.00
Expense	0.00	78,659.90	44,388.31	34,271.59	94,392.00
Total Fund: 357 - 2018 CY STREET PROJECTS:	0.00	0.00	0.00	0.00	0.00
Fund: 360 - 2019 GO BONDS & PROJECTS					
Revenue	0.00	4,779,099.00	5,714,818.97	935,719.97	5,734,919.00
Expense	5,976.57	1,872,280.70	371,740.63	1,500,540.07	2,246,737.00
Total Fund: 360 - 2019 GO BONDS & PROJECTS:	-5,976.57	2,906,818.30	5,343,078.34	2,436,260.04	3,488,182.00

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Account Typ...	April Activity	YTD Budget	YTD Activity	Variance Favorable (Unfavorable)	Total Budget
Fund: 361 - LIBRARY BUILDING ADDITION					
Revenue	750.00	0.00	750.00	750.00	0.00
Total Fund: 361 - LIBRARY BUILDING ADDITION:	750.00	0.00	750.00	750.00	0.00
Fund: 381 - 2019 CY STREET,SIDEWALK,PARKING PROJECTS					
Revenue	3,143.49	37,500.00	47,589.13	10,089.13	45,000.00
Expense	130,906.29	1,558,333.30	586,081.04	972,252.26	1,870,000.00
Total Fund: 381 - 2019 CY STREET,SIDEWALK,PARKING PROJECTS:	-127,762.80	-1,520,833.30	-538,491.91	982,341.39	-1,825,000.00
Fund: 383 - COLISEUM REMODEL					
Revenue	7,779.24	2,812,345.60	2,357,801.33	-454,544.27	3,375,381.00
Expense	42,906.50	1,967,821.30	355,575.02	1,612,246.28	2,362,271.00
Total Fund: 383 - COLISEUM REMODEL:	-35,127.26	844,524.30	2,002,226.31	1,157,702.01	1,013,110.00
Fund: 392 - TIF DISTRICT III CAP PROJECTS					
Revenue	14.15	41.60	155.50	113.90	50.00
Total Fund: 392 - TIF DISTRICT III CAP PROJECTS:	14.15	41.60	155.50	113.90	50.00
Fund: 393 - TIF DISTRICT IV CAP PROJECTS					
Expense	0.00	89,890.90	107,871.50	-17,980.60	107,872.00
Total Fund: 393 - TIF DISTRICT IV CAP PROJECTS:	0.00	89,890.90	107,871.50	-17,980.60	107,872.00
Fund: 395 - ECONOMIC DEVELOPMENT PROJECT FUND					
Expense	-83,375.30	0.00	0.00	0.00	0.00
Total Fund: 395 - ECONOMIC DEVELOPMENT PROJECT FUND:	-83,375.30	0.00	0.00	0.00	0.00
Fund: 610 - WATER POLLUTION CONTROL					
Revenue	331,358.00	12,805,679.10	11,437,192.13	-1,368,486.97	15,366,815.00
Expense	268,434.74	12,798,303.80	11,426,713.23	1,371,590.57	15,359,019.00
Total Fund: 610 - WATER POLLUTION CONTROL:	62,923.26	7,375.30	10,478.90	3,103.60	7,796.00
Fund: 611 - WPCP REVENUE					
Revenue	888,903.24	13,397,743.00	15,565,594.91	2,167,851.91	16,077,296.00
Expense	331,358.00	12,889,012.40	11,452,681.35	1,436,331.05	15,466,815.00
Total Fund: 611 - WPCP REVENUE:	557,545.24	508,730.60	4,112,913.56	3,604,182.96	610,481.00
Fund: 612 - WPCP REVENUE BOND FUND					
Revenue	0.00	2,915,500.00	1,198,499.24	-1,717,000.76	3,500,000.00
Expense	142,885.78	2,916,666.50	1,465,011.12	1,451,655.38	3,500,000.00
Total Fund: 612 - WPCP REVENUE BOND FUND:	-142,885.78	-1,166.50	-266,511.88	-265,345.38	0.00
Fund: 614 - WPCP CAPITAL IMPROVEMENT RSRV					
Revenue	1,867.29	20,833.30	27,896.93	7,063.63	25,000.00
Total Fund: 614 - WPCP CAPITAL IMPROVEMENT RSRV:	1,867.29	20,833.30	27,896.93	7,063.63	25,000.00
Fund: 616 - SANITARY SEWER REHAB PROJECT					
Revenue	0.00	83,333.30	13,122.25	-70,211.05	100,000.00

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Account Typ...	April Activity	YTD Budget	YTD Activity	Variance Favorable (Unfavorable)	Total Budget
Expense	0.00	83,333.30	13,122.25	70,211.05	100,000.00
Total Fund: 616 - SANITARY SEWER REHAB PROJECT:	0.00	0.00	0.00	0.00	0.00
Fund: 617 - SANITARY SEWER NEW CONSTRUCTN					
Revenue	3,972.00	12,916.60	12,728.00	-188.60	15,500.00
Total Fund: 617 - SANITARY SEWER NEW CONSTRUCTN:	3,972.00	12,916.60	12,728.00	-188.60	15,500.00
Fund: 690 - TRANSIT OPERATING					
Revenue	108,853.47	680,157.90	678,901.11	-1,256.79	816,190.00
Expense	66,553.10	674,025.00	621,223.13	52,801.87	809,059.00
Total Fund: 690 - TRANSIT OPERATING:	42,300.37	6,132.90	57,677.98	51,545.08	7,131.00
Fund: 740 - STORM SEWER UTILITY					
Revenue	120,775.59	1,263,370.60	1,206,644.65	-56,725.95	1,516,045.00
Expense	48,288.35	1,819,718.50	1,223,926.87	595,791.63	2,183,805.00
Total Fund: 740 - STORM SEWER UTILITY:	72,487.24	-556,347.90	-17,282.22	539,065.68	-667,760.00
Fund: 741 - 2016 GO STORM WATER PROJ					
Revenue	0.00	897,946.60	603,882.53	-294,064.07	1,077,536.00
Expense	34,042.24	1,841,666.60	1,770,388.45	71,278.15	2,210,000.00
Total Fund: 741 - 2016 GO STORM WATER PROJ:	-34,042.24	-943,720.00	-1,166,505.92	-222,785.92	-1,132,464.00
Fund: 750 - COMPOSTING FACILITY					
Revenue	10,689.00	48,173.90	53,019.48	4,845.58	57,809.00
Expense	13,836.91	59,363.90	65,368.57	-6,004.67	71,261.00
Total Fund: 750 - COMPOSTING FACILITY:	-3,147.91	-11,190.00	-12,349.09	-1,159.09	-13,452.00
Fund: 751 - TORNADO - COMPOST					
Expense	0.00	127,816.60	153,380.00	-25,563.40	153,380.00
Total Fund: 751 - TORNADO - COMPOST:	0.00	127,816.60	153,380.00	-25,563.40	153,380.00
Fund: 760 - P&R CONCESSIONS ENTERPRISE					
Revenue	0.00	34,166.60	23,186.15	-10,980.45	41,000.00
Expense	0.00	33,562.60	27,814.71	5,747.89	40,276.00
Total Fund: 760 - P&R CONCESSIONS ENTERPRISE:	0.00	604.00	-4,628.56	-5,232.56	724.00
Fund: 881 - OCCUPATIONAL INSURANCE ESCROW					
Revenue	16,062.04	0.00	114,836.44	114,836.44	0.00
Expense	5,113.92	0.00	126,825.05	-126,825.05	0.00
Total Fund: 881 - OCCUPATIONAL INSURANCE ESCROW:	10,948.12	0.00	-11,988.61	-11,988.61	0.00
Fund: 884 - GROUP HEALTH INSURANCE ESCROW					
Revenue	225,871.70	0.00	2,750,854.28	2,750,854.28	0.00
Expense	161,548.54	0.00	3,133,230.63	-3,133,230.63	0.00
Total Fund: 884 - GROUP HEALTH INSURANCE ESCROW:	64,323.16	0.00	-382,376.35	-382,376.35	0.00
Fund: 886 - WORKMAN'S COMP DEDUCTIBLE FUND					
Revenue	64.99	0.00	757.17	757.17	0.00
Expense	0.00	0.00	973.12	-973.12	0.00

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Account Typ...	April Activity	YTD Budget	YTD Activity	Variance Favorable (Unfavorable)	Total Budget
Total Fund: 886 - WORKMAN'S COMP DEDUCTIBLE FUND:	64.99	0.00	-215.95	-215.95	0.00
Fund: 910 - POLICE PENSION - T & A					
Revenue	0.00	0.00	8,282.90	8,282.90	0.00
Expense	828.29	0.00	9,111.19	-9,111.19	0.00
Total Fund: 910 - POLICE PENSION - T & A:	-828.29	0.00	-828.29	-828.29	0.00
Fund: 913 - 911 COMMISSION					
Revenue	147,161.84	0.00	802,858.11	802,858.11	0.00
Expense	113,385.80	0.00	859,752.83	-859,752.83	0.00
Total Fund: 913 - 911 COMMISSION:	33,776.04	0.00	-56,894.72	-56,894.72	0.00
Report Total:	4,033,138.66	-3,016,284.10	10,312,025.00	13,328,309.10	-3,630,321.51

Fund Summary

Fund	April Activity	YTD Budget	YTD Activity	Variance Favorable (Unfavorable)	Total Budget
001 - GENERAL FUND	981,808.84	88,210.40	-210,540.69	-298,751.09	102,351.35
010 - CASH FLOW RESERVE FUND	4,162.20	43,522.40	78,554.60	35,032.20	52,227.00
030 - CAPITAL RESERVE	-28,437.26	-197,709.30	-21,193.01	176,516.29	-237,270.00
031 - CAPITAL RSRV-BLDG MAINT	490.29	-7,874.10	5,424.01	13,298.11	-9,455.00
032 - CIP LARGE VEHICLE/EQUIPMI	0.00	88,333.30	106,000.00	17,666.70	106,000.00
110 - ROAD USE TAX	214,073.64	-886,497.70	131,826.54	1,018,324.24	-1,064,797.00
112 - EMPLOYEE BENEFITS FUND	803,950.01	71,845.70	540,255.60	468,409.90	86,215.00
117 - POLICE/FIRE RETIREMENT	336,281.69	22,906.60	183,535.61	160,629.01	27,039.00
119 - EMERGENCY FUND	70,754.00	0.00	70,754.00	70,754.00	0.00
121 - LOCAL OPTION SALES TAX	-123,734.39	341,469.00	514,065.17	172,596.17	408,529.00
125 - TAX INCREMENT FINANCING	170,699.05	-86,448.20	403,816.58	490,264.78	-103,735.00
126 - TIF-LMI	1,323.28	14,626.60	26,554.91	11,928.31	17,552.00
130 - CITY TORT LIABILITY	-14,557.05	-6.40	-18,039.33	-18,032.93	0.00
132 - GRANTS-STATE/LOCAL AGEN	0.00	41,264.10	-290,050.00	-331,314.10	49,517.00
140 - PARK & REC DONATION FUNI	-1,124.65	-8,333.20	49,949.48	58,282.68	-10,000.00
141 - MTOWN TENNIS ASSOC	3.09	16.60	33.95	17.35	20.00
142 - SOFTBALL ASSOCIATION FUN	-985.38	7.30	-12,135.21	-12,142.51	0.00
144 - LIVE HEALTHY IOWA	0.00	122.40	-5,126.33	-5,248.73	149.00
145 - TORNADO GENERAL	411,079.72	-892,814.70	-223,403.02	669,411.68	-1,071,475.00
146 - FEMA VALOR	0.00	6,752.50	9,183.85	2,431.35	8,103.00
147 - FEMA DEMO	0.00	-25,326.30	-24,516.72	809.58	-30,392.00
148 - FEMA-COVID19	-1,743.58	0.00	-1,889.07	-1,889.07	0.00
150 - COPS FAST GRANTS	-11,579.77	3,711.30	-12,706.62	-16,417.92	4,455.00
151 - DEPT OF JUSTICE GRANTS	4,827.36	0.00	7,017.05	7,017.05	0.00
152 - POLICE UNDESIGNATED GRAI	-1,394.12	7,172.70	-11,963.72	-19,136.42	8,615.30
153 - POLICE DEPT DONATION FUN	-683.22	-8,822.80	-14,168.80	-5,346.00	-10,591.95
156 - FIRE DEPT DONATION FUND	11.33	-2,500.00	-2,592.86	-92.86	-3,000.00
157 - FIRE DEPT GRANTS	1,761.52	50.00	1,845.88	1,795.88	60.00
160 - ECONOMIC DEVELOPMENT G	91.60	291.60	1,006.89	715.29	350.00
161 - SURETY DEPOSITS/SUBDIVIDI	19.11	154.10	210.07	55.97	185.00
170 - LIBRARY DONATION FUND	-2,608.49	-9,416.70	-807.76	8,608.94	-11,300.00
177 - SEIZED ASSETS (POLICE)	-3,327.30	-5,527.80	-5,222.19	305.61	-6,636.46
179 - OTHER COMM AND ECON DE	136.41	-3,819.30	-3,462.05	357.25	-4,585.00
180 - HOUSING GRANTS	47.97	386.60	856.05	469.45	464.00
182 - #4 HUD LEAD GRANT	0.00	-278.20	-334.00	-55.80	-334.00
183 - FY 08 EDI (ECON DEV INCENT	0.00	-533.10	-360.00	173.10	-640.00
184 - VOUCHERS - 002, 003	-3,756.90	-54,700.20	-107,086.80	-52,386.60	-65,721.00
189 - #6 HUD LEAD GRANT	9,891.34	7,606.90	3,334.81	-4,272.09	8,500.00
200 - GO BONDS DEBT FUND	656,780.39	-15,692.60	2,997,651.76	3,013,344.36	-20,028.00
300 - CIP COLLECTION FUND	176,882.61	-2,706.80	-16,671.24	-13,964.44	-3,248.00

Monthly Budget Report - Marshalltown
For Fiscal: Current Period Ending: 04/30/2020

311 - RISE STREET GRANTS	-15,683.50	-3,333.30	-47,905.00	-44,571.70	-4,000.00
312 - AIRPORT PROJECT FUND	-143,739.94	18,445.80	-149,715.38	-168,161.18	22,135.00
320 - SPECIAL ASSESSMENT PROJEC	0.00	4,166.60	5,603.00	1,436.40	5,000.00
340 - BIKE PATH PROJECT FUND	-2,082.80	-35.30	-91,603.04	-91,567.74	0.00
341 - TREES FOREVER PROJECT	5,023.43	0.00	5,177.21	5,177.21	0.00
350 - GO BONDS CAPITAL PROJECT	15.57	41.60	171.14	129.54	50.00
354 - POLICE & FIRE STATIONS	-38,765.77	-2,403,819.10	-2,217,692.97	186,126.13	-2,886,834.75
355 - 2015 GO BONDS (D&D)	-7,347.98	-218,204.80	-190,197.87	28,006.93	-261,841.00
357 - 2018 CY STREET PROJECTS	0.00	0.00	0.00	0.00	0.00
360 - 2019 GO BONDS & PROJECTS	-5,976.57	2,906,818.30	5,343,078.34	2,436,260.04	3,488,182.00
361 - LIBRARY BUILDING ADDITION	750.00	0.00	750.00	750.00	0.00
381 - 2019 CY STREET,SIDEWALK,P	-127,762.80	-1,520,833.30	-538,491.91	982,341.39	-1,825,000.00
383 - COLISEUM REMODEL	-35,127.26	844,524.30	2,002,226.31	1,157,702.01	1,013,110.00
392 - TIF DISTRICT III CAP PROJECT	14.15	41.60	155.50	113.90	50.00
393 - TIF DISTRICT IV CAP PROJECT	0.00	-89,890.90	-107,871.50	-17,980.60	-107,872.00
395 - ECONOMIC DEVELOPMENT P	83,375.30	0.00	0.00	0.00	0.00
610 - WATER POLLUTION CONTROL	62,923.26	7,375.30	10,478.90	3,103.60	7,796.00
611 - WPCP REVENUE	557,545.24	508,730.60	4,112,913.56	3,604,182.96	610,481.00
612 - WPCP REVENUE BOND FUND	-142,885.78	-1,166.50	-266,511.88	-265,345.38	0.00
614 - WPCP CAPITAL IMPROVEMENT	1,867.29	20,833.30	27,896.93	7,063.63	25,000.00
616 - SANITARY SEWER REHAB PRC	0.00	0.00	0.00	0.00	0.00
617 - SANITARY SEWER NEW CONS	3,972.00	12,916.60	12,728.00	-188.60	15,500.00
690 - TRANSIT OPERATING	42,300.37	6,132.90	57,677.98	51,545.08	7,131.00
740 - STORM SEWER UTILITY	72,487.24	-556,347.90	-17,282.22	539,065.68	-667,760.00
741 - 2016 GO STORM WATER PRC	-34,042.24	-943,720.00	-1,166,505.92	-222,785.92	-1,132,464.00
750 - COMPOSTING FACILITY	-3,147.91	-11,190.00	-12,349.09	-1,159.09	-13,452.00
751 - TORNADO - COMPOST	0.00	-127,816.60	-153,380.00	-25,563.40	-153,380.00
760 - P&R CONCESSIONS ENTERPR	0.00	604.00	-4,628.56	-5,232.56	724.00
881 - OCCUPATIONAL INSURANCE	10,948.12	0.00	-11,988.61	-11,988.61	0.00
884 - GROUP HEALTH INSURANCE I	64,323.16	0.00	-382,376.35	-382,376.35	0.00
886 - WORKMAN'S COMP DEDUCT	64.99	0.00	-215.95	-215.95	0.00
910 - POLICE PENSION - T & A	-828.29	0.00	-828.29	-828.29	0.00
913 - 911 COMMISSION	33,776.04	0.00	-56,894.72	-56,894.72	0.00
Report Total:	4,033,138.66	-3,016,284.10	10,312,025.00	13,328,309.10	-3,630,321.51

**RESOLUTION APPROVING IOWA DOT AGREEMENT 2020-R-005 FOR A RISE GRANT IN
THE AMOUNT OF \$1,640,342**

WHEREAS the City of Marshalltown applied for a RISE Grant from the Iowa Department of Transportation to support the development of the extension of Edgewood Street and North 8th Avenue to provide a truck diversion route from Highway 14 to industries on the eastern side of the City; and

WHEREAS, the Iowa DOT Commission approved a grant of \$1,640,342 to the City of Marshalltown at their October 2019 meeting; and

WHEREAS, the City has continued to pursue additional funding for the project and required stormwater infrastructure through the United States Economic Development Administration, which changed some aspects of the City's original scope of work with the Iowa DOT; and

WHEREAS, the Iowa DOT has presented an Agreement 2020-R-005 to the City of Marshalltown for the acceptance of the RISE Grant for \$1,640,342, which matches the new developable acreage;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF MARSHALLTOWN, IOWA, Iowa DOT Agreement 2020-R-005 is hereby approved and the Mayor is directed to execute the Agreement.

Passed this 26th day of May, 2020, and signed this _____ day of May, 2020.

CITY OF MARSHALLTOWN, IOWA

Joel T.S. Greer, Mayor

ATTEST:

Shari L. Coughenour, CMC, City Clerk

Interstate Power & Light Company (Applicable to the Iowa Service Area)
ESTIMATE

Customer Name: Marshalls town City Street Lights
 Contact Name:
 Mailing Address: 24 N Center St
 Marshalltown, IA 50158

Date: 5/6/2020

Phone #

Project Address: Uptown Marshalltown

Account ID 1997221000
 SA ID 1990454478
 SP ID

Lighting WR # 4208526

Standard Charge Description	Billing Code	QTY	Installed Cost
30' STEEL LIGHTING POLE (INCLUDES BASE)	S-09	72 each	\$114,768.00
U GUARD FOR WOODEN LIGHTING POLE	S-33	22 each	\$4,202.00
DOWN GUY & ANCHOR FOR WOODEN LIGHTING POLE	S-34	1 each	\$241.00
LIGHTING UNDERGROUND CABLE	S-30	3,369 feet	\$2,358.30
DIRECTIONAL BORING - 2"	I-10	11,490 feet	\$195,330.00
HAND DIGGING	I-15	37 feet	\$314.50
DUCT - PVC 2" # of Ducts = 1	I-12	11,499 feet	\$28,747.50
LABOR - CABLE PULLING (PER FOOT PER DUCT) # of Ducts = 1	I-06	11,499 feet	\$28,747.50
CONCRETE SIDEWALK REMOVAL & REPLACEMENT	I-07	1,500 sq ft	\$29,100.00
TOP SOIL & SEED	I-18	600 sq ft	\$960.00
GRAVEL OR SAND BACKFILL	I-14	30 ton	\$1,230.00
EASEMENT PREPARATION - 1ST EASEMENT ONLY	X-01	1 each	\$315.00
ADDITIONAL EASEMENT PREPARATION - EACH AFTER FIRST	X-02	1 each	\$200.00
1 PHASE CABLE ONLY - RURAL UNDERGROUND PRIMARY - 4/0 AL	E-24	100 feet	\$261.62
1 PHASE CABLE SPLICES - UNDERGROUND PRIMARY - #2 AL	E-24	100 feet	\$261.62
1 PHASE SECONDARY RISER	E-30	21 each	\$6,343.19
1 PHASE UNDERGROUND SECONDARY PEDESTAL	E-31	15 each	\$6,350.33

Iowa Total Free Conductor Footage = 0 feet

Iowa Total Free Cable Footage = 8158 feet

Iowa Free Trenching Footage = 8026 feet

Street Lighting Facilities Installed Standard Charge = \$406,513.80

Electric Distribution Facilities Installed Standard Charge = \$13,216.77

Iowa Lighting Contribution Tax Adder = 8.495%

Iowa Electric Distribution Contribution Tax Adder = 18.920%

Tax Amount = \$37,033.96

Non-Refundable Contribution In Aid of Construction Required = \$441,047.15

Reimbursable Charge Description	Billing Code	Amount
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Non-Refundable Reimbursement Required = \$0.00

Tariff Item Description	Rate Code	QTY	Total Charge
Roadway: 47-113 Watts / 150 HPS	640	73 each	\$672.33
Shared Wood	640	1 each	\$3.59
30' Steel	640	72 each	\$2,304.00
Concrete Base	640	72 each	\$1,395.36

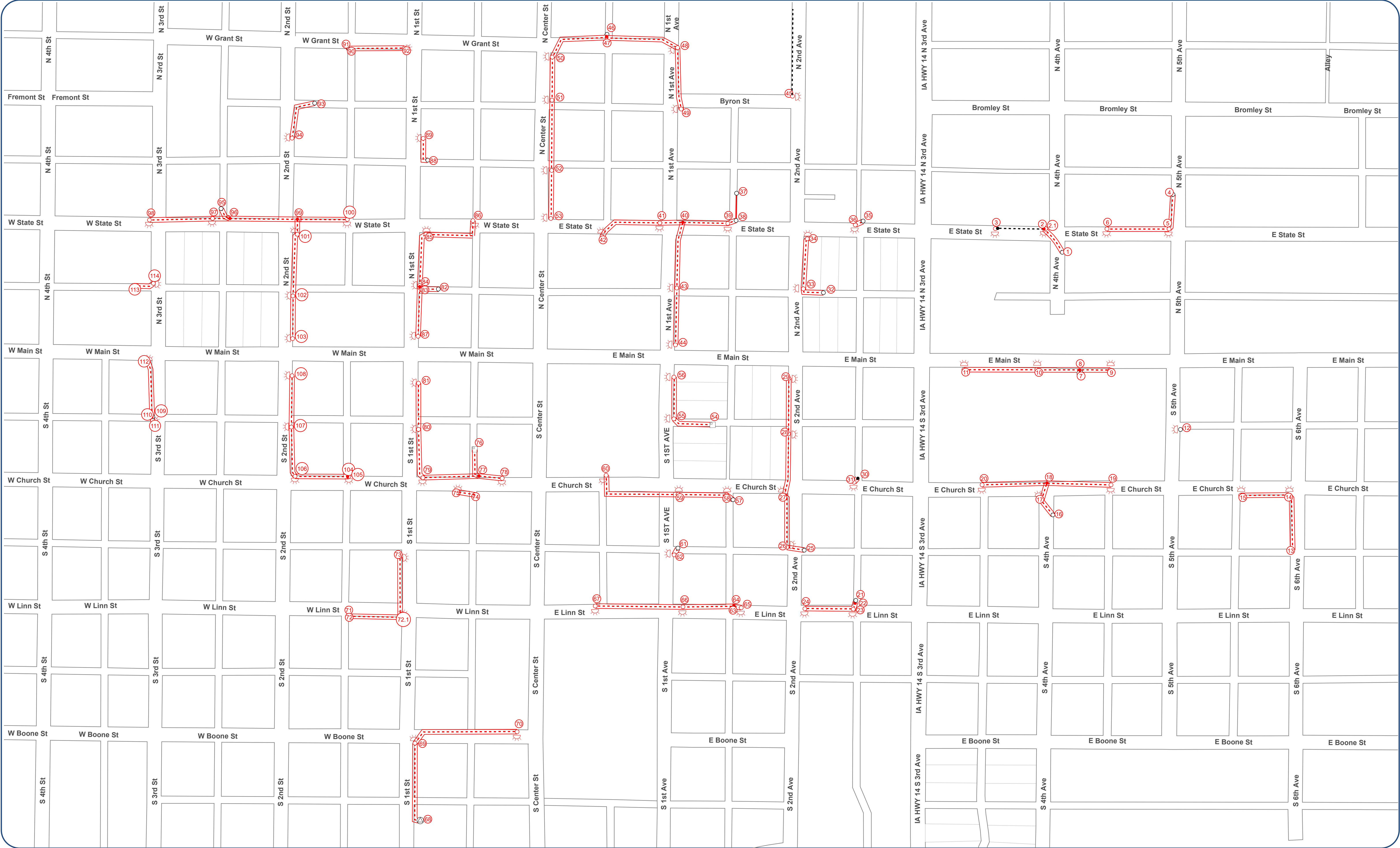
monthly Tariff cost without energy charge and taxes = \$675.92

Total Non-Refundable Project Contribution = \$441,047.15



Pricing valid for 30 calendar days. (until 06/05/2020)

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MARSHALLTOWN

— I O W A —

City Administrator's Office

Joel Greer, Mayor
Jessica Kinser, Administrator
Shari L. Coughenour, Clerk
24 North Center Street
Marshalltown, IA 50158-4911
Tel - (641) 754-5799
Fax - (641) 754-5717

To: Mayor Greer and the City Council
From: Jessica Kinser, City Administrator
Date: May 15, 2020
RE: Street Light Replacement

Policy Issue: Council is required to approve purchases over \$44,999

Recommendation: To approve the resolution as proposed

Background: The tornado destroyed the street light infrastructure in Downtown in a way that could not be quickly repaired. Many street lights needed to be replaced completely and the overhead wiring which connected the lights was gone. The City has been working with Alliant Energy for more than a year to plan for the installation of lights and underground wiring to bring back consistent, reliable street lighting to Downtown.

Alliant Energy conducted a lighting study to review where street lights needed to be placed to provide the necessary lumens for each block in the night hours. This study showed that street lights did not need to be replaced exactly as they stood before the tornado, and gave some flexibility to how the project could be planned. The overview map shows that most streets will have lighting on one side of the street, which was done to eliminate the amount of underground boring required back and forth across a street in order to keep a series of lights connected.

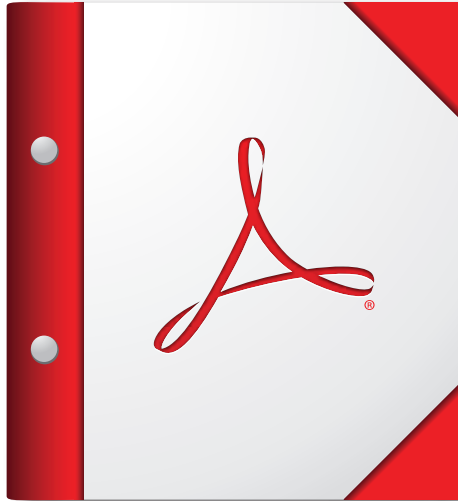
After consulting with the MCBF, we determined that the poles will be a black powder-coated pole to better match the decorative street lights, trash cans and benches throughout Downtown. The City will be responsible for future maintenance of the powder coating.

Budget Impact: \$250,000 in Road Use Tax in FY21 was budgeted and has been adjusted to match the current quote of \$441,000.

Attachment: Quote and Map

City Council
Susan Cahill, Michael Gowdy, Al Hoop,
Gabriel Isom, Leon Lamer, Bill Martin, Bethany Wirin





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#2020- _____

**RESOLUTION DECLARING CERTAIN PROPERTY SURPLUS PROPERTY AND
AUTHORIZING SALE AND DISPOSAL THEREOF, 1996 Cat Forklift, Model GC15**

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

WHEREAS the City is the sole owner of the equipment listed in Section 1 which is to be declared surplus property; and

WHEREAS this surplus property should be disposed of or sold to raise additional revenue and prevent the further decline in value thereof prior to sale; and.

WHEREAS the disposal of excess property is in the best interests of the City of Marshalltown.

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

Section 1. The property listed below is hereby declared as surplus property:

<u>Asset Id</u>	<u>Description</u>
5766	1996 Cat Forklift, Model GC15 (serial # 2EM03783)

Section 2. The surplus property the subject of this resolution shall be sold or disposed of in accordance with applicable Federal, State and City guidelines.

Passed this 26th day of May 2020, and signed this ____ day of May 2020.

CITY OF MARSHALLTOWN, IOWA

Joel Greer, Mayor
ATTEST:

Shari L. Coughenour, CMC, City Clerk

RESOLUTION ORDERING CONSTRUCTION OF THE 1ST STREET PARKING LOT
PROJECT PLT19001, 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 construction of the 1ST Street Parking Lot Project No. PLT19001, in the City of Marshalltown, Iowa, as is fully set forth in the plans and specifications for Project No. PLT19001 , 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 1st Street Parking Lot Project in the City of Marshalltown, Iowa, which public improvement is fully and particularly described in the plans and specifications for Project No. PLT19001, 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 1st Street Parking Lot 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 May 26__, 2020, 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. The City Clerk 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 o'clock A.M., local time, on July 7, 2020_. The bids will be opened, read, and tabulated by the City Engineer or his 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 o'clock P.M., local time, on July 13, 2020, 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 26th day of May, 2020, and signed this _____ day of May, 2020,.

CITY OF MARSHALLTOWN, IOWA

Joel Greer, Mayor

ATTEST:

Shari L. Coughenour, CMC, City Clerk



Joel Greer, Mayor
Jessica Kinser, Administrator
Justin Nickel, Public Works Director
24 North Center Street
Marshalltown, IA 50158-4911
Tel - (641) 754-5760
Fax - (641) 754-5781

DEPARTMENT OF PUBLIC WORKS

May 26, 2020

To: Mayor Joel Greer
Members of the City Council

From: Jay C. Koch
Civil Engineer II

Re: Order Construction – 1st Street Parking Lot, PLT19001.

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

Recommendation: Staff recommends approving the Resolution ordering construction of the 1st Street Parking Lot project.

Background: The City received sponsored project funds as a bonus to borrowing from the State Revolving Fund for use in a water quality project. In 2017, the Council selected the parking lot at 1st Street and Church to reconstruct a permeable paver parking lot. The estimated project cost is \$975,000. The project is expected to begin in late July or early August 2020 and be complete by November or December 2020.

Budget Impact: This project will be funded with SRF sponsored project funds, Iowa Department of Agriculture and Land Stewardship grant, stormwater funds and GO bonds.

Attachment: None

cc: Jessica Kinser, City Administrator

City Council
Susan Cahill, Gary Thompson, Mike Gowdy,
Al Hoop, Gabriel Isom, Bill Martin, Bethany Wirin



RESOLUTION ORDERING CONSTRUCTION OF THE WASHINGTON STREET
EXTENSION PROJECT ECO20001, 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 construction of the Washington Street Extension Project No. ECO20001, in the City of Marshalltown, Iowa, as is fully set forth in the plans and specifications for Project No ECO20001 , 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 Washington Street Extension Project in the City of Marshalltown, Iowa, which public improvement is fully and particularly described in the plans and specifications for Project No. ECO20001, 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 Washington Street Extension 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 May 26__, 2020, 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. The City Clerk 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 o'clock A.M., local time, on June 9, 2020_. The bids will be opened, read, and tabulated by the City Engineer or his 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 o'clock P.M., local time, on June 22, 2020, 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 26th day of May, 2020, and signed this _____ day of May, 2020,.

CITY OF MARSHALLTOWN, IOWA

Joel Greer, Mayor

ATTEST:

Shari L. Coughenour, CMC, City Clerk

PROJECT PRE-PLANNING WORKSHEET

DESCRIPTION	RESPONSIBLE	NOTES
PROJECT NAME	Washington Street Extension	
PROJECT NUMBER	ECO20001	
ARCHITECT		PROJECT TIMELINE: First day to file plans with MBI plan room / Civil Plus Bid Notice 4/25/2020
ENGINEER	LEE Chamberlin Consultant Engineers Wade Harris wharris@leechamberlinengineers.com (515) 344-5562	Receive Plans / Project Manual DEADLINE 5/21/2020
CITY STAFF NAME RESPONSIBLE FOR WORKING WITH ARCHITECT / ENGINEER TO GET DOCUMENTS	Jay Koch jkoch@marshalltown-ia.gov Ext.4150	RES TO ORDER CONSTRUCTION DUE IN WIP FILE 5/21/2020
RES ORDER CONSTRUCTION - DATE (REQUIRES PLANS AND MANUAL IN HAND, PDF FORMAT, BY CITY)	5/26/2020	LEAD STAFF (WITH ASSIST BY CLERK) First day to publish hearing notice for plans / specs with TR 5/6/2020
RES HRG PLANS SPECIFICATIONS	5/26/2020	LEAD STAFF (WITH ASSIST BY CLERK) RES PH FOR PLANS SPECS DUE IN WIP FILE 5/21/2020
PRECONSTRUCTION MEETING	none	Last day to file plans with MBI plan room / Civic Plus Bid Notice 5/27/2020
BIDS DUE : time 10:00 AM	6/9/2020	Last day to publish hearing notice for plans / specs with TR 5/22/2020
RES AUTH AWARD / NEGOT CONTRACT (REQUIRES BID TAB IN HAND, PDF FORMAT, BY CITY)	6/22/2020	Preconstruction meeting none
ESTIMATED COMPLETION DATE	9/15/2020	Bids Due 6/9/2020
RESOLUTION ORDERING CONSTRUCTION (no later than Friday am) - PDF FORMAT	5/21/2020	Bid Tab Due IN WIP FILE 6/17/2020
ORDERING CONSTRUCTION (no later than Friday am) PDF FORMAT	5/21/2020	RES AUTH AWARD / NEGOT CONTRACT DUE IN WIP FILE 6/17/2020
BID TAB BY (DEADLINE DATE)*no later than Friday am	6/17/2020 6/19/2020	LEAD STAFF - SAVE IN WIP MEETING FILE
		SALES TAX EXEMP CERT ISSUED AFTER SIGNED CONTRACT, BOND, INS, W-9 IS RECEIVED
		List of Subs provided to Clerk for Sales Tax Certificates
		ESTIMATED COMPLETION DATE
		RES CERTIFYING PROJECT COMPLETE DATE
ROOM - NO MORE THAN 45 DAYS BEFORE /NO LESS THAN 13 DAYS BEFORE BIDS DUE - DATE RANGE:	4/25/2020 5/27/2020	CLERK REQUIRES PROJECT MANUAL AND PLANS PDF FORMAT
DAYS BEFORE /NO LESS THAN 13 DAYS BEFORE BIDS DUE - DATE RANGE:	4/25/2020 5/27/2020	LEAD STAFF (NEED PLANS & MANUAL)
TR NPH PLANS /SPECS PUBLICATION DATE RANGE - 20/4 REQ	5/6/2020 5/22/2020	CLERK

PROJECT PRE-PLANNING WORKSHEET

FOR CONTRACTOR BEFORE ISSUE SALES TAX EXEMPTION CERTIFICATE	CLERK
LIST OF SUBCONTRACTORS/TIN/ TYPE OF WORK/ FOR SALES TAX EXEMPTION CERTIFICATE ISSUE	CLERK
LEGAL EXPENSE ACCOUNT	
ACCOUNT NUMBER FOR PUBLICATION EXPENSE	

Washington Street Extension
Marshalltown, Iowa

DATE: 5/18/2020

ENGINEERS ESTIMATE OF PROBABLE CONSTRUCTION COST						
ITEM NO.	ITEM CODE	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	EXTENDED PRICE
DIVISION 2 - EARTHWORK						
2.1	2010-108-B-0	CLEARING AND GRUBBING	LS	1	\$ 7,500.00	\$ 7,500.00
2.2	2010-108-D-1	TOPSOIL, STRIP, SALVAGE AND RESPREAD	CY	1,405	\$ 4.50	\$ 6,322.50
2.3	2010-108-E-0	EXCAVATION, CLASS 10	CY	1,970	\$ 10.00	\$ 19,700.00
2.4	2010-108-G-12	SUBGRADE PREPARATION, 12 IN.	SY	3,393	\$ 2.50	\$ 8,482.50
2.5	2010-108-H-0	SUBGRADE TREATMENT, TRI-AX GEOGRID	SY	3,393	\$ 3.00	\$ 10,179.00
2.6	2010-108-I-12	MODIFIED SUBBASE, 12"	TON	2,214	\$ 35.00	\$ 77,490.00
DIVISION 4 - SEWERS AND DRAINS						
4.1	4020-108-A-18	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 2000D, 18 IN.	LF	208	\$ 70.00	\$ 14,560.00
4.2	4020-108-A-18	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 3000D, 18 IN.	LF	105	\$ 75.00	\$ 7,875.00
4.3	4020-108-A-24	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 2000D, 24 IN.	LF	978	\$ 90.00	\$ 88,020.00
4.4	4020-108-A-24	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 3000D, 24 IN.	LF	35	\$ 95.00	\$ 3,325.00
4.5	4020-108-A-36	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 2000D, 36 IN.	LF	354	\$ 150.00	\$ 53,100.00
4.6	4030-108-B-36	PIPE APRON, REINFORCED CONCRETE PIPE (RCP), 36 IN.	EA	1	\$ 2,500.00	\$ 2,500.00
4.7	4030-108-C-0	FOOTING FOR CONCRETE PIPE APRON	EA	1	\$ 750.00	\$ 750.00
4.8	4030-108-D-0	PIPE APRON GUARD	EA	1	\$ 250.00	\$ 250.00
4.9	4040-108-A-4	SUBDRAIN, LONGITUDINAL, 4 IN. DIA.	LF	1,542	\$ 12.00	\$ 18,504.00
4.10	4040-108-D-0	SUBDRAIN OUTLET / CONNECTION TO INTAKE OR MANHOLE	EA	16	\$ 450.00	\$ 7,200.00
DIVISION 6 - STRUCTURES FOR SANITARY AND STORM SEWERS						
6.1	6010-108-B-0	INTAKE, SW-509	EA	11	\$ 6,500.00	\$ 71,500.00
6.2	6010-108-F-0	MANHOLE ADJUSTMENT, MINOR	EA	1	\$ 750.00	\$ 750.00
6.3	6010-108-F-0	MANHOLE ADJUSTMENT, MAJOR	EA	3	\$ 2,000.00	\$ 6,000.00
DIVISION 7 - STREETS AND RELATED WORK						
7.1	7010-108-A-8	PAVEMENT, PCC, 8 IN., CLASS C MIX	SY	3,008	\$ 60.00	\$ 180,480.00
7.2	7030-108-H-7	DRIVEWAY, PCC, 7 IN.	SY	151	\$ 55.00	\$ 8,305.00
7.3	7040-108-H-0	PAVEMENT REMOVAL	SY	315	\$ 20.00	\$ 6,300.00
DIVISION 8 - TRAFFIC CONTROL						
8.1	8010-208-B-0	2 - 4 IN. PVC CONDUIT DUCTBANK	LF	876.00	\$ 12.00	\$ 10,512.00
8.2	8020-108-B-0	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED	STA	16.72	\$ 150.00	\$ 2,508.00
8.3	8030-108-A-0	TEMPORARY TRAFFIC CONTROL	LS	1	\$ 5,000.00	\$ 5,000.00
DIVISION 9 - SITE WORK AND LANDSCAPING						
9.1	9010-108-B-0	HYDRAULIC SEEDING, SEEDING, FERTILIZING, AND HYDROMULCHING	AC	0.60	\$ 3,500.00	\$ 2,100.00
9.2	9040-108-A-1	SWPPP MANAGEMENT	LS	1	\$ 1,500.00	\$ 1,500.00
9.3	9040-108-D-1	FILTER SOCK	LF	2,400	\$ 1.50	\$ 3,600.00
9.4	9040-108-D-2	FILTER SOCK REMOVAL	LF	2,400	\$ 0.25	\$ 600.00
9.5	9040-108-N-1	SILT FENCE / SILT FENCE FOR DITCH CHECKS	LF	2,300	\$ 1.50	\$ 3,450.00
9.6	9040-108-N-3	SILT FENCE / SILT FENCE FOR DITCH CHECKS, REMOVAL OF DEVICE	LF	2,300	\$ 0.25	\$ 575.00
9.7	9040-108-O-1	STABILIZED CONSTRUCTION ENTRANCE	SY	500	\$ 30.00	\$ 15,000.00
9.8	9040-108-Q-2	EROSION CONTROL MULCHING, SEEDING AND HYDROMULCHING	AC	1.20	\$ 1,500.00	\$ 1,800.00
9.9	9040-108-T-1	INLET PROTECTION DEVICE, OPEN THROAT	EA	11	\$ 500.00	\$ 5,500.00
9.10	9040-108-T-2	INLET PROTECTION DEVICE, MAINTENANCE	EA	22.0	\$ 75.00	\$ 1,650.00
DIVISION 11 - MISCELLANEOUS						
11.1	11,020-108-A-0	MOBILIZATION	LS	1.0	\$ 40,000.00	\$ 40,000.00
11.2	11,050-108-A-0	CONCRETE WASHOUT	LS	1.0	\$ 3,000.00	\$ 3,000.00
SUBTOTAL						\$ 695,888.00
CONTINGENCY (5%)						\$ 34,800.00
TOTAL						\$ 730,688.00



Joel Greer, Mayor
Jessica Kinser, Administrator
Justin Nickel, Public Works Director
24 North Center Street
Marshalltown, IA 50158-4911
Tel - (641) 754-5760
Fax - (641) 754-5781

DEPARTMENT OF PUBLIC WORKS

May 18, 2020

To: Mayor Joel Greer
Members of the City Council

From: Jay C. Koch
Civil Engineer II

Re: Order Construction – Washington Street Extension, Project No. ECO20001.

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

Recommendation: Staff recommends approving the Resolution ordering construction of the Washington Street Extension Project.

Background: Construction includes the extension of West Washington Street from 9th Avenue to the west to connect with existing street. Work will include storm sewer, sanitary sewer, and water distribution utilities. This street is required for the development of the Park Place Condominiums. The costs for the street will be shared by Kading Properties and the City of Marshalltown.

Budget Impact: This project will be funded with Road Use Tax revenues.

Attachment: None

cc: Jessica Kinser, City Administrator

City Council
Susan Cahill, Gary Thompson, Mike Gowdy,
Al Hoop, Gabriel Isom, Bill Martin, Bethany Wirin



WASHINGTON STREET EXTENSION
CITY OF MARSHALLTOWN
MARSHALL COUNTY, IOWA
CITY PROJECT NO. EC020001
PROJECT NO. 19023

LEGEND

▲ SECTION CORNER FOUND	■ PUMP STATION	--- 100 --- PROPOSED CONTOURS
△ SECTION CORNER SET	○ WATER TANK	— 100 — PROPERTY LINE
● PROPERTY PIN FOUND	⊙ WELL	— - - - - CENTERLINE OF ROADWAY
○ PROPERTY PIN SET	⊙ ELECTRIC MANHOLE	— - - - - RIGHT-OF-WAY
⊙ GPS MONUMENT	⊙ ELECTRIC BOX	— - - - - FENCE LINE
⊙ BENCHMARK	⊙ TRANSFORMER PAD	— - - - - CONSTRUCTION LIMITS
⊙ MONUMENT	⊙ GUY WIRE	— - - - - SANITARY SEWER LINE
⊙ SOIL BORING	⊙ FIBER OPTICS MANHOLE	— SS — STORM SEWER LINE
⊙ TEST WELL	⊙ TELEPHONE MANHOLE	— ST — STORM CULVERT PIPE
⊙ MONITORING WELL	⊙ TELEPHONE PEDESTAL	— CP — REINFORCED CONCRETE PIPE
⊙ SANITARY SEWER MANHOLE	⊙ TELEPHONE BOOTH	— RCP — DUCTILE IRON PIPE
⊙ SANITARY CLEANOUT	⊙ UNKNOWN MANHOLE	— DI — WATER LINE
⊙ SEPTIC TANK	⊙ UTILITY POLE	— W — OVERHEAD ELECTRIC LINE
⊙ CISTERN	⊙ DECIDUOUS TREE (EXISTING)	— OP — UNDERGROUND ELECTRIC LINE
⊙ LIFT STATION	⊙ DECIDUOUS TREE (REQUIRED)	— E — UNDERGROUND TELEPHONE LINE
⊙ STORM SEWER MANHOLE	⊙ CONIFEROUS TREE (EXISTING)	— T — FIBER OPTICS LINE
⊙ CURB INTAKE	⊙ CONIFEROUS TREE (REQUIRED)	— FO — HIGH PRESSURE GAS LINE
⊙ BEEHIVE INTAKE	⊙ SHRUB (EXISTING)	— HG — LOW PRESSURE GAS LINE
⊙ CATCH BASIN	⊙ SHRUB (REQUIRED)	— G —
⊙ FLARED END SECTION	⊙ TREE REMOVAL REQUIRED	⊙ STEEL LUMINAIRE
⊙ CULVERT	⊙ STUMP	⊙ WOOD LUMINAIRE
⊙ WATER MANHOLE	⊙ PROPOSED PAVEMENT ELEVATION	⊙ SIGN
⊙ FIRE HYDRANT	⊙ GRADE FLOW ARROW	⊙ MAILBOX
⊙ YARD HYDRANT	⊙ PIPE FLOW ARROW	⊙ BIN
⊙ WATER VALVE		⊙ PROPANE TANK
⊙ POST INDICATOR VALVE		
⊙ VALVE PIT		
⊙ WATER METER		
⊙ PUMP		
⊙ METER STATION		

UTILITY COORDINATION

THE CONTRACTOR IS RESPONSIBLE TO COORDINATE CONSTRUCTION WITH THE FOLLOWING UTILITIES KNOW TO HAVE SERVICES IN THE AREA:

(ANW) Alliant Energy
name: Alliant Energy Field Eng
phone: (800) 255-4268
email: locate_tpl@alliantenergy.com

(CTLIA01) centurylink
name: Jeremy Leven
phone: (515) 370-5627

(MARSW) Marshalltown, City of Sewer
name: Troy McGahuey
phone: (641) 751-9608
email: tmcgahuey@marshalltown-ia.gov

(SCY) Sprint Nextel
name: Michael Chebul
phone: (402) 880-8720
email: michael.j.chebul@sprint.com

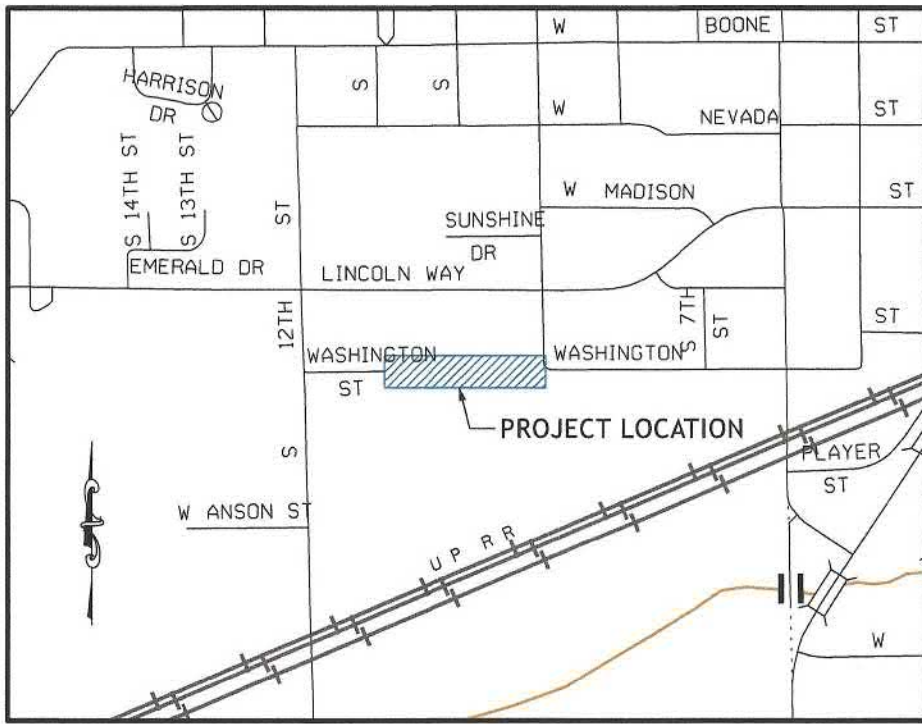
(MWS) Marshalltown Water Works
name: shelli lovell
phone: (641) 753-7913
email: shelli@marshalltownwater.com

(TC4) Mediacom L.L.C.
name: Curt Hodges
phone: (515) 669-3647
email: chodges@mediacomcc.com

(TC7) Mediacom
name: Curt Hodges
phone: (515) 669-3647
email: chodges@mediacomcc.com

THIS PROJECT IS COVERED BY THE IOWA DEPARTMENT OF NATURAL RESOURCES NPDES GENERAL PERMIT NO. 2. THE CONTRACTOR SHALL CARRY OUT THE TERMS AND CONDITIONING OF GENERAL PERMIT NO. 2 AND STORM WATER POLLUTION PREVENTION PLAN WHICH IS PART OF THESE CONTRACT DOCUMENTS. REFER TO SECTION 2602 OF THE DOT STANDARD SPECIFICATION FOR ADDITIONAL INFORMATION.

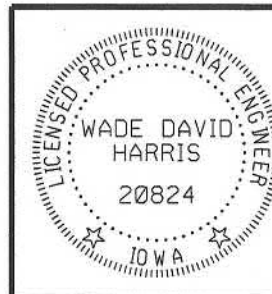
THE STATEWIDE URBAN DESIGN AND SPECIFICATIONS (SUDAS 2019) AND THE IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS PLUS GENERAL SUPPLEMENTAL SPECIFICATIONS; AND APPLICABLE SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, AND SPECIAL PROVISIONS, AND ALL APPROPRIATE ADDENDUMS AND REVISIONS SHALL APPLY TO THE CONSTRUCTION WORK ON THIS PROJECT UNLESS NOTED ON THE PLANS OR IN THE CONTRACT.



VICINITY SKETCH
NOT TO SCALE

INDEX OF PAGES

SHEET NO.	DESCRIPTION
A SHEETS A.1	TITLE SHEET COVER SHEET
B SHEETS B.1 B.2 - B.9	TYPICAL CROSS SECTIONS & DETAILS TYPICAL CROSS SECTIONS DETAILS
C SHEETS C.1 C.2 - C.3 C.4	QUANTITIES & GENERAL INFORMATION PROJECT QUANTITIES ESTIMATE REFERENCE INFORMATION GENERAL NOTES
D SHEETS D.1 - D.2	MAINLINE PLAN & PROFILE SHEETS WASHINGTON STREET PLAN & PROFILE
EC SHEETS EC.1	EROSION CONTROL PLAN SHEETS WASHINGTON STREET EROSION CONTROL PLAN
G SHEETS G.1	SURVEY SHEETS CONTROL POINTS & ALIGNMENT DATA
H SHEETS H.1	RIGHT-OF-WAY SHEETS RIGHT-OF-WAY
J SHEETS J.1 J.2	TRAFFIC CONTROL & STAGING SHEETS TRAFFIC CONTROL NOTES WASHINGTON STREET TRAFFIC CONTROL PLAN
L SHEETS L.1 - L.3	GEOMETRIC, STAKING, & JOINTING SHEETS WASHINGTON STREET GEOMETRIC, STAKING, & JOINTING PLAN
M SHEETS M.1 - M.3 M.4	STORM SEWER SHEETS WASHINGTON STREET STORM SEWER PLAN AND PROFILE STORM SEWER TABULATION
N SHEETS N.1	TRAFFIC SIGNAL SHEETS PAVEMENT MARKINGS AND SIGN PLAN
U SHEETS U.1	MODIFIED STANDARDS & DETAIL SHEETS DEMOLITION PLAN
W SHEETS W.1 - W.6	MAINLINE CROSS SECTION SHEETS WASHINGTON STREET CROSS SECTIONS



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: Wade Harris Date: 5/15/20
Name: (Printed or typed) WADE DAVID HARRIS
License Number 20824
My license renewal date is December 31, 2021.
Pages or sheets covered by this seal: _____



WASHINGTON STREET EXTENSION
CITY OF MARSHALLTOWN, IOWA
MARSHALL COUNTY, IOWA



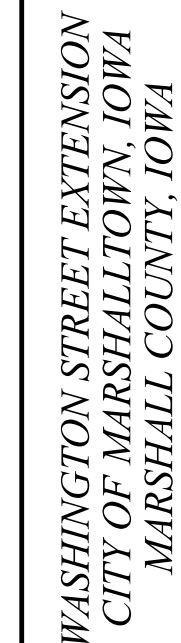
14030 New York Ave, Ste C
URBANDALE, IA 50322-3773
TEL: (515) 669-4188
EMAIL ADDRESS:
mlee@leechamberlinengineers.com

DRAWING TITLE

COVER
SHEET

DRAWN BY
W.D.H.
CHECKED BY
M.L.L.
DATE
06/01/2020
JOB NO
19023
SHEET

A.1



TYPICAL SECTION

DRAWN BY
W.D.H.
CHECKED BY
M.L.L.
DATE
05/01/2020
JOB NO
19023
SHEET
B.1



STA 104+25.00 TO STA 110+75.00

Diagram illustrating four cross-sectional views of concrete cradles for Class I bedding material, labeled CLASS R-1, CLASS R-2, CLASS R-3, and CLASS R-4.

CLASS R-1: Shows a circular pipe (OD) within a concrete cradle. The bedding material is Class I. The top width is TW. The bedding layer thickness is d. The label "CLASS R-1" is present.

CLASS R-2: Shows a circular pipe (OD) within a concrete cradle. The bedding material is Class I. The top width is TW. The bedding layer thickness is d. The label "CLASS R-2" is present.

CLASS R-3: Shows a circular pipe (OD) within a concrete cradle. The bedding material is Class I. The top width is 1.25 x OD (OD + 8" min.). The bedding layer thickness is d. The label "CLASS R-3" is present.

CLASS R-4: Shows a circular pipe (OD) within a concrete cradle. The bedding material is Class I. The top width is 1.25 x OD (OD + 8" min.). The bedding layer thickness is d. The label "CLASS R-4" is present.

Labels and dimensions include:

- Class I Bedding Material
- OD (Outside Diameter)
- OD/6
- OD/4
- OD/2
- D/4 or 4" min.
- 1.25 x OD (OD + 8" min.)
- Concrete Cradle
- Cradle Top

- ① Use Bedding Class R-1 or R-2 unless specified otherwise.
- ② Place remainder of bedding and backfill materials as specified in the contract documents.

Key

Diagram illustrating three cross-sectional views of Class R-5 concrete masonry units, showing the opening shape and dimensions:

- CLASS R-5 Arch:** Shows a semi-circular opening (OS) within a unit. The unit is labeled "CLASS R-5" and "Bedding Material". The height is indicated as 12".
- CLASS R-5 Vertical Elliptical:** Shows an elliptical opening (OS) within a unit. The unit is labeled "CLASS R-5" and "Bedding Material". The height is indicated as 12".
- CLASS R-5 Horizontal Elliptical:** Shows an elliptical opening (OS) within a unit. The unit is labeled "CLASS R-5" and "Bedding Material". The height is indicated as 12".

	SUDAS		IOWA DOT	REVISION 3 04-19-17
FIGURE 301B.102		STANDARD ROAD PLAN		SW-102
				SHEET 1 of 2
REVISIONS: <u>Changed Class 3 to Class Iir.Glass B.S. Vertical In Roadway Detail.</u>				
DESIGNED BY: JEFFREY L. HARRIS		CHECKED BY: MICHAEL D. KOPPELBERG		
RIGID GRAVITY PIPE TRENCH BEDDING				

Pipe Diameter (in)	Class R-1 Bedding	Class R-2 Bedding	Class R-3 & R-4 Bedding		
			No Steel	As=0.4%	As=1.0%
12	18"	23"	35"	48"	48"
15	19"	24"	40"	48"	48"
18	19"	30"	40"	40"	48"
21	25"	40"	40"	40"	48"
24	34"	40"	40"	40"	48"
27	48"	48"	48"	48"	48"
30	48"	48"	48"	48"	48"
33	48"	48"	40"	48"	48"
36	48"	48"	40"	40"	48"
42	37"	48"	40"	40"	48"
48	35"	48"	40"	40"	48"
54	33"	48"	48"	48"	48"
60	32"	48"	40"	48"	48"
66	31"	48"	40"	40"	48"
72	31"	48"	40"	40"	48"

As = Area of Steel Reinforcing

Pipe Dia. (in)	Bedding Class					
	R-1	R-2	R-3 & R-4			
			No Steel	As=0.4%	As=1%	
6	25'	30'	30'	30'	30'	
8	20'	26'	30'	30'	30'	
10	18'	23'	30'	30'	30'	
12	16'	20'	30'	30'	30'	
15	15'	19'	28'	30'	30'	
18	14'	18'	30'	30'	30'	
21	15'	22'	30'	30'	30'	
24	18'	28'	30'	30'	30'	
27	28'	30'	30'	30'	30'	
30	19'	29'	30'	30'	30'	
33	20'	30'	30'	30'	30'	
36	20'	30'	30'	30'	30'	
39	19'	29'	30'	30'	30'	
42	18'	26'	30'	30'	30'	

As = Area of Steel Reinforcing

Pipe Size (in x in)	Equiv. Dia. (in)	Pipe Class	
		A-III	A-IV
18 x 11	15	6'	11'
22 x 13	18	6'	11'
26 x 15	21	6'	13'
29 x 18	24	7'	15'
36 x 22	30	8'	15'
44 x 27	36	8'	14'
51 x 31	42	8'	15'
58 x 36	48	8'	15'
65 x 40	54	8'	15'
73 x 45	60	8'	14'
88 x 54	72	9'	14'

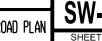
Based on Class R-5 bedding

Pipe Size (in x in)	Equiv. Dia. (in)	Pipe Class	
		ME-III	HE-I
14 x 23	18	12'	22'
15 x 30	24	15'	29'
22 x 34	27	15'	28'
24 x 38	30	15'	27'
27 x 42	33	15'	27'
29 x 45	36	15'	26'
32 x 49	39	15'	26'
34 x 54	42	15'	25'
38 x 60	48	15'	25'
43 x 68	54	15'	24'
48 x 76	60	15'	24'
53 x 83	66	15'	24'
58 x 91	72	15'	24'
63 x 98	78	15'	23'
68 x 106	84	15'	23'

Based on Class R-5 bedding

Pipe Size (in x in)	Equiv. Dia. (in)	Pipe Class			
		VE-III	VE-IV	VE-V	VE-VI
23 x 14	18	10'	15'	22'	33'
30 x 19	24	10'	16'	34'	40'
34 x 22	27	11'	20'	40'	40'
38 x 24	30	12'	23'	40'	40'
42 x 27	33	15'	30'	40'	40'
45 x 29	36	15'	29'	40'	40'
49 x 32	39	15'	29'	40'	40'
54 x 34	42	15'	28'	40'	40'
60 x 38	48	15'	27'	40'	40'
68 x 43	54	15'	27'	40'	40'
76 x 48	60	15'	26'	40'	40'
83 x 53	66	15'	25'	40'	40'
91 x 58	72	15'	25'	40'	40'
98 x 63	78	15'	25'	40'	40'
106 x 68	84	15'	24'	40'	40'

Based on Class R-5 bedding

	SUDAS		IOWA DOT	REVISION 3 04-15
FIGURE 3010.102		STANDARD ROAD PLAN		SW-102
REVISIONS: Changed Class 1 to Class J in CLASS B's Vertical Electrical Detail.				SHEET 2 of 2
				
DESIGNED BY: [blank]		CHECKED BY: [blank]		
RIGID GRAVITY PIPE TRENCH BEDDING				

6' min.

3"

6' min.

Trim pipe and fill voids with mortar.

① 6'x6' - w2xw2 (8ga.) Wire Mesh

TYPE PC-1 CONCRETE COLLAR CONNECTION

6" min. 3" 12" 12"

① 6" x 6" - w2 x w2 (8ga) Wire Mesh

TYPE PC-2 CONCRETE COLLAR CONNECTION

The diagram illustrates the application of pipe joint wrapping to a pipe-to-pipe connection. It shows two pipes joined at a central point labeled "Pipe Joint". The wrapping material is applied in two layers: a top layer with a cross-hatch pattern and a bottom layer with a solid gray pattern. The top layer is labeled "Overlap fabric 12' at top of pipe." with arrows indicating a 12' width on each side of the joint. The bottom layer is labeled "Engineering Fabric" with an arrow pointing to it. The entire assembly is labeled "PIPE JOINT WRAPPING" and "PIPE TO PIPE CONNECTION".

- ① Lap ends of wire mesh a minimum of 6 inches.
- ② Concrete collar is required when annular space between the outside of the pipe and the wall of the structure is 2 inches or greater.
- ③ Provide two #4 hoop bars in concrete collar. Lap bars a minimum of 6 inches.
- ④ Trowel concrete flush with inside wall of structure.

 SUDAS	 IOWA DOT	REVISION
		2 04-12-11
FIGURE 4020.211	STANDARD ROAD PLAN	SW-211
		SHEET 1 of 1
REVISIONS: Removed "Invert" column on Pipe to Structure View. Restored and replaced old Iowa DOT and SUDAS logos with new logos.		
IOWA DOT STANDARD SPECIFICATIONS FOR HIGHWAYS SECTION 1000.00 - GENERAL NOTES 1000.00.01 - STANDARD SPECIFICATIONS FOR HIGHWAYS		

6"

RCP Apron Section

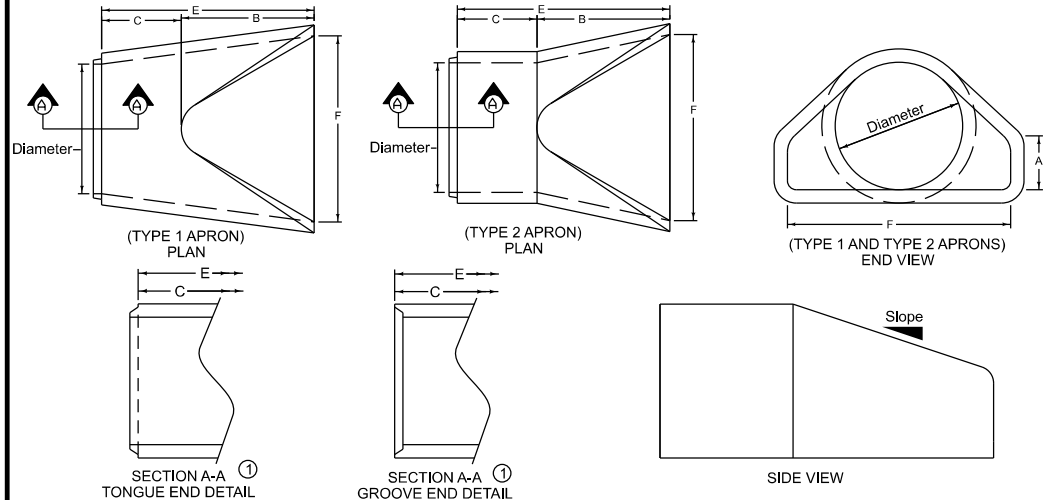
48"

1'-8"

D	W	Mark	Size	Length	Count
12"	2'-4"	4f1	4	2'-0"	3
		4f2	4	3'-8"	2
15"	2'-10"	4f1	4	2'-6"	*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

	SUDAS	
	REVISION 1 10-21-1	
	4030.22 SHEET 3 of 3	



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.

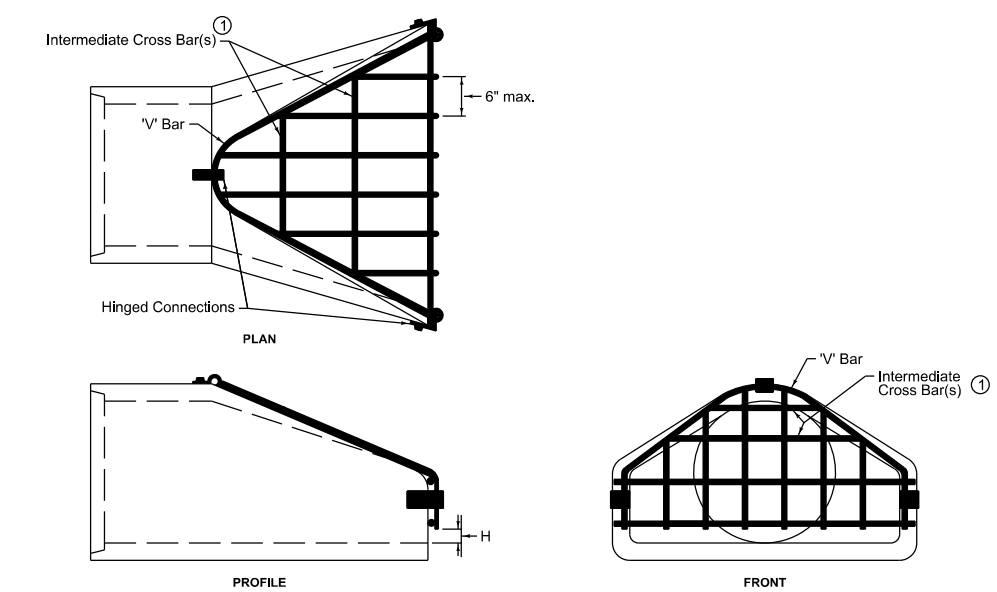
TYPE 1 APRONS							
DIAM.	SLOPE	A	B	MINIMUM		F	
				C	E		
12"	2.4:1	4"	2'-0"	4'-6"	6'-6"	2'-0"	
15"	2.4:1	6"	2'-3"	3'-10"	6'-11"	2'-6"	
18"	2.3:1	9"	2'-3"	3'-10"	6'-11"	3'-0"	
21"	2.4:1	9"	3'-0"	3'-11"	6'-11"	3'-5"	
24"	2.5:1	9"	3'-7"	2'-6"	6'-11"	4'-0"	
27"	2.5:1	10"	4'-1"	2'-0"	6'-11"	4'-4"	
30"	2.5:1	12"	4'-6"	1'-7"	6'-11"	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"	1.8:1	27"	5'-0"	3'-0"	8'-0"	7'-6"	
60"	1.6:1	29"	5'-0"	3'-0"	8'-0"	8'-0"	
66"	1.7:1	30"	6'-0"	2'-3"	8'-3"	8'-0"	
72"	1.6:1	30"	6'-6"	1'-9"	8'-3"	9'-0"	
78"	1.8:1	36"	7'-6"	1'-9"	9'-3"	9'-6"	
84"	1.3:1	29"	6'-9"	2'-6"	9'-3"	10'-0"	

TYPE 2 APRONS							
DIAM.	SLOPE	A	B	MINIMUM		F	
				C	E		
12"	2.4:1	4"	2'-0"	4'-6"	6'-6"	2'-0"	
15"	2.4:1	6"	2'-3"	3'-10"	6'-11"	2'-6"	
18"	2.3:1	9"	2'-3"	3'-10"	6'-11"	3'-0"	
21"	2.4:1	9"	3'-0"	3'-11"	6'-11"	3'-5"	
24"	2.5:1	9"	3'-7"	2'-6"	6'-11"	4'-0"	
27"	2.5:1	10"	4'-1"	2'-0"	6'-11"	4'-4"	
30"	2.5:1	12"	4'-6"	1'-7"	6'-11"	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'-5"	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"	7'-6"	1'-9"	9'-3"	10'-0"	

 **SUDAS**

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4030.222
SHEET 1 of 1

CIRCULAR CONCRETE APRONS



Provide guard dimensions to fit with type of apron provided. Ensure 'V' Bar completely rests on apron.

① All guards must include at least one intermediate cross bar. If pipe diameter, or equivalent diameter, is 60 inches or greater, use two intermediate cross bars equally spaced.

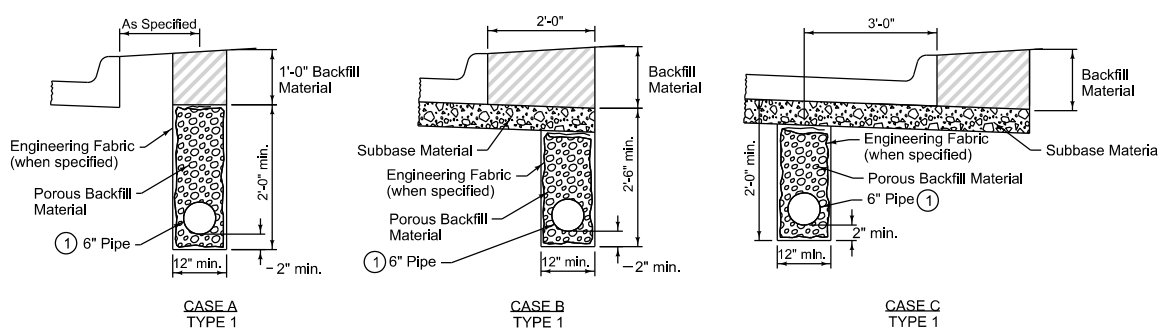
ROUND		ARCH		ELLIPTICAL	
PIPE SIZE	H	EQUIVALENT DIAMETER	H	EQUIVALENT DIAMETER	H
12"	2 3/4"	18" to 24"	4"	18"	3"
15"	3"	30" to 36"	5"	24"	4"
18" - 24"	4"	42" to 54"	6"	30" to 36"	5"
27" - 36"	5"	60" to 72"	7"	42" to 54"	6"
42" - 54"	6"			60"	7"
60" - 72"	7"				
78" - 90"	8"				

BAR SIZES			
PIPE SIZE (DIA. or EQUIV.)	HOLE DIA. REQ'D.	BOLT DIA.	BAR SIZE
12" - 24"	3/8"	3/8"	3/8"
27" - 48"	3/8"	3/8"	1"
54" - 90"	1 1/8"	1"	1 1/2"
up to 24" eq.	3/8"	3/8"	3/8"
30" to 48"	3/8"	3/8"	1"
54" to 72"	1 1/8"	1"	1 1/2"
up to 24" eq.	3/8"	3/8"	3/8"
30" to 48"	3/8"	3/8"	1"
54" to 60"	1 1/8"	1"	1 1/2"
BOLT LENGTH = PIPE WALL THICKNESS + 24"			

 **SUDAS**

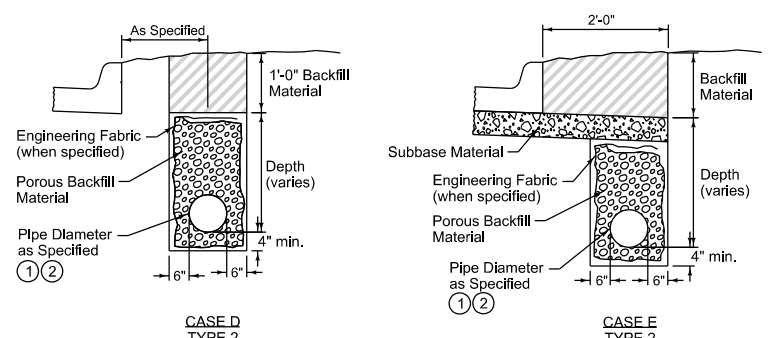
REVISION
New 10-18-18
4030.224
SHEET 1 of 1

CONCRETE PIPE APRON GUARD



Type 1 installation is for longitudinal subdrain only. Type 2 installation is for combination subdrain/footing drain collectors.

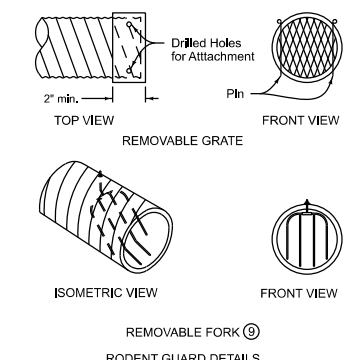
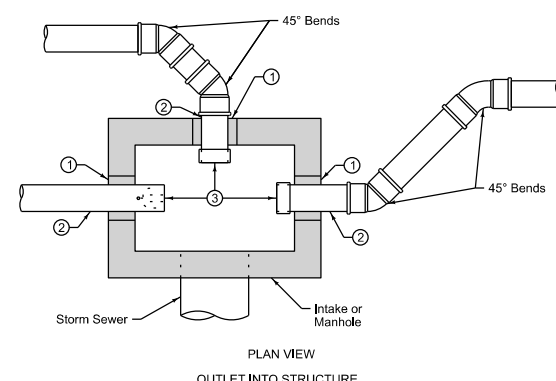
- ①
②



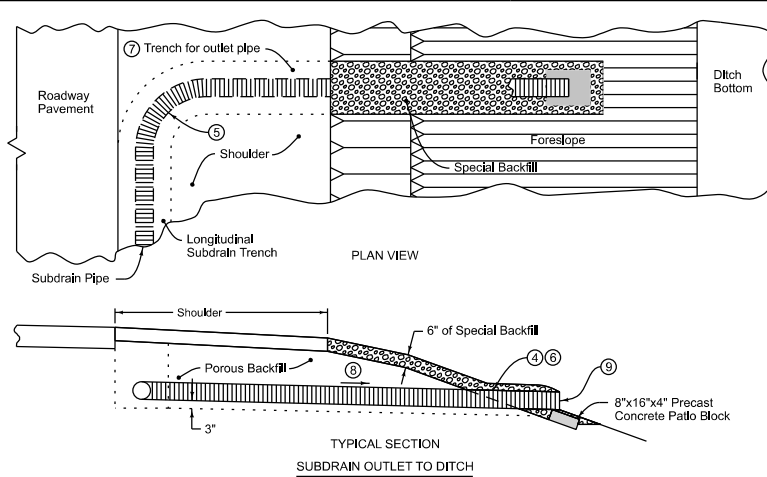
 **SUDAS**

REVISION
1 10-21-14
4040.231
SHEET 1 of 1

SUBDRAINS



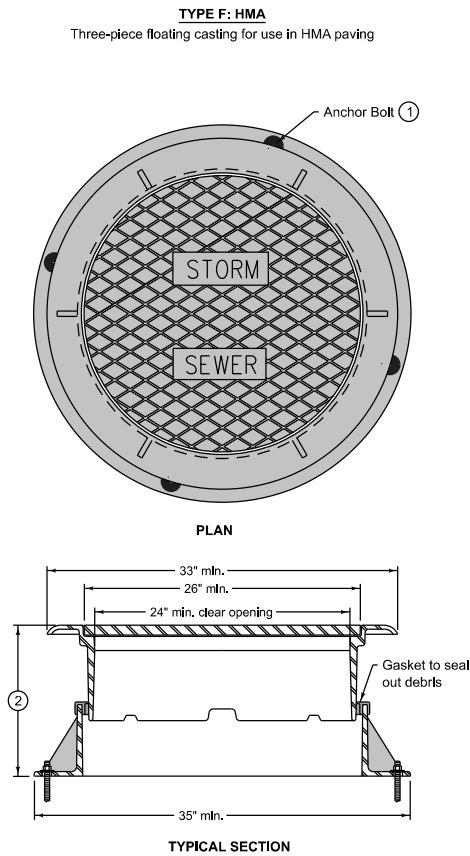
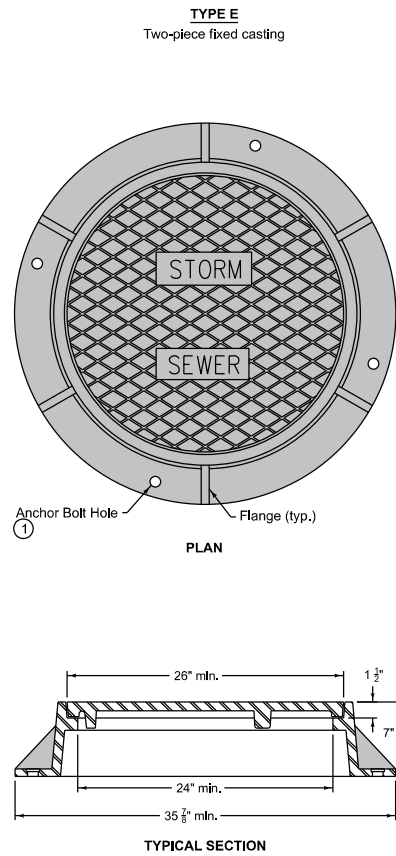
- Transverse and backslope subdrains require only single outlets. Install double outlet pipes on all longitudinal subdrain systems, except at the beginning and end of the system. At these locations, install a single outlet pipe.
- ① Fill annular space with non-shrink grout.
 - ② Outlets through intake walls to be CMP: corrugated, double-walled HDPE; or PVC.
 - ③ Extend outlet pipe into structure as required to install removable rodent guard.
 - ④ Construct subdrain outlet to ditch with the same type and size of pipe as used for the subdrain.
 - ⑤ Provide a minimum 1 foot radius for all bends or use two 45° fittings
 - ⑥ If a CMP outlet is specified in the contract documents, construct the final 10 to 12 feet of the subdrain outlet to ditch with CMP 2 inches larger than the subdrain pipe. Connect pipes with a manufactured coupler or concrete collar.
 - ⑦ Provide a minimum trench width of 12 inches for a single outlet and 24 inches for a double outlet.
 - ⑧ Provide a 6 inch minimum drop in elevation between longitudinal subdrain and outlet.
 - ⑨ Use only fork type rodent guard for subdrain outlet to ditch.



 **SUDAS**

REVISION
3 10-18-18
4040.233
SHEET 1 of 1

SUBDRAIN OUTLETS



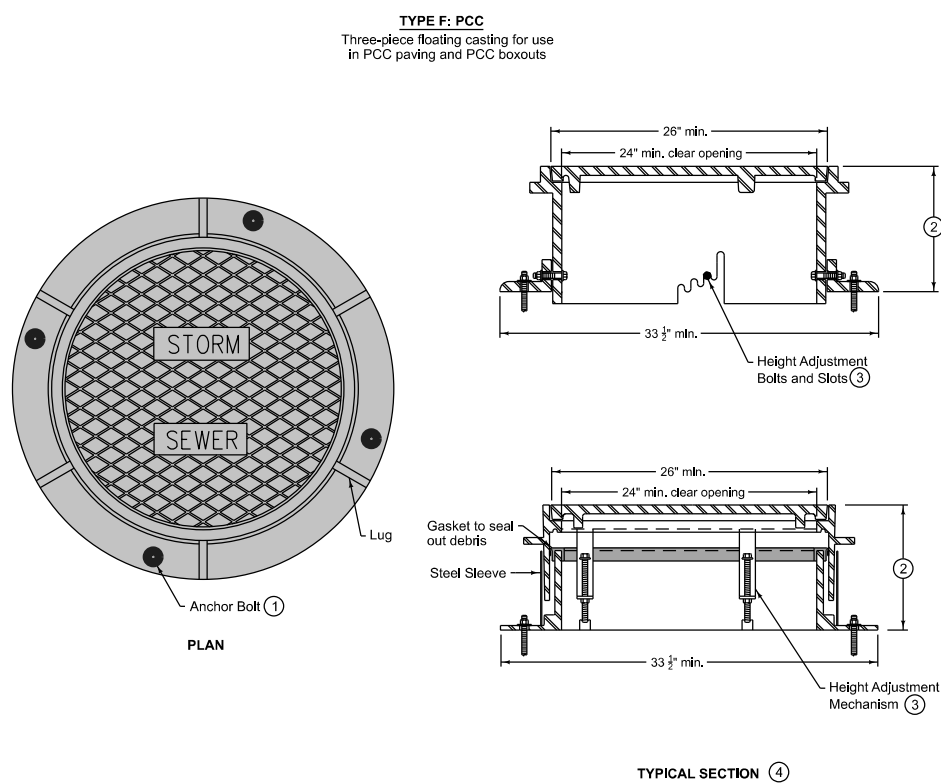
Frame Notes:
Size, spacing, and number of lugs and flanges may vary.

Cover Notes:
Roughness pattern and text style may vary.
Minimum one pickhole.

① Anchor the lower frame of all three-piece castings to the manhole structure. When specified in the contract documents, anchor the frame of two-piece castings to the manhole structure. If casting frame does not include anchor holes or slots, drill four 7/8 inch diameter holes, equally spaced around the frame.

② Casting height varies. Minimum adjustment range of 4 inches.

		REVISION 4 04-21-20
FIGURE 6010.602	STANDARD ROAD PLAN	SW-602
REVISIONS: Add option for 3-piece HMA casting		SHEET 1 of 3
CASTINGS FOR STORM SEWER MANHOLES		



Frame Notes:
Size, spacing, and number of lugs and flanges may vary.

Cover Notes:
Roughness pattern and text style may vary.
Minimum one pickhole.

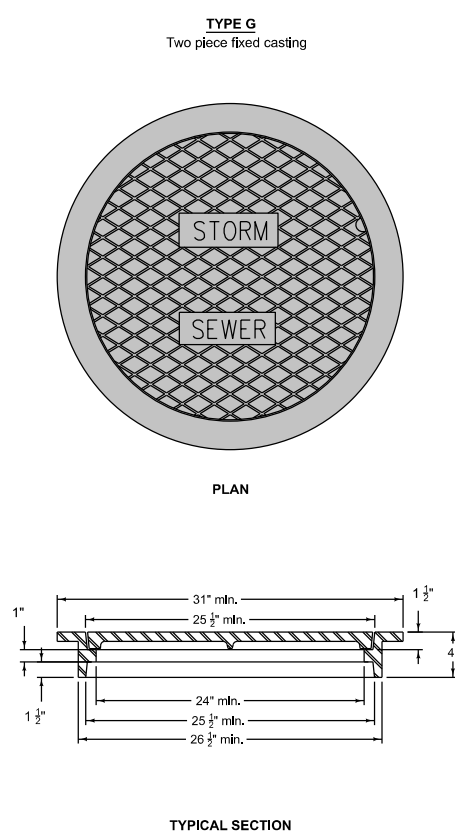
① Anchor the lower frame of all three-piece castings to the manhole structure. When specified in the contract documents, anchor the frame of two-piece castings to the manhole structure. If casting frame does not include anchor holes or slots, drill four 7/8 inch diameter holes, equally spaced around the frame.

② Casting height varies. Minimum adjustment range of 4 inches.

③ Set casting at proper grade using the adjustment slots or adjustment mechanism. Remove bolts or mechanism upon completion of paving.

④ Height adjustment method may vary; two options are shown.

		REVISION 4 04-21-20
FIGURE 6010.602	STANDARD ROAD PLAN	SW-602
REVISIONS: Add option for 3-piece HMA casting		SHEET 2 of 3
CASTINGS FOR STORM SEWER MANHOLES		



Cover Notes:
Roughness pattern and text style may vary.
Minimum one pickhole.

		REVISION 4 04-21-20
FIGURE 6010.602	STANDARD ROAD PLAN	SW-602
REVISIONS: Add option for 3-piece HMA casting		SHEET 3 of 3
CASTINGS FOR STORM SEWER MANHOLES		



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MARSHALL COUNTY, IOWA

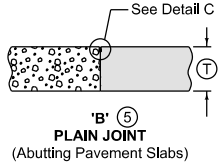
LEE
CHAMBERLIN
CONSULTANT ENGINEERS

14030 New York Ave, Ste C
URBANDALE, IA 50322-3773
TELE: (515) 669-4188
EMAIL ADDRESS:
mlee@leechamberlinengineers.com

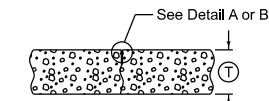
DRAWING TITLE

DETAILS

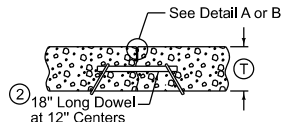
DRAWN BY
W.D.H.
CHECKED BY
M.L.L.
DATE
05/01/2020
JOB NO
19023
SHEET
B.5



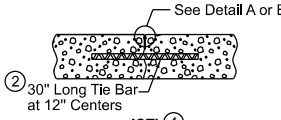
'B' ⑤
PLAIN JOINT
(Butting Pavement Slabs)



'C' ⑥
CONTRACTION JOINT

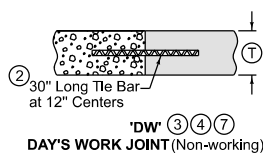


'CD' ① ④ ⑥
DOWELED CONTRACTION JOINT

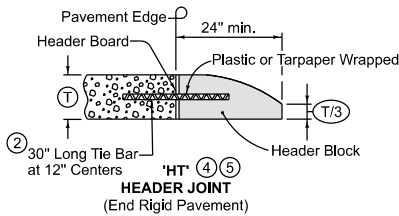


'CT' ④
TIED CONTRACTION JOINT

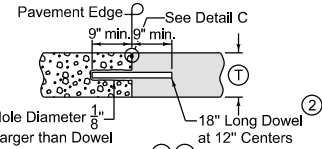
TRANSVERSE CONTRACTION



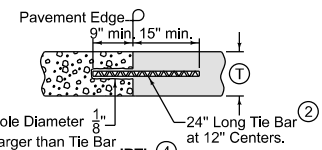
'DW' ③ ④ ⑦
DAY'S WORK JOINT (Non-working)



'HT' ④ ⑤
HEADER JOINT
(End Rigid Pavement)

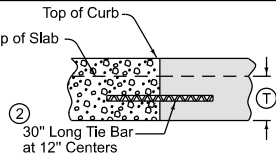


'RD' ④ ⑤
ABUTTING PAVEMENT JOINT



'RT' ④
ABUTTING PAVEMENT JOINT RIGID TIE

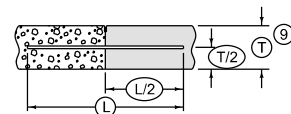
- ① See dowel assemblies for fabrication details.
- ② See Bar Size Table for Contraction Joints on Sheet 2.
- ③ Locate 'DW' joint at a mid-panel location between future 'C' or 'CD' joints. Place no closer than 5 feet to a 'C' or 'CD' joint.
- ④ Place bars within the limits shown under dowel assemblies.
- ⑤ Edge with 1/8 inch tool for length of joint. For HT joint, remove header block and board when second slab is placed.
- ⑥ Unless specified otherwise, use 'CD' transverse contraction joints in mainline pavement when T is greater or equal to 8 inches. Use 'C' joints when T is less than 8 inches.
- ⑦ 'RT' joint may be used in lieu of 'DW' joint at the end of the days work. Remove any pavement damaged due to the drilling at no additional cost to the Contracting Authority.



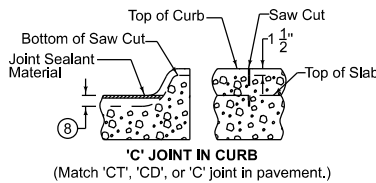
'DW - CG' ③ ④
DAY'S WORK JOINT CURB AND GUTTER UNIT

LEGEND	
	Existing Pavement
	Proposed Pavement

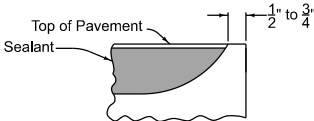
		REVISION 10 04-21-20
FIGURE 7010.101	STANDARD ROAD PLAN	PV-101
REVISIONS: Modified Dowel Assemblies on Sheets 6 and 7 to eliminate reference to 14 pavements.		SHEET 1 of 8
JOINTS		



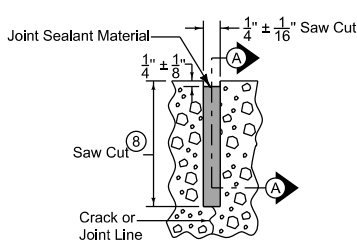
BAR PLACEMENT
(Applies to all joints unless otherwise detailed.)



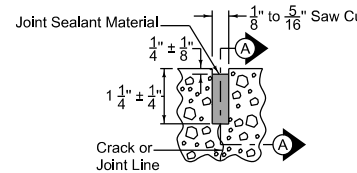
'C' JOINT IN CURB
(Match 'CT', 'CD', or 'C' joint in pavement.)



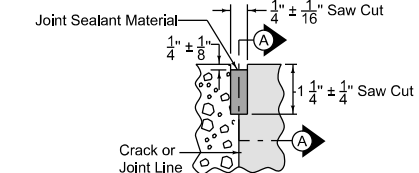
SECTION A-A
(Detail at Edge of Pavement)



DETAIL A
(Saw cut formed by conventional concrete sawing equipment.)



DETAIL B
(Saw cut formed by approved early concrete sawing equipment.)



DETAIL C

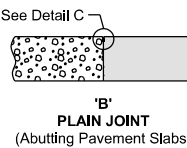
- ⑧ Saw 'CD' joint to a depth of $T/3 \pm 1/4$ "; saw 'C' joint to a depth of $T/4 \pm 1/4$ ".
- ⑨ When tying into old pavement, T represents the depth of sound PCC.

BAR SIZE TABLE FOR CONTRACTION JOINTS			
T	Solid Dowel Diameter	Tubular Dowel Diameter	Tie Bar Size
$< 8"$	$\frac{3}{4}"$	$\frac{7}{8}"$	#6
$\geq 8"$ but $< 10"$	$1 \frac{1}{4}"$	$1 \frac{3}{8}"$	#10
$\geq 10"$	$1 \frac{1}{2}"$	$1 \frac{5}{8}"$	#11

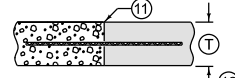
Tubular Dowel Bars will not be allowed for RD joints.

LEGEND	
	Existing Pavement
	Proposed Pavement

		REVISION 10 04-21-20
FIGURE 7010.101	STANDARD ROAD PLAN	PV-101
REVISIONS: Modified Dowel Assemblies on Sheets 6 and 7 to eliminate reference to 14 pavements.		SHEET 2 of 8
JOINTS		



'B'
PLAIN JOINT
(Butting Pavement Slabs)

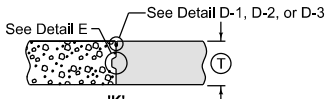


T	Joint	Bars	Bar Length and Spacing
$< 8"$	'BT-1'	#4	36" Long at 30" Centers
$\geq 8"$	'BT-2'	#5	36" Long at 30" Centers

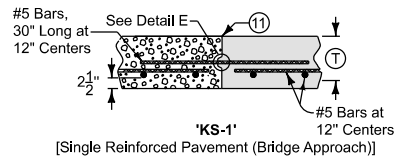


'BT'
ABUTTING PAVEMENT JOINT - RIGID TIE (Drilled)

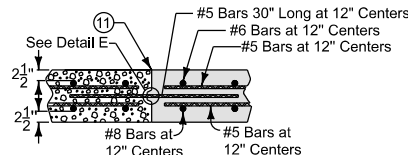
T	Joint	Bars	Bar Length and Spacing
$< 8"$	'BT-5'	#4	24" Long at 30" Centers
$\geq 8"$	'BT-3'	#5	24" Long at 30" Centers
	'BT-4'	#5	24" Long at 15" Centers



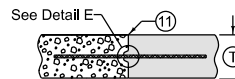
'K'
KEYED JOINT FOR ADJACENT SLABS
(Where T is 8" or more)



'KS-1'
[Single Reinforced Pavement (Bridge Approach)]



'KS-2'
[Double Reinforced Pavement (Bridge Approach)]

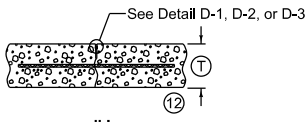


'KT'
ABUTTING PAVEMENT JOINT - KEYWAY TIE

T	Joint	Bars	Bar Length and Spacing
$< 8"$	'KT-1'	#4	30" Long at 30" Centers
$\geq 8"$	'KT-2'	#5	30" Long at 30" Centers
	'KT-3'	#5	30" Long at 15" Centers

LONGITUDINAL CONTRACTION

- ⑩ Bar supports may be necessary for fixed form paving to ensure the bar remains in a horizontal position in the plastic concrete.
- ⑪ Sawing or sealing of joint not required.
- ⑫ The following joints are interchangeable, subject to the pouring sequence:
'BT-1', 'L-1', and 'KT-1'
'KT-2' and 'L-2'
'KT-3' and 'L-3'

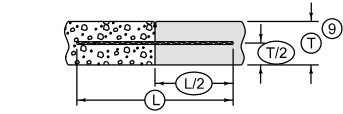


'L' CONTRACTION JOINT

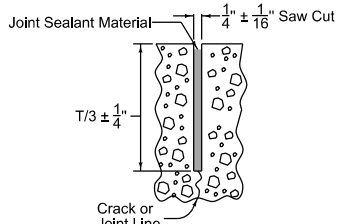
T	Joint	Bars	Bar Length and Spacing
$< 8"$	'L-1'	#4	36" Long at 30" Centers
$\geq 8"$	'L-2'	#5	36" Long at 30" Centers
	'L-3'	#5	36" Long at 15" Centers

LEGEND	
	Existing Pavement
	Proposed Pavement

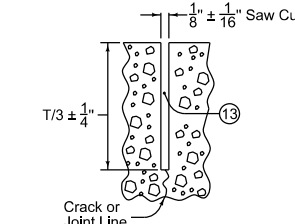
		REVISION 10 04-21-20
FIGURE 7010.101	STANDARD ROAD PLAN	PV-101
REVISIONS: Modified Dowel Assemblies on Sheets 6 and 7 to eliminate reference to 14 pavements.		SHEET 3 of 8
JOINTS		



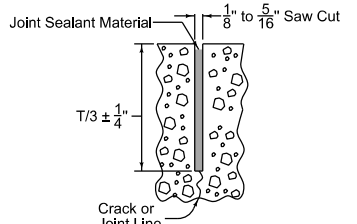
TIE BAR PLACEMENT
(Applies to all joints unless otherwise detailed.)



DETAIL D-2
(Required when the Department of Transportation is not the Contracting Authority, or when specified in the contract documents)

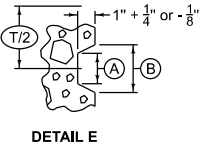


DETAIL D-1
(Required when specified in the contract documents.)



DETAIL D-3
(Required when the Department of Transportation is the Contracting Authority, or when specified in the contract documents)

- ⑨ When tying into old pavement, T represents the depth of sound PCC.
- ⑬ Sealant or cleaning not required.

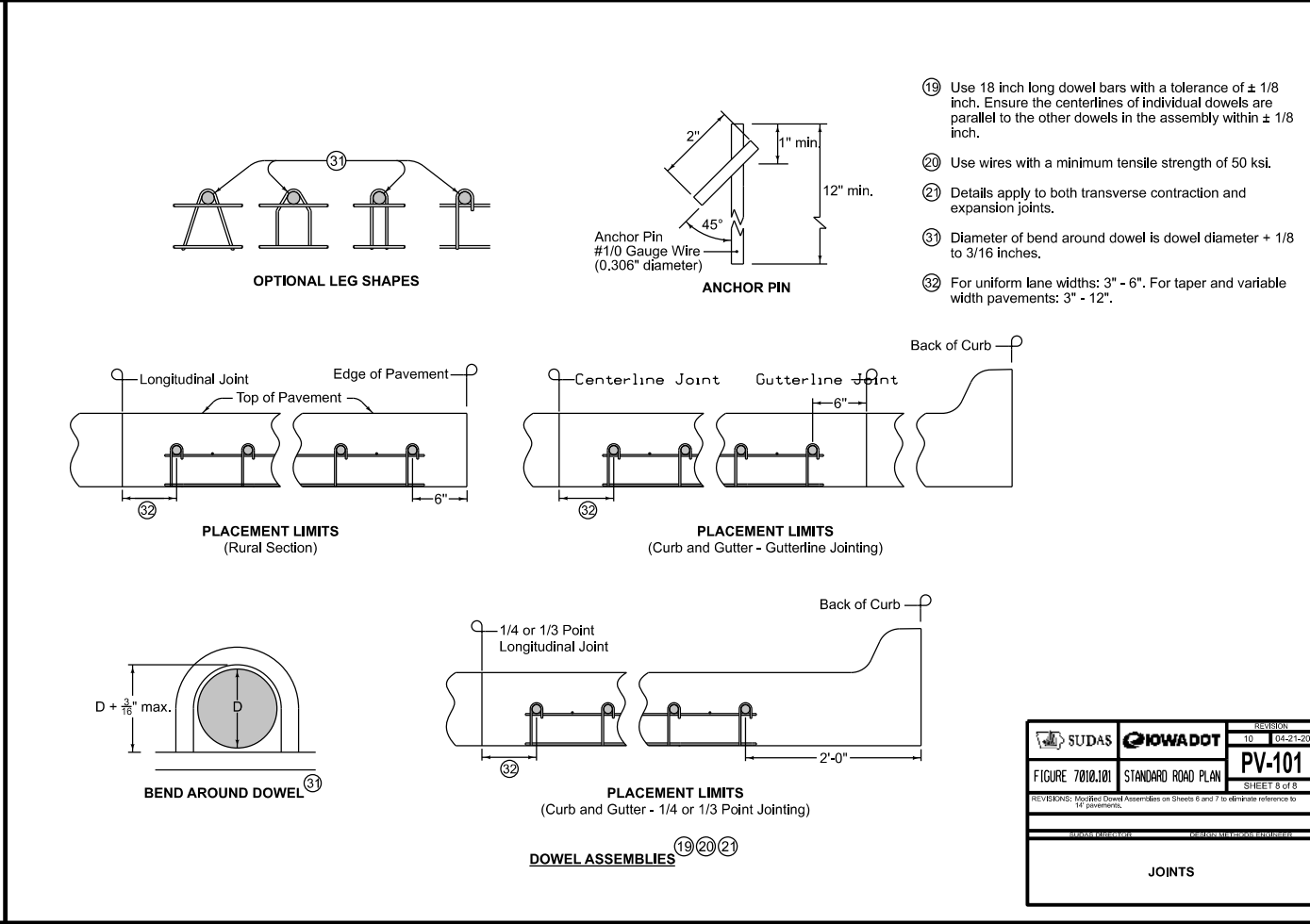
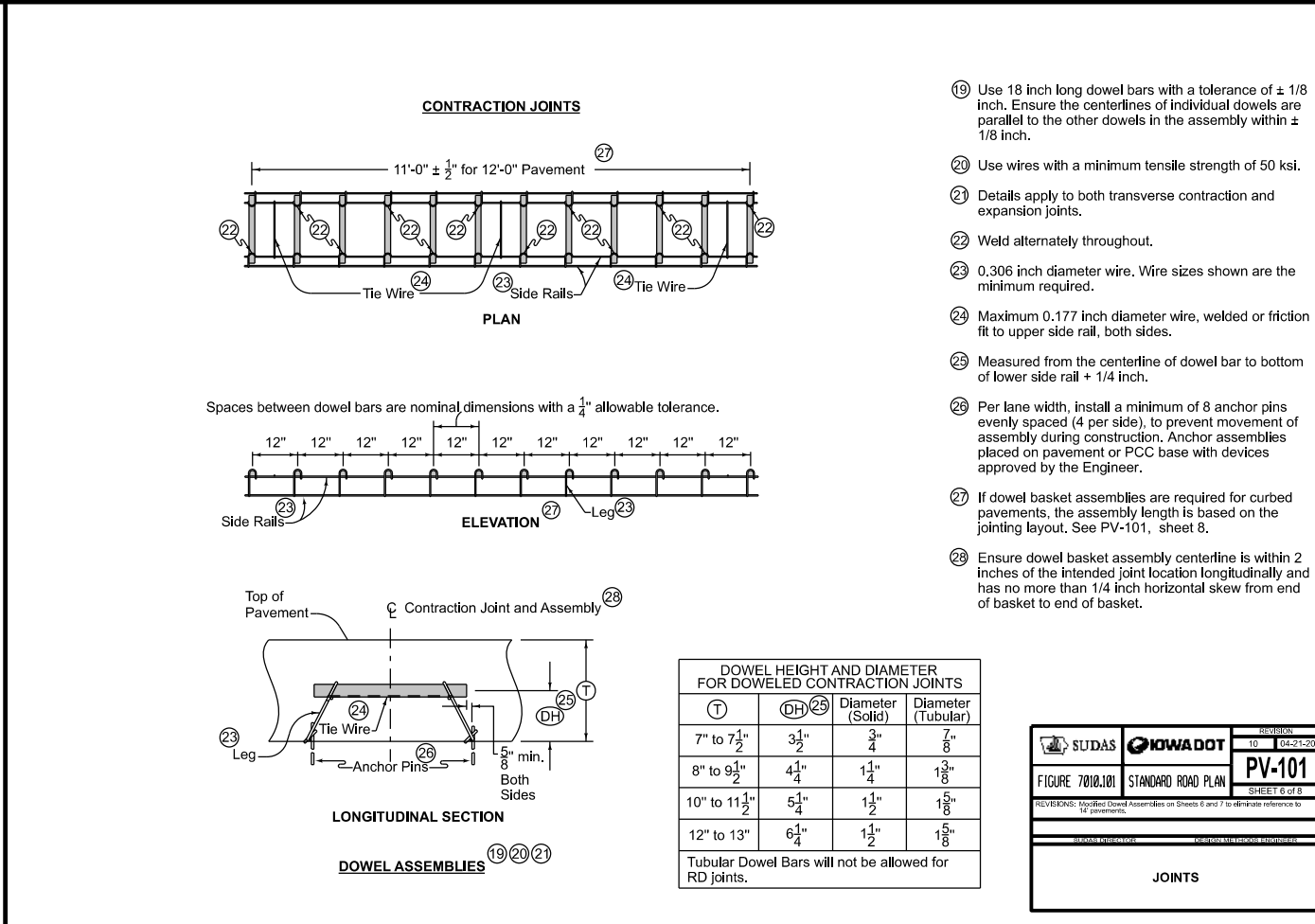
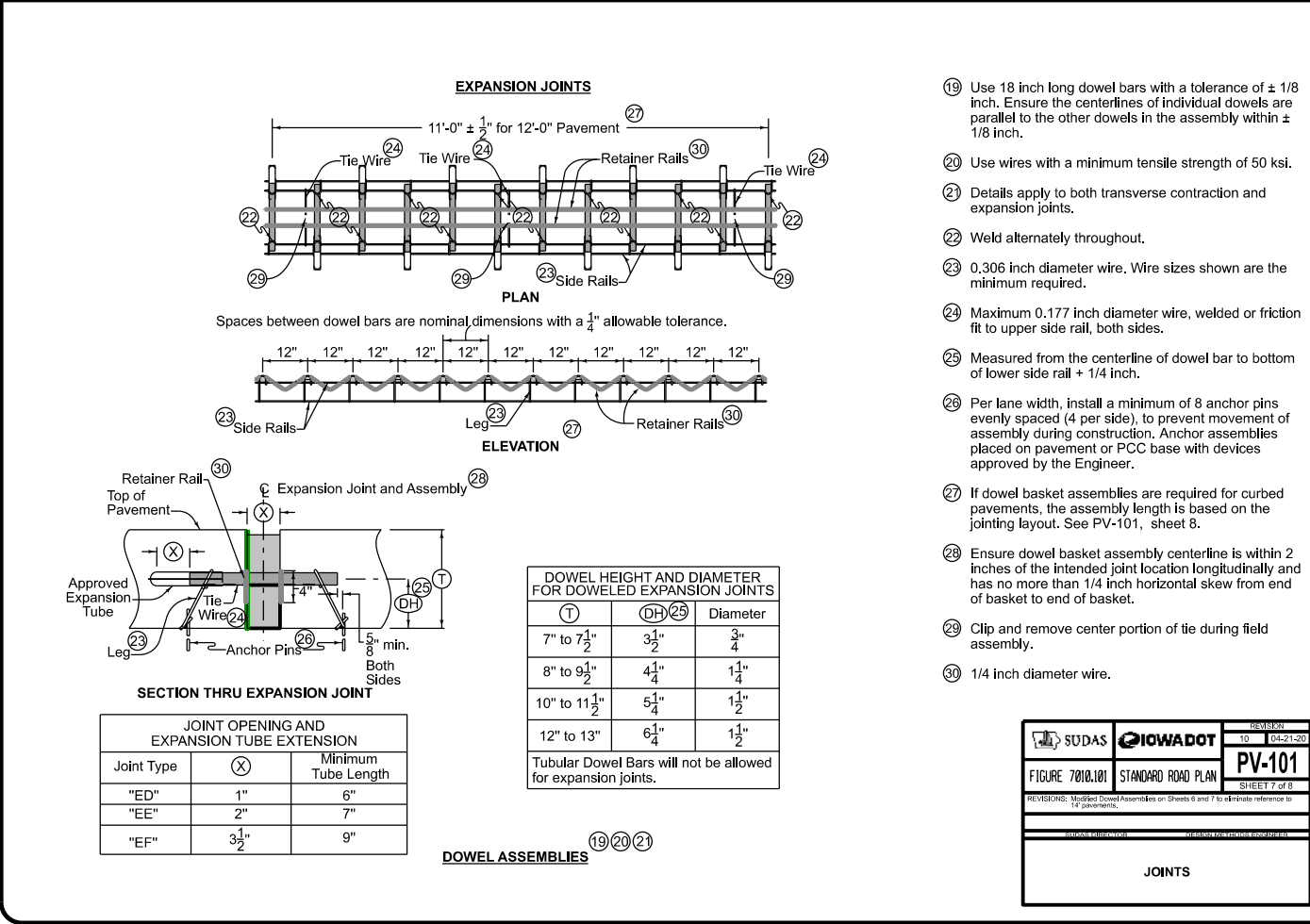
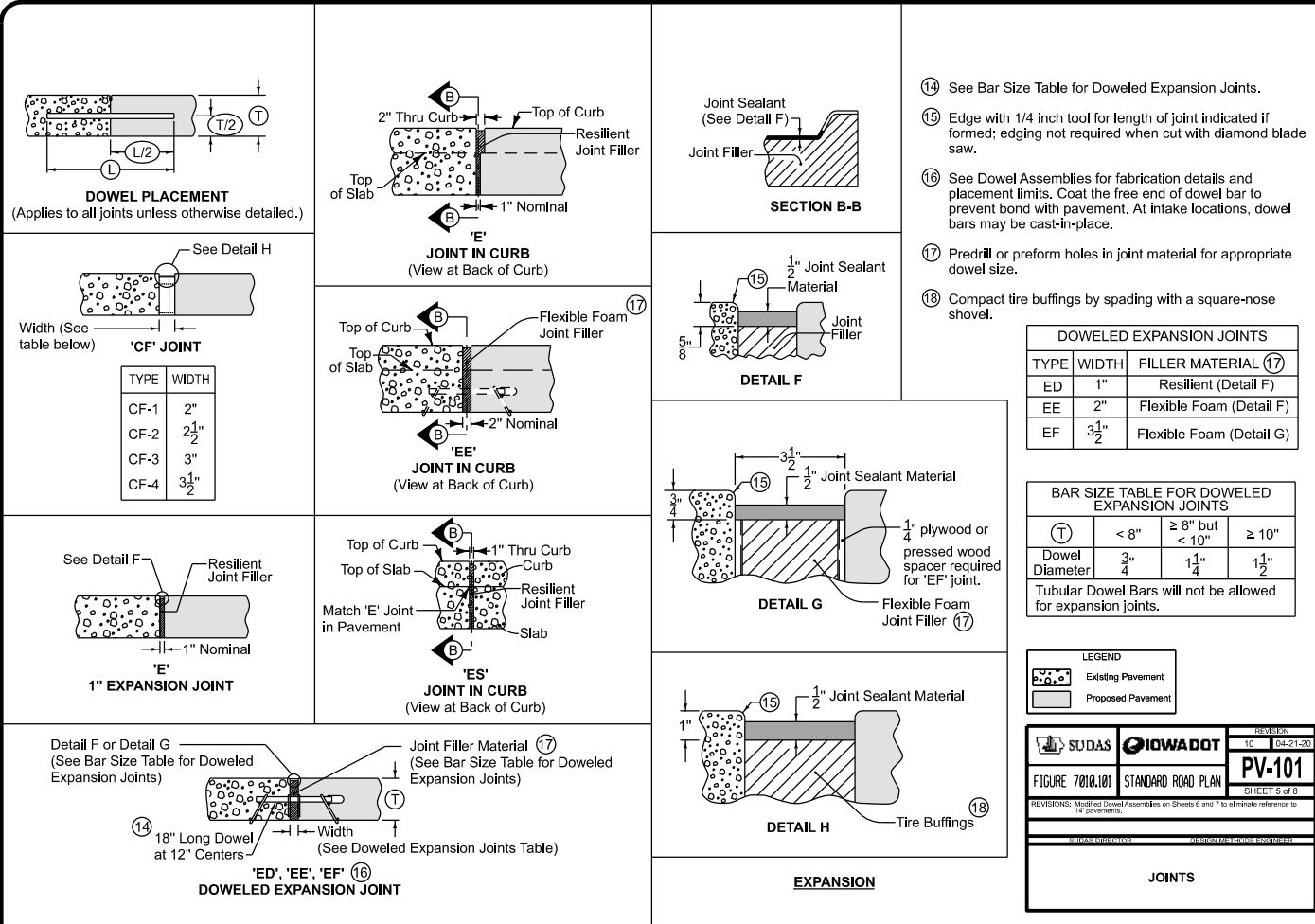


DETAIL E

KEYWAY DIMENSIONS			
Keyway Type	Pavement Thickness T	(A)	(B)
Standard	8" or greater	$1 \frac{3}{4}"$	$2 \frac{3}{4}"$
Narrow	Less than 8"	1"	2"

LEGEND	
	Existing Pavement
	Proposed Pavement

		REVISION 10 04-21-20
FIGURE 7010.101	STANDARD ROAD PLAN	PV-101
REVISIONS: Modified Dowel Assemblies on Sheets 6 and 7 to eliminate reference to 14 pavements.		SHEET 4 of 8
JOINTS		



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CITY OF MARSHALLTOWN, IOWA
MARSHALL COUNTY, IOWA

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TEL: (515) 669-4188
EMAIL ADDRESS:
mlee@leechamberlinengineers.com

DRAWING TITLE

DETAILS

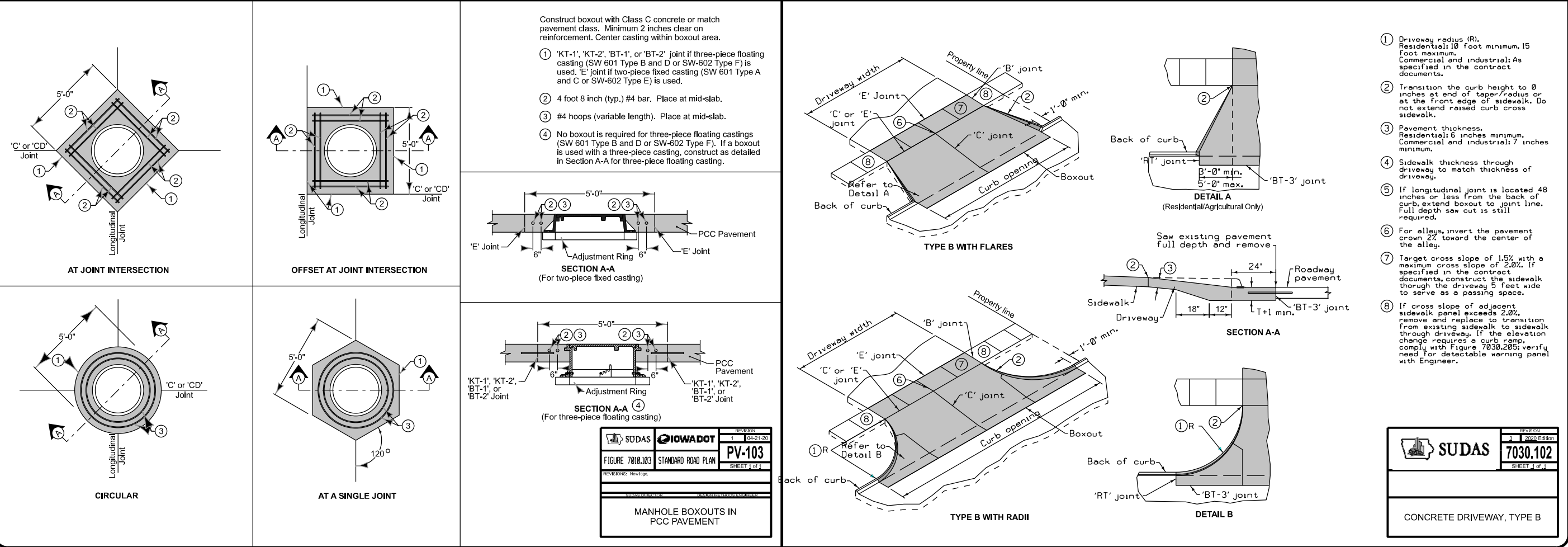
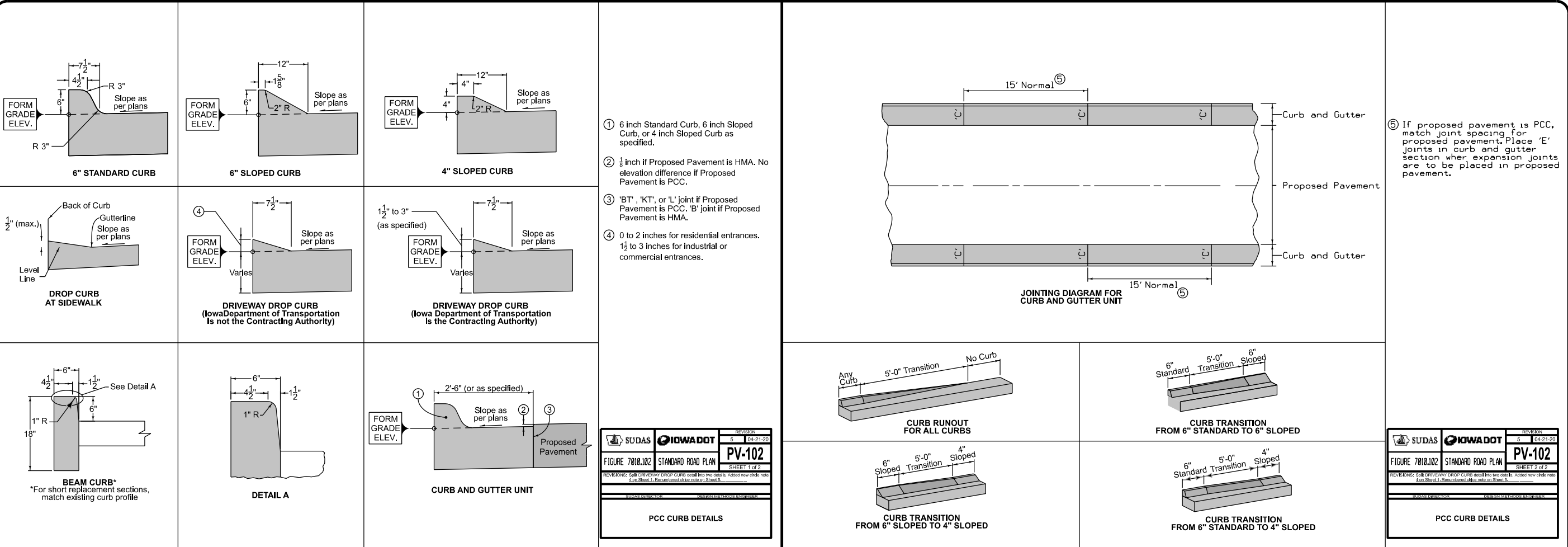
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W.D.H.

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M.L.L.

DATE
05/01/2020

JOB NO
19023

SHEET
B. 7



WASHINGTON STREET EXTENSION
CITY OF MARSHALLTOWN, IOWA
MARSHALL COUNTY, IOWA

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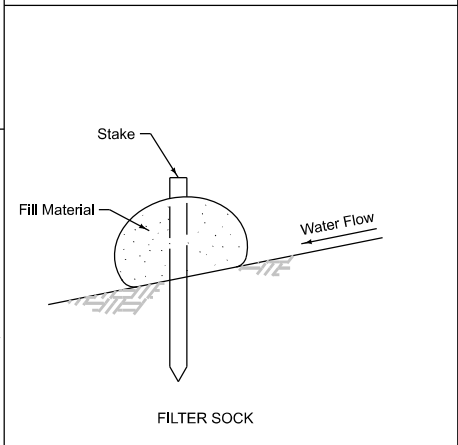
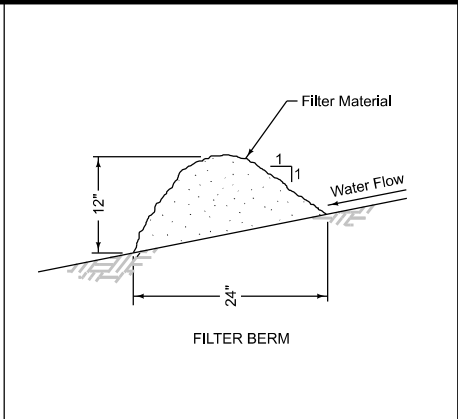
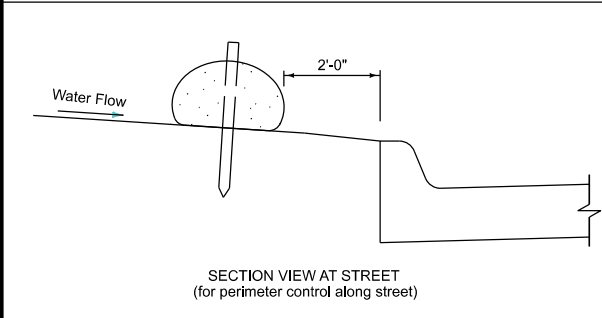
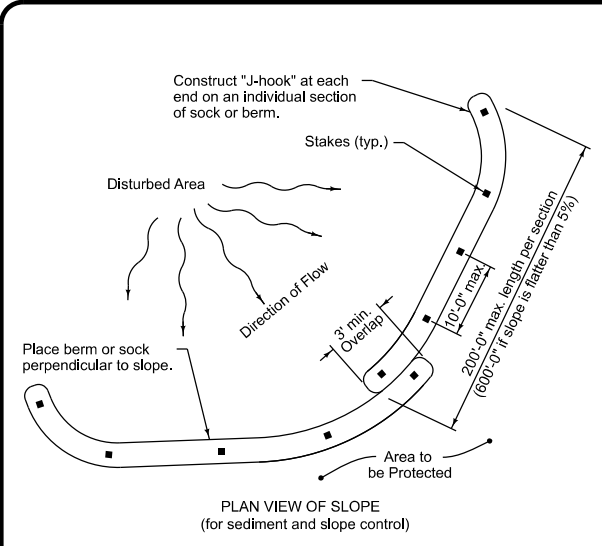
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B.8

CONCRETE DRIVEWAY, TYPE B



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 windrow perpendicular to the slope at locations specified in the contract documents.

Filter sock diameter as specified in the contract documents.

	REVISION
	4 10-17-17
	9040.102
SHEET 1 of 1	
FILTER BERM AND FILTER SOCK	

Entrance length: 50 foot minimum (30 foot for single family residential), or as specified in the contract documents. Length of entrance may be increased if sediment track-out occurs.

	REVISION
	2 10-21-14
	9040.120
SHEET 1 of 1	
STABILIZED CONSTRUCTION ENTRANCE	

Variable (20'-0" for a normal 10'-0" wide ditch.)

1 Insert 12 inches of fabric a minimum of 6 inches deep (fabric may be folded below the ground line).

ATTACHMENT TO POST

	REVISION
	2 10-21-14
	9040.119
SHEET 1 of 2	
SILT FENCE	

Install parallel to ground contour.

Install "J-hook" at each end of an individual section of silt fence.

TYPICAL SILT FENCE INSTALLATION ON LONGITUDINAL SLOPES (Plan View)

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.

DETAILS OF SILT FENCE ON LONGITUDINAL SLOPES

TYPICAL SILT FENCE INSTALLATION ON LONGITUDINAL SLOPES (Profile View)

	REVISION
	2 10-21-14
	9040.119
SHEET 2 of 2	
SILT FENCE	



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SHEET
B.9

ESTIMATED PROJECT QUANTITIES					
Item No.	Item Code	Item	Unit	Total	As Built Qty.
DIVISION 2 - EARTHWORK					
2.1	2010-108-B-0	CLEARING AND GRUBBING	LS	1	
2.2	2010-108-D-1	TOPSOIL, STRIP, SALVAGE AND RESPREAD	CY	1,405	
2.3	2010-108-E-0	EXCAVATION, CLASS 10	CY	1,970	
2.4	2010-108-G-12	SUBGRADE PREPARATION, 12 IN.	SY	3,393	
2.5	2010-108-H-0	SUBGRADE TREATMENT, TRI-AX GEOGRID	SY	3,393	
2.6	2010-108-I-12	MODIFIED SUBBASE, 12"	TON	2,214	
DIVISION 4 - SEWERS AND DRAINS					
4.1	4020-108-A-18	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 2000D, 18 IN.	LF	208	
4.2	4020-108-A-18	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 3000D, 18 IN.	LF	105	
4.3	4020-108-A-24	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 2000D, 24 IN.	LF	978	
4.4	4020-108-A-24	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 3000D, 24 IN.	LF	35	
4.5	4020-108-A-36	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 2000D, 36 IN.	LF	354	
4.6	4030-108-B-36	PIPE APRON, REINFORCED CONCRETE PIPE (RCP), 36 IN.	EA	1	
4.7	4030-108-C-0	FOOTING FOR CONCRETE PIPE APRON	EA	1	
4.8	4030-108-D-0	PIPE APRON GUARD	EA	1	
4.9	4040-108-A-4	SUBDRAIN, LONGITUDINAL, 4 IN. DIA.	LF	1,542	
4.10	4040-108-D-0	SUBDRAIN OUTLET / CONNECTION TO INTAKE OR MANHOLE	EA	16	
DIVISION 6 - STRUCTURES FOR SANITARY AND STORM SEWERS					
6.1	6010-108-B-0	INTAKE, SW-509	EA	11	
6.2	6010-108-F-0	MANHOLE ADJUSTMENT, MINOR	EA	1	
6.3	6010-108-F-0	MANHOLE ADJUSTMENT, MAJOR	EA	3	
DIVISION 7 - STREETS AND RELATED WORK					
7.1	7010-108-A-8	PAVEMENT, PCC, 8 IN., CLASS C MIX	SY	3,008	
7.2	7030-108-H-7	DRIVEWAY, PCC, 7 IN.	SY	151	
7.3	7040-108-H-0	PAVEMENT REMOVAL	SY	315	
DIVISION 8 - TRAFFIC CONTROL					
8.1	8010-208-B-0	2 - 4 IN. PVC CONDUIT DUCTBANK	LF	876	
8.2	8020-108-B-0	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED	STA	17	
8.3	8030-108-A-0	TEMPORARY TRAFFIC CONTROL	LS	1	
DIVISION 9 - SITE WORK AND LANDSCAPING					
9.1	9010-108-B-0	HYDRAULIC SEEDING, SEEDING, FERTILIZING, AND HYDROMULCHING	AC	1	
9.2	9040-108-A-1	SWPPP MANAGEMENT	LS	1	
9.3	9040-108-D-1	FILTER SOCK	LF	2,400	
9.4	9040-108-D-2	FILTER SOCK REMOVAL	LF	2,400	
9.5	9040-108-N-1	SILT FENCE / SILT FENCE FOR DITCH CHECKS	LF	2,300	
9.6	9040-108-N-3	SILT FENCE / SILT FENCE FOR DITCH CHECKS, REMOVAL OF DEVICE	LF	2,300	
9.7	9040-108-O-1	STABILIZED CONSTRUCTION ENTRANCE	SY	500	
9.8	9040-108-Q-2	EROSION CONTROL MULCHING, SEEDING AND HYDROMULCHING	AC	1	
9.9	9040-108-T-1	INLET PROTECTION DEVICE, OPEN THROAT	EA	11	
9.10	9040-108-T-2	INLET PROTECTION DEVICE, MAINTENANCE	EA	22	
DIVISION 11 - MISCELLANEOUS					
11.1	11,020-108-A-0	MOBILIZATION	LS	1	
11.2	11,050-108-A-0	CONCRETE WASHOUT	LS	1	



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PROJECT
QUANTITIES

DRAWN BY
W.D.H.

CHECKED BY
M.L.L.

DATE
05/01/2020

JOB NO
19023

SHEET
C.1

ESTIMATE REFERENCE INFORMATION		
Item No.	Item Code	Description
DIVISION 2 - EARTHWORK		
2.1	2010-108-B-0	CLEARING AND GRUBBING CLEAR AND GRUB TREES WITHIN GRADING LIMITS. BURNING WILL NOT BE ALLOWED. WOOD CHIPS SHALL BE HAULED OFF SITE. INCIDENTAL TO THIS ITEM IS THE REMOVAL OF ALL OTHER NECESSARY ROCK, DEBRIS, OR ABANDONED UTILITIES ENCOUNTERED DURING CONSTRUCTION.
2.2	2010-108-D-1	TOPSOIL, STRIP, SALVAGE AND RESPREAD STRIP AND SALVAGE TOPSOIL TO A MINIMUM DEPTH OF 8 INCHES BEFORE EXCAVATION OCCURS. TOPSOIL TO BE SPREAD TO A MINIMUM OF 8 INCHES IN A DISTURBED AREAS. SUPPLEMENT WITH OFF-SITE TOPSOIL NECESSARY TO MEET MINIMUM REQUIREMENTS. EXCESS TOPSOIL, IF ANY, SHALL BE WASTED UPON FORESLOPES.
2.3	2010-108-E-0	EXCAVATION, CLASS 10 ITEM INCLUDES BUT IS NOT LIMITED TO SITE PREPARATION FOR, AND THE CONSTRUCTION OF, EMBANKMENT, FILLS, SHOULDER BACKFILL, AND BACKFILL BEHIND CURBS; FINISHING THE SOIL SURFACE, INCLUDING ROADWAYS, SHOULDERS, BEHIND CURBS, AND SLOPES. OVERHAUL SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. ESTIMATED SHRINKAGE FACTOR OF 30% WAS ASSUMED FOR EXCAVATION QUANTITIES. CUT = 1,967 CY; FILL W/SHRINK = 1,110 CY; WASTE = 857 CY. WASTE TO BE DISPOSED OF AT THE SITE DEVELOPMENT ADJACENT TO THE ROADWAY PROJECT. NO ADDITIONAL PAYMENT WILL BE MADE FOR WASTING MATERIAL OFF SITE. COORDINATION WITH SITE CONTRACTOR SHALL BE REQUIRED. THIS ITEM SHALL BE PAID FOR BASED ON PLAN QUANTITY.
2.4	2010-108-G-12	SUBGRADE PREPARATION, 12 IN. REFER TO B SHEETS FOR TYPICAL SECTIONS. THIS SHALL INCLUDE PREPARATION OF THE TOP 12 INCHES OF SUBGRADE UNDERNEATH ALL PAVING ROAD SURFACING. SUBGRADE SHALL BE PREPARED IN TWO 6 INCH LIFTS. FOR AREAS IN CUT, REMOVE AND REPLACE TOP 6 INCHES OF EXISTING SUBGRADE TO PREPARE LOWER LIFT. SUBGRADE PREPARATION SHALL EXTEND 2 FEET BEYOND EDGE OF PAVEMENT.
2.5	2010-108-H-0	SUBGRADE TREATMENT, TRI-AX GEOGRID ITEM INCLUDES BUT IS NOT LIMITED TO FURNISHING, PLACING, AND INCORPORATING THE SUBGRADE TREATMENT MATERIAL (TRI-AX GEOGRID).
2.6	2010-108-I-12	MODIFIED SUBBASE, 12" MODIFIED SUBBASE TO BE PLACED TO THICKNESSES AS SHOWN IN THE B SHEETS. MODIFIED SUBBASE TO BE PLACED TO 2 FEET BEHIND BACK OF CURB. PLACE MODIFIED SUBBASE IN LIFTS WITH A THICKNESS NO GREATER THAN 6 INCHES. RECYCLED PAVEMENT SHALL NOT BE ALLOWED.
DIVISION 4 - SEWERS AND DRAINS		
4.1	4020-108-A-18	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 2000D, 18 IN.
4.2	4020-108-A-18	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 3000D, 18 IN.
4.3	4020-108-A-24	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 2000D, 24 IN.
4.4	4020-108-A-24	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 3000D, 24 IN.
4.5	4020-108-A-36	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 2000D, 36 IN. REFER TO M SHEETS FOR LOCATIONS AND DETAILS. PROVIDE CLASS R-2 AND R-5 BEDDING PER SUDAS FIGURE 3010.101, REFER TO M-3 FOR ADDITIONAL INFORMATION. WRAP PIPE JOINTS WITH ENGINEERING FABRIC. CONTRACTOR SHALL BE REQUIRED TO PERFORM VIDEO INSPECTION ON ALL STORM SEWER AFTER COMPLETION OF INSTALLATION BUT BEFORE PAVING HAS BEGUN. VIDEO INSPECTION SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. ITEM INCLUDES BUT IS NOT LIMITED TO TRENCH EXCAVATION; DEWATERING; FURNISHING AND INSTALLING PIPE; FURNISHING, PLACING, AND COMPACTING BEDDING AND BACKFILL MATERIAL; JOINT WRAPPING; WYES AND OTHER FITTINGS; PIPE JOINTS; PIPE CONNECTIONS; AND INSPECTION.
4.6	4030-108-B-36	PIPE APRON, REINFORCED CONCRETE PIPE (RCP), 36 IN. REFER TO M SHEETS FOR LOCATIONS AND DETAILS. ITEM SHALL INCLUDE BUT IS NOT LIMITED TO TRENCH EXCAVATION; DEWATERING; FURNISHING AND INSTALLING PIPE; FURNISHING, PLACING, AND COMPACTING BEDDING AND BACKFILL MATERIAL; CONNECTORS; AND OTHER APPURTENANCES.
4.7	4030-108-C-0	FOOTING FOR CONCRETE PIPE APRON FOOTING TO BE INSTALLED PER SUDAS FIGURE 4030.22. ITEM SHALL INCLUDE BUT IS NOT LIMITED TO EXCAVATION; DEWATERING; REINFORCING STEEL; CONCRETE; FURNISHING AND INSTALLING APRON; FURNISHING, PLACING AND COMPACTING BEDDING AND BACKFILL MATERIAL.
4.8	4030-108-D-0	PIPE APRON GUARD PIPE APRON GUARD TO BE INSTALLED PER SUDAS FIGURE 4030.224.
4.9	4040-108-A-4	SUBDRAIN, LONGITUDINAL, 4 IN. DIA. REFER TO TYPICAL SECTIONS ON B SHEETS FOR DETAILS. LONGITUDINAL SUBDRAIN SHALL BE CORRUGATED POLYETHYLENE TUBING. SPOILS FROM SUBDRAIN TRENCH EXCAVATION SHALL NOT BE PLACED ON MODIFIED SUBBASE. INCLUDES NECESSARY ELBOWS, TEES, CONNECTIONS, BACKFILL, AND FABRIC NECESSARY TO INSTALL THE SUBDRAIN.
4.10	4040-108-D-0	SUBDRAIN OUTLET / CONNECTION TO INTAKE OR MANHOLE ITEM IS FOR OUTLET OF LONGITUDINAL SUBDRAIN INTO STORM SEWER INTAKES. ITEM TO INCLUDE NON-SHRINK GROUT, COUPLING BANDS, RODENT GUARDS, AND OTHER MATERIAL NECESSARY TO INSTALL THE SUBDRAIN OUTLET. REFER TO SUDAS FIGURE 4040.233 FOR ADDITIONAL INFORMATION.

ESTIMATE REFERENCE INFORMATION		
Item No.	Item Code	Description
DIVISION 6 - STRUCTURES FOR SANITARY AND STORM SEWERS		
6.1	6010-108-B-0	INTAKE, SW-509 REFER TO M SHEETS FOR LOCATIONS. ITEM INCLUDES BUT IS NOT LIMITED TO EXCAVATION; FURNISHING AND INSTALLING PIPE; FURNISHING, PLACING, AND COMPACTING BEDDING AND BACKFILL MATERIAL; BASE; STRUCTURAL CONCRETE; REINFORCING STEEL; PRECAST UNITS; CONCRETE FILLETS; PIPE CONNECTIONS TO NEW OR EXISTING PIPES/STRUCTURES; CASTINGS; AND ADJUSTMENT RINGS.
6.2	6010-108-F-0	MANHOLE ADJUSTMENT, MINOR
6.3	6010-108-F-0	MANHOLE ADJUSTMENT, MAJOR REFER TO D AND M SHEETS FOR LOCATIONS. CASTING SHALL BE A THREE-PIECE TYPE B. ITEM INCLUDES BUT NOT LIMITED TO REMOVAL OF EXISTING CASTING, ADJUSTMENT RINGS, TOP SECTIONS, AND RISERS IF REQUIRED; EXCAVATION; CONCRETE AND REINFORCING STEEL OR PRECAST SECTIONS; FURNISHING AND INSTALLING NEW CASTING; INSTALLING NEW INFILTRATION BARRIER; PLACING BACKFILL MATERIAL; AND COMPACTION.
DIVISION 7 - STREETS AND RELATED WORK		
7.1	7010-108-A-8	PAVEMENT, PCC, 8 IN., CLASS C MIX SEE L SHEETS FOR LOCATIONS. INCLUDES INTEGRAL CURBS. ALL PAVEMENT JOINTS SHALL BE CLEANED AND SEALED. PAVEMENT THICKNESS INCENTIVES SHALL NOT APPLY. REINFORCING STEEL SHALL BE EPOXY COATED. KEYWAY JOINTS WILL NOT BE ALLOWED. ITEM INCLUDES BUT IS NOT LIMITED TO FINAL TRIMMING OF SUBGRADE OR SUBBASE, INTEGRAL CURB, BARS AND REINFORCEMENT, JOINTS AND SEALING, SURFACE CURING AND PAVEMENT PROTECTION, SAFETY FENCING, CONCRETE FOR RIGID HEADERS, AND BOXOUTS FOR FIXTURES.
7.2	7030-108-H-7	DRIVEWAY, PCC, 7 IN. SEE L SHEETS FOR LOCATIONS. INCLUDES INTEGRAL CURBS. ALL PAVEMENT JOINTS SHALL BE CLEANED AND SEALED. PAVEMENT THICKNESS INCENTIVES SHALL NOT APPLY. REINFORCING STEEL SHALL BE EPOXY COATED. KEYWAY JOINTS WILL NOT BE ALLOWED. ITEM INCLUDES BUT IS NOT LIMITED TO FINAL TRIMMING OF SUBGRADE OR SUBBASE, INTEGRAL CURB, BARS AND REINFORCEMENT, JOINTS AND SEALING, SURFACE CURING AND PAVEMENT PROTECTION, SAFETY FENCING, CONCRETE FOR RIGID HEADERS, AND BOXOUTS FOR FIXTURES.
7.3	7040-108-H-0	PAVEMENT REMOVAL REMOVE PAVEMENT AS SHOWN ON THE U SHEETS. FULL-DEPTH SAWCUT WILL BE REQUIRED AT ALL PAVEMENT REMOVAL LOCATIONS. PAYMENT SHALL INCLUDE DISPOSAL IN ACCORDING WITH ALL FEDERAL, STATE, AND LOCAL LAWS. SAW CUTS SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. THIS ITEM INCLUDES ALL REMOVAL OF PCC AND/OR HMA PAVEMENT.
DIVISION 8 - TRAFFIC CONTROL		
8.1	8010-208-B-0	2 - 4 IN. PVC CONDUIT DUCTBANK CONDUIT DUCTBANK TO BE INSTALLED PER SUDAS FIGURE 8010.103. PVC SCHEDULE 40 PLASTIC CONDUIT AND FITTINGS COMPLYING WITH NEMA TC-2 (PIPE) AND NEMA TC-3 (FITTINGS). CONDUIT SPACERS AND PULL ROPES SHALL BE INSTALLED AND SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. ITEM INCLUDES BUT IS NOT LIMITED TO FITTINGS, PIPE, PULL ROPE, TRENCHING, BACKFILLING, AND CONDUIT SPACERS.
8.2	8020-108-B-0	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED REFER TO N SHEET FOR LOCATIONS. ITEM INCLUDES BUT IS NOT LIMITED TO REFLECTORIZING SPHERES, LAYOUT, SURFACE PREPARATION, AND APPLICATION OF MARKING PAINT.
8.3	8030-108-A-0	TEMPORARY TRAFFIC CONTROL REFER TO "J" SHEETS FOR TRAFFIC CONTROL PLAN. ITEM SHALL INCLUDE INSTALLATION, MAINTENANCE, AND REMOVAL OF TRAFFIC CONTROL INCLUDING SAFETY CLOSURES AS REQUIRED BY DETOURS, THE STAGING PLANS, AND THE CONTRACTOR'S MEANS AND METHODS OF CONSTRUCTION. TEMPORARY CONSTRUCTION SAFETY FENCE SHALL BE CONSIDERED INCIDENTAL TO THIS ITEM. PERMANENT SIGNS SHOWN ON THE N SHEET SHALL BE CONSIDERED INCIDENTAL TO THE TEMPORARY TRAFFIC CONTROL BID ITME AND SHALL BE INSTALLED WITH CURRENT MUTCD STANDARDS.
DIVISION 9 - SITE WORK AND LANDSCAPING		
9.1	9010-108-B-0	HYDRAULIC SEEDING, SEEDING, FERTILIZING, AND HYDROMULCHING TYPE 1 SEEDING SHALL BE RESCUE PLUS TALL FESCUE/ BLUEGRASS MIX (85% SUMMER TURF TYPE TALL FESCUE & 15% ELITE KENTUCKY BLUEGRASS). PLACE IN ACCORDANCE WITH STORM WATER POLLUTION PREVENTION PLAN. TOP SIX INCHES OF THE SEEDBED SHALL BE FREE OF ROCK AND DEBRIS. TYPE 1 SEEDING SHALL BE PLACED UPON ALL FORESLOPES, BACK SLOPES AND DITCHES. PAYMENT SHALL INCLUDE ALL NECESSARY MATERIAL, LABOR AND INSTALLATION FOR COMPLETE SEEDING, FERTILIZING, HYDROMULCHING, AND WATERING. BONDED FIBER MATRIX SHALL BE USED FOR HYDROMULCHING. COMPLY WITH MANUFACTURERS RECOMMENDATIONS FOR EACH TYPE OF MULCH USED. HYDROMULCHING USED IN CONJUNCTION WITH HYDROSEEDING CAN BE APPLIED TOGETHER IN ONE APPLICATION, PROVIDED THAT ALL MANUFACTURES RECOMMENDATIONS ALLOW.
9.2	9040-108-A-1	SWPPP MANAGEMENT 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. ITEM ALSO INCLUDES WEEKLY INSPECTIONS REQUIRED TO SATISFY THE PROVISIONS OF GENERAL PERMIT NO. 2, UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.
9.3	9040-108-D-1	FILTER SOCK PLACE IN ACCORDANCE WITH STORM WATER POLLUTION PREVENTION PLAN OR AT THE DIRECTION OF THE ENGINEER. AN ADDITIONAL 50% HAS BEEN ADDED TO THE QUANTITY TO ACCOUNT FOR CHANGES TO THE EROSION CONTROL PLAN AND REPLACEMENT OF DAMAGED FILTER SOCK. INCLUDES ANCHORING STAKES. REFER TO SUDAS SPECIFICATIONS 9040.102 AND 9040.105 FOR FURTHER INFORMATION ON FILTER SOCK.



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SHEET C.3

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
9.4	9040-108-D-2	FILTER SOCK REMOVAL REMOVE FILTER SOCK AS NECESSARY AND AT THE COMPLETION OF THE PROJECT. INCLUDES RESTORATION OF THE AREA TO FINISHED GRADE AND OFF-SITE DISPOSAL OF FILTER SOCKS AND ACCUMULATED SEDIMENT.
9.5	9040-108-N-1	SILT FENCE / SILT FENCE FOR DITCH CHECKS PLACE IN ACCORDANCE WITH STORM WATER POLLUTION PREVENTION PLAN OR AT THE DIRECTION OF THE ENGINEER. AN ADDITIONAL 50% HAS BEEN ADDED TO THE QUANTITY TO ACCOUNT FOR REPLACEMENT OF FENCE AND PROTECTION OF ADDITIONAL AREAS. REFER TO SUDAS SPECIFICATION 9040.119 FOR FURTHER INFORMATION ON SILT FENCE.
9.6	9040-108-N-3	SILT FENCE / SILT FENCE FOR DITCH CHECKS, REMOVAL OF DEVICE REMOVE SILT FENCE AS NECESSARY AND AT THE COMPLETION OF THE PROJECT. INCLUDES RESTORATION OF THE AREA TO FINISHED GRADE AND OFF-SITE DISPOSAL OF FENCE, POSTS, AND ACCUMULATED SEDIMENT.
9.7	9040-108-O-1	STABILIZED CONSTRUCTION ENTRANCE STABILIZED CONSTRUCTION ENTRANCE TO BE INSTALLED PER SUDAS FIGURE 9040.120. CONTRACTOR SHALL INSTALL A 4 INCH BASE LAYER OF 3 INCH STONE AS A BASE AND UTILIZE A 2 INCH LAYER OF 1 INCH CLEAN AS A SURFACE LAYER. ENTRANCE SHALL BE 30 FEET WIDE AND 50 FEET LONG.
9.8	9040-108-Q-2	EROSION CONTROL MULCHING, SEEDING AND HYDROMULCHING PLACE IN ACCORDANCE WITH STORM WATER POLLUTION PREVENTION PLAN OR AT THE DIRECTION OF THE ENGINEER. HYDRAULIC SEEDING AND FERTILIZING, TYPE 4 QUANTITY HAS BEEN CALCULATED TO INCLUDE UP TO TWO (2) APPLICATIONS MEASURED TO THE TEMPORARY CONSTRUCTION LIMITS. DISTURBED AREAS BEYOND THE TEMPORARY CONSTRUCTION LIMIT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO STABILIZE. BONDED FIBER MATRIX SHALL BE USED FOR HYDROMULCHING. COMPLY WITH MANUFACTURERS RECOMMENDATIONS FOR EACH TYPE OF MULCH USED. HYDROMULCHING USED IN CONJUNCTION WITH HYDROSEEDING CAN BE APPLIED TOGETHER IN ONE APPLICATION, PROVIDED THAT ALL MANUFACTURES RECOMMENDATIONS ALLOW.
9.9	9040-108-T-1	INLET PROTECTION DEVICE, OPEN THROAT INLET PROTECTION DEVICE SHALL BE PLACED IN ALL OPEN THROAT CURB INTAKES.
9.10	9040-108-T-2	INLET PROTECTION DEVICE, MAINTENANCE REMOVE SEDIMENT AS NEEDED THROUGHOUT THE DURATION OF THE PROJECT TO KEEP INLET PROTECTION DEVICES FUNCTIONING OPTIMALLY. QUANTITY ASSUMES REMOVAL WILL BE REQUIRED TWICE PER DEVICE DURING THE CONSTRUCTION PERIOD.
DIVISION 11 - MISCELLANEOUS		
11.10	11,020-108-A-0	MOBILIZATION ITEM SHALL INCLUDE BUT IS NOT LIMITED TO THE MOVEMENT OF PERSONNEL, EQUIPMENT, AND SUPPLIES TO THE PROJECT SITE; THE ESTABLISHMENT OF OFFICES, BUILDINGS, AND OTHER FACILITIES NECESSARY FOR THE PROJECT; AND BONDING, PERMITS, AND OTHER EXPENSES INCURRED PRIOR TO CONSTRUCTION.
11.20	11,050-108-A-0	CONCRETE WASHOUT THIS BID ITEM INCLUDES, BUT IS NOT LIMITED TO, PROVIDING CONTAINMENT, COLLECTION, AND DISPOSAL FOR CONCRETE WASH WATER.

GENERAL NOTES	
GENERAL NOTES	
1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CURRENT VERSION OF THE URBAN STANDARDS SPECIFICATIONS FOR PUBLIC IMPROVEMENTS (SUDAS) ON THE DATE OF APPROVAL AND THE CITY OF MARSHALLTOWN SUPPLEMENTAL SPECIFICATIONS AS STATED HEREIN.	
2. A PRECONSTRUCTION MEETING IS REQUIRED PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE THIS MEETING.	
3. ALL PERMITS (IDNR, IDOT, ARMY CORP., ETC.) SHALL BE OBTAINED PRIOR TO THE START OF CONSTRUCTION.	
4. THE DEVELOPER AND/OR CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE THE CITY OF MARSHALLTOWN WITH RECORD DRAWINGS OF ALL IMPROVEMENTS AS PER CITY STANDARD PROCEDURES.	
STORM SEWER NOTES	
1. ALL STORM SEWER ON ROADWAY CULVERTS IN THE ROW SHALL BE RCP, UNLESS OTHERWISE NOTED ON THE PLANS.	
2. ALL FLARED END SECTIONS SHALL HAVE FOOTINGS AND APRON GRATES. THE LAST 3 PIPE SECTIONS AND THE FLARED END SECTION ON ALL CULVERTS SHALL BE TIED.	
3. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY FIELD TILE DAMAGED DURING CONSTRUCTION. THE TILE SHOULD BE DIRECTED TO PUBLIC DRAINAGE SYSTEMS IF POSSIBLE. THE CONTRACTOR SHALL RECORD THE ELEVATION AND LOCATION OF ALL TILES.	
GENERAL CONSTRUCTION NOTES	
UTILITY WARNING: THE UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND/OR RECORDS OBTAINED. THE SURVEYOR MAKES NO GUARANTEE THAT THE UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED.	
EXISTING UTILITY FACILITIES SUCH AS UTILITY POLES UNDERGROUND CONDUIT, GUY WIRES, UNDERGROUND CARRIER PIPE, AND SERVICE LINES SHALL BE RELOCATED, REMOVED OR ADJUSTED BY THE RESPECTIVE UTILITY COMPANIES. ALL UTILITY WORK DOES NOT APPEAR ON THE PLANS. COORDINATION WITH UTILITY COMPANIES FOR THE LOCATION AND ACCESS FOR RELOCATION OF THEIR LINES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.	
ANY AND ALL DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY. ALL QUANTITIES ARE FOR CONTRACTOR CONVENIENCE. WHERE CONFLICTS OCCUR, DRAWINGS SHALL PREVAIL.	
ALL ELEVATIONS ARE TO NAVD 88 DATUM AND ARE TO BE PROVIDED BY LEE CHAMBERLIN.	
REMOVAL OF EXISTING FEATURES SHALL BE CONSIDERED INCIDENTAL TO OTHER ITEMS OF WORK ON THE PROJECT IF NOT OUTLINED SPECIFICALLY AS A BID ITEM. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL MATERIALS REMOVED AS PART OF THIS PROJECT.	
THE CONTRACTOR SHALL TAKE CARE NOT TO REMOVE OR DAMAGE PUBLIC OR PRIVATE PROPERTY NOT MARKED FOR REMOVAL ON THE PLAN. ITEMS NOT SCHEDULED FOR REMOVAL SHALL BE REPLACED AT NO COST TO THE OWNER IF REMOVED OR DAMAGED.	
THE COST INCURRED WHEN A SECTION OF REMOVAL IS SKIPPED OR WHERE PAVING IS DONE IN SECTIONS IN ORDER TO MAINTAIN ACCESS TO ADJACENT PROPERTIES SHALL BE INCIDENTAL TO THE PROJECT. CONTRACTOR SHALL MAINTAIN FARMFIELD ACCESS AT THE REQUEST OF LANDOWNER FOR FARMING PURPOSES.	
THE CONTRACTOR IS CAUTIONED NOT TO OBSTRUCT OR REMOVE UNNECESSARY PAVEMENT OR TO DISTURB THE EXISTING TRAFFIC PATTERN MORE THAN NECESSARY FOR THE PROPER EXECUTION OF WORK.	
THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF EXISTING VALVES, FIRE HYDRANTS, MANHOLES, TREES, POLES, GUYS, AND EXISTING FACILITIES.	
CONTRACTOR WILL NOT BE COMPENSATED FOR ANY QUANTITY OVER-RUNS UNLESS PRIOR APPROVAL IS OBTAINED FROM THE ENGINEER.	
ANY WORK REQUIRED TO COMPLETE THE SCOPE OF THE PROJECT AS SPECIFIED OR SHOWN ON THE PLANS, BUT NOT SET FORTH AS A SPECIFIC BID ITEM SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT	
CONSTRUCTION FENCE IS REQUIRED AROUND CONSTRUCTION AREAS AND ALL UNATTENDED OPEN EXCAVATIONS. FENCE SHALL BE CONSTRUCTED AND MAINTAINED IN AN UPRIGHT POSITION AT ALL TIMES. CONTRACTOR SHALL USE EXTREME CAUTION WHILE INSTALLING FENCE NOT TO DAMAGE UNDERGROUND UTILITIES. TEMPORARY FENCING IS INCIDENTAL TO THE WORK AND IS NOT A PAID BID ITEM.	
ALL DISTURBED AREAS SHALL BE RESTORED IN ACCORDANCE WITH THE SPECIFICATIONS.	
CONSTRUCTION ACTIVITIES ARE TO BE LIMITED TO THE EXISTING RIGHT-OF-WAY, EASEMENTS, AND WORK LIMITS AS SHOWN ON PLANS. IF ADDITIONAL AREAS ARE NEEDED FOR STAGING, STORAGE, ETC. IT IS THE CONTRACTORS' RESPONSIBILITY TO OBTAIN WRITTEN PERMISSION FROM THE PROPERTY OWNER(S). COPIES OF THE AGREEMENTS SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATIVE PRIOR TO USE OF THE PROPERTY.	
ALL ROADWAYS AND DRIVES SHALL BE KEPT OPEN AT ALL TIMES UNLESS NOTED OTHERWISE IN THE PLANS. THE CONTRACTOR MUST PERFORM THE WORK IN A MANNER THAT WILL MAINTAIN UNINTERRUPTED VEHICULAR AND PEDESTRIAN TRAFFIC.	
SITE CLEANUP SHALL BE PERFORMED ON A DAILY BASIS. PUBLIC ROADWAYS SHALL BE KEPT CLEAN AT ALL TIMES.	
GENERAL UTILITY NOTES	
COORDINATE ALL UTILITY CONNECTIONS.	
UNDERGROUND UTILITIES SHALL BE INSTALLED IN TRENCHES WITH BEDDING AS PER SUDAS SPECIFICATIONS, AND AS INDICATED ON THE PLANS AND DETAILS.	
ALL UTILITY WORK SHALL BE VISUALLY OBSERVED BY THE CITY PRIOR TO BACKFILLING TRENCHES, WITH ALL DEFICIENCIES CORRECTED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFICATION OF APPROPRIATE OFFICIALS PRIOR TO COMMENCEMENT OF WORK.	
FINAL ACCEPTANCE SHALL NOT BE MADE UNTIL ALL WORK SHOWN ON APPROVED UTILITY PLANS IS COMPLETED INCLUDED GRADING, AND ALL REQUIRED ADJUSTMENTS SHALL BE SUBJECT TO APPROVAL BY THE CITY.	
UTILITY NOTES	
1. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT EACH UTILITY'S OPERATING AUTHORITY AND SCHEDULE JOINT MEET LOCATES. THE CONTRACTOR SHALL VERIFY WITH EACH UTILITY'S OPERATING AUTHORITY THAT LOCATES HAVE BEEN PERFORMED. IOWA ONE CALL SYSTEM: 1-800-292-8989. THE CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES. THE CONTRACTOR SHALL WORK TO EXPLORE AND VERIFY THE LOCATION OR ELEVATION OF ALL UTILITIES AT LEAST 100 FEET IN ADVANCE OF THE EXCAVATION WORK. IN THE EVENT THAT A UTILITY IS DISCOVERED THAT WAS NOT SHOWN ON THE DRAWINGS OR A SUBSTANTIAL DEVIATION IN LOCATION OR ELEVATION OF A KNOWN UTILITY EXISTS, THE CONTRACTOR SHALL REPORT IT TO THE OWNER'S REPRESENTATIVE AS SOON AS DISCOVERED. UTILITIES DAMAGED OR BROKEN BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE OWNER.	
2. NOTIFY UTILITY COMPANIES WHOSE FACILITIES ARE SHOWN ON THE PLANS OR KNOWN TO BE WITHIN CONSTRUCTION LIMITS OF THE SCHEDULE PRIOR TO EACH STAGE OF CONSTRUCTION.	
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF EXISTING UTILITIES AS REQUIRED FOR THE IMPROVEMENTS AND SHALL COORDINATE TEMPORARY DISRUPTION OF SERVICE WITH THE CITY OF GRIMES AND AFFECTED UTILITY COMPANY.	
4. SHORING IS INCIDENTAL TO UTILITY INSTALLATION. SHORING FOR UTILITY INSTALLATION MAY NOT BE SHOWN ON THE PLANS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ASCERTAIN IF SHORING IS NEEDED IN ADDITION TO WHAT IS SHOWN ON THE DRAWINGS BASED ON THE OWNER'S REQUIREMENTS FOR VEGETATION, STRUCTURE, AND PAVING PROTECTION.	

GENERAL NOTES	
5. COORDINATE ALL UTILITY OUTAGES WITH OWNER OF UTILITY. PHASE WORK TO MEET UTILITY OUTAGE AND PROJECT SCHEDULE REQUIREMENTS. PROVIDE A 3 DAY NOTICE TO OWNER AND ENGINEER OF ANY UTILITY OUTAGE.	
6. THE CONTRACTOR IS RESPONSIBLE TO FURNISH AND INSTALL ALL UTILITIES UNLESS SPECIFICALLY INDICATED TO BE INSTALLED BY OTHERS.	
TESTING INFORMATION	
1. SOILS COMPACTION TESTING AND PAVEMENT TESTING WILL BE THE RESPONSIBILITY OF THE OWNER.	
SITE RESTORATION & GRADING NOTES	
1. ALL DISTURBED AREAS SHALL BE FINAL GRADED IN PREPARATION OF SEEDING.	
2. SEED ALL DISTURBED AREAS. SEED ALL DISTURBED AREAS PRIOR TO SEPTEMBER 30. IF ADDITIONAL AREAS ARE DISTURBED BEYOND SEPTEMBER 30 THE REMAINDER OF THE PERMANENT SEEDING WILL BE ALLOWED TO BE PLANTED OUTSIDE THE CONTRACT COMPLETION DATE BETWEEN APRIL 15 AND MAY 31. CONTRACTOR SHALL INSTALL TEMPORARY TYPE 4 SEED MIX ON DISTURBED AREAS BETWEEN OUTSIDE OF THE NORMAL SEEDING DATES. TEMPORARY SEEDING IS INCIDENTAL TO SEEDING FERTILIZING AND MULCHING FOR HYDRAULIC SEEDING. CONTRACTOR MUST MAINTAIN SWPPP AND EROSION CONTROL FINAL RESTORATION IS COMPLETE.	
3. SITE TO BE GRADED TO MATCH EXISTING UNLESS OTHERWISE STATED IN THE PLANS. GRADING SHALL BE DONE IN A MANNER WHICH MAINTAINS POSITIVE SITE DRAINAGE AT ALL TIMES. FULFILLMENT OF THE GRADING REQUIREMENTS WILL BE AT THE OWNER'S DISCRETION.	
4. ADJUST ALL NEW AND EXISTING VALVES, HYDRANTS, CASTINGS, PULL BOXES, ETC TO MATCH THE FINISHED ELEVATIONS INDICATED ON THE PLANS. ALL RIM ELEVATIONS WITHN PAVED SURFACES SHALL BE ADJUSTED TO MATCH FINISHED PAVING.	
WORK TO BE COMPLETED PRIOR TO CONSTRUCTION:	
1. JOINT UTILITY LOCATE MEETING. CONTRACTOR SHALL SET UP A ONE-CALL MEETING.	
2. PRECONSTRUCTION MEETING WITH THE CONTRACTOR, THE ENGINEER, CITY, UTILITIES AND OTHER PARTIES THAT MAY HAVE INTEREST IN THE CONSTRUCTION.	
3. CONTRACTOR SHALL COMPLETE EXPLORATORY DIGGING AND/OR POTHOLING AT ALL POTENTIAL UTILITY CONFLICT LOCATIONS PRIOR TO BEGINNING CONSTRUCTION.	
COORDINATION REQUIREMENTS	
ANY CONFLICTS BETWEEN CONTRACTORS, SUBCONTRACTORS, CITY, UTILITIES OR OTHERS MAY BE RECONCILED BY THE CITY OF MARSHALLTOWN.	
WORK BY PUBLIC UTILITIES	
WORK BY PUBLIC UTILITIES SHALL BE COORDINATED BY THE CONTRACTOR. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO, THE RELOCATION OF OVERHEAD POWER LINES, TELEPHONE LINES, FIBER OPTIC LINES, CABLE, ETC.	
LAND FOR CONSTRUCTION PURPOSES	
CONTRACTOR MAY BE PERMITTED TO USE AVAILABLE LAND BELONGING TO OR LEASED BY THE OWNER, ON OR NEAR THE SITE OF THE WORK, FOR CONSTRUCTION PURPOSES AND FOR THE STORAGE OF MATERIALS AND EQUIPMENT. THE LOCATION AND EXTENT OF THE AREAS AVAILABLE TO THE CONTRACTOR SHALL BE AS INDICATED ON THE DRAWINGS. ANY ADDITIONAL RIGHT-OF-WAY DESIRED BY THE CONTRACTOR SHALL BE ACQUIRED AT HIS EXPENSE, AND THE CONTRACTOR SHALL HOLD HARMLESS THE OWNER, AND ENGINEER FROM CLAIMS FOR DAMAGES MADE BY THE OWNERS OF SUCH ADDITIONAL RIGHT-OF-WAY. DISTURBED AREAS SHALL BE RESTORED UPON FINAL PROJECT COMPLETION.	
SITE ACCESS	
ALL CONSTRUCTION ACCESS SHALL BE FROM AVAILABLE PUBLIC ACCESS RIGHT-OF-WAY. NO CONSTRUCTION TRAFFIC SHALL BE ALLOWED THROUGH RESIDENTIAL AREAS UNLESS OTHERWISE INDICATED ON THE PLANS.	
NOTICES	
CONTRACTOR SHALL NOTIFY OWNERS OF ADJACENT PROPERTIES AND UTILITIES WHEN PROSECUTION OF THE WORK MAY AFFECT THEM. WHEN IT IS NECESSARY TO TEMPORARILY DENY ACCESS BY OWNERS OR TENANTS TO THEIR PROPERTY, OR WHEN ANY UTILITY SERVICE CONNECTION MUST BE INTERRUPTED, THE CONTRACTOR SHALL GIVE NOTICES SUFFICIENTLY IN ADVANCE TO ENABLE THE AFFECTED PERSONS TO PROVIDE FOR THEIR NEEDS. NOTICES WHETHER GIVEN ORALLY OR IN WRITING SHALL INCLUDE APPROPRIATE INFORMATION CONCERNING THE INTERRUPTION AND INSTRUCTION ON HOW TO LIMIT THEIR INCONVENIENCE.	
LINES AND GRADES	
ALL WORK SHALL BE DONE TO THE LINES, GRADES, AND ELEVATIONS INDICATED ON THE DRAWINGS. HORIZONTAL AND TWO VERTICAL CONTROL POINTS WILL BE ESTABLISHED OR DESIGNATED BY THE ENGINEER. THESE POINTS SHALL BE USED AS DATUM FOR THE WORK. ALL ADDITIONAL SURVEY, LAYOUT, AND MEASUREMENT WORK SHALL BE PERFORMED BY THE OWNER OR ENGINEER AT THE REQUEST OF THE CONTRACTOR. THE CONTRACTOR SHALL VERIFY ALL MATCH POINTS DURING THE PHASING OF THE WORK AND MAINTAIN DRAINAGE PATHS DURING THE WORK TO PREVENT PONDING OF WATER.	
CONNECTIONS TO EXISTING FACILITIES	
UNLESS OTHERWISE SPECIFIED OR INDICATED, CONTRACTOR SHALL MAKE ALL NECESSARY CONNECTIONS TO EXISTING FACILITIES, INCLUDING STRUCTURES, DRAINLINES, AND UTILITIES SUCH AS WATER, SANITARY SEWER, GAS, TELECOMMUNICATIONS, STORM SEWER AND ELECTRIC. IN EACH CASE, CONTRACTOR SHALL RECEIVE PERMISSION FROM OWNER OR THE OWNING UTILITY PRIOR TO UNDERTAKING CONNECTIONS. CONTRACTOR SHALL PROTECT FACILITIES AGAINST DELETERIOUS SUBSTANCES AND DAMAGE. CONNECTIONS TO EXISTING FACILITIES, WHICH ARE IN SERVICE, SHALL BE THOROUGHLY PLANNED IN ADVANCE, AND ALL REQUIRED EQUIPMENT, MATERIALS, AND LABOR SHALL BE ON HAND AT THE TIME OF UNDERTAKING THE CONNECTIONS. WORK SHALL PROCEED CONTINUOUSLY IF NECESSARY TO COMPLETE CONNECTIONS IN THE MINIMUM TIME. OPERATIONS OF VALVES, HYDRANTS, OR OTHER APPURTENANCES ON EXISTING UTILITIES, WHEN REQUIRED, SHALL BE BY OR UNDER THE DIRECT SUPERVISION OF THE OWNING UTILITY.	
CLEAN UP	
CONTRACTOR SHALL KEEP THE PREMISES OCCUPIED BY THE CONTRACTOR FREE FROM ACCUMULATIONS OF WASTE MATERIALS AND RUBBISH AT ALL TIMES. CONTRACTOR SHALL PROVIDE SEPARATE RECYCLING AND TRASH RECEPTACLES ABOUT THE WORK SITE, PROMPTLY EMPTY CONTAINERS WHEN FILLED, AND PROPERLY DISPOSE OF WASTE MATERIALS AT HIS EXPENSE. WASTES SHALL NOT BE BURIED OR BURNED ON THE SITE OR DISPOSED OF IN TRENCHES, STORM DRAINS, SEWER, STREAMS, OR WATERWAYS.	
SITE EROSION NOTES	
SILT FENCING SHOULD BE CONSTRUCTED AS SHOWN ON THE PLAN. ADDITIONAL SILT FENCING SHALL BE INSTALLED IF FIELD CONDITIONS DICTATE, OR AS DIRECTED BY THE OWNER OR ENGINEER. SEED, FERTILIZE, AND MULCH ALL DISTURBED AREAS. TEMPORARY SEEDING MIXTURE FOR AREAS THAT WILL NOT BE DISTURBED FOR TWO MONTHS OR GREATER SHALL BE SEEDDED AS PER SUDAS. OUTSIDE THE NORMAL FALL SEEDING WINDOW, TEMPORARY EROSION CONTROL MEASURES SHALL BE PLACED AND MAINTAINED UNTIL SEEDING CAN BEGIN. SILT FENCE TO BE MAINTAINED WEEKLY. DISPOSE OF ACCUMULATED SEDIMENT AND SILT. SEE POLLUTION PREVENTION PLAN SHEET FOR ADDITIONAL INFORMATION	



WASHINGTON STREET EXTENSION
CITY OF MARSHALLTOWN, IOWA
MARSHALL COUNTY, IOWA



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GENERAL
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CHECKED BY M.L.L.
DATE 05/01/2020
JOB NO 19023
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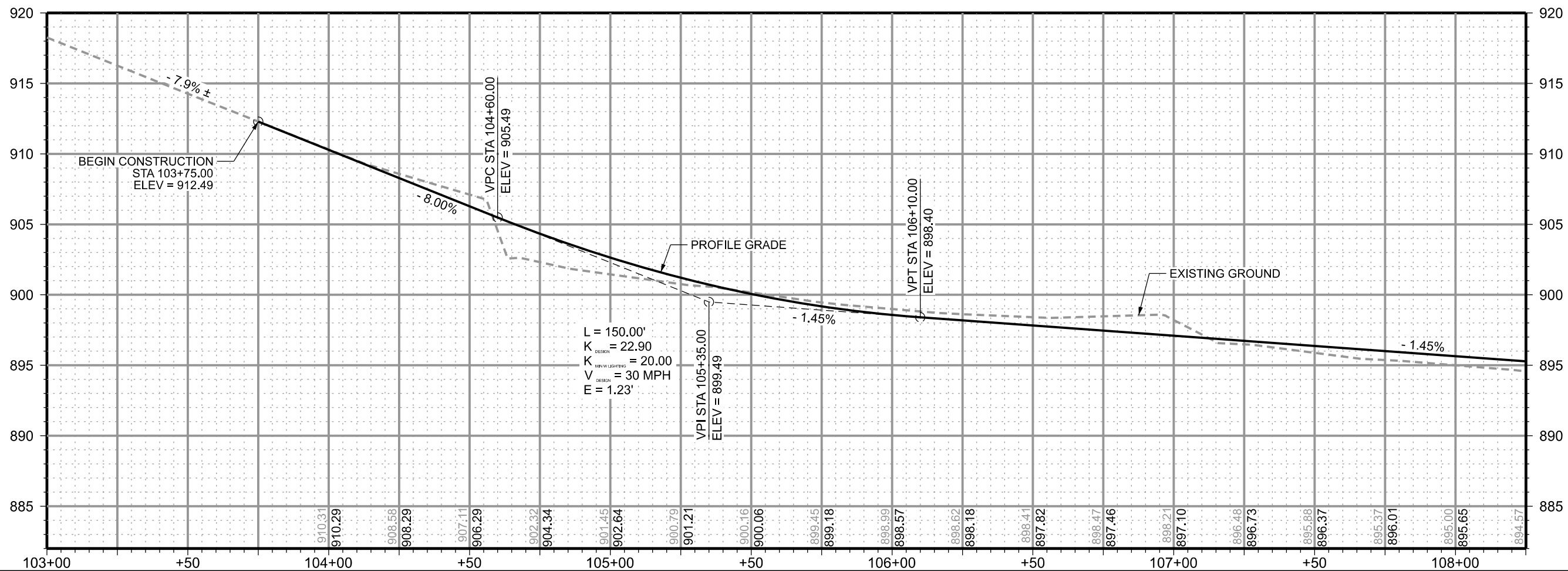
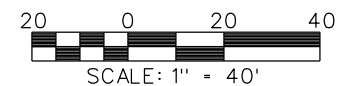
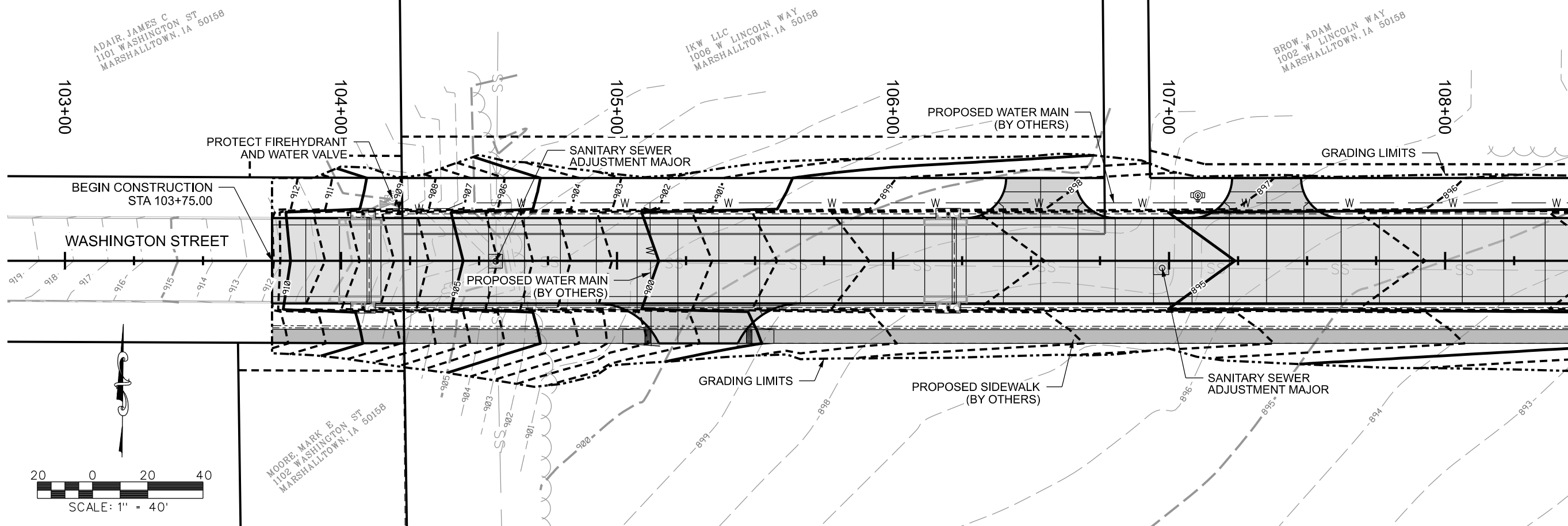
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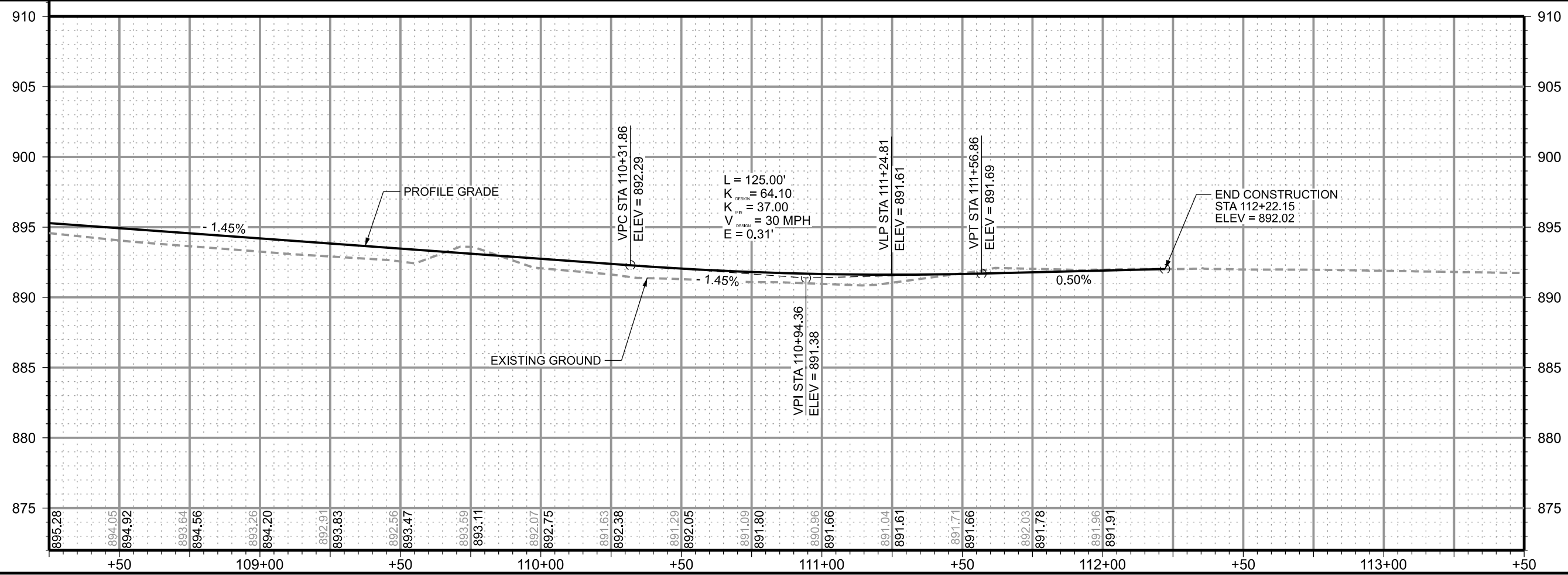
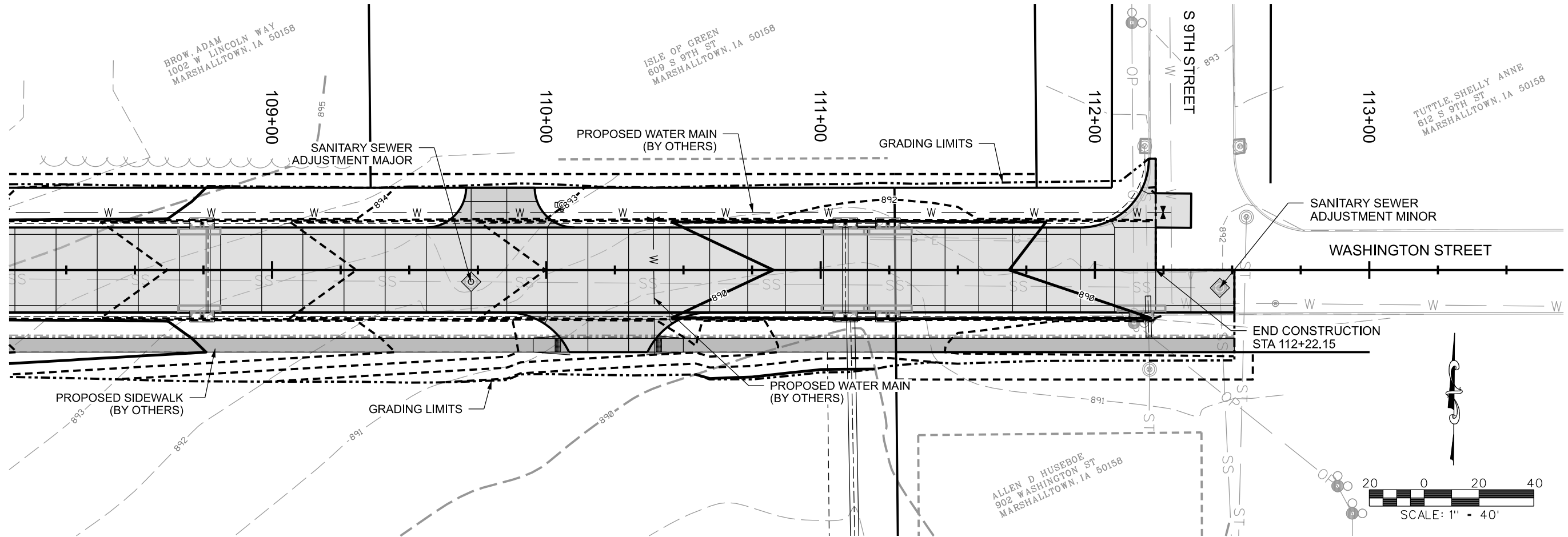


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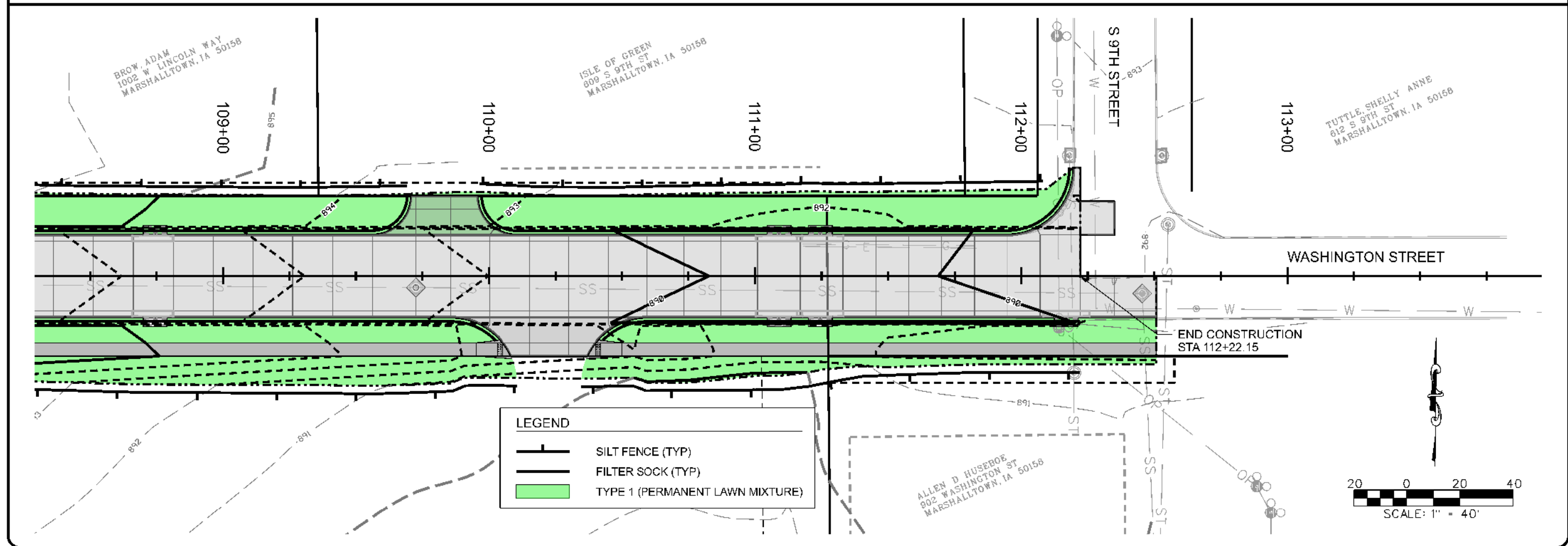
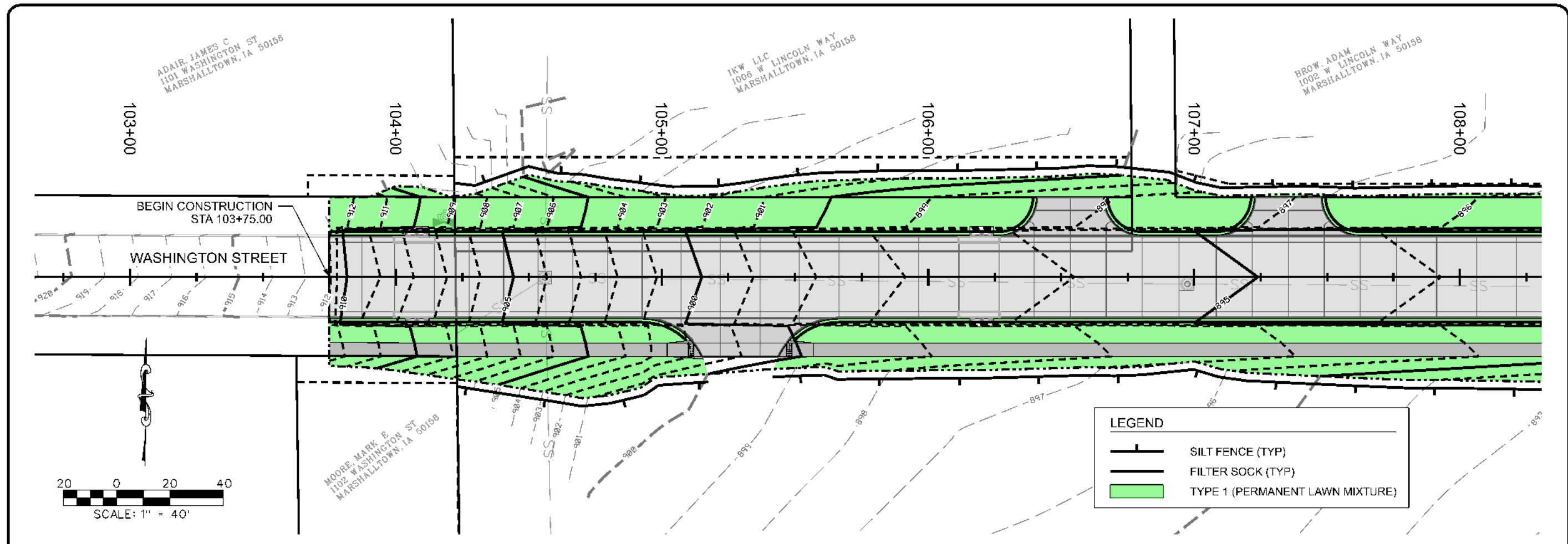
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WASHINGTON STREET EXTENSION
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MARSHALL COUNTY, IOWA

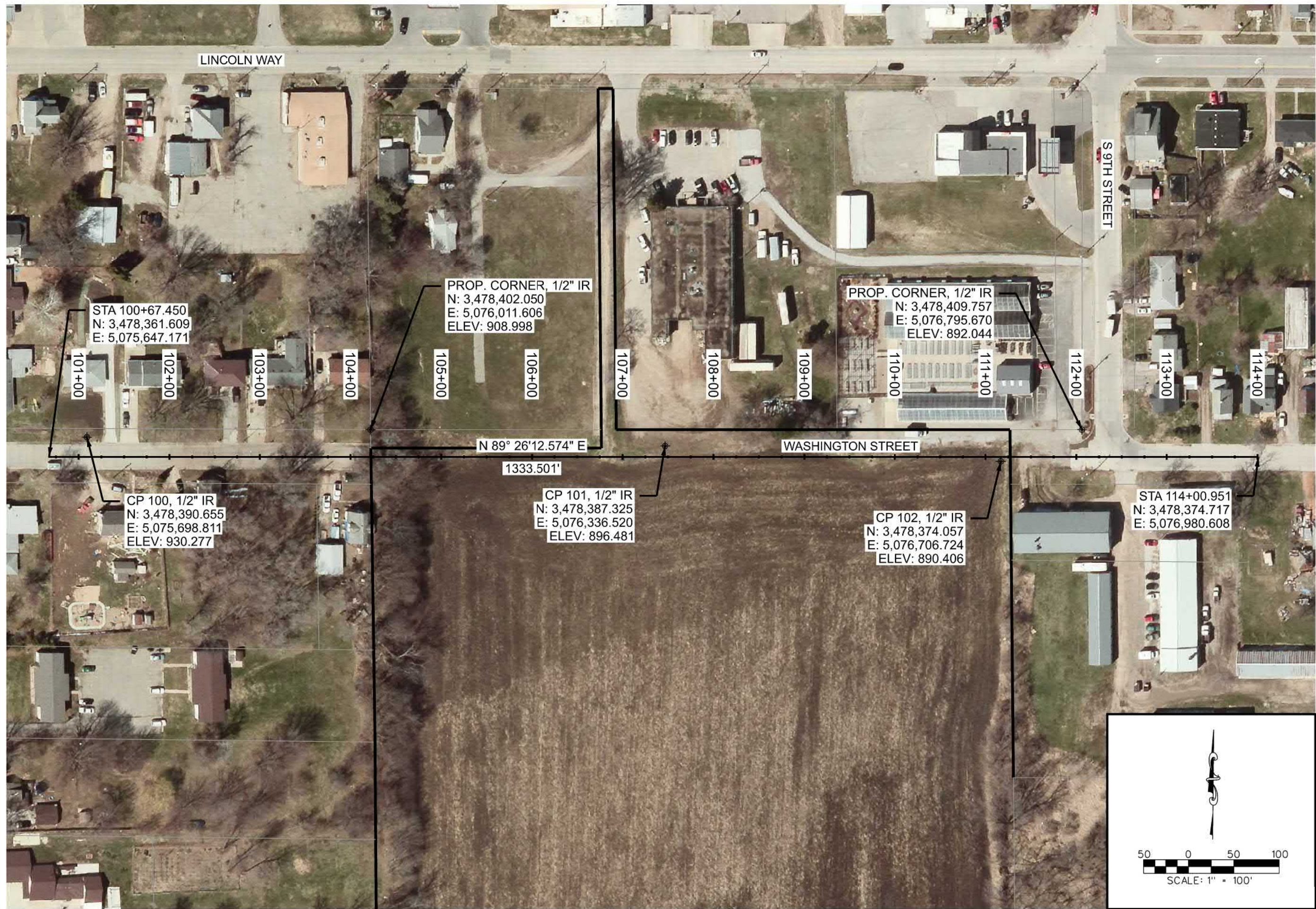
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Welcome
to the City of
MARSHALLTOWN

WASHINGTON STREET EXTENSION
CITY OF MARSHALLTOWN, IOWA
MARSHALL COUNTY, IOWA

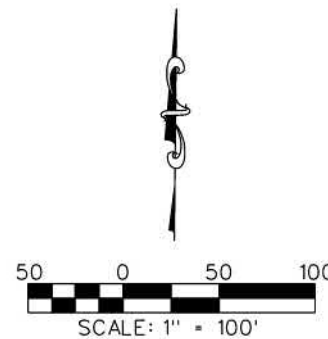


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WASHINGTON STREET EXTENSION
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MARSHALL COUNTY, IOWA

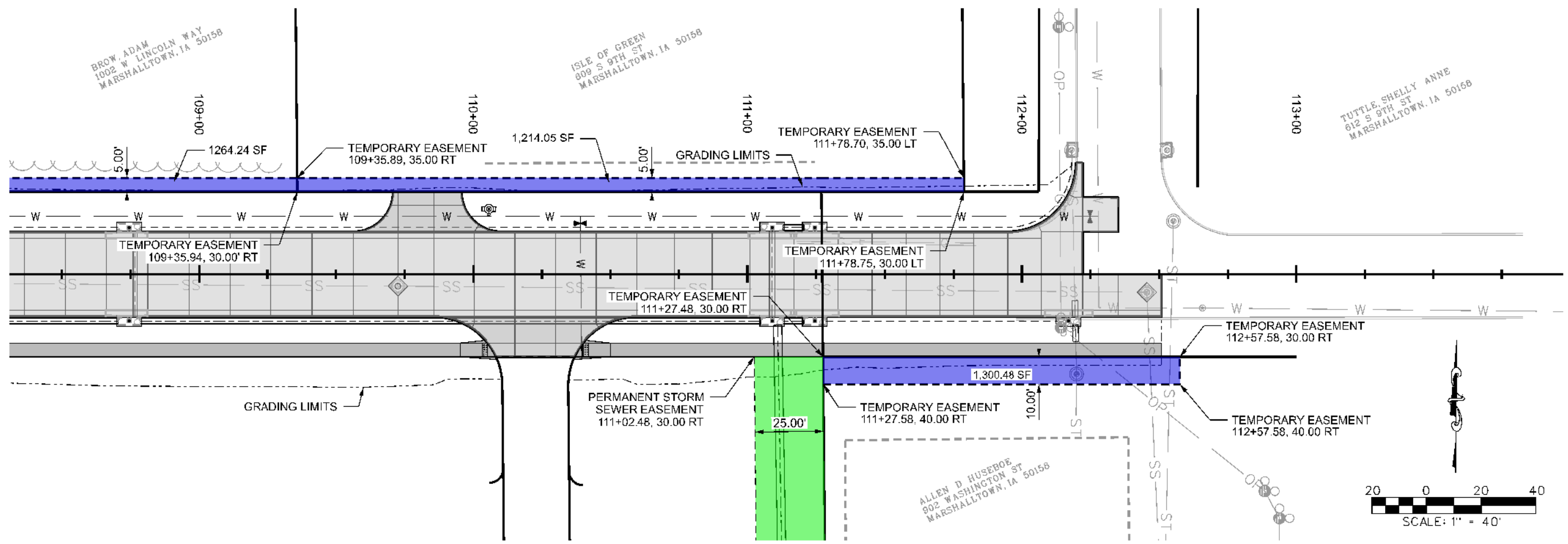
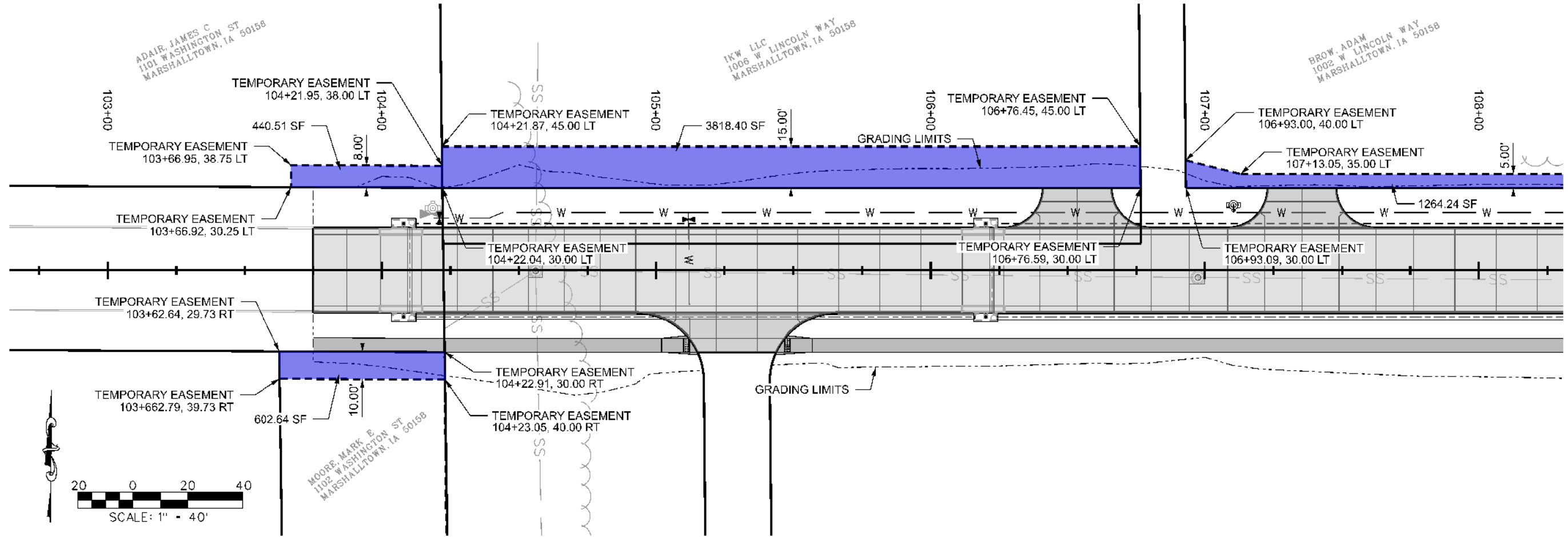


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GENERAL TRAFFIC CONTROL NOTES:

1.
- THE TRAFFIC CONTROL PLAN IS DEVELOPED IN CONFORMANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES PART 6, 2009 EDITION. THE TRAFFIC CONTROL DEVICES INDICATED REPRESENT CONDITIONS KNOWN DURING PLAN DEVELOPMENT. IN THE EVENT ACTUAL PHYSICAL CONDITIONS WARRANT ADDITIONAL TRAFFIC CONTROL DEVICES, THEY SHALL BE INSTALLED IN CONFORMANCE WITH THE M.U.T.C.D. PART 6 AS DIRECTED BY THE ENGINEER.
2.
- ALL BLACK ON ORANGE CONSTRUCTION SIGNS SHALL BE FABRICATED USING TYPES XI FLUORESCENT ORANGE REFLECTIVE SHEETING MATERIAL FOR THE SIGN BACKGROUND.
3.
- DURING NON-WORKING HOURS NO EQUIPMENT OR MATERIAL SHALL BE PARKED OR STORED CLOSER THAN 30 FEET TO THE EDGE OF ANY ROADWAY CARRYING TRAFFIC. WHEN THIS IS NOT PRACTICAL, IT SHALL BE PLACED IN AN AREA APPROVED BY THE ENGINEER AND DELINEATED BY REFLECTORIZED DRUMS. THIS INCLUDES STORAGE OF TRAFFIC CONTROL DEVICES SUCH AS TRAILER MOUNTED OR OTHER TEMPORARY SIGNS, BARRICADES, DRUMS, ETC., WHICH ARE NOT IN USE DURING NON-WORKING HOURS. TO BE FURNISHED BY THE CONTRACTOR WITHOUT COST TO THE CITY.
4.
- WHERE THE LOCATION OF A REQUIRED SIGN FALLS IN A DRIVEWAY, SIDEWALK, BRIDGE, ETC., OR WHERE THE VISIBILITY OF A SIGN IS LIMITED TO THE TRAVELING PUBLIC, THE LOCATION SHALL BE ADJUSTED AS DIRECTED BY THE ENGINEER.
5.
- THE CONTRACTOR IS TO REMOVE, RELOCATE OR COVER DURING CONSTRUCTION AND THEN RESET OR UNCOVER UPON COMPLETION OF A PARTICULAR SECTION ANY CONFLICTING IN-PLACE ROADWAY SIGNS AND DELINEATORS, AS DIRECTED BY THE ENGINEER. SIGNS REQUIRING REMOVAL SHALL BE STOCKPILED AS DIRECTED BY THE ENGINEER,
6.
- DURING ALL PHASES OF WORK, NON-APPLICABLE PAVEMENT STRIPING OR MARKINGS SHALL BE REMOVED AND APPROPRIATE PAVEMENT STRIPING OR MARKINGS SHALL BE PLACED AS EXPEDITIOUSLY AS PRACTICAL, BUT IN ALL CASES, SHALL BE IN PLACE BY NIGHTFALL ON ANY ROADWAY CARRYING TRAFFIC, EXCEPT ON SHORT TERM OPERATIONS WHERE IT IS DETERMINED BY THE ENGINEER, THAT SUCH REMOVAL AND REPLACEMENT IS MORE HAZARDOUS THAN LEAVING EXISTING MARKINGS IN PLACE.
7.
- THE CONTRACTOR SHALL PLACE ALL ADVANCE WARNING SIGNS BEFORE PROCEEDING WITH HIS WORK. SIGNS SHALL BE PLACED IN ORDER, IN THE DIRECTION OF TRAFFIC AND REMOVED IN REVERSE ORDER.
8.
- ALL VEHICLES, EQUIPMENT, PERSONNEL (EXCEPT FLAGGERS), AND THEIR ACTIVITIES, ARE RESTRICTED AT ALL TIMES TO ONE SIDE OF THE PAVEMENT UNLESS OTHERWISE AUTHORIZED BY THE ENGINEER.
9.
- THE CONTRACTOR SHALL MAINTAIN AT LEAST ONE ACCESS TO BUSINESSES AND RESIDENCES DURING ALL PHASES OF CONSTRUCTION.
10.
- CONSTRUCTION SIGNS MOUNTED ON TEMPORARY SUPPORTS SHALL BE MOUNTED AT A MINIMUM HEIGHT OF 7 FEET.
11.
- FLAGGERS SHALL BE PROPERLY ATTIRED, EQUIPPED WITH STAFF MOUNTED STOP/SLOW PADDLES IN SIGHT OF EACH OTHER, OR HAVE DIRECT COMMUNICATION AT ALL TIMES. FLAGGER STATION LOCATION MAY BE VARIED FROM THOSE SHOWN BASED ON ROADWAY ALIGNMENT AND CONDITIONS AT THE TIME OF THE LANE CLOSURE.
12.
- FLAGGERS ARE TO BE USED WHEN DIRECTED BY THE ENGINEER. SIGNS SHALL BE PLACED AT THE APPROPRIATE TIME, AND SHALL BE COVERED OR REMOVED WHEN FLAGGERS ARE NOT ON DUTY AND DURING NON-WORKING HOURS.
13.
- FOR MOVING OPERATIONS, THE TRAFFIC CONES MAY BE DELETED IF THE FLAGGERS ARE IN SIGHT OF EACH OTHER, OR IF A PILOT CAR IS USED ON A TWO LANE ROADWAY.
14.
- ALL CONTRACTOR'S EMPLOYEES' PERSONAL VEHICLES, AND CONTRACTOR'S EQUIPMENT NOT IN OPERATION, SHALL BE PARKED A MINIMUM OF THIRTY (30) FEET FROM THE TRAVELED WAY DURING WORKING HOURS, AS NOT TO CREATE A HAZARD.
15.
- THE TRAFFIC CONTROL PLAN IS NOT ALL INCLUSIVE. THE TCP PROVIDES SEVERAL DETAILED DRAWINGS INDICATING THE TRAFFIC CONTROL NECESSARY FOR THE DIFFERENT CONSTRUCTION ACTIVITIES ANTICIPATED FOR THIS PROJECT. THE CONTRACTOR SHALL SELECT THE DETAILED DRAWING THAT BEST FITS THE ACTIVITY TO BE PERFORMED.
16.
- REQUIRED TEMPORARY ROUTE MARKER ASSEMBLIES THAT ARE TO BE LOCATED IN THE VICINITY OF EXISTING ROUTE MARKERS SHOULD BE PLACED ALONG SIDE OF THOSE ALREADY IN PLACE. SOME EXISTING ROUTE MARKERS MAY HAVE TO BE COVERED OR REMOVED, AS DIRECTED BY THE ENGINEER.
17.
- ALL TRAFFIC CONTROL DEVICES THAT ARE NOT APPLICABLE AT ANY SPECIFIC TIME SHALL BE COVERED OR REMOVED AS DIRECTED BY THE ENGINEER.
18.
- THE CONTRACTOR SHALL MAKE PROVISIONS FOR THE SAFETY OF PEDESTRIAN TRAFFIC CROSSING THE WORK ZONES DURING CONSTRUCTION.
19.
- ALL SIGNS SHALL BE POST-MOUNTED IF THE WORK PERIOD EXCEEDS FOUR DAYS, EXCEPT FOR THOSE SIGNS WHICH ARE MOUNTED ON BARRICADES. FOR REPEATED DAY OPERATIONS, SIGNS MAY BE MOUNTED ON TEMPORARY SUPPORTS AND REMOVED AT THE COMPLETION OF THE DAY'S OPERATION.

GENERAL TRAFFIC CONTROL NOTES CONTINUED:

20.
- DURING THE WIDENING OR RESURFACING OF ANY ROADWAY CARRYING TRAFFIC, THE CONTRACTOR SHALL ADVISE THE MOTORISTS OF ANY EDGE OF PAVEMENT DROP-OFFS 3 INCHES OR GREATER BY PLACING SHOULDER DROP-OFF SIGNS EVERY ½ MILE BEGINNING PRIOR TO THE WIDENING OR RESURFACING. REQUIRED SHOULDER WORK TO ELIMINATE THE DROP-OFFS SHALL BE PURSUED IN AN EXPEDITIOUS MANNER FOLLOWING THE WIDENING AND/OR RESURFACING.
21.
- A DIFFERENCE IN ELEVATION OF APPROXIMATELY 2 INCHES OR LESS AT THE CENTERLINE MAY BE ALLOWED DURING NON-WORKING HOURS WITHOUT ADDITIONAL TRAFFIC CONTROL. SPECIAL CONDITIONS MAY EXIST WHERE PROTECTION SHOULD BE PROVIDED WHERE THE DIFFERENCE IS 2 INCHES OR LESS.
22.
- SIGNS ON TEMPORARY SUPPORTS ARE TO BE REMOVED OR COVERED WHEN NO WORK IS BEING PERFORMED OR AT THE COMPLETION OF THE DAY'S OPERATION.
23.
- CHANNELIZING DRUMS PLACED ON PAVEMENT DURING WORKING HOURS SHALL BE SHIFTED TO THE EDGE OF SHOULDER DURING NON-WORKING HOURS AND DURING PEAK PERIODS.
24.
- CHANNELIZING DEVICES SHALL EXTEND TO A POINT WHERE THEY ARE VISIBLE TO APPROACHING TRAFFIC.
25.
- FOR DIVIDED ROADWAYS, THE REQUIRED ADVANCE WARNING SIGNS SHALL BE POSTED ON BOTH THE RIGHT AND LEFT SIDE OF THE ROADWAY.
26.
- THE CONTRACTOR SHALL CLOSE THE LANE ADJACENT TO THE WORK AREA ANYTIME WORK OUTSIDE THE EXISTING TRAVEL LANES ENCROACHES WITHIN 2 FEET OF THE EXISTING EDGE OF PAVEMENT.
27.
- UNEVEN LANES SIGNS SHALL BE COVERED OR REMOVED WHEN NO UNEVEN PAVEMENT CONDITIONS EXIST.
28.
- THE CONTRACTOR AND THE CONSTRUCTION ENGINEER SHALL DISCUSS AND PLAN FOR THE HANDLING OF TRAFFIC FOR ALL HOLIDAYS BEFORE ANY WORK BEGINS. UNLESS OTHERWISE PRE-APPROVED BY THE PROJECT ENGINEER, THE FOLLOWING SHALL HOLD:
29.
- THE CONTRACTOR SHALL NOT HAVE A LANE CLOSURE DURING THE FOLLOWING PERIODS UNLESS OTHERWISE DIRECTED BY THE ENGINEER:

FOR CHRISTMAS AND NEW YEARS DAY:
FROM 11:59 PM DECEMBER 23 THROUGH 6:00 AM JANUARY 2.

FOR NATIONAL MEMORIAL DAY AND LABOR DAY:
FROM 12:00 NOON THE FRIDAY BEFORE THE HOLIDAY THROUGH 11:59 PM THE DAY OF THE HOLIDAY.

FOR INDEPENDENCE DAY (THE 4TH OF JULY):
FROM 12:00 NOON THE DAY BEFORE THE HOLIDAY THROUGH 11:59 PM THE DAY OF THE HOLIDAY.

FOR THANKSGIVING DAY:
FROM 12:00 NOON THE WEDNESDAY BEFORE THANKSGIVING DAY THROUGH 11:59 PM THE SUNDAY FOLLOWING THANKSGIVING DAY.

ANY OTHER STATE HOLIDAYS WILL BE HANDLED AS APPROVED BY THE PROJECT ENGINEER.
30.
- THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER AND LOCAL GOVERNMENT ON TRAFFIC AND/OR WORK RESTRICTIONS FOR LOCAL HOLIDAYS OR EVENTS NOT LISTED ON IDOT'S LIST OF OFFICIAL STATE HOLIDAYS.

Welcome
to the city of
MARSHALLTOWN

WASHINGTON STREET EXTENSION
CITY OF MARSHALLTOWN, IOWA
MARSHALL COUNTY, IOWA

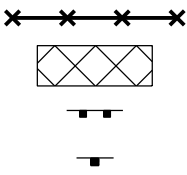
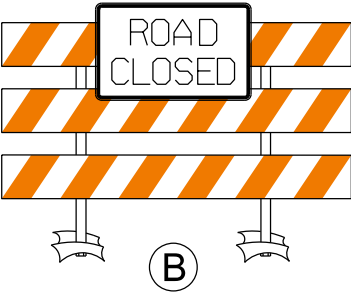
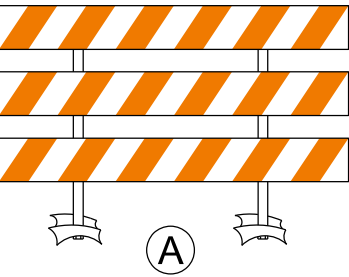
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CHAMBERLIN
CONSULTANT ENGINEERS

14030 New York Ave, Ste C
URBANDALE, IA 50322-3773
TELE: (515) 669-4188
EMAIL ADDRESS:
mlee@leechamberlinengineers.com

DRAWING TITLE

TRAFFIC
CONTROL
NOTES

DRAWN BY
W.D.H.
CHECKED BY
M.L.L.
DATE
05/01/2020
JOB NO
19023
SHEET
J.1

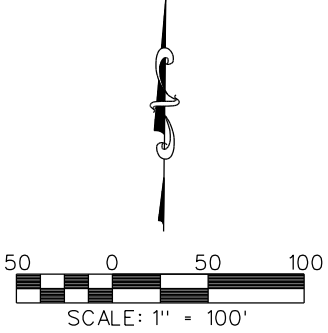


CONSTRUCTION SAFETY FENCE
CONSTRUCTION WORK AREA
TYPE III BARRIER
ADVANCED WARNING SIGN

NOTES:

LANE CLOSERS AT THE INTERSECTION OF WASHINGTON STREET AND S 9TH STREET TO BE MINIMIZED TO TWO (2) DAYS. DURING LANE CLOSER TC-211 TO BE IMPLEMENTED. ALL OTHER WORK TO BE COMPLETED WITH NO IMPACTS TO TRAFFIC OPERATIONS AT THE INTERSECTION OF WASHINGTON STREET AND S 9TH STREET.

ACCESS SHALL BE MAINTAINED TO ADJACENT PROPERTIES AT ALL TIMES.



WASHINGTON STREET EXTENSION
CITY OF MARSHALLTOWN, IOWA
MARSHALL COUNTY, IOWA

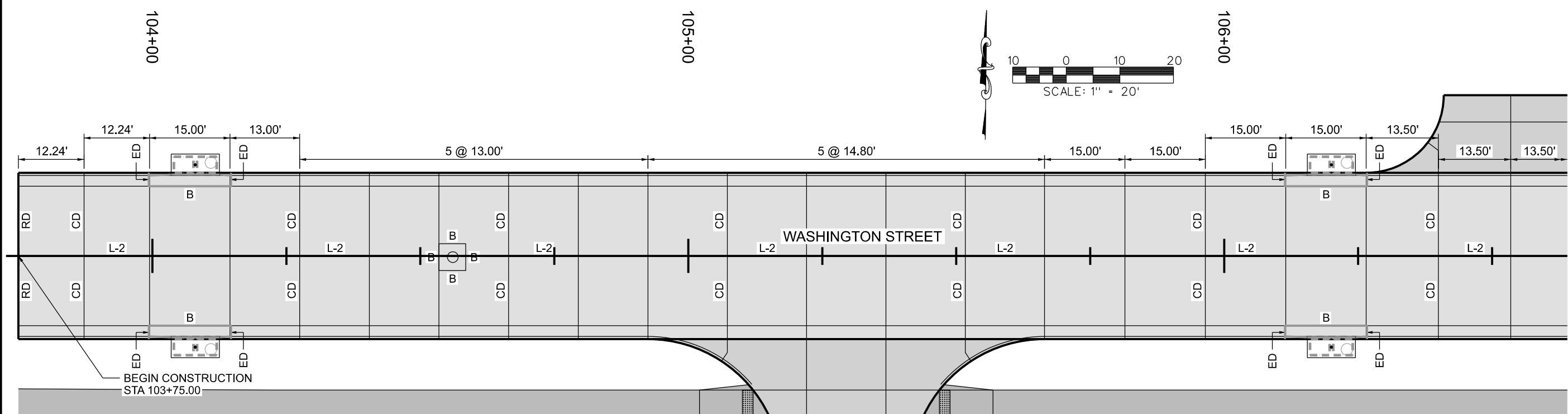
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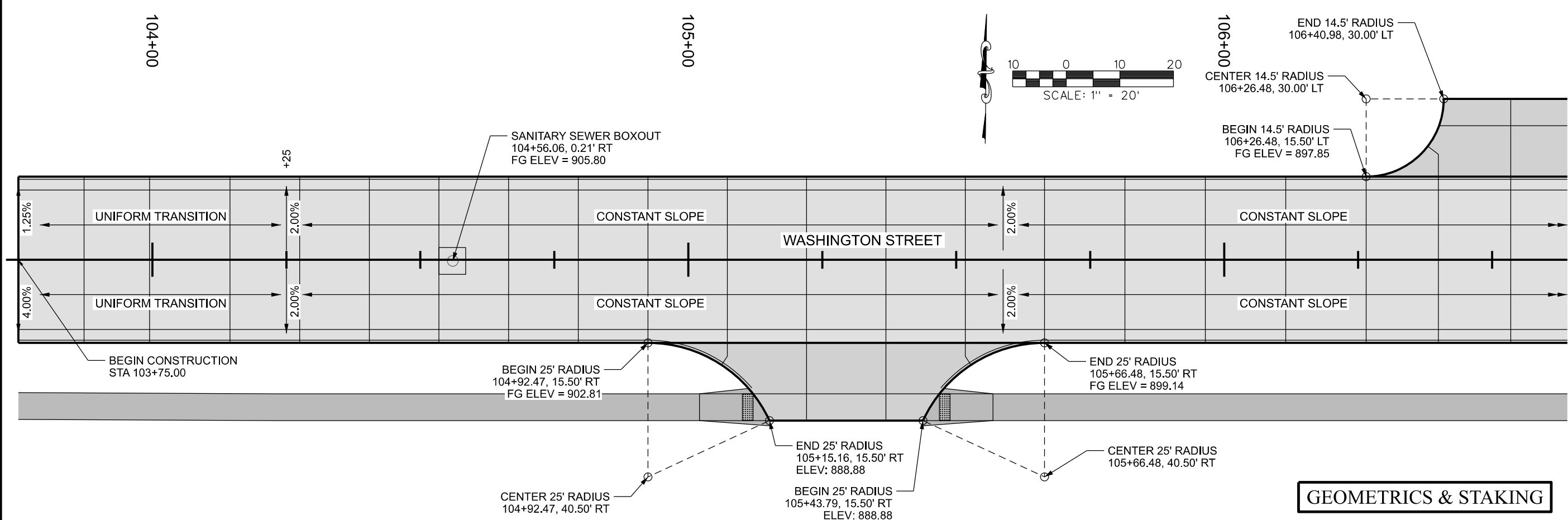
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TRAFFIC
CONTROL
PLAN

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JOB NO 19023
SHEET J.2



JOINTING PLAN



GEOMETRICS & STAKING



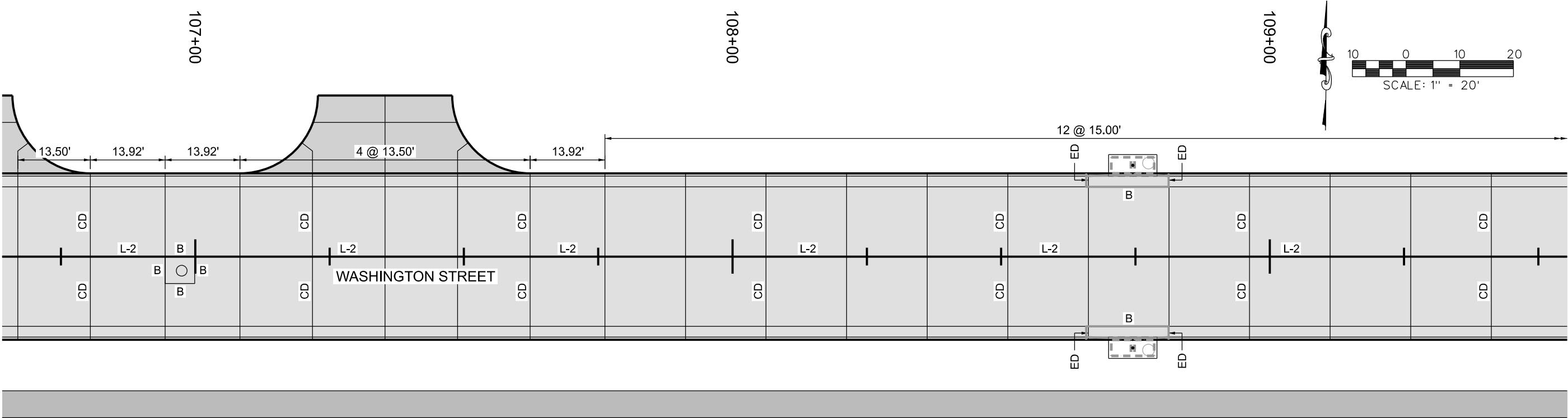
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CITY OF MARSHALLTOWN, IOWA
MARSHALL COUNTY, IOWA

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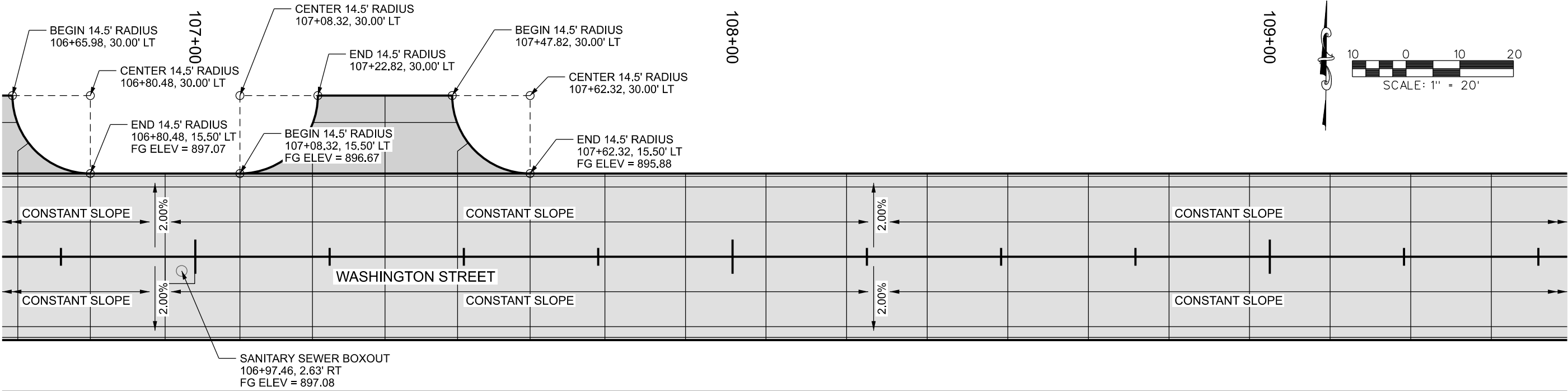
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DRAWING TITLE
GEOMETRIC,
STAKING,
&
JOINTING
PLAN

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DATE 05/01/2020
JOB NO 19023
SHEET L.1



JOINTING PLAN



GEOMETRICS & STAKING



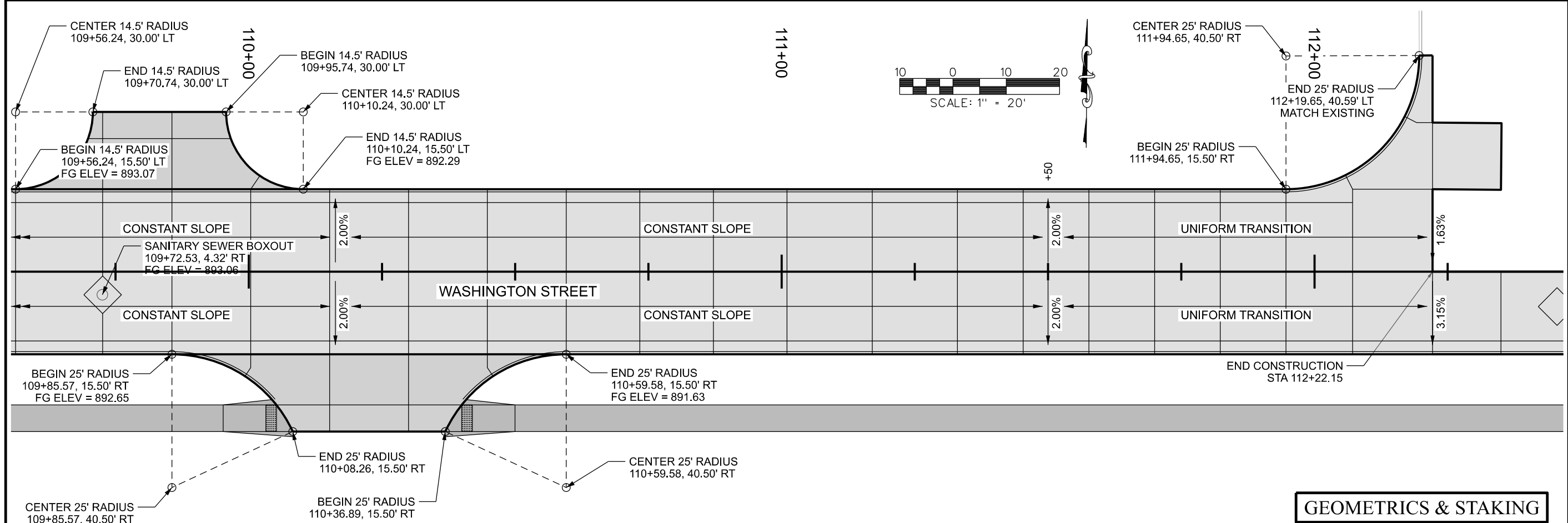
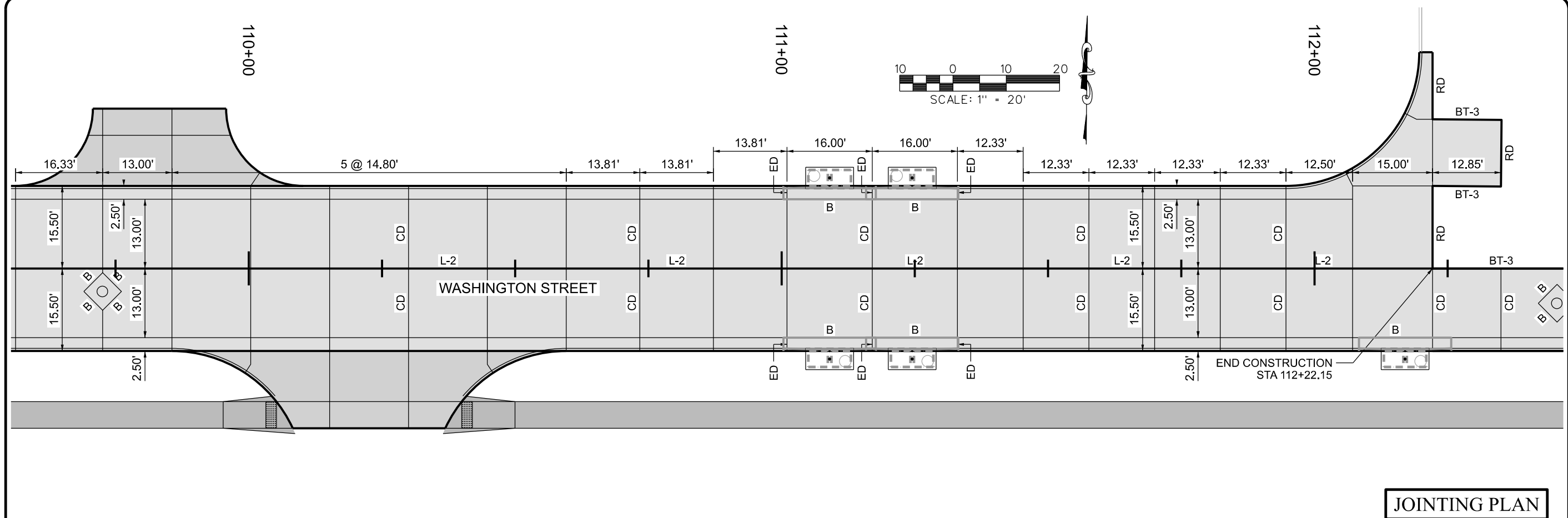
WASHINGTON STREET EXTENSION
CITY OF MARSHALLTOWN, IOWA
MARSHALL COUNTY, IOWA

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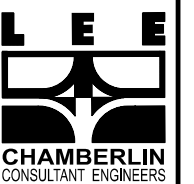
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WASHINGTON STREET EXTENSION
CITY OF MARSHALLTOWN, IOWA
MARSHALL COUNTY, IOWA



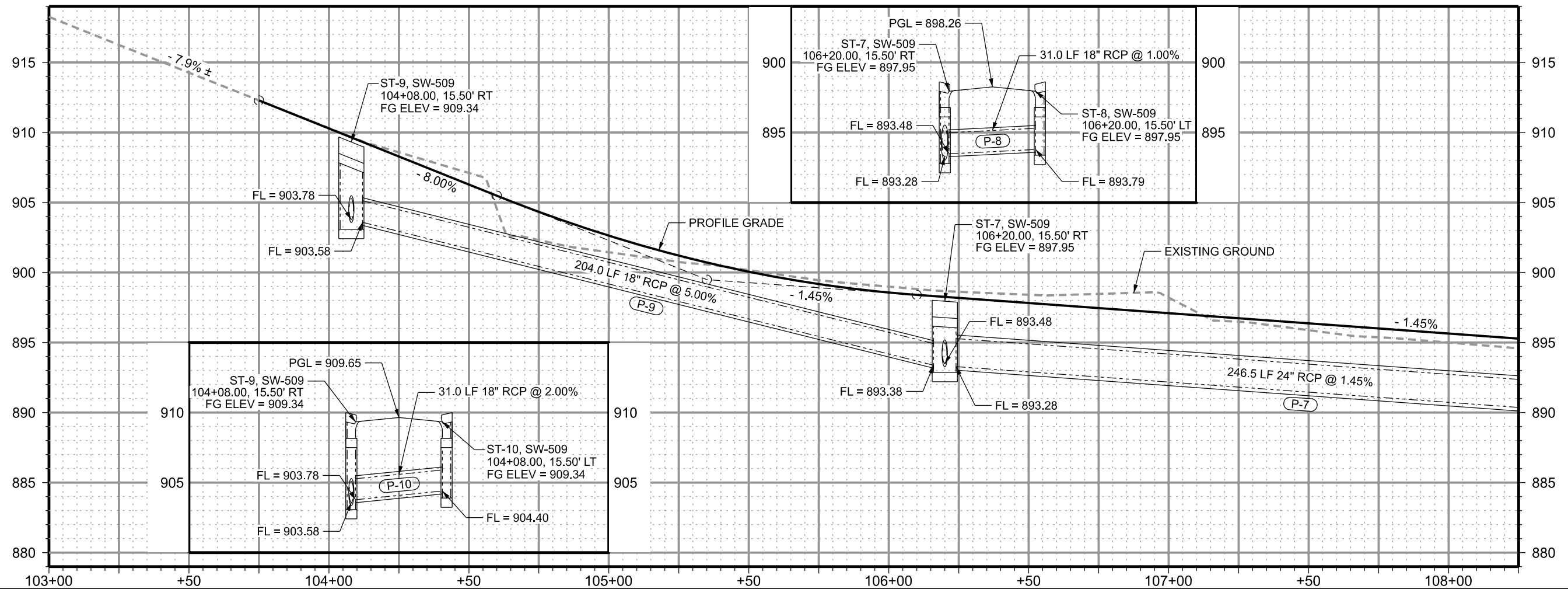
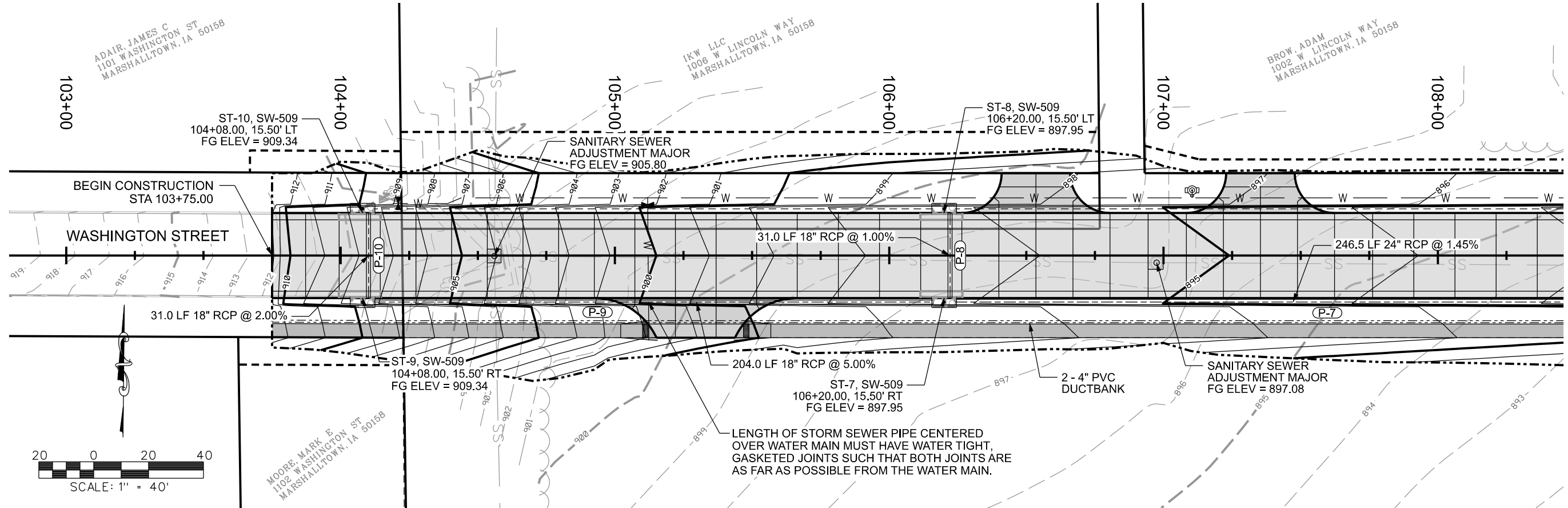
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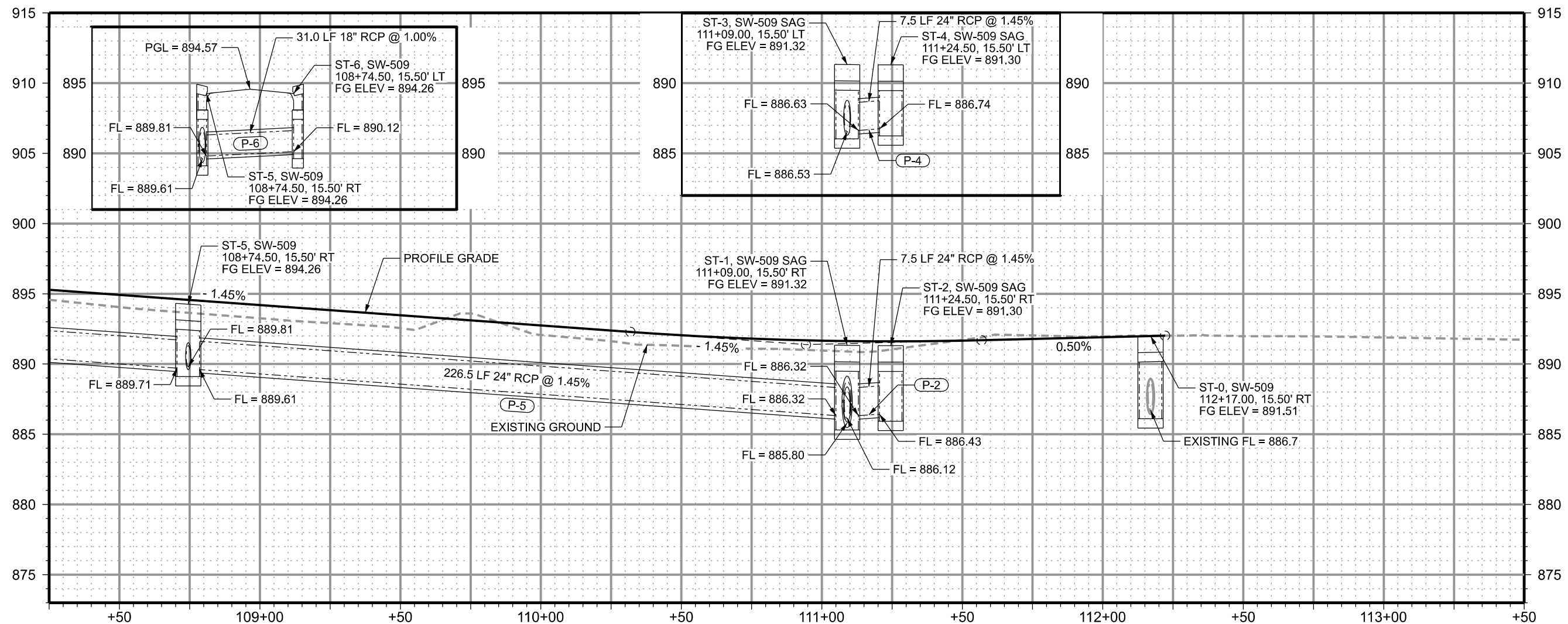
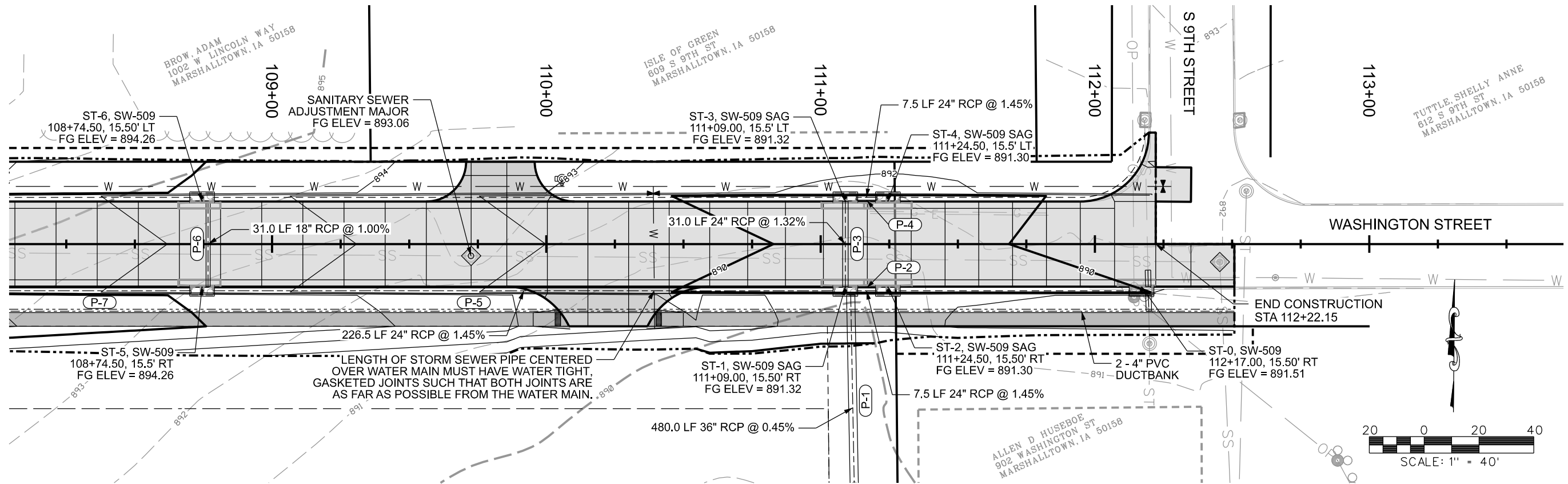
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GEOMETRIC,
STAKING,
&
JOINTING
PLAN

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JOB NO
19023
SHEET

L. 3





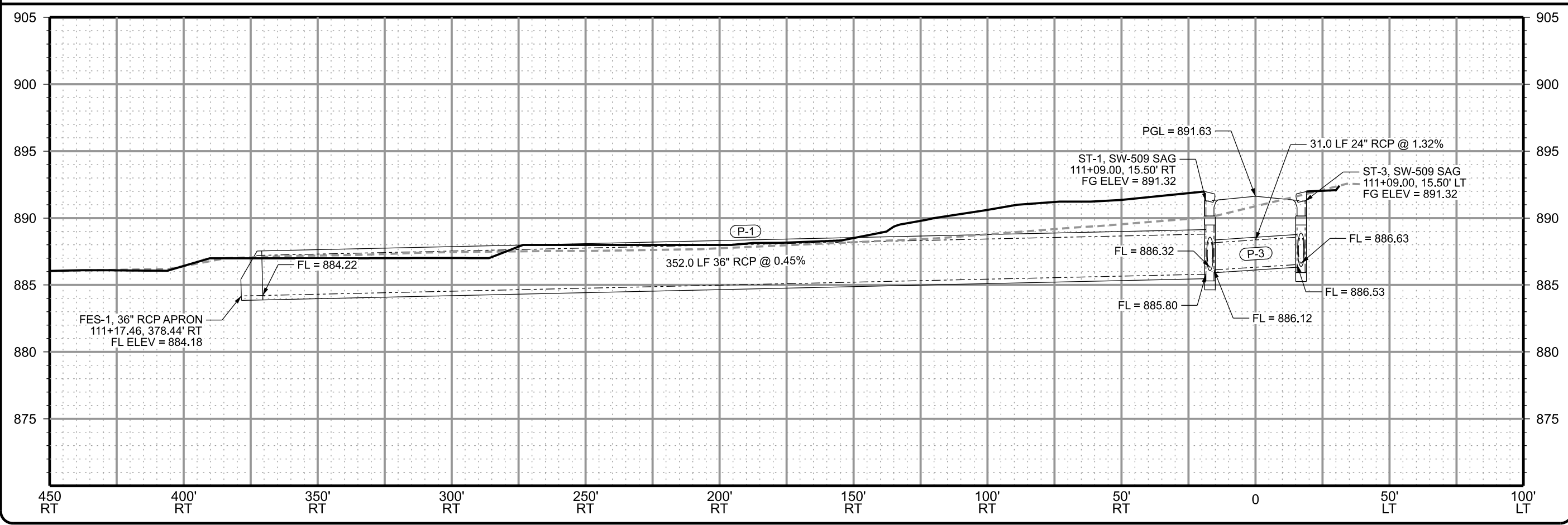
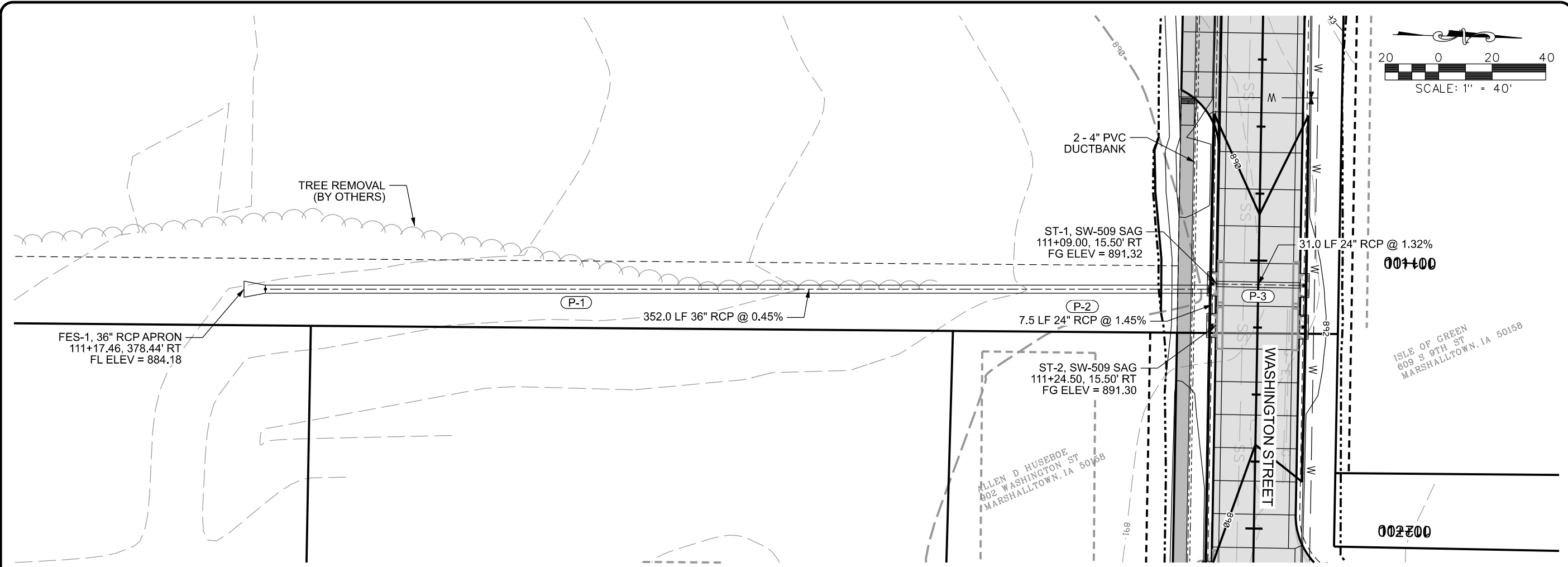
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DRAWING TITLE
STORM
SEWER
PLAN
&
PROFILE

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05/01/2020
JOB NO
19023
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M.2



WASHINGTON STREET EXTENSION
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**STORM
SEWER
PLAN
&
PROFILE**

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05/01/2020
JOB NO
19023
SHEET
M.3

STORM SEWER

104-5B
10-20-15

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WASHINGTON STREET EXTENSION
CITY OF MARSHALLTOWN, IOWA
MARSHALL COUNTY, IOWA



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STORM SEWER TABULATION

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SHEET

M. 4



WASHINGTON STREET EXTENSION
CITY OF MARSHALLTOWN, IOWA
MARSHALL COUNTY, IOWA

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DRAWING TITLE
PAVEMENT
MARKINGS
&
SIGN PLAN

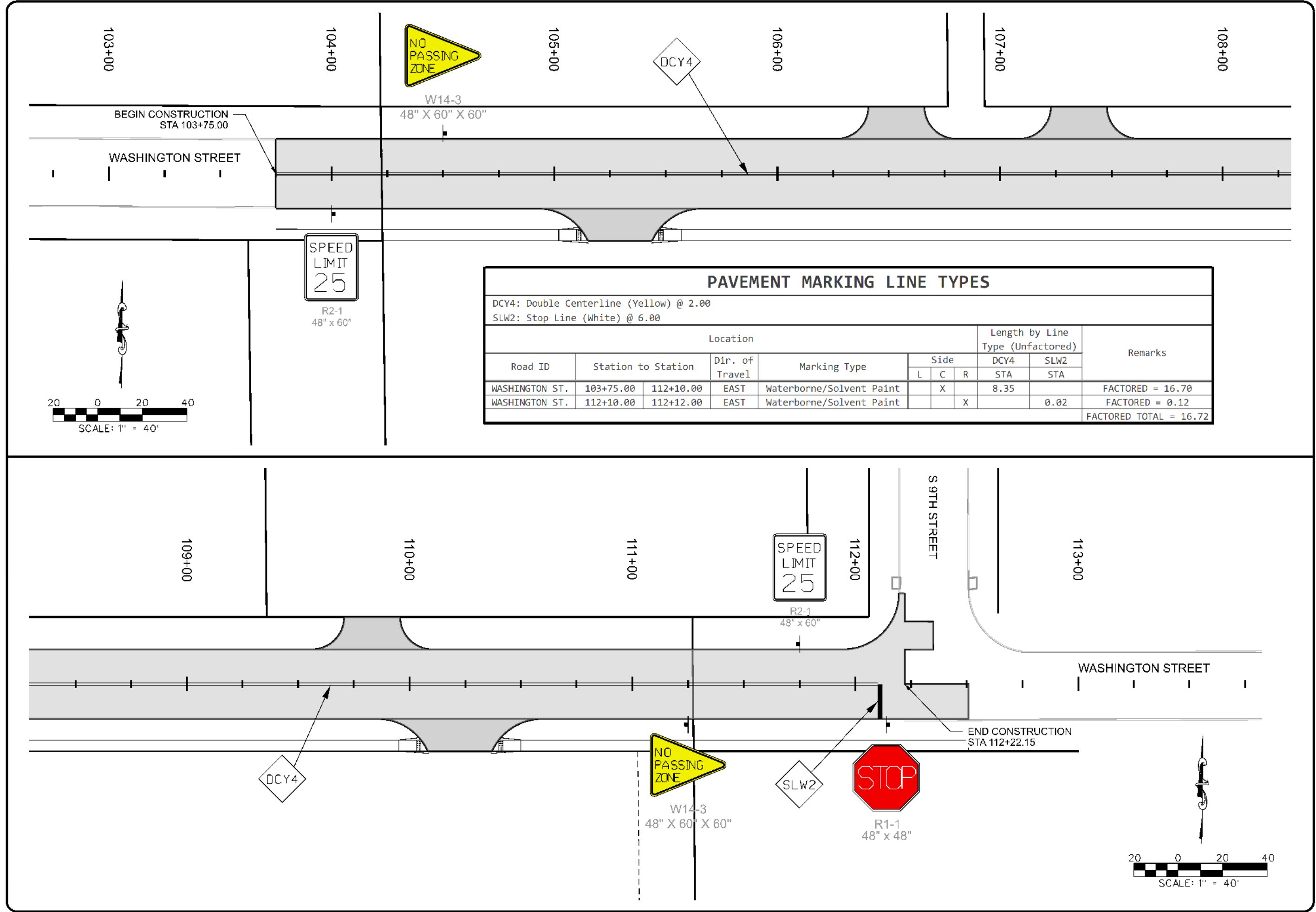
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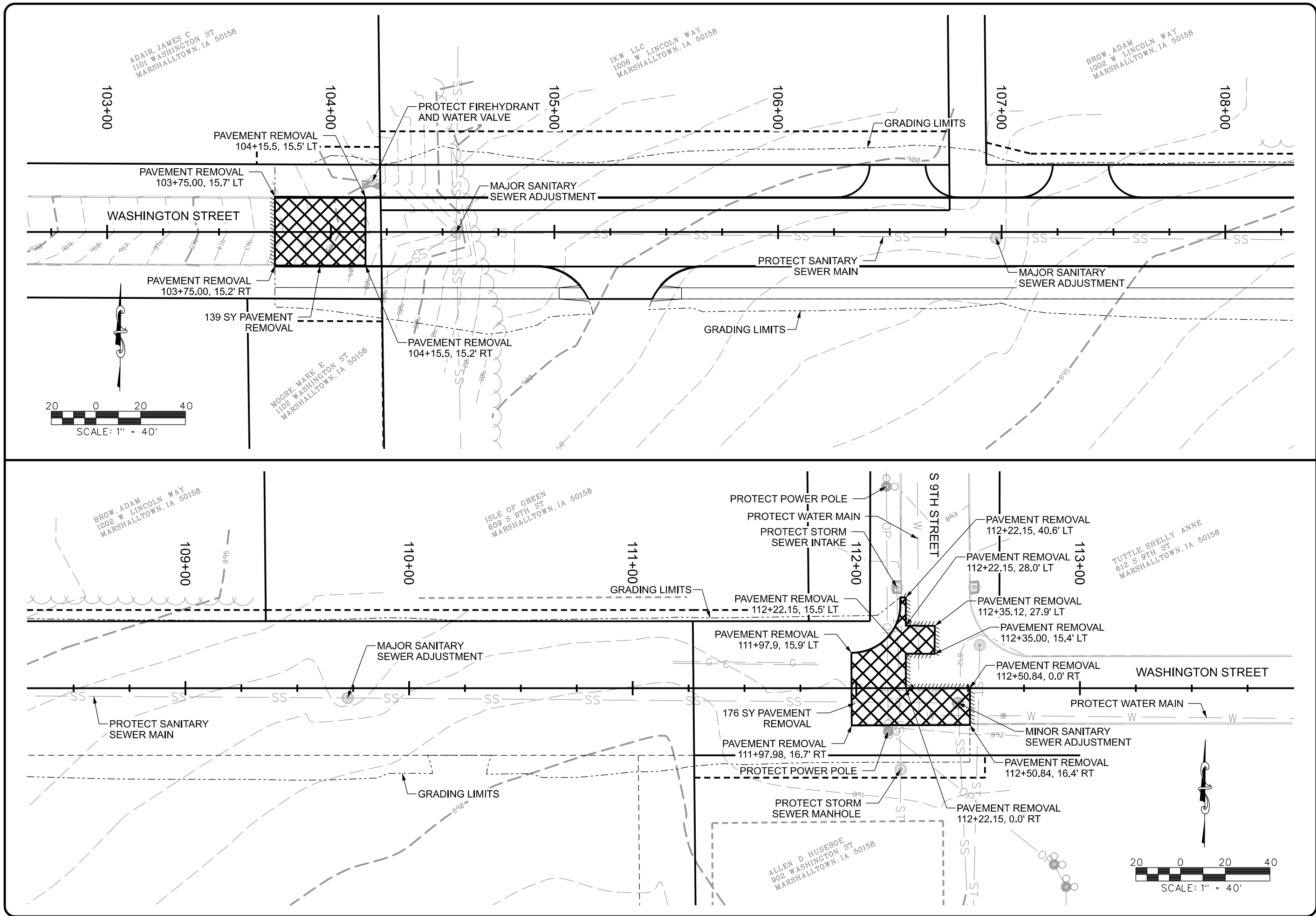
DATE
05/01/2020

JOB NO
19023

SHEET
N.1



PAVEMENT MARKING LINE TYPES											
DCY4: Double Centerline (Yellow) @ 2.00											
SLW2: Stop Line (White) @ 6.00											
Location							Length by Line Type (Unfactored)		Remarks		
Road ID	Station to Station		Dir. of Travel	Marking Type	Side			DCY4			SLW2
					L	C	R	STA			STA
WASHINGTON ST.	103+75.00	112+10.00	EAST	Waterborne/Solvent Paint		X		8.35		FACTORED = 16.70	
WASHINGTON ST.	112+10.00	112+12.00	EAST	Waterborne/Solvent Paint			X		0.02	FACTORED = 0.12	
									FACTORED TOTAL = 16.72		



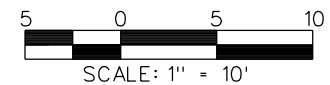
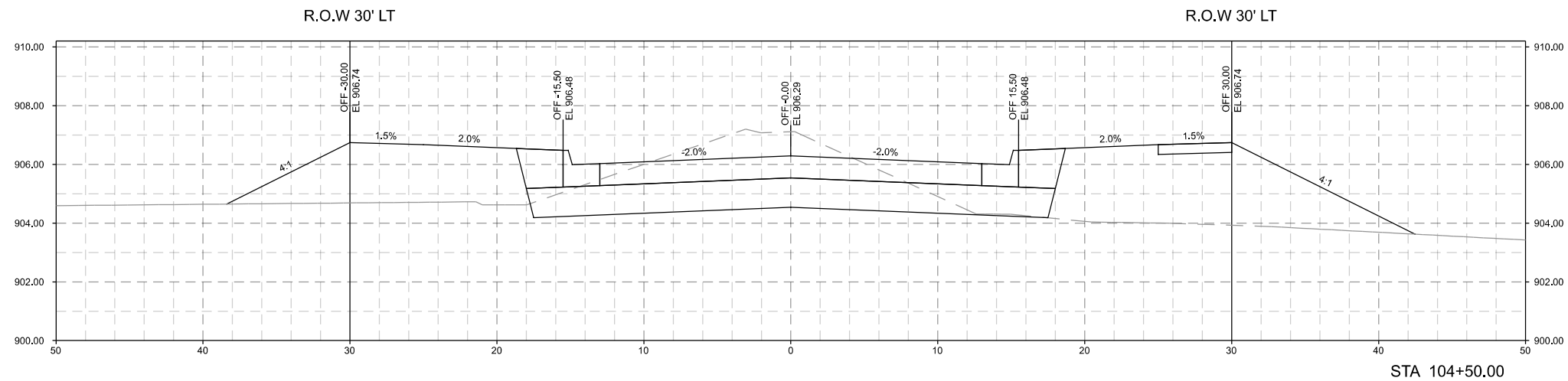
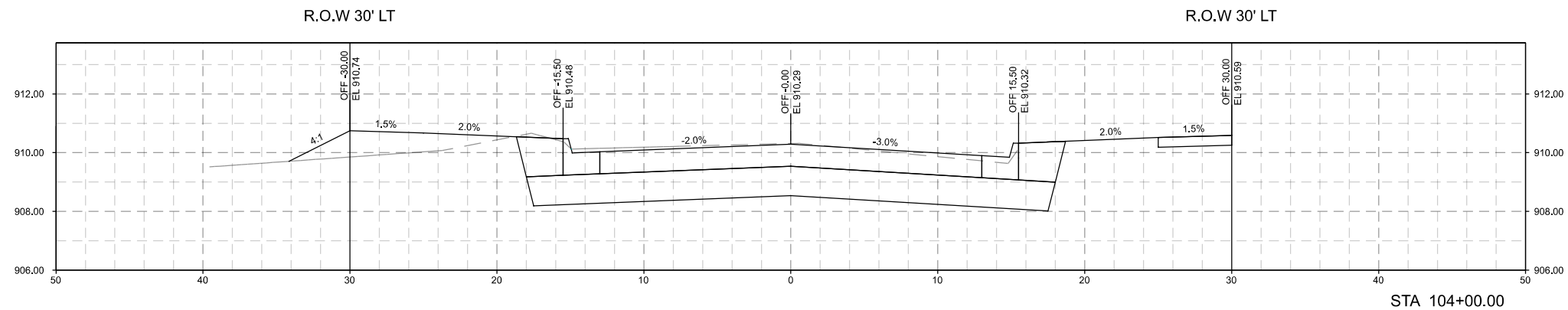
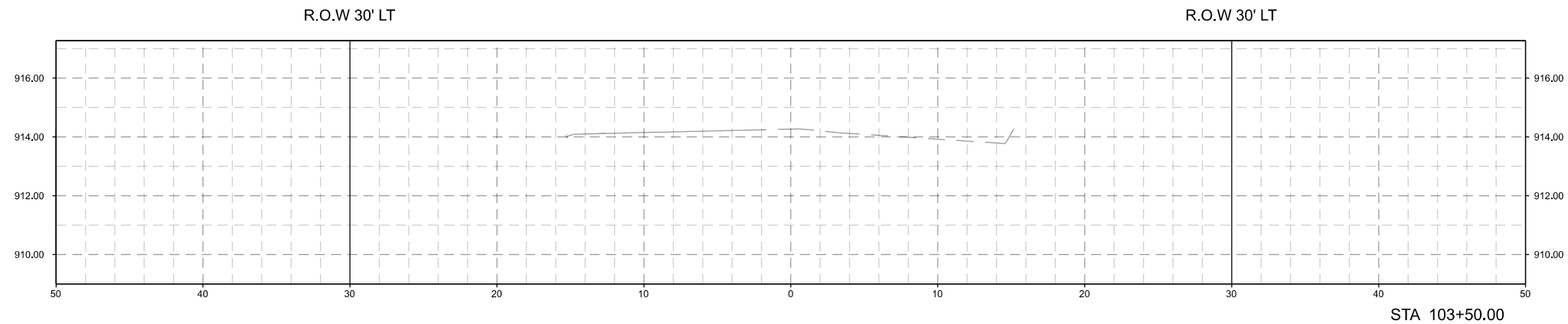
WASHINGTON STREET EXTENSION
CITY OF MARSHALLTOWN, IOWA
MARSHALL COUNTY, IOWA

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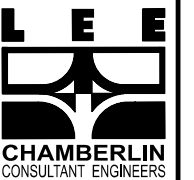
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PLAN**

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SHEET U.1



WASHINGTON STREET EXTENSION
CITY OF MARSHALLTOWN, IOWA
MARSHALL COUNTY, IOWA



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WASHINGTON STREET
CROSS
SECTIONS
103+50.00 - 104+50.00

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DATE
05/01/2020
JOB NO
19023
SHEET
W.1



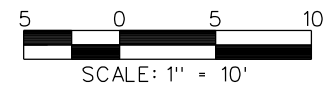
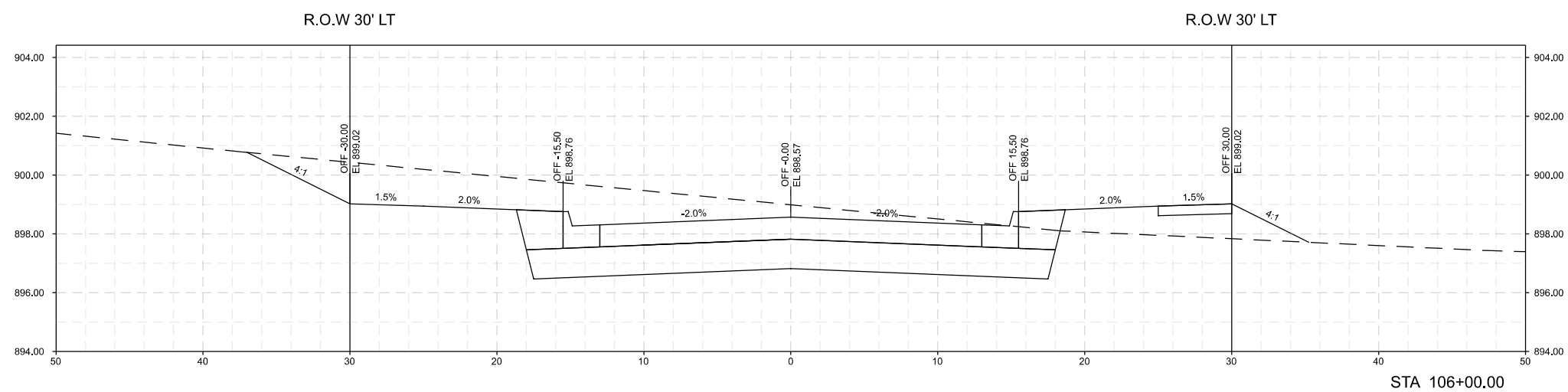
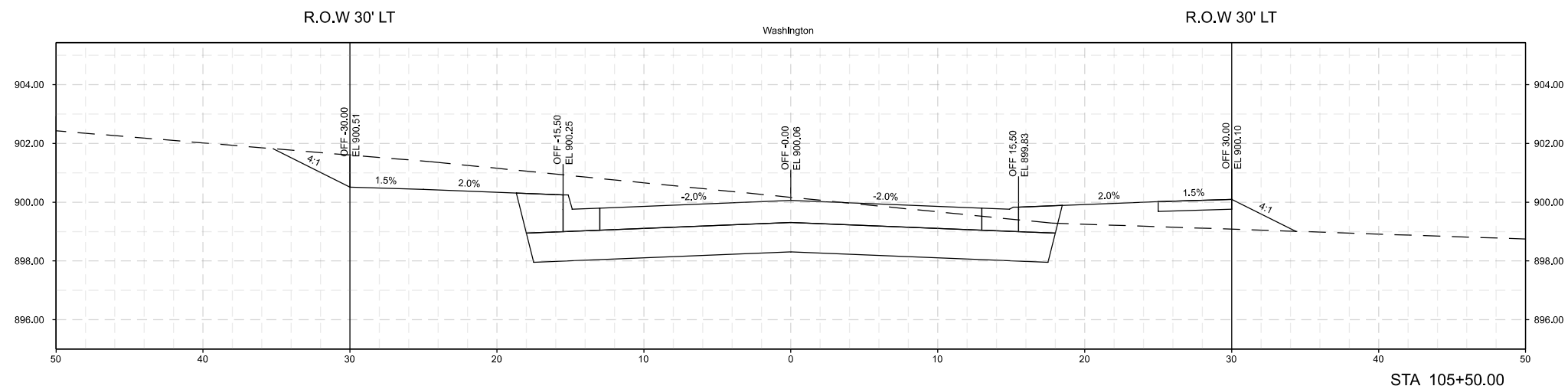
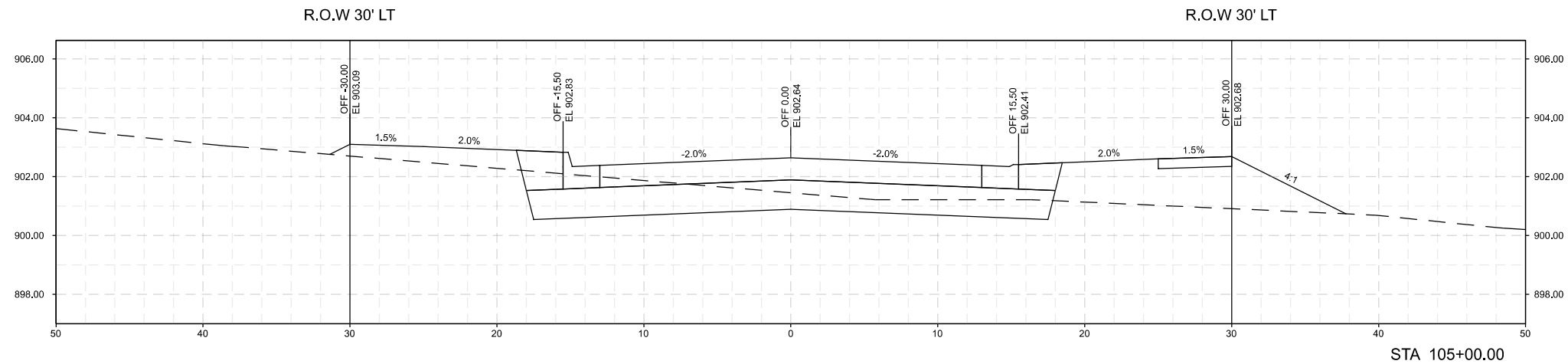
WASHINGTON STREET EXTENSION
CITY OF MARSHALLTOWN, IOWA
MARSHALL COUNTY, IOWA

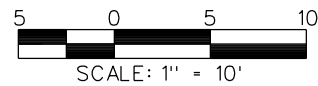
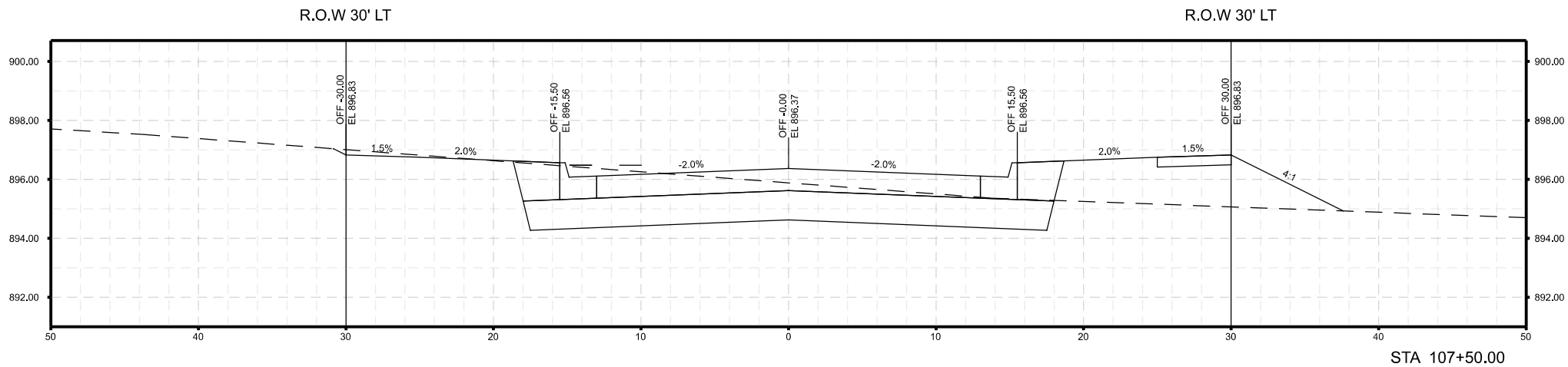
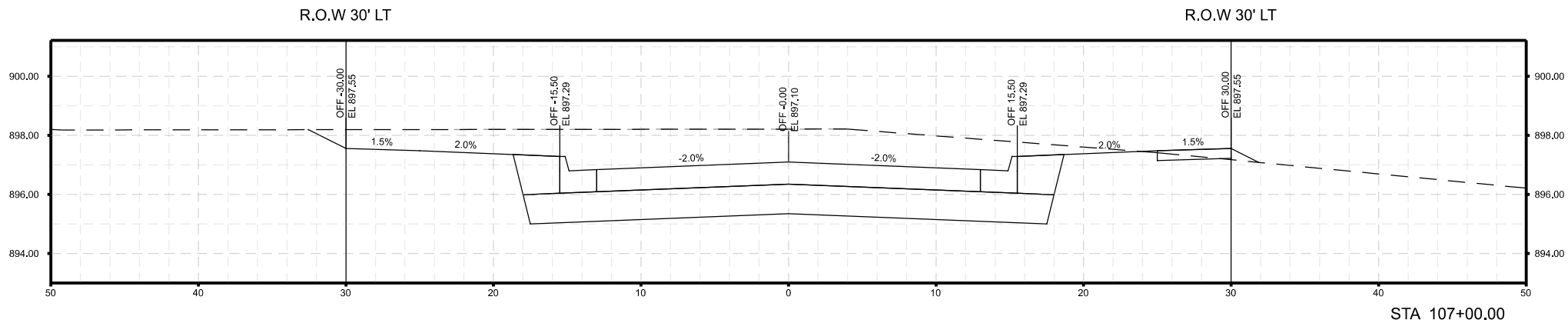
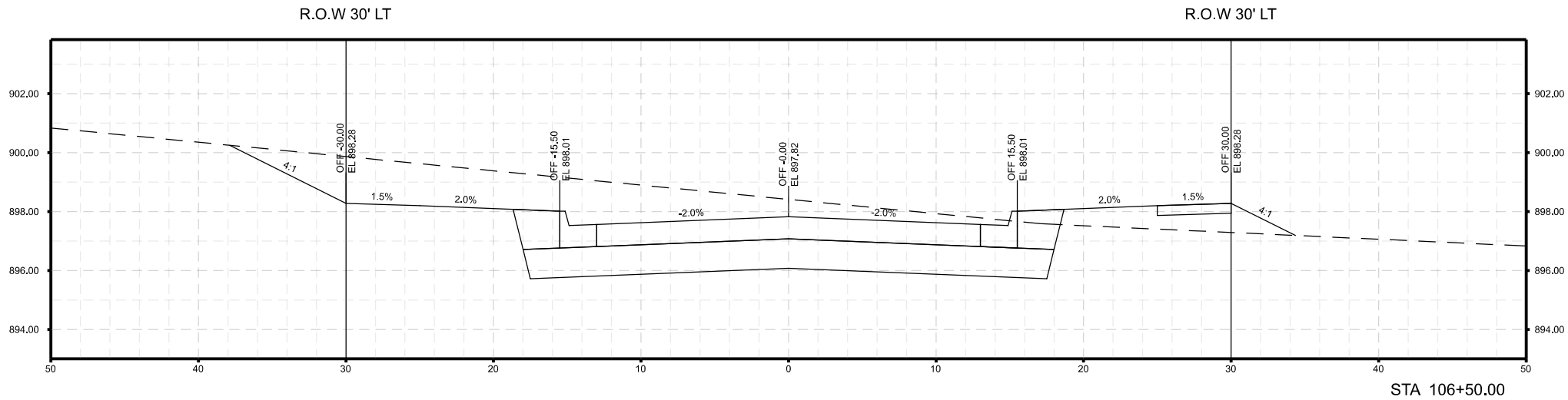


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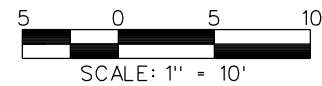
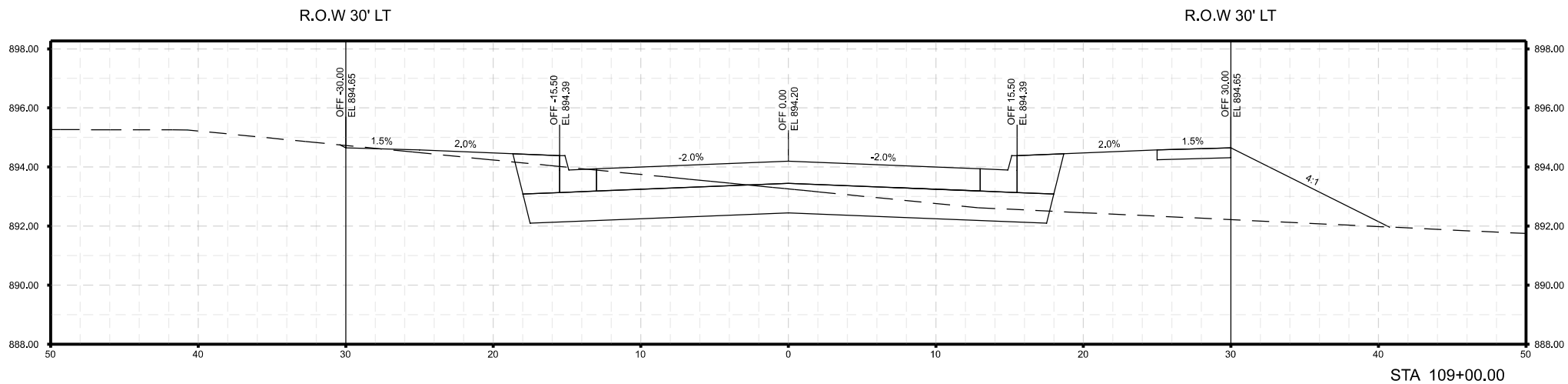
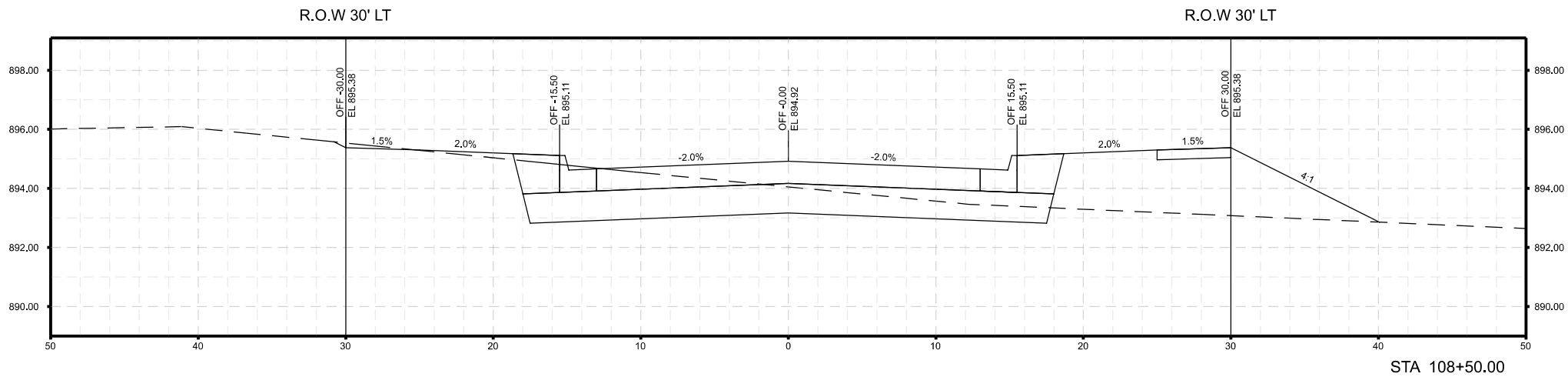
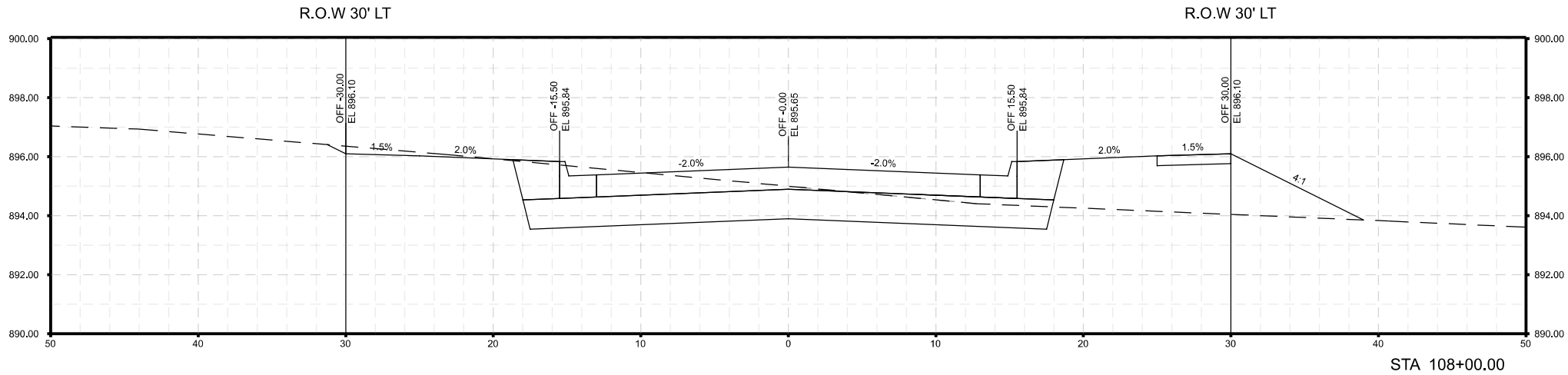
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CITY OF MARSHALLTOWN, IOWA
MARSHALL COUNTY, IOWA



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JOB NO 19023
SHEET W. 4





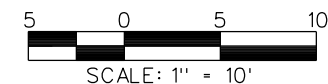
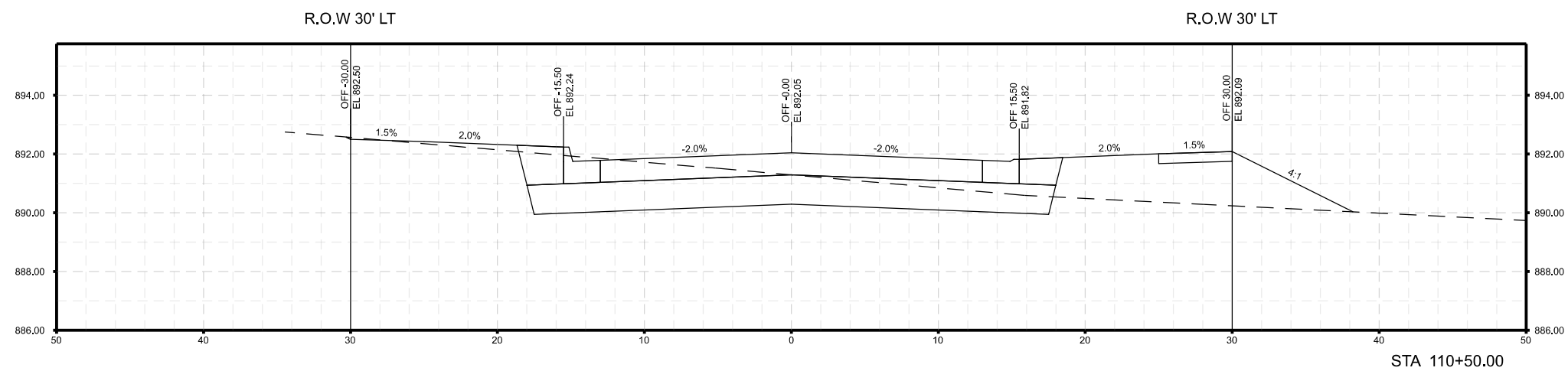
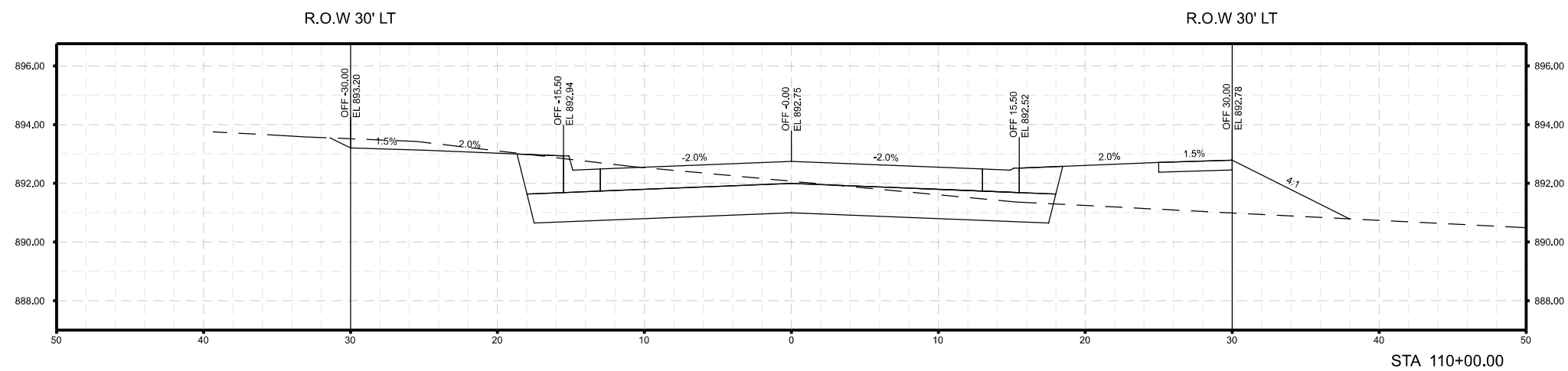
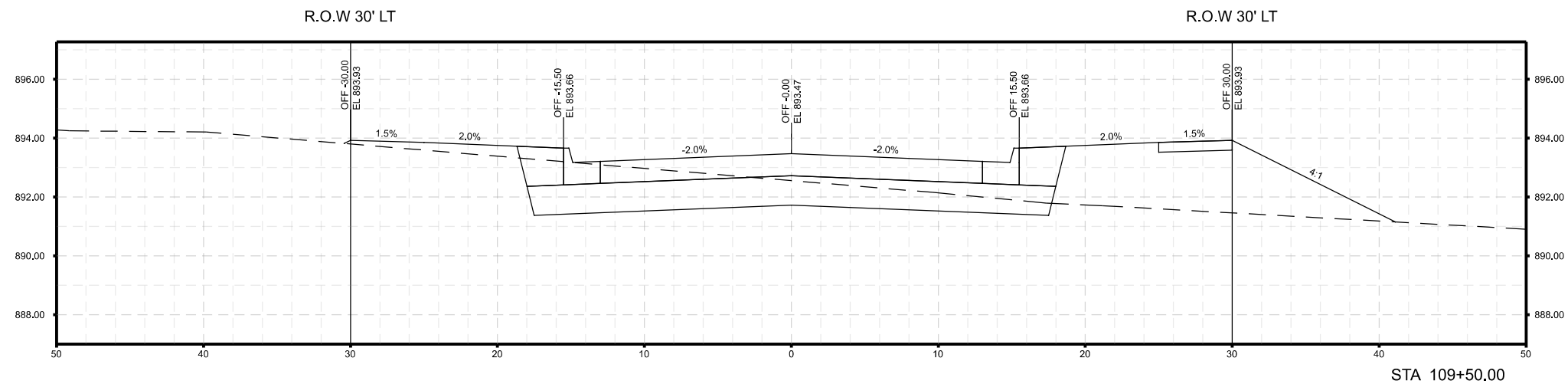
WASHINGTON STREET EXTENSION
CITY OF MARSHALLTOWN, IOWA
MARSHALL COUNTY, IOWA

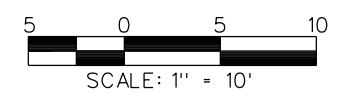
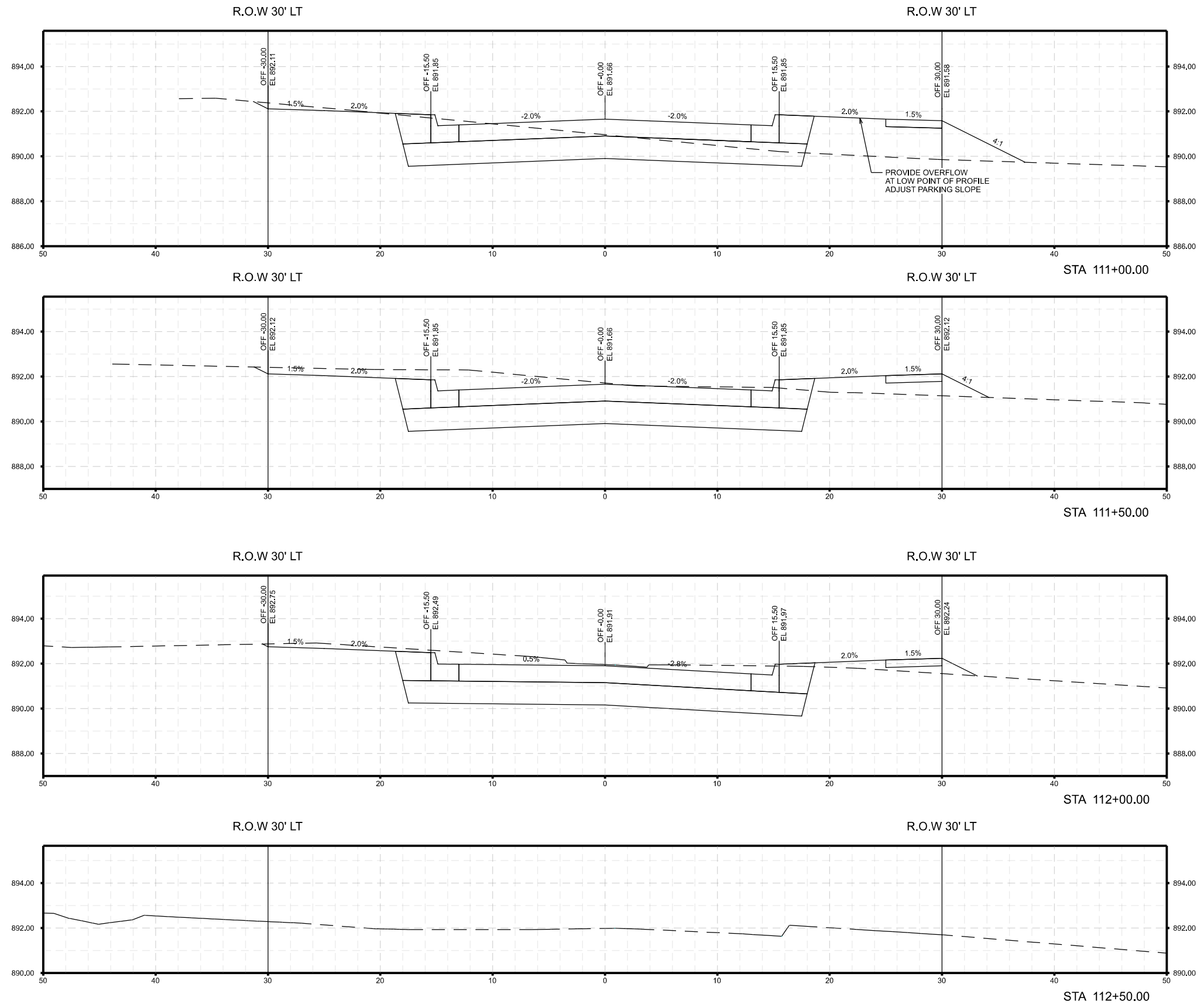


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WASHINGTON STREET EXTENSION
CITY OF MARSHALLTOWN, IOWA
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DATE 05/01/2020
JOB NO 19023
SHEET W.6

OFFICIAL NOTICE OF HEARING AND LETTING

**CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA
WASHINGTON STREET EXTENSION
PROJECT NO. ECO-20001**

NOTICE OF PUBLIC HEARING ON PROPOSED PLANS, SPECIFICATIONS, PROPOSED FORM OF CONTRACT AND ESTIMATED COST FOR THE WASHINGTON STREET EXTENSION IN THE CITY OF MARSHALLTOWN, IOWA, AND THE TAKING OF BIDS FOR SUCH IMPROVEMENTS.

A public hearing will be held at 5:30 p.m. local time on the **26th day of May, 2020** in the Council Chambers, Second Floor, 10 West State Street, Marshalltown, Iowa, on the proposed plans, specifications, proposed form of contract, and the estimated cost of improvements proposed to be constructed under PROJECT NO. ECO-20001, the WASHINGTON STREET EXTENSION is now on file in the office of the City Clerk and at said hearing any interested person may appear and file objection thereto or to the bidding process.

Sealed proposals based upon the proposed plans, specifications, proposed form of contract, estimated costs of improvement, will be received at the City Clerk's Office located at 24 N. Center Street, Marshalltown, IA until 10:00 a.m. local time, on the **9th day of June, 2020** for the construction of the WASHINGTON STREET EXTENSION as described in the plans and specifications for Project No. ECO-20001, and which will be opened, read, and tabulated by the City Engineer or his designate at that time, will be acted upon by the City Council of said City at a meeting to be held in the Council Chambers on the **22th day of June, 2020** or at such later time and place as may then be fixed.

The proposed work will involve furnishing the labor, equipment, and materials necessary for constructing the WASHINGTON STREET EXTENSION in Marshalltown, Iowa as shown in the plans and specifications for PROJECT NO. ECO-20001 the WASHINGTON STREET EXTENSION.

The estimated quantities of materials and labor to be furnished in the construction of said improvements and on which bids will be received are as follows:

ESTIMATED PROJECT QUANTITIES				
Item No.	Item Code	Item	Unit	Total
DIVISION 2 - EARTHWORK				
2.1	2010-108-B-0	CLEARING AND GRUBBING	LS	1
2.2	2010-108-D-1	TOPSOIL, STRIP, SALVAGE AND RESREAD	CY	1,405
2.3	2010-108-E-0	EXCAVATION, CLASS 10	CY	1,970
2.4	2010-108-G-12	SUBGRADE PREPARATION, 12 IN.	SY	3,393
2.5	2010-108-H-0	SUBGRADE TREATMENT, TRI-AX GEOGRID	SY	3,393
2.6	2010-108-I-12	MODIFIED SUBBASE, 12"	TON	2,214
DIVISION 4 - SEWERS AND DRAINS				
4.1	4020-108-A-18	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 2000D, 18 IN.	LF	208

Item No.	Item Code	Item	Unit	Total
4.2	4020-108-A-18	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 3000D, 18 IN.	LF	105
4.3	4020-108-A-24	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 2000D, 24 IN.	LF	978
4.4	4020-108-A-24	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 3000D, 24 IN.	LF	35
4.5	4020-108-A-36	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 2000D, 36 IN.	LF	354
4.6	4030-108-B-36	PIPE APRON, REINFORCED CONCRETE PIPE (RCP), 36 IN.	EA	1
4.7	4030-108-C-0	FOOTING FOR CONCRETE PIPE APRON	EA	1
4.8	4030-108-D-0	PIPE APRON GUARD	EA	1
4.9	4040-108-A-4	SUBDRAIN, LONGITUDINAL, 4 IN. DIA.	LF	1,542
4.10	4040-108-D-0	SUBDRAIN OUTLET / CONNECTION TO INTAKE OR MANHOLE	EA	16
DIVISION 6 - STRUCTURES FOR SANITARY AND STORM SEWERS				
6.1	6010-108-B-0	INTAKE, SW-509	EA	11
6.2	6010-108-F-0	MANHOLE ADJUSTMENT, MINOR	EA	1
6.3	6010-108-F-0	MANHOLE ADJUSTMENT, MAJOR	EA	3
DIVISION 7 - STREETS AND RELATED WORK				
7.1	7010-108-A-8	PAVEMENT, PCC, 8 IN., CLASS C MIX	SY	3,008
7.2	7030-108-H-6	DRIVEWAY, PCC, 7 IN.	SY	151
7.3	7040-108-H-0	PAVEMENT REMOVAL	SY	315
DIVISION 8 - TRAFFIC CONTROL				
8.1	8010-208-B-0	2 - 4 IN. PVC CONDUIT DUCTBANK	LF	876
8.2	8020-108-B-0	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED	STA	16.72
8.3	8030-108-A-0	TEMPORARY TRAFFIC CONTROL	LS	1
DIVISION 9 - SITE WORK AND LANDSCAPING				
9.1	9010-108-B-0	HYDRAULIC SEEDING, SEEDING, FERTILIZING, AND HYDROMULCHING	AC	0.60
9.2	9040-108-A-1	SWPPP MANAGEMENT	LS	1
9.3	9040-108-D-1	FILTER SOCK	LF	2,400
9.4	9040-108-D-2	FILTER SOCK REMOVAL	LF	2,400
9.5	9040-108-N-1	SILT FENCE / SILT FENCE FOR DITCH CHECKS	LF	2,300
9.6	9040-108-N-3	SILT FENCE / SILT FENCE FOR DITCH CHECKS, REMOVAL OF DEVICE	LF	2,300
9.7	9040-108-O-1	STABILIZED CONSTRUCTION ENTRANCE	SY	500
9.8	9040-108-Q-2	EROSION CONTROL MULCHING, SEEDING AND HYDROMULCHING	AC	1.20
9.9	9040-108-T-1	INLET PROTECTION DEVICE, OPEN THROAT	EA	11
9.10	9040-108-T-2	INLET PROTECTION DEVICE, MAINTENANCE	EA	22
DIVISION 11 - MISCELLANEOUS				
11.1	11,020-108-A-0	MOBILIZATION	LS	1
11.2	11,050-108-A-0	CONCRETE WASHOUT	LS	1

All work is to be done in strict compliance with the Plans and Specifications for said

PROJECT NO. ECO-20001 as proposed by the City Engineer.

Obtaining the Bidding Documents

Plans, specifications and proposed contract documents may be examined at the office of the City Engineer, Marshalltown, Iowa, and at the office of the City Clerk, Marshalltown, Iowa.

A deposit of \$25 per paper set of Bidding Requirements and Contract Documents will be charged, all of which will be refunded if the paper documents are returned in reusable condition within 14 days of the Award of Contract. If all paper documents are not returned in reusable condition and within 14 days, the deposit will be forfeited.

Pre-bid Conference

A pre-bid conference will not be held for the Project.

Instructions to Bidders.

A Bid must be accompanied by Bid security made payable to Owner in an amount of ten (10) percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a Bid bond issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions or a certified check in an amount equal to ten percent (10%) of the total amount of the bid, in a separate sealed envelope, drawn on and certified payable by a solvent bank to the City Treasurer of the City. Such Bid bond will be issued in the form included in the Bidding Documents.

For all further requirements regarding bid submittal, qualifications, procedures, and contract award, refer to the Instructions to Bidders that are included in the Bidding Documents.

The City Council reserves the right to reject any and all bids and to waive technicalities and irregularities and all bids must remain effective for a period of 30 days of opening same.

This Notice to Bidders is hereby published by authority of resolution duly adopted by the Council of the City of Marshalltown on the _____ day of _____, 2020.

Owner: _____ City of Marshalltown

By: _____ Shari L. Coughenour, CMC

Title: _____ City Clerk

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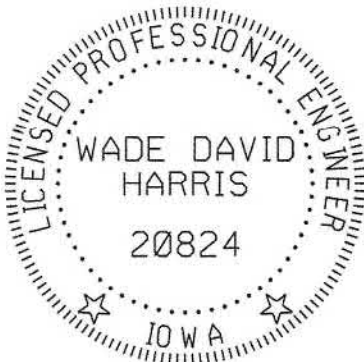
**PROJECT
WASHINGTON STREET EXTENSION**

PROJECT NO. ECO-20001

PREPARED BY:



**14030 New York Ave, Ste C
URBANDALE, IA 50322-3773**



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: Wade Harris Date: 5/15/2020

Name: Wade D. Harris, P. E.

Iowa Reg. No. 20824

My license renewal date is December 31, 2021

Pages or sheets covered by this seal: ALL

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PART I – BIDDING AND CONTRACT DOCUMENTS

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OFFICIAL NOTICE OF HEARING AND LETTING

**CITY OF MARSHALLTOWN
MARSHALLTOWN, IOWA
WASHINGTON STREET EXTENSION
PROJECT NO. ECO-20001**

NOTICE OF PUBLIC HEARING ON PROPOSED PLANS, SPECIFICATIONS, PROPOSED FORM OF CONTRACT AND ESTIMATED COST FOR THE WASHINGTON STREET EXTENSION IN THE CITY OF MARSHALLTOWN, IOWA, AND THE TAKING OF BIDS FOR SUCH IMPROVEMENTS.

A public hearing will be held at 5:30 p.m. local time on the **26th day of May, 2020** in the Council Chambers, Second Floor, 10 West State Street, Marshalltown, Iowa, on the proposed plans, specifications, proposed form of contract, and the estimated cost of improvements proposed to be constructed under PROJECT NO. ECO-20001, the WASHINGTON STREET EXTENSION is now on file in the office of the City Clerk and at said hearing any interested person may appear and file objection thereto or to the bidding process.

Sealed proposals based upon the proposed plans, specifications, proposed form of contract, estimated costs of improvement, will be received at the City Clerk's Office located at 24 N. Center Street, Marshalltown, IA until 10:00 a.m. local time, on the **9th day of June, 2020** for the construction of the WASHINGTON STREET EXTENSION as described in the plans and specifications for Project No. ECO-20001, and which will be opened, read, and tabulated by the City Engineer or his designate at that time, will be acted upon by the City Council of said City at a meeting to be held in the Council Chambers on the **22th day of June, 2020** or at such later time and place as may then be fixed.

The proposed work will involve furnishing the labor, equipment, and materials necessary for constructing the WASHINGTON STREET EXTENSION in Marshalltown, Iowa as shown in the plans and specifications for PROJECT NO. ECO-20001 the WASHINGTON STREET EXTENSION.

The estimated quantities of materials and labor to be furnished in the construction of said improvements and on which bids will be received are as follows:

ESTIMATED PROJECT QUANTITIES				
Item No.	Item Code	Item	Unit	Total
DIVISION 2 - EARTHWORK				
2.1	2010-108-B-0	CLEARING AND GRUBBING	LS	1
2.2	2010-108-D-1	TOPSOIL, STRIP, SALVAGE AND RESREAD	CY	1,405
2.3	2010-108-E-0	EXCAVATION, CLASS 10	CY	1,970
2.4	2010-108-G-12	SUBGRADE PREPARATION, 12 IN.	SY	3,393
2.5	2010-108-H-0	SUBGRADE TREATMENT, TRI-AX GEOGRID	SY	3,393
2.6	2010-108-I-12	MODIFIED SUBBASE, 12"	TON	2,214
DIVISION 4 - SEWERS AND DRAINS				
4.1	4020-108-A-18	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 2000D, 18 IN.	LF	208

Item No.	Item Code	Item	Unit	Total
4.2	4020-108-A-18	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 3000D, 18 IN.	LF	105
4.3	4020-108-A-24	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 2000D, 24 IN.	LF	978
4.4	4020-108-A-24	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 3000D, 24 IN.	LF	35
4.5	4020-108-A-36	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 2000D, 36 IN.	LF	354
4.6	4030-108-B-36	PIPE APRON, REINFORCED CONCRETE PIPE (RCP), 36 IN.	EA	1
4.7	4030-108-C-0	FOOTING FOR CONCRETE PIPE APRON	EA	1
4.8	4030-108-D-0	PIPE APRON GUARD	EA	1
4.9	4040-108-A-4	SUBDRAIN, LONGITUDINAL, 4 IN. DIA.	LF	1,542
4.10	4040-108-D-0	SUBDRAIN OUTLET / CONNECTION TO INTAKE OR MANHOLE	EA	16
DIVISION 6 - STRUCTURES FOR SANITARY AND STORM SEWERS				
6.1	6010-108-B-0	INTAKE, SW-509	EA	11
6.2	6010-108-F-0	MANHOLE ADJUSTMENT, MINOR	EA	1
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7.1	7010-108-A-8	PAVEMENT, PCC, 8 IN., CLASS C MIX	SY	3,008
7.2	7030-108-H-6	DRIVEWAY, PCC, 7 IN.	SY	151
7.3	7040-108-H-0	PAVEMENT REMOVAL	SY	315
DIVISION 8 - TRAFFIC CONTROL				
8.1	8010-208-B-0	2 - 4 IN. PVC CONDUIT DUCTBANK	LF	876
8.2	8020-108-B-0	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED	STA	16.72
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9.1	9010-108-B-0	HYDRAULIC SEEDING, SEEDING, FERTILIZING, AND HYDROMULCHING	AC	0.60
9.2	9040-108-A-1	SWPPP MANAGEMENT	LS	1
9.3	9040-108-D-1	FILTER SOCK	LF	2,400
9.4	9040-108-D-2	FILTER SOCK REMOVAL	LF	2,400
9.5	9040-108-N-1	SILT FENCE / SILT FENCE FOR DITCH CHECKS	LF	2,300
9.6	9040-108-N-3	SILT FENCE / SILT FENCE FOR DITCH CHECKS, REMOVAL OF DEVICE	LF	2,300
9.7	9040-108-O-1	STABILIZED CONSTRUCTION ENTRANCE	SY	500
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DIVISION 11 - MISCELLANEOUS				
11.1	11,020-108-A-0	MOBILIZATION	LS	1
11.2	11,050-108-A-0	CONCRETE WASHOUT	LS	1

All work is to be done in strict compliance with the Plans and Specifications for said

PROJECT NO. ECO-20001 as proposed by the City Engineer.

Obtaining the Bidding Documents

Plans, specifications and proposed contract documents may be examined at the office of the City Engineer, Marshalltown, Iowa, and at the office of the City Clerk, Marshalltown, Iowa.

A deposit of \$25 per paper set of Bidding Requirements and Contract Documents will be charged, all of which will be refunded if the paper documents are returned in reusable condition within 14 days of the Award of Contract. If all paper documents are not returned in reusable condition and within 14 days, the deposit will be forfeited.

Pre-bid Conference

A pre-bid conference will not be held for the Project.

Instructions to Bidders.

A Bid must be accompanied by Bid security made payable to Owner in an amount of ten (10) percent of Bidder's maximum Bid price (determined by adding the base bid and all alternates) and in the form of a Bid bond issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions or a certified check in an amount equal to ten percent (10%) of the total amount of the bid, in a separate sealed envelope, drawn on and certified payable by a solvent bank to the City Treasurer of the City. Such Bid bond will be issued in the form included in the Bidding Documents.

For all further requirements regarding bid submittal, qualifications, procedures, and contract award, refer to the Instructions to Bidders that are included in the Bidding Documents.

The City Council reserves the right to reject any and all bids and to waive technicalities and irregularities and all bids must remain effective for a period of 30 days of opening same.

This Notice to Bidders is hereby published by authority of resolution duly adopted by the Council of the City of Marshalltown on the _____ day of _____, 2020.

Owner: _____ City of Marshalltown

By: _____ Shari L. Coughenour, CMC

Title: _____ City Clerk

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INSTRUCTIONS TO BIDDERS FOR CONSTRUCTION CONTRACT

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ARTICLE 1— DEFINED TERMS

- 1.01 Terms used in these Instructions to Bidders have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below:
- A. *Issuing Office*—The office from which the Bidding Documents are to be issued, and which registers plan holders.

ARTICLE 2— BIDDING DOCUMENTS

- 2.01 Bidder shall obtain a complete set of Bidding Requirements and proposed Contract Documents (together, the Bidding Documents). See the Agreement for a list of the Contract Documents. It is Bidder's responsibility to determine that it is using a complete set of documents in the preparation of a Bid. Bidder assumes sole responsibility for errors or misinterpretations resulting from the use of incomplete documents, by Bidder itself or by its prospective Subcontractors and Suppliers.
- 2.02 Bidding Documents are made available for the sole purpose of obtaining Bids for completion of the Project and permission to download or distribution of the Bidding Documents does not confer a license or grant permission or authorization for any other use. Authorization to download documents, or other distribution, includes the right for plan holders to print documents solely for their use, and the use of their prospective Subcontractors and Suppliers, provided the plan holder pays all costs associated with printing or reproduction. Printed documents may not be re-sold under any circumstances.
- 2.03 Bidder may register as a plan holder and obtain complete sets of Bidding Documents, in the number and format stated in the Advertisement or invitation to bid, from the Issuing Office. Bidders may rely that sets of Bidding Documents obtained from the Issuing Office are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner.
- 2.04 *Electronic Documents*
- A. When the Bidding Requirements indicate that electronic (digital) copies of the Bidding Documents are available, such documents will be made available to the Bidders as Electronic Documents in the manner specified.
- B. Bidding Documents will be provided in Adobe PDF (Portable Document Format) (.pdf) that is readable by Adobe Acrobat Reader Version 2019 or later. It is the intent of the Engineer and Owner that such Electronic Documents are to be exactly representative of the paper copies of the documents. However, because the Owner and Engineer cannot totally control the transmission and receipt of Electronic Documents nor the Contractor's means of reproduction of such documents, the Owner and Engineer cannot and do not guarantee that Electronic Documents and reproductions prepared from those versions are identical in every manner to the paper copies.
- C. Unless otherwise stated in the Bidding Documents, the Bidder may use and rely upon complete sets of Electronic Documents of the Bidding Documents,

described in Paragraph 2.06.A above. However, Bidder assumes all risks associated with differences arising from transmission/receipt of Electronic Documents versions of Bidding Documents and reproductions prepared from those versions and, further, assumes all risks, costs, and responsibility associated with use of the Electronic Documents versions to derive information that is not explicitly contained in printed paper versions of the documents, and for Bidder's reliance upon such derived information.

- D. After the Contract is awarded, the Owner will provide or direct the Engineer to provide for the use of the Contractor documents that were developed by Engineer as part of the Project design process, as Electronic Documents in native file formats.
- E. Electronic Documents that are available in native file format include:
 - 1. Plans in Microstation format.
- F. Release of such documents will be solely for the convenience of the Contractor. No such document is a Contract Document.
- G. Unless the Contract Documents explicitly identify that such information will be available to the Successful Bidder (Contractor), nothing herein will create an obligation on the part of the Owner or Engineer to provide or create such information, and the Contractor is not entitled to rely on the availability of such information in the preparation of its Bid or pricing of the Work. In all cases, the Contractor shall take appropriate measures to verify that any electronic/digital information provided in Electronic Documents is appropriate and adequate for the Contractor's specific purposes.
- H. In no case will the Contractor be entitled to additional compensation or time for completion due to any differences between the actual Contract Documents and any related document in native file format.

ARTICLE 3— QUALIFICATIONS OF BIDDERS

- 3.01 Bidder is to submit the following information with its Bid to demonstrate Bidder's qualifications to perform the Work:
- A. Written evidence establishing its qualifications such as financial data, previous experience, and present commitments.
 - B. A written statement that Bidder is authorized to do business in the state where the Project is located, or a written certification that Bidder will obtain such authority prior to the Effective Date of the Contract.
 - C. Bidder's state or other contractor license number, if applicable.
 - D. Subcontractor and Supplier qualification information.
 - E. Other required information regarding qualifications.

- 3.02 A Bidder's failure to submit required qualification information within the times indicated may disqualify Bidder from receiving an award of the Contract.
- 3.03 No requirement in this Article 3 to submit information will prejudice the right of Owner to seek additional pertinent information regarding Bidder's qualifications.

ARTICLE 4— PRE-BID CONFERENCE

- 4.01 A pre-bid conference will not be conducted for this Project.

ARTICLE 5— SITE AND OTHER AREAS; EXISTING SITE CONDITIONS; EXAMINATION OF SITE; OWNER'S SAFETY PROGRAM; OTHER WORK AT THE SITE

5.01 *Site and Other Areas*

- A. The Site is identified in the Bidding Documents. By definition, the Site includes rights-of-way, easements, and other lands furnished by Owner for the use of the Contractor. Any additional lands required for temporary construction facilities, construction equipment, or storage of materials and equipment, and any access needed for such additional lands, are to be obtained and paid for by Contractor.

5.02 *Existing Site Conditions*

- A. Subsurface and Physical Conditions; Hazardous Environmental Conditions
- B. The Supplementary Conditions identify the following regarding existing conditions at or adjacent to the Site:
1. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data.
 2. Those drawings known to Owner of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data.
 3. Reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site.
 4. Technical Data contained in such reports and drawings.
- C. Owner will make copies of reports and drawings referenced above available to any Bidder on request. These reports and drawings are not part of the Contract Documents, but the Technical Data contained therein upon whose accuracy Bidder is entitled to rely, as provided in the General Conditions, has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any Technical Data or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.

- D. If the Supplementary Conditions do not identify Technical Data, the default definition of Technical Data set forth in Article 1 of the General Conditions will apply.
- E. *Underground Facilities:* Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05 of the General Conditions, and not in the drawings referred to in Paragraph 5.02.A of these Instructions to Bidders. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

5.03 *Other Site-related Documents*

- A. No other Site-related documents are available.

5.04 *Site Visit and Testing by Bidders*

- A. Bidder is required to visit the Site and conduct a thorough visual examination of the Site and adjacent areas. During the visit the Bidder must not disturb any ongoing operations at the Site.
- B. Bidder is not required to conduct any subsurface testing, or exhaustive investigations of Site conditions.
- C. On request, and to the extent Owner has control over the Site, and schedule permitting, the Owner will provide Bidder general access to the Site to conduct such additional examinations, investigations, explorations, tests, and studies as Bidder deems necessary for preparing and submitting a successful Bid. Owner will not have any obligation to grant such access if doing so is not practical because of existing operations, security or safety concerns, or restraints on Owner's authority regarding the Site. Bidder is responsible for establishing access needed to reach specific selected test sites.
- D. Bidder must comply with all applicable Laws and Regulations regarding excavation and location of utilities, obtain all permits, and comply with all terms and conditions established by Owner or by property owners or other entities controlling the Site with respect to schedule, access, existing operations, security, liability insurance, and applicable safety programs.
- E. Bidder must fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

5.05 *Owner's Safety Program*

- A. Site visits and work at the Site may be governed by an Owner safety program. If an Owner safety program exists, it will be noted in the Supplementary Conditions.

5.06 *Other Work at the Site*

- A. Reference is made to Article 8 of the Supplementary Conditions for the identification of the general nature of other work of which Owner is aware (if any) that is to be performed at the Site by Owner or others (such as utilities

and other prime contractors) and relates to the Work contemplated by these Bidding Documents. If Owner is party to a written contract for such other work, then on request, Owner will provide to each Bidder access to examine such contracts (other than portions thereof related to price and other confidential matters), if any.

ARTICLE 6— BIDDER’S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Express Representations and Certifications in Bid Form, Agreement*

- A. The Bid Form that each Bidder will submit contains express representations regarding the Bidder’s examination of Project documentation, Site visit, and preparation of the Bid, and certifications regarding lack of collusion or fraud in connection with the Bid. Bidder should review these representations and certifications, and assure that Bidder can make the representations and certifications in good faith, before executing and submitting its Bid.
- B. If Bidder is awarded the Contract, Bidder (as Contractor) will make similar express representations and certifications when it executes the Agreement.

ARTICLE 7— INTERPRETATIONS AND ADDENDA

- 7.01 Owner on its own initiative may issue Addenda to clarify, correct, supplement, or change the Bidding Documents.
- 7.02 Bidder shall submit all questions about the meaning or intent of the Bidding Documents to Engineer in writing. Contact information and submittal procedures for such questions are as follows:
 - A. LEE Chamberlin Consultant Engineers Attn: Wade Harris
wharris@leechamberlinengineers.com
- 7.03 Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda delivered to all registered plan holders. Questions received less than seven days prior to the date for opening of Bids may not be answered.
- 7.04 Only responses set forth in an Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect. Responses to questions are not part of the Contract Documents unless set forth in an Addendum that expressly modifies or supplements the Contract Documents.

ARTICLE 8— BID SECURITY

- 8.01 A Bid must be accompanied by Bid security made payable to Owner in an amount of **ten (10)** percent of Bidder’s maximum Bid price (determined by adding the base bid and all alternates) and in the form of a Bid bond issued by a surety meeting the requirements of Paragraph 6.01 of the General Conditions or a certified check in an amount equal to ten percent (10%) of the total amount of the bid, in a separate sealed envelope, drawn on and certified payable by a solvent bank to the City

Treasurer of the City. Such Bid bond will be issued in the form included in the Bidding Documents.

- 8.02 The Bid security of the apparent Successful Bidder will be retained until Owner awards the contract to such Bidder, and such Bidder has executed the Contract, furnished the required Contract security, and met the other conditions of the Notice of Award, whereupon the Bid security will be released. If the Successful Bidder fails to execute and deliver the Contract and furnish the required Contract security within 15 days after the Notice of Award, Owner may consider Bidder to be in default, annul the Notice of Award, and the Bid security of that Bidder will be forfeited, in whole in the case of a penal sum bid bond, and to the extent of Owner's damages in the case of a damages-form bond. Such forfeiture will be Owner's exclusive remedy if Bidder defaults.
- 8.03 The Bid security of other Bidders that Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of 7 days after the Effective Date of the Contract or 31 days after the Bid opening, whereupon Bid security furnished by such Bidders will be released.
- 8.04 Bid security of other Bidders that Owner believes do not have a reasonable chance of receiving the award will be released within 7 days after the Bid opening.

ARTICLE 9— CONTRACT TIMES

- 9.01 The number of days within which, or the dates by which, the Work is to be (a) substantially completed and (b) ready for final payment, and (c) Milestones (if any) are to be achieved, are set forth in the Agreement.
- 9.02 Provisions for liquidated damages, if any, for failure to timely attain a Milestone, Substantial Completion, or completion of the Work in readiness for final payment, are set forth in the Agreement.

ARTICLE 10— SUBSTITUTE AND “OR EQUAL” ITEMS

- 10.01 The Contract for the Work, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration during the bidding and Contract award process of possible substitute or “or-equal” items. In cases in which the Contract allows the Contractor to request that Engineer authorize the use of a substitute or “or-equal” item of material or equipment, application for such acceptance may not be made to and will not be considered by Engineer until after the Effective Date of the Contract.
- 10.02 All prices that Bidder sets forth in its Bid will be based on the presumption that the Contractor will furnish the materials and equipment specified or described in the Bidding Documents, as supplemented by Addenda. Any assumptions regarding the possibility of post-Bid approvals of “or-equal” or substitution requests are made at Bidder's sole risk.

ARTICLE 11— SUBCONTRACTORS, SUPPLIERS, AND OTHERS

- 11.01 Such list must be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor or Supplier. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, Owner may, before the Notice of Award is given, request apparent Successful Bidder to submit an acceptable substitute, without an increase in Bid price..
- 11.02 If apparent Successful Bidder declines to make any such substitution, Owner may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors and Suppliers. Declining to make requested substitutions will not constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor or Supplier, so listed and against which Owner or Engineer makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to subsequent revocation of such acceptance as provided in Paragraph 7.07 of the General Conditions.
- 11.03 Contractor shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom Contractor has reasonable objection.
- 11.04 The Contractor shall not award work to Subcontractor(s) in excess of the limits stated in SC 7.06.

ARTICLE 12— PREPARATION OF BID

- 12.01 The Bid Form is included with the Bidding Documents.
- A. All blanks on the Bid Form must be completed in ink and the Bid Form signed in ink. Erasures or alterations must be initialed in ink by the person signing the Bid Form. A Bid price must be indicated for each section, Bid item, alternate, adjustment unit price item, and unit price item listed therein.
 - B. If the Bid Form expressly indicates that submitting pricing on a specific alternate item is optional, and Bidder elects to not furnish pricing for such optional alternate item, then Bidder may enter the words “No Bid” or “Not Applicable.”
- 12.02 If Bidder has obtained the Bidding Documents as Electronic Documents, then Bidder shall prepare its Bid on a paper copy of the Bid Form printed from the Electronic Documents version of the Bidding Documents. The printed copy of the Bid Form must be clearly legible, printed on 8½ inch by 11-inch paper and as closely identical in appearance to the Electronic Document version of the Bid Form as may be practical. The Owner reserves the right to accept Bid Forms which nominally vary in appearance from the original paper version of the Bid Form, providing that all required information and submittals are included with the Bid.
- 12.03 A Bid by a corporation must be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation must be shown.

- 12.04 A Bid by a partnership must be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership must be shown.
- 12.05 A Bid by a limited liability company must be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown.
- 12.06 A Bid by an individual must show the Bidder's name and official address.
- 12.07 A Bid by a joint venture must be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The joint venture must have been formally established prior to submittal of a Bid, and the official address of the joint venture must be shown.
- 12.08 All names must be printed in ink below the signatures.
- 12.09 The Bid must contain an acknowledgment of receipt of all Addenda, the numbers of which must be filled in on the Bid Form.
- 12.10 Postal and e-mail addresses and telephone number for communications regarding the Bid must be shown.
- 12.11 The Bid must contain evidence of Bidder's authority to do business in the state where the Project is located, or Bidder must certify in writing that it will obtain such authority within the time for acceptance of Bids and attach such certification to the Bid.
- 12.12 If Bidder is required to be licensed to submit a Bid or perform the Work in the state where the Project is located, the Bid must contain evidence of Bidder's licensure, or Bidder must certify in writing that it will obtain such licensure within the time for acceptance of Bids and attach such certification to the Bid. Bidder's state contractor license number, if any, must also be shown on the Bid Form.

ARTICLE 13— BASIS OF BID

13.01 *Unit Price*

- A. Bidders must submit a Bid on a unit price basis for each item of Work listed in the unit price section of the Bid Form.
- B. The "Bid Price" (sometimes referred to as the extended price) for each unit price Bid item will be the product of the "Estimated Quantity", which Owner or its representative has set forth in the Bid Form, for the item and the corresponding "Bid Unit Price" offered by the Bidder. The total of all unit price Bid items will be the sum of these "Bid Prices"; such total will be used by Owner for Bid comparison purposes. The final quantities and Contract Price will be determined in accordance with Paragraph 13.03 of the General Conditions.
- C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated

sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.

13.02 Allowances

- A. For cash allowances the Bid price must include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash allowances, if any, named in the Contract Documents, in accordance with Paragraph 13.02.B of the General Conditions.

ARTICLE 14— SUBMITTAL OF BID

- 14.01 The Bidding Documents include the Bid Form, ~~and, if required, the Bid Bond Form,~~ and other required documents. The Bid Form is to be completed and submitted with the Bid security and the other documents required to be submitted under the terms of Article 2 of the Bid Form.
- 14.02 A Bid must be received no later than the date and time prescribed and at the place indicated in the Advertisement or invitation to bid and must be enclosed in a plainly marked package with the Project title, and, if applicable, the designated portion of the Project for which the Bid is submitted, the name and address of Bidder, and must be accompanied by the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid must be enclosed in a separate package plainly marked on the outside with the notation "BID ENCLOSED." A mailed Bid must be addressed to the location designated in the Advertisement.
- 14.03 Bids received after the date and time prescribed for the opening of bids, or not submitted at the correct location or in the designated manner, will not be accepted and will be returned to the Bidder unopened.

ARTICLE 15— MODIFICATION AND WITHDRAWAL OF BID

- 15.01 An unopened Bid may be withdrawn by an appropriate document duly executed in the same manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids. Upon receipt of such notice, the unopened Bid will be returned to the Bidder.
- 15.02 If a Bidder wishes to modify its Bid prior to Bid opening, Bidder must withdraw its initial Bid in the manner specified in Paragraph 15.01 and submit a new Bid prior to the date and time for the opening of Bids.
- 15.03 If within 24 hours after Bids are opened any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, the Bidder may withdraw its Bid, and the Bid security will be returned.

Thereafter, if the Work is rebid, the Bidder will be disqualified from further bidding on the Work.

ARTICLE 16— OPENING OF BIDS

16.01 Bids will be opened at the time and place indicated in the advertisement or invitation to bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.

ARTICLE 17—BIDS TO REMAIN SUBJECT TO ACCEPTANCE

17.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.

17.02 Should there be any reason why the contract cannot be awarded within the period of time stated in the Bid Form, the time may be extended by mutual agreement between the Owner and the apparent successful Bidder.

ARTICLE 18— EVALUATION OF BIDS AND AWARD OF CONTRACT

18.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner also reserves the right to waive all minor Bid informalities not involving price, time, or changes in the Work.

18.02 Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible.

18.03 If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, whether in the Bid itself or in a separate communication to Owner or Engineer, then Owner will reject the Bid as nonresponsive.

18.04 If Owner awards the contract for the Work, such award will be to the responsible Bidder submitting the lowest responsive Bid.

18.05 *Evaluation of Bids*

A. In evaluating Bids, Owner will consider whether the Bids comply with the prescribed requirements, and such alternates, unit prices, and other data, as may be requested in the Bid Form or prior to the Notice of Award.

B. In the comparison of Bids, alternates will be applied in the same order of priority as listed in the Bid Form. To determine the Bid prices for purposes of comparison, Owner will announce to all bidders a “Base Bid plus alternates” budget after receiving all Bids, but prior to opening them. For comparison purposes alternates will be accepted, following the order of priority established in the Bid Form, until doing so would cause the budget to be exceeded. After

determination of the Successful Bidder based on this comparative process and on the responsiveness, responsibility, and other factors set forth in these Instructions, the award may be made to said Successful Bidder on its base Bid and any combination of its additive alternate Bids for which Owner determines funds will be available at the time of award.

- C. For the determination of the apparent low Bidder when unit price bids are submitted, Bids will be compared on the basis of the total of the products of the estimated quantity of each item and unit price Bid for that item, together with any lump sum items.

18.06 In evaluating whether a Bidder is responsible, Owner will consider the qualifications of the Bidder and may consider the qualifications and experience of Subcontractors and Suppliers proposed for those portions of the Work for which the identity of Subcontractors and Suppliers must be submitted as provided in the Bidding Documents.

18.07 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders and any proposed Subcontractors or Suppliers.

ARTICLE 19— BONDS AND INSURANCE

19.01 Article 6 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth Owner's requirements as to performance and payment bonds, other required bonds (if any), and insurance. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by required bonds and insurance documentation.

19.02 Article 8, Bid Security, of these Instructions, addresses any requirements for providing bid bonds as part of the bidding process.

ARTICLE 20— SIGNING OF AGREEMENT

20.01 When Owner issues a Notice of Award to the Successful Bidder, it will be accompanied by the unexecuted counterparts of the Agreement along with the other Contract Documents as identified in the Agreement. Within 15 days thereafter, Successful Bidder must execute and deliver the required number of counterparts of the Agreement and any bonds and insurance documentation required to be delivered by the Contract Documents to Owner. Within 10 days thereafter, Owner will deliver one fully executed counterpart of the Agreement to Successful Bidder, together with printed and electronic copies of the Contract

ARTICLE 21— SALES AND USE TAXES

21.01 Owner is exempt from Iowa state sales and use taxes on materials and equipment to be incorporated in the Work. (Exemption No. A128063. Said taxes must not be included in the Bid. Refer to Paragraph SC-7.10 of the Supplementary Conditions for additional information.

ARTICLE 22— PREFERENCE FOR IOWA PRODUCTS

22.01 By virtue of statutory authority, a preference will be given to products and provisions grown and coal produced within the State of Iowa, (Chapter 73, Code of Iowa).

ARTICLE 23— ENGINEER INFORMATION

23.01 The Engineering firm is: LEE Chamberlin Consultant Engineers

23.02 The Engineering firm's contact person is: Wade Harris, Project Engineer

23.03 The firm's address is: 10430 New York Ave, Ste. C, Urbandale, Iowa 50322

23.04 Phone: (515) 344-5562

23.05 Email: wharris@leechamberlinengineers.com

BIDDING DOCUMENTS

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BID FORM FOR CONSTRUCTION CONTRACT

The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

ARTICLE 1— OWNER AND BIDDER

- A. This Bid is submitted to: The City of Marshalltown, 24 N. Center Street, Marshalltown, IA 50158.
- B. The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2— ATTACHMENTS TO THIS BID

- A. The following documents are submitted with and made a condition of this Bid:
 - Required Bid security;
 - List of Proposed Subcontractors;
 - List of Proposed Suppliers;
 - Evidence of authority to do business in the state of the Project; or a written covenant to obtain such authority within the time for acceptance of Bids;
 - Contractor's license number as evidence of Bidder's State Contractor's License or a covenant by Bidder to obtain said license within the time for acceptance of Bids;
 - Required Bidder Qualification Statement with supporting data; and
 - Bidders Status Form.

ARTICLE 3— BASIS OF BID — UNIT PRICES

- A. Unit Price Bids

Bidder will perform the following Work at the indicated unit prices:

Item No.	Item	Unit	Total	Bid Unit Price	Bid Amount
DIVISION 2 - EARTHWORK					
2.1	CLEARING AND GRUBBING	LS	1		
2.2	TOPSOIL, STRIP, SALVAGE AND RESPREAD	CY	1,405		
2.3	EXCAVATION, CLASS 10	CY	1,970		
2.4	SUBGRADE PREPARATION, 12 IN.	SY	3,393		

Item No.	Item	Unit	Total	Bid Unit Price	Bid Amount
2.6	MODIFIED SUBBASE, 12"	TON	2,214		
DIVISION 4 - SEWERS AND DRAINS					
4.1	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 2000D, 18 IN.	LF	208		
4.2	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 3000D, 18 IN.	LF	105		
4.3	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 2000D, 24 IN.	LF	978		
4.4	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 3000D, 24 IN.	LF	35		
4.5	STORM SEWER, REINFORCED CONCRETE PIPE (RCP), 2000D, 36 IN.	LF	354		
4.6	PIPE APRON, REINFORCED CONCRETE PIPE (RCP), 36 IN.	EA	1		
4.7	FOOTING FOR CONCRETE PIPE APRON	EA	1		
4.8	PIPE APRON GUARD	EA	1		
4.9	SUBDRAIN, LONGITUDINAL, 4 IN. DIA.	LF	1,542		
4.10	SUBDRAIN OUTLET / CONNECTION TO INTAKE OR MANHOLE	EA	16		
DIVISION 6 - STRUCTURES FOR SANITARY AND STORM SEWERS					
6.1	INTAKE, SW-509	EA	11		
6.2	MANHOLE ADJUSTMENT, MINOR	EA	1		
6.3	MANHOLE ADJUSTMENT, MAJOR	EA	3		
DIVISION 7 - STREETS AND RELATED WORK					
7.1	PAVEMENT, PCC, 8 IN., CLASS C MIX	SY	3,008		
7.2	DRIVEWAY, PCC, 6 IN.	SY	151		
7.3	PAVEMENT REMOVAL	SY	315		
DIVISION 8 - TRAFFIC CONTROL					
8.1	2 - 4 IN. PVC CONDUIT DUCTBANK	LF	876		
8.2	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED	STA	16.72		
8.3	TEMPORARY TRAFFIC CONTROL	LS	1		
DIVISION 9 - SITE WORK AND LANDSCAPING					
9.1	HYDRAULIC SEEDING, SEEDING, FERTILIZING, AND HYDROMULCHING	AC	0.60		

Item No.	Item	Unit	Total	Bid Unit Price	Bid Amount
9.2	SWPPP MANAGEMENT	LS	1		
9.3	FILTER SOCK	LF	2,400		
9.4	FILTER SOCK REMOVAL	LF	2,400		
9.5	SILT FENCE / SILT FENCE FOR DITCH CHECKS	LF	2,300		
9.6	SILT FENCE / SILT FENCE FOR DITCH CHECKS, REMOVAL OF DEVICE	LF	2,300		
9.7	STABILIZED CONSTRUCTION ENTRANCE	SY	500		
9.8	EROSION CONTROL MULCHING, SEEDING AND HYDROMULCHING	AC	1.20		
9.9	INLET PROTECTION DEVICE, OPEN THROAT	EA	11		
9.10	INLET PROTECTION DEVICE, MAINTENANCE	EA	22		
DIVISION 11 - MISCELLANEOUS					
11.1	MOBILIZATION	LS	1		
11.2	CONCRETE WASHOUT	LS	1		
TOTAL OF ALL UNIT PRICE BID ITEMS:					

Bidder acknowledges that:

1. each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and
2. estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Work will be based on actual quantities, determined as provided in the Contract Documents.

ARTICLE 4—Time of Completion

- A. Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.
- B. Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 5—BIDDER’S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

5.01 Bid Acceptance Period

- A. This Bid will remain subject to acceptance for 30 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

5.02 Instructions to Bidders

- A. Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security.

5.03 Receipt of Addenda

- A. Bidder hereby acknowledges receipt of the following Addenda:

Addendum Number	Addendum Date

ARTICLE 6—BIDDER’S REPRESENTATIONS AND CERTIFICATIONS

6.01 Bidder’s Representations

- A. In submitting this Bid, Bidder represents the following:
 - 1. Bidder has examined and carefully studied the Bidding Documents, including Addenda.
 - 2. Bidder has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
 - 3. Bidder is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
 - 4. Bidder has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.
 - 5. Bidder has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.
 - 6. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be

employed by Bidder, if selected as Contractor; and (c) Bidder's (Contractor's) safety precautions and programs.

7. Based on the information and observations referred to in the preceding paragraph, Bidder agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
8. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
9. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
10. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
11. The submission of this Bid constitutes an incontrovertible representation by Bidder that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

6.02 Bidder's Certifications

A. The Bidder certifies the following:

1. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.
2. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.
3. Bidder has not solicited or induced any individual or entity to refrain from bidding.
4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 8.02.A:
 - a. Corrupt practice means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process.
 - b. Fraudulent practice means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition.
 - c. Collusive practice means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels.

- d. Coercive practice means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

BIDDER hereby submits this Bid as set forth above:

Bidder:

(typed or printed name of organization)

By: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Date: _____
(typed or printed)

If Bidder is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.

Attest: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Date: _____
(typed or printed)

Address for giving notices:

Bidder's Contact:

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Phone: _____

Email: _____

Address: _____

Bidder's Contractor License No.: (if _____
.....)

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BID BOND (PENAL SUM FORM)

Bidder Name: [Full formal name of Bidder] Address (<i>principal place of business</i>): [Address of Bidder's principal place of business]	Surety Name: [Full formal name of Surety] Address (<i>principal place of business</i>): [Address of Surety's principal place of business]
Owner Name: City of Marshalltown Address (<i>principal place of business</i>): 24 N. Center Street Marshalltown, IA 50158	Bid Project (<i>name and location</i>): ECO-20001 – Washington Street Extension, S 9th Street west to dead end of existing Washington Street. Bid Due Date: June 9th, 2020
Bond Penal Sum: [Amount] Date of Bond: [Date] Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth in this Bid Bond, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.	
Bidder _____ <i>(Full formal name of Bidder)</i> By: _____ <i>(Signature)</i> Name: _____ <i>(Printed or typed)</i> Title: _____ Attest _____ _____ <i>(Signature)</i> Name: _____ <i>(Printed or typed)</i> Title: _____	Surety _____ <i>(Full formal name of Surety) (corporate seal)</i> By: _____ <i>(Signature) (Attach Power of</i> Name: _____ <i>(Printed or typed)</i> Title: _____ Attest _____ _____ <i>(Signature)</i> Name: _____ <i>(Printed or typed)</i> Title: _____
Notes: (1) Note: Addresses are to be used for giving any required notice. (2) Provide execution by any additional parties, such as joint venturers, if necessary.	

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond will be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder occurs upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation will be null and void if:
 - 3.1. Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
 - 3.2. All Bids are rejected by Owner, or
 - 3.3. Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions does not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action will be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety, and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond will be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder must be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Postal Service registered or certified mail, return receipt requested, postage pre-paid, and will be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond will be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute governs and the remainder of this Bond that is not in conflict therewith continues in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

BIDDERS QUALIFICATIONS STATEMENT

ARTICLE 1—GENERAL INFORMATION

1.01 Provide contact information for the Business:

Legal Name of Business:			
Corporate Office			
Name:		Phone number:	
Title:		Email address:	
Business address of corporate office:			
Local Office			
Name:		Phone number:	
Title:		Email address:	
Business address of local office:			

1.02 Provide information on the Business's organizational structure:

Form of Business:	☐ Sole Proprietorship ☐ Partnership ☐ Corporation		
☐ Limited Liability Company ☐ Joint Venture comprised of the following companies:			
1.			
2.			
3.			
Date Business was formed:		State in which Business was formed:	
Is this Business authorized to operate in the Project location?		☐ Yes ☐ No ☐ Pending	

ARTICLE 2—LICENSING

2.01 Provide information regarding licensure for Business:

Name of License:			
Licensing Agency:			
License No:		Expiration Date:	
Name of License:			
Licensing Agency:			
License No:		Expiration Date:	

ARTICLE 3—DIVERSE BUSINESS CERTIFICATIONS

3.01 Provide information regarding Business's Diverse Business Certification, if any.
Provide evidence of current certification.

Certification	Certifying Agency	Certification Date
☐ Disadvantaged Business Enterprise		
☐ Minority Business Enterprise		
☐ Woman-Owned Business Enterprise		
☐ Small Business Enterprise		
☐ Disabled Business Enterprise		
☐ Veteran-Owned Business Enterprise		
☐ Service-Disabled Veteran-Owned Business		
☐ HUBZone Business (Historically Underutilized) Business		
☐ Other		
☐ None		

ARTICLE 4—SAFETY

4.01 Provide information regarding Business's safety organization and safety performance.

Name of Business's Safety Officer:		
Safety Certifications		
Certification Name	Issuing Agency	Expiration

ARTICLE 5—CONSTRUCTION EXPERIENCE

5.01 Provide information that will identify the overall size and capacity of the Business.

Average number of current full-time employees:	
Estimate of revenue for the current year:	
Estimate of revenue for the previous year:	

5.02 Provide information regarding the Business's previous contracting experience.

Years of experience with projects like the proposed project:
Has Business, or a predecessor in interest, or an affiliate identified in Paragraph 1.03:
Been disqualified as a bidder by any local, state, or federal agency within the last 5 years? ☐ Yes ☐ No

Been barred from contracting by any local, state, or federal agency within the last 5 years? ☐ Yes ☐ No
Been released from a bid in the past 5 years? ☐ Yes ☐ No
Defaulted on a project or failed to complete any contract awarded to it? ☐ Yes ☐ No
Refused to construct or refused to provide materials defined in the contract documents or in a change order? ☐ Yes ☐ No
Been a party to any currently pending litigation or arbitration? ☐ Yes ☐ No
Provide full details in a separate attachment if the response to any of these questions is Yes.

5.03 Completed projects: (List several from past two years.)

Location and Description of Work	Owner	Contract Amount	Date Completed

5.04 Work in Progress

Location and Description of Work	Owner	Contract Amount	Date Completed

ARTICLE 6—CONSTRUCTION EXPERIENCE CERTIFICATION

6.01 This Statement of Qualifications is offered by:

Business: _____
(typed or printed name of organization)

By: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Date: _____
(date signed)

(If Business is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Address for giving notices:

Designated Representative:

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Address: _____

Phone: _____

Email: _____

Schedule A—Current Projects

Name of Organization					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

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Schedule B—Previous Experience with Similar Projects

Name of Organization					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Schedule B—Previous Experience with Similar Projects

Name of Organization					
Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Project Owner			Project Name		
General Description of Project					
Project Cost			Date Project		
Key Project Personnel	Project Manager	Project Superintendent	Safety Manager	Quality Control Manager	
Name					
Reference Contact Information (listing names indicates approval to contacting the names individuals as a reference)					
	Name	Title/Position	Organization	Telephone	Email
Owner					
Designer					
Construction Manager					

Schedule C—Key Individuals

Project Manager			
Name of individual			
Years of experience as project manager			
Years of experience with this organization			
Number of similar projects as project manager			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	
Project Superintendent			
Name of individual			
Years of experience as project superintendent			
Years of experience with this organization			
Number of similar projects as project superintendent			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	

Safety Manager			
Name of individual			
Years of experience as project manager			
Years of experience with this organization			
Number of similar projects as project manager			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	
Quality Control Manager			
Name of individual			
Years of experience as project superintendent			
Years of experience with this organization			
Number of similar projects as project superintendent			
Number of similar projects in other positions			
Current Project Assignments			
Name of assignment		Percent of time used for this project	Estimated project completion date
Reference Contact Information (listing names indicates approval to contact named individuals as a reference)			
Name		Name	
Title/Position		Title/Position	
Organization		Organization	
Telephone		Telephone	
Email		Email	
Project		Project	
Candidate's role on project		Candidate's role on project	

BIDDER STATUS FORM

To be completed by all bidders

Part A

Please answer "Yes" or "No" for each of the following:

- ☐ Yes ☐ No My company is authorized to transact business in Iowa.
(To help you determine if your company is authorized, please review the worksheet on the next page).
- ☐ Yes ☐ No My company has an office to transact business in Iowa.
- ☐ Yes ☐ No My company's office in Iowa is suitable for more than receiving mail, telephone calls, and e-mail.
- ☐ Yes ☐ No My company has been conducting business in Iowa for at least 3 years prior to the first request for bids on this project.
- ☐ Yes ☐ No My company is not a subsidiary of another business entity or my company is a subsidiary of another business entity that would qualify as a resident bidder in Iowa.

If you answered "Yes" for each question above, your company qualifies as a resident bidder. Please complete Parts B and D of this form.

If you answered "No" to one or more questions above, your company is a nonresident bidder. Please complete Parts C and D of this form.

To be completed by resident bidders

Part B

My company has maintained offices in Iowa during the past 3 years at the following addresses:

Dates: ____/____/____ to ____/____/____ Address: _____

City, State, Zip: _____

Dates: ____/____/____ to ____/____/____ Address: _____

City, State, Zip: _____

Dates: ____/____/____ to ____/____/____ Address: _____

You may attach additional sheet(s) if needed. City, State, Zip: _____

To be completed by non-resident bidders

Part C

- Name of home state or foreign country reported to the Iowa Secretary of State: _____
- Does your company's home state or foreign country offer preferences to resident bidders, resident labor force preferences or any other type of preference to bidders or laborers? g Yes g 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: _____

You must submit the completed form to the governmental body requesting bids per 875 Iowa Administrative Code Chapter 156. This form has been approved by the Iowa Labor Commissioner.

Worksheet: Authorization to Transact Business

This worksheet may be used to help complete Part A of the Resident Bidder Status form. If at least one of the following describes your business, you are authorized to transact business in Iowa.

- ☐ Yes ☐ No My business is currently registered as a contractor with the Iowa Division of Labor.
- ☐ Yes ☐ No My business is a sole proprietorship and I am an Iowa resident for Iowa income tax purposes.
- ☐ Yes ☐ No My business is a general partnership or joint venture. More than 50 percent of the general partners or joint venture parties are residents of Iowa for Iowa income tax purposes.
- ☐ Yes ☐ No My business is an active corporation with the Iowa Secretary of State and has paid all fees required by the Secretary of State, has filed its most recent biennial report, and has not filed articles of dissolution.
- ☐ Yes ☐ No My business is a corporation whose articles of incorporation are filed in a state other than Iowa, the corporation has received a certificate of authority from the Iowa secretary of state, has filed its most recent biennial report with the secretary of state, and has neither received a certificate of withdrawal from the secretary of state nor had its authority revoked.
- ☐ Yes ☐ No My business is a limited liability partnership which has filed a statement of qualification in this state and the statement has not been canceled.
- ☐ Yes ☐ No My business is a limited liability partnership which has filed a statement of qualification in a state other than Iowa, has filed a statement of foreign qualification in Iowa and a statement of cancellation has not been filed.
- ☐ Yes ☐ No My business is a limited partnership or limited liability limited partnership which has filed a certificate of limited partnership in this state, and has not filed a statement of termination.
- ☐ Yes ☐ No My business is a limited partnership or a limited liability limited partnership whose certificate of limited partnership is filed in a state other than Iowa, the limited partnership or limited liability limited partnership has received notification from the Iowa secretary of state that the application for certificate of authority has been approved and no notice of cancellation has been filed by the limited partnership or the limited liability limited partnership.
- ☐ Yes ☐ No My business is a limited liability company whose certificate of organization is filed in Iowa and has not filed a statement of termination.
- ☐ Yes ☐ No My business is a limited liability company whose certificate of organization is filed in a state other than Iowa, has received a certificate of authority to transact business in Iowa and the certificate has not been revoked or canceled.

CONTRACT DOCUMENTS

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NOTICE OF AWARD

Date of Issuance:

Owner: City of Marshalltown

Owner's Project No.: **ECO-20001**

Engineer: LEE Chamberlin Consultant Engineers

Engineer's Project No.: **19023**

Project: Washington Street Extension

Contract Name:

Bidder:

Bidder's Address:

You are notified that Owner has accepted your Bid dated **June 22, 2020** for the above Contract, and that you are the Successful Bidder and are awarded a Contract for:

PROJECT NO. ECO-20001, the WASHINGTON STREET EXTENSION

The Contract Price of the awarded Contract is \$[**Contract Price**]. Contract Price is subject to adjustment based on the provisions of the Contract, including but not limited to those governing changes, Unit Price Work, and Work performed on a cost-plus-fee basis, as applicable.

Three (3) unexecuted counterparts of the Agreement accompany this Notice of Award, and one copy of the Contract Documents accompanies this Notice of Award, or has been transmitted or made available to Bidder electronically.

☐ Drawings will be delivered separately from the other Contract Documents.

You must comply with the following conditions precedent within 15 days of the date of receipt of this Notice of Award:

1. Deliver to Owner **three (3)** counterparts of the Agreement, signed by Bidder (as Contractor).
2. Deliver with the signed Agreement(s) the Contract security (such as required performance and payment bonds) and insurance documentation, as specified in the Instructions to Bidders and in the General Conditions, Articles 2 and 6.
3. Other conditions precedent (if any):

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited.

Within 10 days after you comply with the above conditions, Owner will return to you one fully signed counterpart of the Agreement, together with any additional copies of the Contract Documents as indicated in Paragraph 2.02 of the General Conditions.

Owner: **City of Marshalltown, Iowa**

By (*signature*):

Name (*printed*):

Title:

Copy: Engineer

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AGREEMENT BETWEEN OWNER AND CONTRACTOR FOR CONSTRUCTION CONTRACT (STIPULATED PRICE)

This Agreement is by and between the City of Marshalltown ("Owner") and [name of contracting entity] ("Contractor").

Terms used in this Agreement have the meanings stated in the General Conditions and the Supplementary Conditions.

Owner and Contractor hereby agree as follows:

ARTICLE 1 – WORK

- 1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows: [Brief description of Work]

ARTICLE 2 – THE PROJECT

- 2.01 The Project, of which the Work under the Contract Documents is a part, is generally described as follows: **Washington Street Extension from S 9th Street west to dead end of existing Washington Street.**

ARTICLE 3 – ENGINEER

- 3.01 The Owner has retained **LEE Chamberlin Consultant Engineers, Inc.** ("Engineer") to act as Owner's representative, assume all duties and responsibilities of Engineer, and have the rights and authority assigned to Engineer in the Contract.
- 3.02 The part of the Project that pertains to the Work has been designed by **LEE Chamberlin Consultant Engineers, Inc.**

ARTICLE 4 – CONTRACT TIMES

4.01 Time is of the Essence

- A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 Contract Times: Dates

- A. The Work will be substantially complete on or before **November 15, 2020** and completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before **December 15, 2020**.

4.03 Liquidated Damages

- A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial and other losses if the Work is not completed and Milestones not achieved within the Contract Times, as duly modified. The parties also recognize the delays, expense, and difficulties involved in proving, in a legal or arbitration proceeding, the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty):

- B. Substantial Completion: Contractor shall pay Owner **\$2,000.00** for each day that expires after the time (as duly adjusted pursuant to the Contract) specified above for Substantial Completion, until the Work is substantially complete.
- C. Completion of Remaining Work: After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times (as duly adjusted pursuant to the Contract) for completion and readiness for final payment, Contractor shall pay Owner **\$2,000.00** for each day that expires after such time until the Work is completed and ready for final payment.
- D. Liquidated damages for failing to timely attain Milestones, Substantial Completion, and final completion are not additive, and will not be imposed concurrently.
- E. If Owner recovers liquidated damages for a delay in completion by Contractor, then such liquidated damages are Owner's sole and exclusive remedy for such delay, and Owner is precluded from recovering any other damages, whether actual, direct, excess, or consequential, for such delay, except for special damages (if any) specified in this Agreement.

4.04 Special Damages

- A. Contractor shall reimburse Owner (1) for any fines or penalties imposed on Owner as a direct result of the Contractor's failure to attain Substantial Completion according to the Contract Times, and (2) for the actual costs reasonably incurred by Owner for engineering, construction observation, inspection, and administrative services needed after the time specified in Paragraph 4.02 for Substantial Completion (as duly adjusted pursuant to the Contract), until the Work is substantially complete.
- B. After Contractor achieves Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Times, Contractor shall reimburse Owner for the actual costs reasonably incurred by Owner for engineering, construction observation, inspection, and administrative services needed after the time specified in Paragraph 4.02 for Work to be completed and ready for final payment (as duly adjusted pursuant to the Contract), until the Work is completed and ready for final payment.
- C. The special damages imposed in this paragraph are supplemental to any liquidated damages for delayed completion established in this Agreement.

ARTICLE 5 – **CONTRACT PRICE**

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents, the amounts that follow, subject to adjustment under the Contract:

- A. For all Work, \$ _____, at the prices stated in Contractor's Bid, attached hereto as an exhibit.

ARTICLE 6 – **PAYMENT PROCEDURES**

6.01 Submittal and Processing of Payments

- A. Contractor shall submit Applications for Payment in accordance with Article 15 of the General Conditions. Applications for Payment will be processed by Engineer as provided in the General Conditions.

6.02 Progress Payments; Retainage

- A. Owner shall make progress payments on the basis of Contractor's Applications for Payment on or about the **25th** day of each month during performance of the Work as provided in Paragraph 6.02.A.1 below, provided that such Applications for Payment have been submitted in a timely manner and otherwise meet the requirements of the Contract. All such payments will be measured by the Schedule of Values established as provided in the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided elsewhere in the Contract.
 - 1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Owner may withhold, including but not limited to liquidated damages, in accordance with the Contract.
 - a. 95 percent of the value of the Work completed (with the balance being retainage).
 - 1) If 50 percent or more of the Work has been completed, as determined by Engineer, and if the character and progress of the Work have been satisfactory to Owner and Engineer, then as long as the character and progress of the Work remain satisfactory to Owner and Engineer, there will be no additional retainage; and
 - b. 95 percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).
- B. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 95 percent of the Work completed, less such amounts set off by Owner pursuant to Paragraph 15.01.E of the General Conditions, and less 200 percent of Engineer's estimate of the value of Work to be completed or corrected as shown on the punch list of items to be completed or corrected prior to final payment.

6.03 Final Payment

- A. Upon final completion and acceptance of the Work, Owner shall pay the remainder of the Contract Price in accordance with Paragraph 15.06 of the General Conditions.

6.04 Consent of Surety

- A. Owner will not make final payment, or return or release retainage at Substantial Completion or any other time, unless Contractor submits written consent of the surety to such payment, return, or release.

6.05 Interest

- A. All amounts not paid when due will bear interest at the rate of 5 percent per annum.

ARTICLE 7 – **CONTRACT DOCUMENTS**

7.01 Contents

- A. The Contract Documents consist of all of the following:
 - 1. This Agreement.

2. Bonds:
 - a. Performance bond (together with power of attorney).
 - b. Payment bond (together with power of attorney).
 3. General Conditions.
 4. Supplementary Conditions.
 5. Specifications as listed in the table of contents of the project manual (copy of list attached).
 6. Drawings (not attached but incorporated by reference) consisting of **36** sheets with each sheet bearing the following general title: **Washington Street Extension, City of Marshalltown, Marshall County, Iowa.**
 7. Addenda (numbers [number] to [number], inclusive).
 8. Exhibits to this Agreement (enumerated as follows):
 - a. [list exhibits]
 9. The following which may be delivered or issued on or after the Effective Date of the Contract and are not attached hereto:
 - a. Notice to Proceed.
 - b. Work Change Directives.
 - c. Change Orders.
 - d. Field Orders.
 - e. Warranty Bond, if any.
- B. The Contract Documents listed in Paragraph 7.01.A are attached to this Agreement (except as expressly noted otherwise above).
- C. There are no Contract Documents other than those listed above in this Article 7.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in the Contract.

ARTICLE 8 – REPRESENTATIONS, CERTIFICATIONS, AND STIPULATIONS

8.01 Contractor's Representations

- A. In order to induce Owner to enter into this Contract, Contractor makes the following representations:
1. Contractor has examined and carefully studied the Contract Documents, including Addenda.
 2. Contractor has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
 3. Contractor is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.

4. Contractor has considered the information known to Contractor itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor; and (c) Contractor's safety precautions and programs.
5. Based on the information and observations referred to in the preceding paragraph, Contractor agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
6. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
7. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
8. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
9. Contractor's entry into this Contract constitutes an incontrovertible representation by Contractor that without exception all prices in the Agreement are premised upon performing and furnishing the Work required by the Contract Documents.

8.02 Contractor's Certifications

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 8.02:
 1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;
 2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
 3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and

4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

8.03 Standard General Conditions

- A. Owner stipulates that if the General Conditions that are made a part of this Contract are EJCDC® C-700, Standard General Conditions for the Construction Contract (2018), published by the Engineers Joint Contract Documents Committee, and if Owner is the party that has furnished said General Conditions, then Owner has plainly shown all modifications to the standard wording of such published document to the Contractor, through a process such as highlighting or “track changes” (redline/strikeout), or in the Supplementary Conditions.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement.

This Agreement will be effective on **22th day of June 2020** (which is the Effective Date of the Contract).

Owner:

City of Marshalltown

(typed or printed name of organization)

By:

(individual's signature)

Date:

(date signed)

Name:

(typed or printed)

Title:

(typed or printed)

Attest:

(individual's signature)

Title:

(typed or printed)

Address for giving notices:

Designated Representative:

Name:

(typed or printed)

Title:

(typed or printed)

Address:

Phone:

Email:

(If [Type of Entity] is a corporation, attach evidence of authority to sign. If [Type of Entity] is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

Contractor:

(typed or printed name of organization)

By:

(individual's signature)

Date:

(date signed)

Name:

(typed or printed)

Title:

(typed or printed)

(If [Type of Entity] is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest:

(individual's signature)

Title:

(typed or printed)

Address for giving notices:

Designated Representative:

Name:

(typed or printed)

Title:

(typed or printed)

Address:

Phone:

Email:

License No.:

(where applicable)

State:

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PERFORMANCE BOND

Contractor Name: [Full formal name of Contractor] Address (<i>principal place of business</i>): [Address of Contractor's principal place of business]	Surety Name: [Full formal name of Surety] Address (<i>principal place of business</i>): [Address of Surety's principal place of business]
Owner Name: City of Marshalltown Mailing address (<i>principal place of business</i>): 24 North Center Street Marshalltown, IA 50158	Contract Description (<i>name and location</i>): ECO-20001 – Washington Street Extension, S 9th Street west to dead end of existing Washington Street. Contract Price: [Amount from Contract] Effective Date of Contract: [Date from Contract]
Bond Bond Amount: [Amount] Date of Bond: [Date] <i>(Date of Bond cannot be earlier than Effective Date of Contract)</i> Modifications to this Bond form: ☐ None ☐ See Paragraph 16	
Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth in this Performance Bond, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.	
Contractor as Principal	Surety
_____ <i>(Full formal name of Contractor)</i>	_____ <i>(Full formal name of Surety) (corporate seal)</i>
By: _____ <i>(Signature)</i>	By: _____ <i>(Signature)(Attach Power of Attorney)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Attest: _____ <i>(Signature)</i>	Attest: _____ <i>(Signature)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.	

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.
2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond will arise after:
 - 3.1. The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice may indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 will be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement does not waive the Owner's right, if any, subsequently to declare a Contractor Default;
 - 3.2. The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and
 - 3.3. The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.
4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 does not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.
5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:
 - 5.1. Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;
 - 5.2. Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;
 - 5.3. Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

- 5.4. Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:
- 5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or
 - 5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.
6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment, or the Surety has denied liability, in whole or in part, without further notice, the Owner shall be entitled to enforce any remedy available to the Owner.
7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner will not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety will not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:
- 7.1. the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
 - 7.2. additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and
 - 7.3. liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.
8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.
9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price will not be reduced or set off on account of any such unrelated obligations. No right of action will accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.
10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
11. Any proceeding, legal or equitable, under this Bond must be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and must be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit will be applicable.

12. Notice to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears.
13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted therefrom and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.
14. Definitions
- 14.1. *Balance of the Contract Price*—The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.
- 14.2. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.
- 14.3. *Contractor Default*—Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.
- 14.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
- 14.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.
15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.
16. Modifications to this Bond are as follows: **“None”**

PAYMENT BOND

Contractor Name: [Full formal name of Contractor] Address (<i>principal place of business</i>): [Address of Contractor's principal place of business]	Surety Name: [Full formal name of Surety] Address (<i>principal place of business</i>): [Address of Surety's principal place of business]
Owner Name: City of Marshalltown Mailing address (<i>principal place of business</i>): 24 North Center Street Marshalltown, IA 50158	Contract Description (<i>name and location</i>): ECO-20001 – Washington Street Extension, S 9th Street west to dead end of existing Washington Street. Contract Price: [Amount, from Contract] Effective Date of Contract: [Date from Contract]
Bond Bond Amount: [Amount] Date of Bond: [Date] <i>(Date of Bond cannot be earlier than Effective Date of Contract)</i> Modifications to this Bond form: ☐ None ☐ See Paragraph 18	
Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth in this Payment Bond, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.	
Contractor as Principal	Surety
_____ <i>(Full formal name of Contractor)</i>	_____ <i>(Full formal name of Surety) (corporate seal)</i>
By: _____ <i>(Signature)</i>	By: _____ <i>(Signature)(Attach Power of Attorney)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
Attest: _____ <i>(Signature)</i>	Attest: _____ <i>(Signature)</i>
Name: _____ <i>(Printed or typed)</i>	Name: _____ <i>(Printed or typed)</i>
Title: _____	Title: _____
<i>Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.</i>	

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.
2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond will arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.
4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.
5. The Surety's obligations to a Claimant under this Bond will arise after the following:
 - 5.1. Claimants who do not have a direct contract with the Contractor
 - 5.1.1. have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
 - 5.1.2. have sent a Claim to the Surety (at the address described in Paragraph 13).
 - 5.2. Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).
6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.
7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:
 - 7.1. Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
 - 7.2. Pay or arrange for payment of any undisputed amounts.
 - 7.3. The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 will not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its

obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

8. The Surety's total obligation will not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond will be credited for any payments made in good faith by the Surety.
9. Amounts owed by the Owner to the Contractor under the Construction Contract will be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfying obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.
10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.
11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.
12. No suit or action will be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit will be applicable.
13. Notice and Claims to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, will be sufficient compliance as of the date received.
14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement will be deemed deleted here from and provisions conforming to such statutory or other legal requirement will be deemed incorporated herein. When so furnished, the intent is that this Bond will be construed as a statutory bond and not as a common law bond.
15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. Definitions

16.1. *Claim*—A written statement by the Claimant including at a minimum:

16.1.1. The name of the Claimant;

- 16.1.2. The name of the person for whom the labor was done, or materials or equipment furnished;
- 16.1.3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
- 16.1.4. A brief description of the labor, materials, or equipment furnished;
- 16.1.5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
- 16.1.6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
- 16.1.7. The total amount of previous payments received by the Claimant; and
- 16.1.8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

16.2. *Claimant*—An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond is to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

16.3. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

16.4. *Owner Default*—Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

16.5. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.

17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond will be deemed to be Subcontractor and the term Owner will be deemed to be Contractor.

18. Modifications to this Bond are as follows: **"None"**

WARRANTY BOND

Contractor	Surety
Name: [Full formal name of Contractor]	Name: [Full formal name of Surety]
Address (<i>principal place of business</i>): [Address of Contractor's principal place of business]	Address (<i>principal place of business</i>): [Insert address of Surety's principal place of business]
Owner	Construction Contract
Name: City of Marshalltown	Description (<i>name and location</i>): ECO-20001 – Washington Street Extension, S 9th Street west to dead end of existing Washington Street.
Address (<i>principal place of business</i>): 24 North Center Street Marshalltown, IA 50158	Contract Price: [Amount from Contract]
	Effective Date of Contract: [Date from Contract]
	Contract's Date of Substantial Completion: [Date from Contract]
Bond	
Bond Amount: [Amount]	Bond Period: Commencing 364 days after Substantial Completion of the Work under the Construction Contract, and continuing until five (5) years after such Substantial Completion.
Date of Bond: [Date]	
Modifications to this Bond form: ☒ None ☐ See Paragraph 9	
Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth herein, do each cause this Warranty Bond to be duly executed by an authorized officer, agent, or representative.	
Contractor as Principal	Surety
(<i>Full formal name of Contractor</i>)	(<i>Full formal name of Surety</i>) (<i>corporate seal</i>)
By: _____ (<i>Signature</i>)	By: _____ (<i>Signature</i>) (<i>Attach Power of Attorney</i>)
Name: _____ (<i>Printed or typed</i>)	Name: _____ (<i>Printed or typed</i>)
Title: _____	Title: _____
Attest: _____ (<i>Signature</i>)	Attest: _____ (<i>Signature</i>)
Name: _____ (<i>Printed or typed</i>)	Name: _____ (<i>Printed or typed</i>)
Title: _____	Title: _____
Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party is considered plural where applicable.	

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract's Correction Period Obligations. The Construction Contract is incorporated herein by reference.
2. If the Contractor performs the Correction Period Obligations, the Surety and the Contractor shall have no obligation under this Warranty Bond.
3. If Owner gives written notice to Contractor and Surety during the Bond Period of Contractor's obligation under the Correction Period Obligations, and Contractor does not fulfill such obligation, then Surety shall be responsible for fulfillment of such Correction Period Obligations. Surety shall either fulfill the Correction Period Obligations itself, through its agents or contractors, or, in the alternative, Surety may waive the right to fulfill the Correction Period Obligations itself, and reimburse the Owner for all resulting costs incurred by Owner in performing Contractor's Correction Period Obligations, including but not limited to correction, removal, replacement, and repair costs.
4. The Surety's liability is limited to the amount of this Warranty Bond. Renewal or continuation of the Warranty Bond will not modify such amount, unless expressly agreed to by Surety in writing.
5. The Surety shall have no liability under this Warranty Bond for obligations of the Contractor that are unrelated to the Construction Contract. No right of action will accrue on this Warranty Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.
6. Any proceeding, legal or equitable, under this Warranty Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located and must be instituted within two years after the Surety refuses or fails to perform its obligations under this Warranty Bond.
7. Written notice to the Surety, the Owner, or the Contractor must be mailed or delivered to the address shown in this Warranty Bond.
8. Definitions
 - 8.1. *Construction Contract*—The agreement between the Owner and Contractor identified on the cover page of this Warranty Bond, including all Contract Documents and changes made to the agreement and the Contract Documents.
 - 8.2. *Contract Documents*—All the documents that comprise the agreement between the Owner and Contractor.
 - 8.3. *Correction Period Obligations*—The duties, responsibilities, commitments, and obligations of the Contractor with respect to correction or replacement of defective Work, as set forth in the Construction Contract's Correction Period clause, EJCDC®C-700, Standard General Conditions of the Construction Contract (2018), Paragraph 15.08, as duly modified.
 - 8.4. *Substantial Completion*—As defined in the Construction Contract.
 - 8.5. *Work*—As defined in the Construction Contract.
9. Modifications to this Bond are as follows: **"None"**

NOTICE TO PROCEED

Owner:	City of Marshalltown	Owner's Project No.:	ECO-20001
Engineer:	Lee Chamberlin Consultant Engineers	Engineer's Project No.:	19023
Contractor:		Contractor's Project No.:	
Project:	Washington Street Extension		
Contract Name:			
Effective Date of Contract:			

Owner hereby notifies Contractor that the Contract Times under the above Contract will commence to run on **[date Contract Times are to start]** pursuant to Paragraph 4.01 of the General Conditions.

On that date, Contractor shall start performing its obligations under the Contract Documents. No Work will be done at the Site prior to such date.

In accordance with the Agreement: **[Select one of the following two alternatives, insert dates or number of days, and delete the other alternative.]**

The date by which Substantial Completion must be achieved is **[date for Substantial Completion, from Agreement]**, and the date by which readiness for final payment must be achieved is **[date for readiness, from Agreement]**.

[or]

The number of days to achieve Substantial Completion is **[number of days, from Agreement]** from the date stated above for the commencement of the Contract Times, resulting in a date for Substantial Completion of **[date, calculated from commencement date above]**; and the number of days to achieve readiness for final payment is **[number of days, from Agreement]** from the commencement date of the Contract Times, resulting in a date for readiness for final payment of **[date, calculated from commencement date above]**.

Before starting any Work at the Site, Contractor must comply with the following:

[Note any access limitations, security procedures, or other restrictions]

Owner:	City of Marshalltown
By (signature):	
Name (printed):	
Title:	
Date Issued:	
Copy: Engineer	

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CONTRACT CONDITIONS

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
 3. *Application for Payment*—The document prepared by Contractor, in a form acceptable to Engineer, to request progress or final payments, and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 5. *Bidder*—An individual or entity that submits a Bid to Owner.
 6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
 7. *Bidding Requirements*—The Advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
 8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.
 9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
 10. *Claim*
 - a. A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an

adjustment of Contract Price or Contract Times; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract.

- b. A demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal, or seeking resolution of a contractual issue that Engineer has declined to address.
 - c. A demand or assertion by Owner or Contractor, duly submitted in compliance with the procedural requirements set forth herein, made pursuant to Paragraph 12.01.A.4, concerning disputes arising after Engineer has issued a recommendation of final payment.
 - d. A demand for money or services by a third party is not a Claim.
11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), lead-based paint (as defined by the HUD/EPA standard), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to Laws and Regulations regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
12. *Contract*—The entire and integrated written contract between Owner and Contractor concerning the Work.
13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents.
15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
17. *Cost of the Work*—See Paragraph 13.01 for definition.
18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
20. *Electronic Document*—Any Project-related correspondence, attachments to correspondence, data, documents, drawings, information, or graphics, including but not limited to Shop Drawings and other Submittals, that are in an electronic or digital format.

21. *Electronic Means*—Electronic mail (email), upload/download from a secure Project website, or other communications methods that allow: (a) the transmission or communication of Electronic Documents; (b) the documentation of transmissions, including sending and receipt; (c) printing of the transmitted Electronic Document by the recipient; (d) the storage and archiving of the Electronic Document by sender and recipient; and (e) the use by recipient of the Electronic Document for purposes permitted by this Contract. Electronic Means does not include the use of text messaging, or of Facebook, Twitter, Instagram, or similar social media services for transmission of Electronic Documents.
22. *Engineer*—The individual or entity named as such in the Agreement.
23. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
24. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto.
- a. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated into the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, is not a Hazardous Environmental Condition.
 - b. The presence of Constituents of Concern that are to be removed or remediated as part of the Work is not a Hazardous Environmental Condition.
 - c. The presence of Constituents of Concern as part of the routine, anticipated, and obvious working conditions at the Site, is not a Hazardous Environmental Condition.
25. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and binding decrees, resolutions, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
26. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
27. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date, or by a time prior to Substantial Completion of all the Work.
28. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.
29. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.
30. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.

31. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising Contractor's plan to accomplish the Work within the Contract Times.
32. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.
33. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative (RPR) includes any assistants or field staff of Resident Project Representative.
34. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
35. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals.
36. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
37. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.
38. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands or areas furnished by Owner which are designated for the use of Contractor.
39. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
40. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
41. *Submittal*—A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers' instructions and reports; records of

delivery of spare parts and tools; operations and maintenance data; Project photographic documentation; record documents; and other such documents required by the Contract Documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.

42. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion of such Work.
43. *Successful Bidder*—The Bidder to which the Owner makes an award of contract.
44. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
45. *Supplier*—A manufacturer, fabricator, supplier, distributor, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
46. *Technical Data*
- a. Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (1) existing subsurface conditions at or adjacent to the Site, or existing physical conditions at or adjacent to the Site including existing surface or subsurface structures (except Underground Facilities) or (2) Hazardous Environmental Conditions at the Site.
 - b. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then Technical Data is defined, with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06, as the data contained in boring logs, recorded measurements of subsurface water levels, assessments of the condition of subsurface facilities, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical, environmental, or other Site or facilities conditions report prepared for the Project and made available to Contractor.
 - c. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data, and instead Underground Facilities are shown or indicated on the Drawings.
47. *Underground Facilities*—All active or not-in-service underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or

traffic or other control systems. An abandoned facility or system is not an Underground Facility.

48. *Unit Price Work*—Work to be paid for on the basis of unit prices.

49. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

50. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 Terminology

- A. The words and terms discussed in Paragraphs 1.02.B, C, D, and E are not defined terms that require initial capital letters, but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives*: The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.
- C. *Day*: The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective*: The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - 1. does not conform to the Contract Documents;
 - 2. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - 3. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or Paragraph 15.04).

E. *Furnish, Install, Perform, Provide*

1. The word “furnish,” when used in connection with services, materials, or equipment, means to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
 2. The word “install,” when used in connection with services, materials, or equipment, means to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
 3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, means to furnish and install said services, materials, or equipment complete and ready for intended use.
 4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.
- F. *Contract Price or Contract Times*:** References to a change in “Contract Price or Contract Times” or “Contract Times or Contract Price” or similar, indicate that such change applies to (1) Contract Price, (2) Contract Times, or (3) both Contract Price and Contract Times, as warranted, even if the term “or both” is not expressed.
- G.** Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Performance and Payment Bonds; Evidence of Insurance*

- A. *Performance and Payment Bonds*:** When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner the performance bond and payment bond (if the Contract requires Contractor to furnish such bonds).
- B. *Evidence of Contractor’s Insurance*:** When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each additional insured (as identified in the Contract), the certificates, endorsements, and other evidence of insurance required to be provided by Contractor in accordance with Article 6, except to the extent the Supplementary Conditions expressly establish other dates for delivery of specific insurance policies.
- C. *Evidence of Owner’s Insurance*:** After receipt of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each additional insured (as identified in the Contract), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

- A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise required by the Contract Documents), Contractor shall submit to Engineer for timely review:
 - 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
 - 2. a preliminary Schedule of Submittals; and
 - 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work, and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other Submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review the schedules submitted in accordance with Paragraph 2.03.A. No progress payment will be made to Contractor until acceptable schedules are submitted to Engineer.
 - 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such

acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.
4. If a schedule is not acceptable, Contractor will have an additional 10 days to revise and resubmit the schedule.

2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may send, and shall accept, Electronic Documents transmitted by Electronic Means.
- B. If the Contract does not establish protocols for Electronic Means, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. Subject to any governing protocols for Electronic Means, when transmitting Electronic Documents by Electronic Means, the transmitting party makes no representations as to long-term compatibility, usability, or readability of the Electronic Documents resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the Electronic Documents.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one Contract Document is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic versions of the Contract Documents (including any printed copies derived from such electronic versions) and the printed record version, the printed record version will govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.
- F. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation will be deemed stricken, and all remaining provisions will continue to be valid and binding upon Owner and Contractor, which agree that the Contract Documents will be reformed to replace such stricken provision or part

thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

G. Nothing in the Contract Documents creates:

1. any contractual relationship between Owner or Engineer and any Subcontractor, Supplier, or other individual or entity performing or furnishing any of the Work, for the benefit of such Subcontractor, Supplier, or other individual or entity; or
2. any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity, except as may otherwise be required by Laws and Regulations.

3.02 *Reference Standards*

A. *Standards Specifications, Codes, Laws and Regulations*

1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, means the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
2. No provision of any such standard specification, manual, reference standard, or code, and no instruction of a Supplier, will be effective to change the duties or responsibilities of Owner, Contractor, or Engineer from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner or Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
2. *Contractor's Review of Contract Documents:* If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor

shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
 - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer in writing all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work.
- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly notify Owner and Contractor in writing that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers shall not:
 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or

- bearing the seal of Engineer or its consultants, including electronic media versions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or
2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein precludes Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the 30th day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the 60th day after the day of Bid opening or the 30th day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work may be done at the Site prior to such date.

4.03 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.
1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.
 2. Proposed adjustments in the Progress Schedule that will change the Contract Times must be submitted in accordance with the requirements of Article 11.

- B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work will be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Such an adjustment will be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
 - 1. Severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
 - 2. Abnormal weather conditions;
 - 3. Acts or failures to act of third-party utility owners or other third-party entities (other than those third-party utility owners or other third-party entities performing other work at or adjacent to the Site as arranged by or under contract with Owner, as contemplated in Article 8); and
 - 4. Acts of war or terrorism.
- D. Contractor's entitlement to an adjustment of Contract Times or Contract Price is limited as follows:
 - 1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.
 - 2. Contractor shall not be entitled to an adjustment in Contract Price for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.
 - 3. Adjustments of Contract Times or Contract Price are subject to the provisions of Article 11.

- E. Each Contractor request or Change Proposal seeking an increase in Contract Times or Contract Price must be supplemented by supporting data that sets forth in detail the following:
1. The circumstances that form the basis for the requested adjustment;
 2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;
 3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;
 4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference; and
 5. The impact on Contract Price, in accordance with the provisions of Paragraph 11.07.
- Contractor shall also furnish such additional supporting documentation as Owner or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the effect of the delay, disruption, or interference on the critical path to completion of the Work.
- F. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5, together with the provisions of Paragraphs 4.05.D and 4.05.E.
- G. Paragraph 8.03 addresses delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

ARTICLE 5—SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor in writing of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.
- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas*

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas, or to improvements, structures, utilities, or similar facilities located at such adjacent lands or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
 2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.13, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or in a court of competent jurisdiction; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.
- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris will conform to applicable Laws and Regulations.
- C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

- D. *Loading of Structures*: Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

- A. *Reports and Drawings*: The Supplementary Conditions identify:

1. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data;
2. Those drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data; and
3. Technical Data contained in such reports and drawings.

- B. *Underground Facilities*: Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05, and not in the drawings referred to in Paragraph 5.03.A. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

- C. *Reliance by Contractor on Technical Data*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b.

- D. *Limitations of Other Data and Documents*: Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto;
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings;
3. the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or Owner's archival documents concerning the Site; or
4. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

- A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site:
1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate;
 2. is of such a nature as to require a change in the Drawings or Specifications;
 3. differs materially from that shown or indicated in the Contract Documents; or
 4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

- B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine whether it is necessary for Owner to obtain additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.
- D. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the subsurface or physical condition in question may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the condition in question has been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.
- E. *Possible Price and Times Adjustments*
1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an

increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

- a. Such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
 - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,
 - c. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
 - a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise;
 - b. The existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
 - c. Contractor failed to give the written notice required by Paragraph 5.04.A.
 3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
 4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.
- F. *Underground Facilities; Hazardous Environmental Conditions*: Paragraph 5.05 governs rights and responsibilities regarding the presence or location of Underground Facilities. Paragraph 5.06 governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of Paragraphs 5.03 and 5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.

5.05 *Underground Facilities*

- A. *Contractor's Responsibilities*: Unless it is otherwise expressly provided in the Supplementary Conditions, the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:
1. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
 2. complying with applicable state and local utility damage prevention Laws and Regulations;

3. verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;
 4. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 5. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated on the Drawings, or was not shown or indicated on the Drawings with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing regarding such Underground Facility.
- C. *Engineer's Review:* Engineer will:
1. promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy;
 2. identify and communicate with the owner of the Underground Facility; prepare recommendations to Owner (and if necessary issue any preliminary instructions to Contractor) regarding the Contractor's resumption of Work in connection with the Underground Facility in question;
 3. obtain any pertinent cost or schedule information from Contractor; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and
 4. advise Owner in writing of Engineer's findings, conclusions, and recommendations.

During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the Underground Facility may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the Underground Facility in question and conditions affected by its presence have been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.

F. Possible Price and Times Adjustments

1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, to the extent that any existing Underground Facility at the Site that was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
 - b. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E; and
 - c. Contractor gave the notice required in Paragraph 5.05.B.
2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.
4. The information and data shown or indicated on the Drawings with respect to existing Underground Facilities at the Site is based on information and data (a) furnished by the owners of such Underground Facilities, or by others, (b) obtained from available records, or (c) gathered in an investigation conducted in accordance with the current edition of ASCE 38, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, by the American Society of Civil Engineers. If such information or data is incorrect or incomplete, Contractor's remedies are limited to those set forth in this Paragraph 5.05.F.

5.06 Hazardous Environmental Conditions at Site

A. Reports and Drawings: The Supplementary Conditions identify:

1. those reports known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site;
2. drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
3. Technical Data contained in such reports and drawings.

B. Reliance by Contractor on Technical Data Authorized: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors,

members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto;
 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.
- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, as a result of such Work stoppage, such special conditions under which Work is agreed to be resumed

by Contractor, or any costs or expenses incurred in response to the Hazardous Environmental Condition, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off. Entitlement to any such adjustment is subject to the provisions of Paragraphs 4.05.D, 4.05.E, 11.07, and 11.08.

- H. If, after receipt of such written notice, Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.
- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court, arbitration, or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I obligates Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J obligates Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of Contractor's obligations under the Contract. These bonds must remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Contract.
- B. Contractor shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Contract.
- C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or Regulations, and must be issued and signed by a surety named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.
- D. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.
- E. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer in writing and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which must comply with the bond and surety requirements above.
- F. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.
- G. Upon request to Owner from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Owner shall provide a copy of the payment bond to such person or entity.
- H. Upon request to Contractor from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Contractor shall provide a copy of the payment bond to such person or entity.

6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this article and in the Supplementary Conditions.

- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized in the state or jurisdiction in which the Project is located to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Alternative forms of insurance coverage, including but not limited to self-insurance and "Occupational Accident and Excess Employer's Indemnity Policies," are not sufficient to meet the insurance requirements of this Contract, unless expressly allowed in the Supplementary Conditions.
- D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by Subcontractors or Suppliers. In any documentation furnished under this provision, Contractor, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Contract.
- E. Owner shall deliver to Contractor, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Owner has obtained and is maintaining the policies and coverages required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.
- F. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, will not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- G. In addition to the liability insurance required to be provided by Contractor, the Owner, at Owner's option, may purchase and maintain Owner's own liability insurance. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.
- H. Contractor shall require:
 - 1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in

the Project, and to name as additional insureds Owner and Engineer (and any other individuals or entities identified in the Supplementary Conditions as additional insureds on Contractor's liability policies) on each Subcontractor's commercial general liability insurance policy; and

2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.
- I. If either party does not purchase or maintain the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- J. If Contractor has failed to obtain and maintain required insurance, Contractor's entitlement to enter or remain at the Site will end immediately, and Owner may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Owner's termination rights under Article 16.
- K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price will be adjusted accordingly.
- L. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests. Contractor is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Contractor deems necessary.
- M. The insurance and insurance limits required herein will not be deemed as a limitation on Contractor's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Owner and other individuals and entities in the Contract or otherwise.
- N. All the policies of insurance required to be purchased and maintained under this Contract will contain a provision or endorsement that the coverage afforded will not be canceled, or renewal refused, until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured and Engineer.

6.03 *Contractor's Insurance*

- A. ***Required Insurance:*** Contractor shall purchase and maintain Worker's Compensation, Commercial General Liability, and other insurance pursuant to the specific requirements of the Supplementary Conditions.
- B. ***General Provisions:*** The policies of insurance required by this Paragraph 6.03 as supplemented must:
 1. include at least the specific coverages required;

2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;
 3. remain in effect at least until the Work is complete (as set forth in Paragraph 15.06.D), and longer if expressly required elsewhere in this Contract, and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract;
 4. apply with respect to the performance of the Work, whether such performance is by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable; and
 5. include all necessary endorsements to support the stated requirements.
- C. *Additional Insureds*: The Contractor's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:
1. include and list as additional insureds Owner and Engineer, and any individuals or entities identified as additional insureds in the Supplementary Conditions;
 2. include coverage for the respective officers, directors, members, partners, employees, and consultants of all such additional insureds;
 3. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);
 4. not seek contribution from insurance maintained by the additional insured; and
 5. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Contractor's acts or omissions, or the acts and omissions of those working on Contractor's behalf, in the performance of Contractor's operations.

6.04 *Builder's Risk and Other Property Insurance*

- A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.
- B. *Property Insurance for Facilities of Owner Where Work Will Occur*: Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.

- C. *Property Insurance for Substantially Complete Facilities*: Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.
- D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.
- E. *Insurance of Other Property; Additional Insurance*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Contractor's expense.

6.05 *Property Losses; Subrogation*

- A. The builder's risk insurance policy purchased and maintained in accordance with Paragraph 6.04 (or an installation floater policy if authorized by the Supplementary Conditions), will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors.
 - 1. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils, risks, or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused.
 - 2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, during partial occupancy or use pursuant to

Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.

1. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.
- C. The waivers in this Paragraph 6.05 include the waiver of rights due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other insured peril, risk, or cause of loss.
- D. Contractor shall be responsible for assuring that each Subcontract contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

6.06 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.04 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.
- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.04 shall maintain such proceeds in a segregated account, and distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, Contractor shall repair or replace the damaged Work, using allocated insurance proceeds.

ARTICLE 7—CONTRACTOR’S RESPONSIBILITIES

7.01 *Contractor’s Means and Methods of Construction*

- A. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. If the Contract Documents note, or Contractor determines, that professional engineering or other design services are needed to carry out Contractor’s responsibilities for construction means, methods, techniques, sequences, and procedures, or for Site safety, then Contractor shall cause such services to be provided by a properly licensed design professional, at Contractor’s expense. Such services are not Owner-delegated professional design services under this Contract, and neither Owner nor Engineer has any responsibility with respect to (1) Contractor’s determination of the need for such services, (2) the qualifications or licensing of the design professionals retained or employed by Contractor, (3) the performance of such services, or (4) any errors, omissions, or defects in such services.

7.02 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who will not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.03 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall maintain good discipline and order at the Site.
- B. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of Contractor’s employees; of Suppliers and Subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor’s own acts and omissions.
- C. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site will be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner’s written consent, which will not be unreasonably withheld.

7.04 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and

incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.

- B. All materials and equipment incorporated into the Work must be new and of good quality, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications will expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment must be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.05 “Or Equals”

- A. *Contractor’s Request; Governing Criteria:* Whenever an item of equipment or material is specified or described in the Contract Documents by using the names of one or more proprietary items or specific Suppliers, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or “or equal” item is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material, or items from other proposed Suppliers, under the circumstances described below.
 - 1. If Engineer in its sole discretion determines that an item of equipment or material proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer will deem it an “or equal” item. For the purposes of this paragraph, a proposed item of equipment or material will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that the proposed item:
 - 1) is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
 - 2) will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
 - 3) has a proven record of performance and availability of responsive service; and
 - 4) is not objectionable to Owner.
 - b. Contractor certifies that, if the proposed item is approved and incorporated into the Work:
 - 1) there will be no increase in cost to the Owner or increase in Contract Times; and

- 2) the item will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal," which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.
- D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request will result in any change in Contract Price. The Engineer's denial of an "or-equal" request will be final and binding, and may not be reversed through an appeal under any provision of the Contract.
- E. *Treatment as a Substitution Request*: If Engineer determines that an item of equipment or material proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the item a proposed substitute pursuant to Paragraph 7.06.

7.06 Substitutes

- A. *Contractor's Request; Governing Criteria*: Unless the specification or description of an item of equipment or material required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material under the circumstances described below. To the extent possible such requests must be made before commencement of related construction at the Site.
1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of equipment or material from anyone other than Contractor.
 2. The requirements for review by Engineer will be as set forth in Paragraph 7.06.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.
 3. Contractor shall make written application to Engineer for review of a proposed substitute item of equipment or material that Contractor seeks to furnish or use. The application:
 - a. will certify that the proposed substitute item will:
 - 1) perform adequately the functions and achieve the results called for by the general design;
 - 2) be similar in substance to the item specified; and

- 3) be suited to the same use as the item specified.
 - b. will state:
 - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times;
 - 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and
 - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
 - c. will identify:
 - 1) all variations of the proposed substitute item from the item specified; and
 - 2) available engineering, sales, maintenance, repair, and replacement services.
 - d. will contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination:* Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- E. *Contractor's Expense:* Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination:* If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the

substitution. The Engineer's denial of a substitution request will be final and binding, and may not be reversed through an appeal under any provision of the Contract. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.06.D, by timely submittal of a Change Proposal.

7.07 *Concerning Subcontractors and Suppliers*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner. The Contractor's retention of a Subcontractor or Supplier for the performance of parts of the Work will not relieve Contractor's obligation to Owner to perform and complete the Work in accordance with the Contract Documents.
- B. Contractor shall retain specific Subcontractors and Suppliers for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor or Supplier to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.
- E. Owner may require the replacement of any Subcontractor or Supplier. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors or Suppliers for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor or Supplier so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor or Supplier.
- F. If Owner requires the replacement of any Subcontractor or Supplier retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor or Supplier, whether initially or as a replacement, will constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.
- H. On a monthly basis, Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.

- I. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors and Suppliers.
- J. The divisions and sections of the Specifications and the identifications of any Drawings do not control Contractor in dividing the Work among Subcontractors or Suppliers, or in delineating the Work to be performed by any specific trade.
- K. All Work performed for Contractor by a Subcontractor or Supplier must be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract for the benefit of Owner and Engineer.
- L. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor for Work performed for Contractor by the Subcontractor or Supplier.
- M. Contractor shall restrict all Subcontractors and Suppliers from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed in this Contract.

7.08 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If an invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights will be disclosed in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.09 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits, licenses, and certificates of occupancy. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

7.10 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

7.11 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It is not Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this does not relieve Contractor of its obligations under Paragraph 3.03.
- C. Owner or Contractor may give written notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such written notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.12 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to

show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations.
- B. Contractor shall designate a qualified and experienced safety representative whose duties and responsibilities are the prevention of Work-related accidents and the maintenance and supervision of safety precautions and programs.
- C. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
 - 1. all persons on the Site or who may be affected by the Work;
 - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- D. All damage, injury, or loss to any property referred to in Paragraph 7.13.C.2 or 7.13.C.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
- E. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection.
- F. Contractor shall notify Owner; the owners of adjacent property; the owners of Underground Facilities and other utilities (if the identity of such owners is known to Contractor); and other contractors and utility owners performing work at or adjacent to the Site, in writing, when Contractor knows that prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.

- G. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. Any Owner's safety programs that are applicable to the Work are identified or included in the Supplementary Conditions or Specifications.
- H. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
- I. Contractor's duties and responsibilities for safety and protection will continue until all the Work is completed, Engineer has issued a written notice to Owner and Contractor in accordance with Paragraph 15.06.C that the Work is acceptable, and Contractor has left the Site (except as otherwise expressly provided in connection with Substantial Completion).
- J. Contractor's duties and responsibilities for safety and protection will resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of safety data sheets (formerly known as material safety data sheets) or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused by an emergency, or are required as a result of Contractor's response to an emergency. If Engineer determines that a change in the Contract Documents is required because of an emergency or Contractor's response, a Work Change Directive or Change Order will be issued.

7.16 *Submittals*

A. *Shop Drawing and Sample Requirements*

- 1. Before submitting a Shop Drawing or Sample, Contractor shall:
 - a. review and coordinate the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determine and verify:
 - 1) all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal;
 - 2) the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

- 3) all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto;
 - c. confirm that the Submittal is complete with respect to all related data included in the Submittal.
 2. Each Shop Drawing or Sample must bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that Submittal, and that Contractor approves the Submittal.
 3. With each Shop Drawing or Sample, Contractor shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Contract Documents. This notice must be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.
- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.
1. *Shop Drawings*
 - a. Contractor shall submit the number of copies required in the Specifications.
 - b. Data shown on the Shop Drawings must be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide, and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.C.
 2. *Samples*
 - a. Contractor shall submit the number of Samples required in the Specifications.
 - b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the Submittal for the limited purposes required by Paragraph 7.16.C.
 3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. *Engineer's Review of Shop Drawings and Samples*
1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the accepted Schedule of Submittals. Engineer's review and approval will be only to determine if the items covered by the Submittals will, after installation or incorporation in the Work, comply with the requirements of the Contract Documents, and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction, or to safety precautions or programs incident thereto.
3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
4. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order or other appropriate Contract modification.
5. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for complying with the requirements of Paragraphs 7.16.A and B.
6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, will not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
7. Neither Engineer's receipt, review, acceptance, or approval of a Shop Drawing or Sample will result in such item becoming a Contract Document.
8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.C.4.

D. *Resubmittal Procedures for Shop Drawings and Samples*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous Submittals.
2. Contractor shall furnish required Shop Drawing and Sample submittals with sufficient information and accuracy to obtain required approval of an item with no more than two resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved Shop Drawing or Sample, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

E. *Submittals Other than Shop Drawings, Samples, and Owner-Delegated Designs*

1. The following provisions apply to all Submittals other than Shop Drawings, Samples, and Owner-delegated designs:
 - a. Contractor shall submit all such Submittals to the Engineer in accordance with the Schedule of Submittals and pursuant to the applicable terms of the Contract Documents.
 - b. Engineer will provide timely review of all such Submittals in accordance with the Schedule of Submittals and return such Submittals with a notation of either Accepted or Not Accepted. Any such Submittal that is not returned within the time established in the Schedule of Submittals will be deemed accepted.
 - c. Engineer's review will be only to determine if the Submittal is acceptable under the requirements of the Contract Documents as to general form and content of the Submittal.
 - d. If any such Submittal is not accepted, Contractor shall confer with Engineer regarding the reason for the non-acceptance, and resubmit an acceptable document.
2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.03, 2.04, and 2.05.

F. Owner-delegated Designs: Submittals pursuant to Owner-delegated designs are governed by the provisions of Paragraph 7.19.

7.17 *Contractor's General Warranty and Guarantee*

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer is entitled to rely on Contractor's warranty and guarantee.
- B. Owner's rights under this warranty and guarantee are in addition to, and are not limited by, Owner's rights under the correction period provisions of Paragraph 15.08. The time in which Owner may enforce its warranty and guarantee rights under this Paragraph 7.17 is limited only by applicable Laws and Regulations restricting actions to enforce such rights; provided, however, that after the end of the correction period under Paragraph 15.08:
 1. Owner shall give Contractor written notice of any defective Work within 60 days of the discovery that such Work is defective; and
 2. Such notice will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the notice.
- C. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 1. abuse, or improper modification, maintenance, or operation, by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.
- D. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents, a release of Contractor's obligation to perform the Work in accordance with the Contract Documents, or a release of Owner's warranty and guarantee rights under this Paragraph 7.17:
1. Observations by Engineer;
 2. Recommendation by Engineer or payment by Owner of any progress or final payment;
 3. The issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 4. Use or occupancy of the Work or any part thereof by Owner;
 5. Any review and approval of a Shop Drawing or Sample submittal;
 6. The issuance of a notice of acceptability by Engineer;
 7. The end of the correction period established in Paragraph 15.08;
 8. Any inspection, test, or approval by others; or
 9. Any correction of defective Work by Owner.
- E. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract will govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 *Indemnification*

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from losses, damages, costs, and judgments (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or

indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A will not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

7.19 *Delegation of Professional Design Services*

- A. Owner may require Contractor to provide professional design services for a portion of the Work by express delegation in the Contract Documents. Such delegation will specify the performance and design criteria that such services must satisfy, and the Submittals that Contractor must furnish to Engineer with respect to the Owner-delegated design.
- B. Contractor shall cause such Owner-delegated professional design services to be provided pursuant to the professional standard of care by a properly licensed design professional, whose signature and seal must appear on all drawings, calculations, specifications, certifications, and Submittals prepared by such design professional. Such design professional must issue all certifications of design required by Laws and Regulations.
- C. If a Shop Drawing or other Submittal related to the Owner-delegated design is prepared by Contractor, a Subcontractor, or others for submittal to Engineer, then such Shop Drawing or other Submittal must bear the written approval of Contractor's design professional when submitted by Contractor to Engineer.
- D. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design professionals retained or employed by Contractor under an Owner-delegated design, subject to the professional standard of care and the performance and design criteria stated in the Contract Documents.
- E. Pursuant to this Paragraph 7.19, Engineer's review, approval, and other determinations regarding design drawings, calculations, specifications, certifications, and other Submittals furnished by Contractor pursuant to an Owner-delegated design will be only for the following limited purposes:
 - 1. Checking for conformance with the requirements of this Paragraph 7.19;
 - 2. Confirming that Contractor (through its design professionals) has used the performance and design criteria specified in the Contract Documents; and
 - 3. Establishing that the design furnished by Contractor is consistent with the design concept expressed in the Contract Documents.
- F. Contractor shall not be responsible for the adequacy of performance or design criteria specified by Owner or Engineer.
- G. Contractor is not required to provide professional services in violation of applicable Laws and Regulations.

ARTICLE 8—OTHER WORK AT THE SITE

8.01 *Other Work*

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any third-party utility work that Owner has arranged to take place at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work.
- D. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.
- E. If the proper execution or results of any part of Contractor's Work depends upon work performed by others, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.
- F. The provisions of this article are not applicable to work that is performed by third-party utilities or other third-party entities without a contract with Owner, or that is performed without having been arranged by Owner. If such work occurs, then any related delay, disruption, or interference incurred by Contractor is governed by the provisions of Paragraph 4.05.C.3.

8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
 - 1. The identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;

2. An itemization of the specific matters to be covered by such authority and responsibility; and
 3. The extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

- A. If, in the course of performing other work for Owner at or adjacent to the Site, the Owner's employees, any other contractor working for Owner, or any utility owner that Owner has arranged to perform work, causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment will take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract, and any remedies available to Contractor under Laws or Regulations concerning utility action or inaction. When applicable, any such equitable adjustment in Contract Price will be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times or Contract Price is subject to the provisions of Paragraphs 4.05.D and 4.05.E.
- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.
1. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this Paragraph 8.03.B.
 2. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due Contractor.
- C. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid

such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9—OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

9.02 *Replacement of Engineer*

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents will be that of the former Engineer.

9.03 *Furnish Data*

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

9.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
- B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
- C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.

B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe, as an experienced and qualified design professional, the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the

completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.07. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Resident Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in the Supplementary Conditions and in Paragraph 10.07.
- B. If Owner designates an individual or entity who is not Engineer's consultant, agent, or employee to represent Owner at the Site, then the responsibilities and authority of such individual or entity will be as provided in the Supplementary Conditions.

10.04 *Engineer's Authority*

- A. Engineer has the authority to reject Work in accordance with Article 14.
- B. Engineer's authority as to Submittals is set forth in Paragraph 7.16.
- C. Engineer's authority as to design drawings, calculations, specifications, certifications and other Submittals from Contractor in response to Owner's delegation (if any) to Contractor of professional design services, is set forth in Paragraph 7.19.
- D. Engineer's authority as to changes in the Work is set forth in Article 11.
- E. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.05 *Determinations for Unit Price Work*

- A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.06 *Decisions on Requirements of Contract Documents and Acceptability of Work*

- A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.07 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, will create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.
- B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- D. Engineer's review of the final Application for Payment and accompanying documentation, and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Contractor under Paragraph 15.06.A, will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.
- E. The limitations upon authority and responsibility set forth in this Paragraph 10.07 also apply to the Resident Project Representative, if any.

10.08 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs of which Engineer has been informed.

ARTICLE 11—CHANGES TO THE CONTRACT

11.01 *Amending and Supplementing the Contract*

- A. The Contract may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
- B. If an amendment or supplement to the Contract includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order.
- C. All changes to the Contract that involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, must be supported by Engineer's recommendation. Owner and Contractor may amend other terms and conditions of the Contract without the recommendation of the Engineer.

11.02 *Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
1. Changes in Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
 2. Changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
 3. Changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.05, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters; and
 4. Changes that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Work Change Directive; Paragraph 11.09, concerning Change Proposals; Article 12, Claims; Paragraph 13.02.D, final adjustments resulting from allowances; Paragraph 13.03.D, final adjustments relating to determination of quantities for Unit Price Work; and similar provisions.
- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of Paragraph 11.02.A, it will be deemed to be of full force and effect, as if fully executed.

11.03 *Work Change Directives*

- A. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.07 regarding change of Contract Price.
- B. If Owner has issued a Work Change Directive and:
1. Contractor believes that an adjustment in Contract Times or Contract Price is necessary, then Contractor shall submit any Change Proposal seeking such an adjustment no later than 30 days after the completion of the Work set out in the Work Change Directive.
 2. Owner believes that an adjustment in Contract Times or Contract Price is necessary, then Owner shall submit any Claim seeking such an adjustment no later than 60 days after issuance of the Work Change Directive.

11.04 *Field Orders*

- A. Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the

design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly.

- B. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.05 *Owner-Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Changes involving the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.
- B. Such changes in the Work may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work must be performed under the applicable conditions of the Contract Documents.
- C. Nothing in this Paragraph 11.05 obligates Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.06 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.C.2.

11.07 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment of Contract Price must comply with the provisions of Article 12.
- B. An adjustment in the Contract Price will be determined as follows:
 - 1. Where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03);
 - 2. Where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.07.C.2); or

3. Where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.07.C).
- C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit will be determined as follows:
1. A mutually acceptable fixed fee; or
 2. If a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. For costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee will be 15 percent;
 - b. For costs incurred under Paragraph 13.01.B.3, the Contractor's fee will be 5 percent;
 - c. Where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.07.C.2.a and 11.07.C.2.b is that the Contractor's fee will be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of 5 percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted Work the maximum total fee to be paid by Owner will be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the Work;
 - d. No fee will be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
 - e. The amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in Cost of the Work will be the amount of the actual net decrease in Cost of the Work and a deduction of an additional amount equal to 5 percent of such actual net decrease in Cost of the Work; and
 - f. When both additions and credits are involved in any one change or Change Proposal, the adjustment in Contractor's fee will be computed by determining the sum of the costs in each of the cost categories in Paragraph 13.01.B (specifically, payroll costs, Paragraph 13.01.B.1; incorporated materials and equipment costs, Paragraph 13.01.B.2; Subcontract costs, Paragraph 13.01.B.3; special consultants costs, Paragraph 13.01.B.4; and other costs, Paragraph 13.01.B.5) and applying to each such cost category sum the appropriate fee from Paragraphs 11.07.C.2.a through 11.07.C.2.e, inclusive.

11.08 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment in the Contract Times must comply with the provisions of Article 12.
- B. Delay, disruption, and interference in the Work, and any related changes in Contract Times, are addressed in and governed by Paragraph 4.05.

11.09 *Change Proposals*

- A. *Purpose and Content:* Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; contest an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; challenge a set-off against payment due; or seek other relief under the Contract. The Change Proposal will specify any proposed change in Contract Times or Contract Price, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents. Each Change Proposal will address only one issue, or a set of closely related issues.
- B. *Change Proposal Procedures*
 - 1. *Submittal:* Contractor shall submit each Change Proposal to Engineer within 30 days after the start of the event giving rise thereto, or after such initial decision.
 - 2. *Supporting Data:* The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal.
 - a. Change Proposals based on or related to delay, interruption, or interference must comply with the provisions of Paragraphs 4.05.D and 4.05.E.
 - b. Change proposals related to a change of Contract Price must include full and detailed accounts of materials incorporated into the Work and labor and equipment used for the subject Work.

The supporting data must be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event.

- 3. *Engineer's Initial Review:* Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal. If in its discretion Engineer concludes that additional supporting data is needed before conducting a full review and making a decision regarding the Change Proposal, then Engineer may request that Contractor submit such additional supporting data by a date specified by Engineer, prior to Engineer beginning its full review of the Change Proposal.
- 4. *Engineer's Full Review and Action on the Change Proposal:* Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either

approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

5. *Binding Decision*: Engineer's decision is final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.

C. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties in writing that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice will be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

D. *Post-Completion*: Contractor shall not submit any Change Proposals after Engineer issues a written recommendation of final payment pursuant to Paragraph 15.06.B.

11.10 *Notification to Surety*

A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12—CLAIMS

12.01 *Claims*

A. *Claims Process*: The following disputes between Owner and Contractor are subject to the Claims process set forth in this article:

1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents;
3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters; and
4. Subject to the waiver provisions of Paragraph 15.07, any dispute arising after Engineer has issued a written recommendation of final payment pursuant to Paragraph 15.06.B.

B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of

the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim rests with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

- C. *Review and Resolution:* The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim will be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation*
1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate will stay the Claim submittal and response process.
 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process will resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process will resume as of the date of the conclusion of the mediation, as determined by the mediator.
 3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval:* If the party receiving a Claim approves the Claim in part and denies it in part, such action will be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim:* If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim will be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results:* If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim will be incorporated in a Change Order or other written document to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13—COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

- A. *Purposes for Determination of Cost of the Work:* The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or
 2. When needed to determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included:* Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work will be in amounts no higher than those commonly incurred in the locality of the Project, will not include any of the costs itemized in Paragraph 13.01.C, and will include only the following items:
1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor in advance of the subject Work. Such employees include, without limitation, superintendents, foremen, safety managers, safety representatives, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work will be apportioned on the basis of their time spent on the Work. Payroll costs include, but are not limited to, salaries and wages plus the cost of fringe benefits, which include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, will be included in the above to the extent authorized by Owner.
 2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts will accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment will accrue to Owner, and Contractor shall make provisions so that they may be obtained.
 3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, which will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of

the Work and fee will be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed or retained for services specifically related to the Work.
5. Other costs consisting of the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - 1) In establishing included costs for materials such as scaffolding, plating, or sheeting, consideration will be given to the actual or the estimated life of the material for use on other projects; or rental rates may be established on the basis of purchase or salvage value of such items, whichever is less. Contractor will not be eligible for compensation for such items in an amount that exceeds the purchase cost of such item.
 - c. *Construction Equipment Rental*
 - 1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner as to price (including any surcharge or special rates applicable to overtime use of the construction equipment or machinery), and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs will be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts must cease when the use thereof is no longer necessary for the Work.
 - 2) Costs for equipment and machinery owned by Contractor or a Contractor-related entity will be paid at a rate shown for such equipment in the equipment rental rate book specified in the Supplementary Conditions. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs.
 - 3) With respect to Work that is the result of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price ("changed Work"), included costs will be based on the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, must cease to accrue when the use thereof is no longer necessary for the changed Work.

- d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
 - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
 - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of builder's risk or other property insurance established in accordance with Paragraph 6.04), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses will be included in the Cost of the Work for the purpose of determining Contractor's fee.
 - g. The cost of utilities, fuel, and sanitary facilities at the Site.
 - h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
 - i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.
- C. *Costs Excluded*: The term Cost of the Work does not include any of the following items:
- 1. Payroll costs and other compensation of Contractor's officers, executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
 - 2. The cost of purchasing, renting, or furnishing small tools and hand tools.
 - 3. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
 - 4. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
 - 5. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of

materials or equipment wrongly supplied, and making good any damage to property.

6. Expenses incurred in preparing and advancing Claims.
7. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. Contractor's Fee

1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:
 - a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.
 - b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:
 - 1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.
 - 2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.
2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.

- E. Documentation and Audit:** Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner will be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner. Pertinent Subcontractors will afford such access to Owner, and preserve such documents, to the same extent required of Contractor.

13.02 Allowances

- A.** It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. Cash Allowances:** Contractor agrees that:
1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment for any of the foregoing will be valid.
- C. *Owner's Contingency Allowance*: Contractor agrees that an Owner's contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor for Work covered by allowances, and the Contract Price will be correspondingly adjusted.

13.03 *Unit Price Work*

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, and the final adjustment of Contract Price will be set forth in a Change Order, subject to the provisions of the following paragraph.
- E. *Adjustments in Unit Price*
 1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:
 - a. the quantity of the item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
 - b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.
 2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.
 3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply with such procedures and programs as applicable.

14.02 *Tests, Inspections, and Approvals*

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work will be governed by the provisions of Paragraph 14.05.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
 - 1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
 - 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
 - 3. by manufacturers of equipment furnished under the Contract Documents;
 - 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
 - 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests will be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.

- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering will be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

- A. *Contractor's Obligation*: It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority*: Engineer has the authority to determine whether Work is defective, and to reject defective Work.
- C. *Notice of Defects*: Prompt written notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement*: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties*: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages*: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work will be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable

set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

- A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.
- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.
 - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
 - 2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work will not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 *Owner May Correct Defective Work*

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace defective Work as required by Engineer, then Owner may, after 7 days' written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of

the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.

- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15—PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 *Progress Payments*

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments for Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *Applications for Payments*
 - 1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents.
 - 2. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment must also be accompanied by: (a) a bill of sale, invoice, copies of subcontract or purchase order payments, or other documentation establishing full payment by Contractor for the materials and equipment; (b) at Owner's request, documentation warranting that Owner has received the materials and equipment free and clear of all Liens; and (c) evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

3. Beginning with the second Application for Payment, each Application must include an affidavit of Contractor stating that all previous progress payments received by Contractor have been applied to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
4. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. Review of Applications

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work;

- b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto;
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work;
 - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid by Owner; or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
- a. the Work is defective, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or
 - e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. Payment Becomes Due

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. Reductions in Payment by Owner

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
- a. Claims have been made against Owner based on Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages resulting from Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;
 - b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;

- c. Contractor has failed to provide and maintain required bonds or insurance;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
 - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
 - f. The Work is defective, requiring correction or replacement;
 - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - h. The Contract Price has been reduced by Change Orders;
 - i. An event has occurred that would constitute a default by Contractor and therefore justify a termination for cause;
 - j. Liquidated or other damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
 - k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens; or
 - l. Other items entitle Owner to a set-off against the amount recommended.
2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed will be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.
 3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld will be treated as an amount due as determined by Paragraph 15.01.D.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than 7 days after the time of payment by Owner.

15.03 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially

complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which will fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have 7 days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.
- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its

intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. At any time, Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through 15.03.E for that part of the Work.
2. At any time, Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.04 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

A. *Application for Payment*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.12), and other documents, Contractor may make application for final payment.
2. The final Application for Payment must be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents;
 - b. consent of the surety, if any, to final payment;

- c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.
 - d. a list of all duly pending Change Proposals and Claims; and
 - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
- 3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.
- B. *Engineer's Review of Final Application and Recommendation of Payment:* If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the final Application for Payment to Owner for payment. Such recommendation will account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.
- C. *Notice of Acceptability:* In support of its recommendation of payment of the final Application for Payment, Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 15.07.
- D. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment and issuance of notice of the acceptability of the Work.
- E. *Final Payment Becomes Due:* Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments.

Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Engineer.

15.07 *Waiver of Claims*

- A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding Claim, appeal under the provisions of Article 17, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.
- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted as a Claim, or appealed under the provisions of Article 17.

15.08 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the Supplementary Conditions or the terms of any applicable special guarantee required by the Contract Documents), Owner gives Contractor written notice that any Work has been found to be defective, or that Contractor's repair of any damages to the Site or adjacent areas has been found to be defective, then after receipt of such notice of defect Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 - 1. correct the defective repairs to the Site or such adjacent areas;
 - 2. correct such defective Work;
 - 3. remove the defective Work from the Project and replace it with Work that is not defective, if the defective Work has been rejected by Owner, and
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting from the corrective measures.
- B. Owner shall give any such notice of defect within 60 days of the discovery that such Work or repairs is defective. If such notice is given within such 60 days but after the end of the correction period, the notice will be deemed a notice of defective Work under Paragraph 7.17.B.
- C. If, after receipt of a notice of defect within 60 days and within the correction period, Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others). Contractor's failure to pay such costs, losses, and damages within 10 days of invoice from Owner will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the failure to pay.

- D. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- E. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- F. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph are not to be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times directly attributable to any such suspension. Any Change Proposal seeking such adjustments must be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
 - 1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment, or failure to adhere to the Progress Schedule);
 - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
 - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
 - 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) 10 days' written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:
 - 1. declare Contractor to be in default, and give Contractor (and any surety) written notice that the Contract is terminated; and

2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within 7 days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.
- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond will govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate for Convenience*

- A. Upon 7 days' written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and
 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.

- B. Contractor shall not be paid for any loss of anticipated profits or revenue, post-termination overhead costs, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon 7 days' written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, 7 days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17—FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this article:
 - 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full, pursuant to Article 12; and
 - 2. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this article, Owner or Contractor may:
 - 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions;
 - 2. agree with the other party to submit the dispute to another dispute resolution process; or
 - 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18—MISCELLANEOUS

18.01 *Giving Notice*

- A. Whenever any provision of the Contract requires the giving of written notice to Owner, Engineer, or Contractor, it will be deemed to have been validly given only if delivered:
 - 1. in person, by a commercial courier service or otherwise, to the recipient's place of business;
 - 2. by registered or certified mail, postage prepaid, to the recipient's place of business; or
 - 3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

18.02 *Computation of Times*

- A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

18.03 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

- A. A party's non-enforcement of any provision will not constitute a waiver of that provision, nor will it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination of the Contract or of the services of Contractor.

18.07 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Assignment of Contract*

- A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party to this Contract of any rights under or interests in the Contract will be binding on the other party without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract.

18.09 *Successors and Assigns*

- A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

18.10 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

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SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

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SUPPLEMENTARY CONDITIONS OF THE CONSTRUCTION CONTRACT

These Supplementary Conditions amend or supplement EJCDC® C-700, Standard General Conditions of the Construction Contract (2018). The General Conditions remain in full force and effect except as amended.

The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added—for example, "Paragraph SC-4.05."

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

No Supplementary Conditions in this Article.

ARTICLE 2—PRELIMINARY MATTERS

2.01 Delivery of Bonds and Evidence of Insurance

SC-2.01 Delete Paragraphs 2.01.B. and C. in their entirety and insert the following in their place:

- B. *Evidence of Contractor's Insurance:* When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner copies of the policies (including all endorsements, and identification of applicable self-insured retentions and deductibles) of insurance required to be provided by Contractor in this Contract. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
- C. *Evidence of Owner's Insurance:* After receipt from Contractor of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor copies of the policies of insurance to be provided by Owner in this Contract (if any). Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

2.02 Copies of Documents

SC-2.02 Amend the first sentence of Paragraph 2.02.A. to read as follows:

Owner shall furnish to Contractor one (1) printed copies of the Contract Documents (including one fully signed counterpart of the Agreement), and one (1) copy in electronic portable document format (PDF).

2.06 *Electronic Transmittals*

SC-2.06 Delete Paragraphs 2.06.B and 2.06.C in their entirety and insert the following in their place:

B. *Electronic Documents Protocol*: The parties shall conform to the following provisions in Paragraphs 2.06.B and 2.06.C, together referred to as the Electronic Documents Protocol (“EDP” or “Protocol”) for exchange of electronic transmittals.

1. Basic Requirements

- a. To the fullest extent practical, the parties agree to and will transmit and accept Electronic Documents in an electronic or digital format using the procedures described in this Protocol. Use of the Electronic Documents and any information contained therein is subject to the requirements of this Protocol and other provisions of the Contract.
- b. The contents of the information in any Electronic Document will be the responsibility of the transmitting party.
- c. Electronic Documents as exchanged by this Protocol may be used in the same manner as the printed versions of the same documents that are exchanged using non-electronic format and methods, subject to the same governing requirements, limitations, and restrictions, set forth in the Contract Documents.
- d. Except as otherwise explicitly stated herein, the terms of this Protocol will be incorporated into any other agreement or subcontract between a party and any third party for any portion of the Work on the Project, or any Project-related services, where that third party is, either directly or indirectly, required to exchange Electronic Documents with a party or with Engineer. Nothing herein will modify the requirements of the Contract regarding communications between and among the parties and their subcontractors and consultants.
- e. When transmitting Electronic Documents, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the receiving party’s use of software application packages, operating systems, or computer hardware differing from those established in this Protocol.
- f. Nothing herein negates any obligation 1) in the Contract to create, provide, or maintain an original printed record version of Drawings and Specifications, signed and sealed according to applicable Laws and Regulations; 2) to comply with any applicable Law or Regulation governing the signing and sealing of design documents or the signing and electronic transmission of any other documents; or 3) to comply with the notice requirements of Paragraph 18.01 of the General Conditions.

2. System Infrastructure for Electronic Document Exchange

- a. Each party will provide hardware, operating system(s) software, internet, e-mail, and large file transfer functions ("System Infrastructure") at its own cost and sufficient for complying with the EDP requirements. With the exception of minimum standards set forth in this EDP, and any explicit system requirements specified by attachment to this EDP, it is the obligation of each party to determine, for itself, its own System Infrastructure.
 - 1) The maximum size of an email attachment for exchange of Electronic Documents under this EDP is 20 MB. Attachments larger than that may be exchanged using large file transfer functions or physical media.
 - 2) Each Party assumes full and complete responsibility for any and all of its own costs, delays, deficiencies, and errors associated with converting, translating, updating, verifying, licensing, or otherwise enabling its System Infrastructure, including operating systems and software, for use with respect to this EDP.
- b. Each party is responsible for its own system operations, security, back-up, archiving, audits, printing resources, and other Information Technology ("IT") for maintaining operations of its System Infrastructure during the Project, including coordination with the party's individual(s) or entity responsible for managing its System Infrastructure and capable of addressing routine communications and other IT issues affecting the exchange of Electronic Documents.
- c. Each party will operate and maintain industry-standard, industry-accepted, ISO-standard, commercial-grade security software and systems that are intended to protect the other party from: software viruses and other malicious software like worms, trojans, adware; data breaches; loss of confidentiality; and other threats in the transmission to or storage of information from the other parties, including transmission of Electronic Documents by physical media such as CD/DVD/flash drive/hard drive. To the extent that a party maintains and operates such security software and systems, it shall not be liable to the other party for any breach of system security.
- d. In the case of disputes, conflicts, or modifications to the EDP required to address issues affecting System Infrastructure, the parties shall cooperatively resolve the issues; but, failing resolution, the Owner is authorized to make and require reasonable and necessary changes to the EDP to effectuate its original intent. If the changes cause additional cost or time to Contractor, not reasonably anticipated under the original EDP, Contractor may seek an adjustment in price or time under the appropriate process in the Contract.
- e. Each party is responsible for its own back-up and archive of

documents sent and received during the term of the contract under this EDP, unless this EDP establishes a Project document archive, either as part of a mandatory Project website or other communications protocol, upon which the parties may rely for document archiving during the specified term of operation of such Project document archive. Further, each party remains solely responsible for its own post-Project back-up and archive of Project documents after the term of the Contract, or after termination of the Project document archive, if one is established, for as long as required by the Contract and as each party deems necessary for its own purposes.

- f. If a receiving party receives an obviously corrupted, damaged, or unreadable Electronic Document, the receiving party will advise the sending party of the incomplete transmission.
- g. The parties will bring any non-conforming Electronic Documents into compliance with the EDP. The parties will attempt to complete a successful transmission of the Electronic Document or use an alternative delivery method to complete the communication.
- h. The Owner will operate a Project information management system (also referred to in this EDP as "Project Website") for use of Owner, Engineer and Contractor during the Project for exchange and storage of Project-related communications and information. Except as otherwise provided in this EDP or the General Conditions, use of the Project Website by the parties as described in this Paragraph will be mandatory for exchange of Project documents, communications, submittals, and other Project-related information. The following conditions and standards will govern use of the Project Website:
 - 1) Describe the period of time during which the Project Website will be operated and be available for reliance by the parties;
 - 2) Provide any minimum system infrastructure, software licensing and security standards for access to and use of the Project Website;
 - 3) Describe the types and extent of services to be provided at the Project Website (such as large file transfer, email, communication and document archives, etc.); and
 - 4) Include any other Project Website attributes that may be pertinent to Contractor's use of the facility and pricing of such use.

C. Software Requirements for Electronic Document Exchange; Limitations

- 1. Each party will acquire the software and software licenses necessary to create and transmit Electronic Documents and to read and to use any Electronic Documents received from the other party (and if relevant from third parties), using the software formats required in this section of the

EDP.

- a. Prior to using any updated version of the software required in this section for sending Electronic Documents to the other party, the originating party will first notify and receive concurrence from the other party for use of the updated version or adjust its transmission to comply with this EDP.
2. The parties agree not to intentionally edit, reverse engineer, decrypt, remove security or encryption features, or convert to another format for modification purposes any Electronic Document or information contained therein that was transmitted in a software data format, including Portable Document Format (PDF), intended by sender not to be modified, unless the receiving party obtains the permission of the sending party or is citing or quoting excerpts of the Electronic Document for Project purposes.
3. Software and data formats for exchange of Electronic Documents will conform to the requirements set forth in Exhibit A to this EDP, including software versions, if listed.

SC-2.06 Supplement Paragraph 2.06 of the General Conditions by adding the following paragraph:

D. Requests by Contractor for Electronic Documents in Other Formats

1. Release of any Electronic Document versions of the Project documents in formats other than those identified in the Electronic Documents Protocol (if any) or elsewhere in the Contract will be at the sole discretion of the Owner.
2. To extent determined by Owner, in its sole discretion, to be prudent and necessary, release of Electronic Documents versions of Project documents and other Project information requested by Contractor ("Request") in formats other than those identified in the Electronic Documents Protocol (if any) or elsewhere in the Contract will be subject to the provisions of the Owner's response to the Request, and to the following conditions to which Contractor agrees:
 - a. The content included in the Electronic Documents created by Engineer and covered by the Request was prepared by Engineer as an internal working document for Engineer's purposes solely, and is being provided to Contractor on an "AS IS" basis without any warranties of any kind, including, but not limited to any implied warranties of fitness for any purpose. As such, Contractor is advised and acknowledges that the content may not be suitable for Contractor's application, or may require substantial modification and independent verification by Contractor. The content may include limited resolution of models, not-to-scale schematic representations and symbols, use of notes to convey design concepts in lieu of accurate graphics, approximations, graphical simplifications, undocumented intermediate revisions, and other devices that may

affect subsequent reuse.

- b. Electronic Documents containing text, graphics, metadata, or other types of data that are provided by Engineer to Contractor under the request are only for convenience of Contractor. Any conclusion or information obtained or derived from such data will be at the Contractor's sole risk and the Contractor waives any claims against Engineer or Owner arising from use of data in Electronic Documents covered by the Request.
 - c. Contractor shall indemnify and hold harmless Owner and Engineer and their subconsultants from all claims, damages, losses, and expenses, including attorneys' fees and defense costs arising out of or resulting from Contractor's use, adaptation, or distribution of any Electronic Documents provided under the Request.
 - d. Contractor agrees not to sell, copy, transfer, forward, give away or otherwise distribute this information (in source or modified file format) to any third party without the direct written authorization of Engineer, unless such distribution is specifically identified in the Request and is limited to Contractor's subcontractors. Contractor warrants that subsequent use by Contractor's subcontractors complies with all terms of the Contract Documents and Owner's response to Request.
3. In the event that Owner elects to provide or directs the Engineer to provide to Contractor any Contractor-requested Electronic Document versions of Project information that is not explicitly identified in the Contract Documents as being available to Contractor, the Owner shall be reimbursed by Contractor on an hourly basis (at \$100.00 per hour) for any engineering costs necessary to create or otherwise prepare the data in a manner deemed appropriate by Engineer.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.03 Reporting and Resolving Discrepancies

SC-3.03.B.1 The following shall be added to Paragraph 3.03.B.1 as Paragraph 3.03.B.1.c:

- c. In resolving conflicts, errors or discrepancies within the Contract Documents, the various elements will be given precedence in the following order:
 - 1) Agreement with Change Orders or Modifications
 - 2) Specific Project Requirements
 - 3) Supplementary Conditions
 - 4) General Conditions
 - 5) Specifications (Part II)
 - 6) Drawings

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.05 *Delays in Contractor's Progress*

SC-4.05 Amend Paragraph 4.05.C by adding the following subparagraphs:

5. *Weather-Related Delays*

- a. If “abnormal weather conditions” as set forth in Paragraph 4.05.C.2 of the General Conditions are the basis for a request for an equitable adjustment in the Contract Times, such request must be documented by data substantiating each of the following: 1) that weather conditions were abnormal for the period of time in which the delay occurred, 2) that such weather conditions could not have been reasonably anticipated, and 3) that such weather conditions had an adverse effect on the Work as scheduled.
- b. The existence of abnormal weather conditions will be determined on a month-by-month basis in accordance with the following:
 - 1) Every workday on which one or more of the following conditions exist will be considered a “bad weather day”:
 - i) Total precipitation (as rain equivalent) occurring between 7:00 p.m. on the preceding day (regardless of whether such preceding day is a workday) through 7:00 p.m. on the workday in question equals or exceeds 1.67 inches of precipitation (as rain equivalent, based on the snow/rain conversion indicated in the table entitled Foreseeable Bad Weather Days; such table is hereby incorporated in this SC-4.05.C by reference.
 - ii) Ambient outdoor air temperature at 11:00 a.m. is equal to or less than the following low temperature threshold: 35 degrees Fahrenheit; or, at 3:00 p.m. the ambient outdoor temperature is equal to or greater than the following high temperature threshold: 85 degrees Fahrenheit.
 - 2) Determination of actual bad weather days during performance of the Work will be based on the weather records measured and recorded by National Weather Service weather monitoring station at Marshalltown, Marshalltown Municipal Airport (KMIW).
 - 3) Contractor shall anticipate the number of foreseeable bad weather days per month indicated in the table in Exhibit B—Foreseeable Bad Weather Days.
 - 4) In each month, every bad weather day exceeding the number of foreseeable bad weather days established in the table in Exhibit B—Foreseeable Bad Weather Days will be considered as “abnormal weather conditions.” The existence of abnormal weather conditions will not relieve Contractor of the obligation to demonstrate and document that delays caused by abnormal

weather are specific to the planned work activities or that such activities thus delayed were on Contractor's then-current Progress Schedule's critical path for the Project.

ARTICLE 5—SITE, SUBSURFACE AND PHYSICAL CONDITIONS, HAZARDOUS ENVIRONMENTAL CONDITIONS

5.03 Subsurface and Physical Conditions

SC-5.03 Add the following new paragraphs immediately after Paragraph 5.03.D:

- E. The following table lists the reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data, and specifically identifies the Technical Data in the report upon which Contractor may rely:

Report Title	Date of Report	Technical Data
		None

- F. The following table lists the drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data, and specifically identifies the Technical Data upon which Contractor may rely:

Report Title	Date of Report	Technical Data
		None

- G. Contractor may examine copies of reports and drawings identified in SC-5.03.E and SC-5.03.F that were not included with the Bidding Documents at City Engineer's Office during regular business hours, or may request copies from Engineer.

5.06 Hazardous Environmental Conditions

SC-5.06 Add the following new paragraphs immediately after Paragraph 5.06.A.3:

4. The following table lists the reports known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and the Technical Data (if any) upon which Contractor may rely:

Report Title	Date of Report	Technical Data
		None

5. The following table lists the drawings known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and Technical Data (if any) contained in such Drawings upon which Contractor may rely:

Report Title	Date of Report	Technical Data
		None

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.A:

1. *Required Performance Bond Form:* The performance bond that Contractor furnishes will be in the form of EJCDC® C-610, Performance Bond (2018 edition).
2. *Required Payment Bond Form:* The payment bond that Contractor furnishes will be in the form of EJCDC® C-615, Payment Bond (2018 edition).

SC-6.01 Add the following paragraphs immediately after Paragraph 6.01.B:

1. The correction period specified as one year after the date of Substantial Completion in Paragraph 15.08.A of the General Conditions is hereby revised to be **four (4) years** after Substantial Completion.
2. After Substantial Completion, Contractor shall furnish a warranty bond issued in the form of EJCDC® C-612, Warranty Bond (2018). The warranty bond must be in a bond amount of **15 percent** of the final Contract Price. The warranty bond period will extend to a date **four (4) years** after Substantial Completion of the Work. Contractor shall deliver the fully executed warranty bond to Owner prior to or with the final application for payment, and in any event no later than 11 months after Substantial Completion.
3. The warranty bond must be issued by the same surety that issues the performance bond required under Paragraph 6.01.A of the General Conditions.

6.02 *Insurance—General Provisions*

SC-6.02 Add the following paragraph immediately after Paragraph 6.02.B:

1. Contractor may obtain worker's compensation insurance from an insurance company that has not been rated by A.M. Best, provided that such company (a) is domiciled in the state in which the Project is located, (b) is certified or authorized as a worker's compensation insurance provider by the appropriate state agency, and (c) has been accepted to provide worker's compensation insurance for similar projects by the state within the last 12 months.

6.03 *Contractor's Insurance*

SC-6.03 Supplement Paragraph 6.03 with the following provisions after Paragraph 6.03.C:

- D. *Workers' Compensation and Employer's Liability:* Contractor shall purchase and maintain workers' compensation and employer's liability insurance, including, as applicable, United States Longshoreman and Harbor Workers' Compensation Act, Jones Act, stop-gap employer's liability coverage for

monopolistic states, and foreign voluntary workers' compensation (from available sources, notwithstanding the jurisdictional requirement of Paragraph 6.02.B of the General Conditions).

Workers' Compensation and Related Policies	Policy limits of not less than:
Workers' Compensation	
State	Statutory
Applicable Federal (e.g., Longshoreman's)	Statutory
Foreign voluntary workers' compensation (employer's responsibility coverage), if applicable	Statutory
Jones Act (if applicable)	
Bodily injury by accident—each accident	Not Applicable
Bodily injury by disease—aggregate	Not Applicable
Employer's Liability	
Each accident	\$500,000
Each employee	\$500,000
Policy limit	\$1,000,000
Stop-gap Liability Coverage	
For work performed in monopolistic states, stop-gap liability coverage must be endorsed to either the worker's compensation or commercial general liability policy with a minimum limit of:	Not Applicable

- E. *Commercial General Liability—Claims Covered:* Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against claims for:
1. damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees,
 2. damages insured by reasonably available personal injury liability coverage, and
 3. damages because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
- F. *Commercial General Liability—Form and Content:* Contractor's commercial liability policy must be written on a 1996 (or later) Insurance Services Organization, Inc. (ISO) commercial general liability form (occurrence form) and include the following coverages and endorsements:
1. Products and completed operations coverage.
 - a. Such insurance must be maintained for three years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the

Contract) evidence of continuation of such insurance at final payment and three years thereafter.

2. Blanket contractual liability coverage, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
 3. Severability of interests and no insured-versus-insured or cross-liability exclusions.
 4. Underground, explosion, and collapse coverage.
 5. Personal injury coverage.
 6. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together). If Contractor demonstrates to Owner that the specified ISO endorsements are not commercially available, then Contractor may satisfy this requirement by providing equivalent endorsements.
 7. For design professional additional insureds, ISO Endorsement CG 20 32 07 04 "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.
- G. *Commercial General Liability—Excluded Content:* The commercial general liability insurance policy, including its coverages, endorsements, and incorporated provisions, must not include any of the following:
1. Any modification of the standard definition of "insured contract" (except to delete the railroad protective liability exclusion if Contractor is required to indemnify a railroad or others with respect to Work within 50 feet of railroad property).
 2. Any exclusion for water intrusion or water damage.
 3. Any provisions resulting in the erosion of insurance limits by defense costs other than those already incorporated in ISO form CG 00 01.
 4. Any exclusion of coverage relating to earth subsidence or movement.
 5. Any exclusion for the insured's vicarious liability, strict liability, or statutory liability (other than worker's compensation).
 6. Any limitation or exclusion based on the nature of Contractor's work.
 7. Any professional liability exclusion broader in effect than the most recent edition of ISO form CG 22 79.
- H. *Commercial General Liability—Minimum Policy Limits*

Commercial General Liability	Policy limits of not less than:
General Aggregate	\$2,000,000
Products—Completed Operations Aggregate	\$1,000,000
Personal and Advertising Injury	\$1,000,000

Commercial General Liability	Policy limits of not less than:
Bodily Injury and Property Damage—Each Occurrence	\$1,000,000

- I. *Automobile Liability:* Contractor shall purchase and maintain automobile liability insurance for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy must be written on an occurrence basis.

Automobile Liability	Policy limits of not less than:
Bodily Injury	
Each Person	\$1,000,000
Each Accident	\$1,000,000
Property Damage	
Each Accident	\$1,000,000
[or]	
Combined Single Limit	
Combined Single Limit (Bodily Injury and Property Damage)	\$1,000,000

- J. *Umbrella or Excess Liability:* Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the Paragraphs above. The coverage afforded must be at least as broad as that of each and every one of the underlying policies.

Excess or Umbrella Liability	Policy limits of not less than:
Each Occurrence	\$2,000,000
General Aggregate	\$2,000,000

- K. *Using Umbrella or Excess Liability Insurance to Meet CGL and Other Policy Limit Requirements:* Contractor may meet the policy limits specified for employer's liability, commercial general liability, and automobile liability through the primary policies alone, or through combinations of the primary insurance policy's policy limits and partial attribution of the policy limits of an umbrella or excess liability policy that is at least as broad in coverage as that of the underlying policy, as specified herein. If such umbrella or excess liability policy was required under this Contract, at a specified minimum policy limit, such umbrella or excess policy must retain a minimum limit of \$5,000,000 after accounting for partial attribution of its limits to underlying policies, as allowed above.

- L. *Contractor's Pollution Liability Insurance:* Contractor shall purchase and maintain a policy covering third-party injury and property damage, including

cleanup costs, as a result of pollution conditions arising from Contractor's operations and completed operations. This insurance must be maintained for no less than three years after final completion.

Contractor's Pollution Liability	Policy limits of not less than:
Each Occurrence/Claim	Not Applicable
General Aggregate	Not Applicable

- M. *Contractor's Professional Liability Insurance:* If Contractor will provide or furnish professional services under this *Contract*, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance must cover negligent acts, errors, or omissions in the performance of professional design or related services by the insured or others for whom the insured is legally liable. The insurance must be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. The retroactive date on the policy must pre-date the commencement of furnishing services on the Project.

Contractor's Professional Liability	Policy limits of not less than:
Each Claim	Not Applicable
Annual Aggregate	Not Applicable

- N. *Railroad Protective Liability Insurance:* Prior to commencing any Work within 50 feet of railroad-owned and controlled property, Contractor shall (1) endorse its commercial general liability policy with ISO CG 24 17, removing the contractual liability exclusion for work within 50 feet of a railroad, (2) purchase and maintain railroad protective liability insurance meeting the following requirements, (3) furnish a copy of the endorsement to Owner, and (4) submit a copy of the railroad protective policy and other railroad-required documentation to the railroad, and notify Owner of such submittal.

[Union Pacific Railroad Protective Liability Insurance](#)

Railroad Protective Liability Insurance	Policy limits of not less than:
Each Claim	Not Applicable
Aggregate	Not Applicable

- O. *Unmanned Aerial Vehicle Liability Insurance:* If Contractor uses unmanned aerial vehicles (UAV—commonly *referred to as* drones) at the Site or in support of any aspect of the Work, Contractor shall obtain UAV liability insurance in the amounts stated; name Owner, Engineer, and all individuals and entities identified in the Supplementary Conditions as additional insureds; and provide a certificate to Owner confirming Contractor's compliance with this requirement.

Such insurance will provide coverage for property damage, bodily injury or death, and invasion of privacy.

Unmanned Aerial Vehicle Liability Insurance	Policy limits of not less than:
Each Claim	Not Applicable
General Aggregate	Not Applicable

P. *Other Required Insurance:* None

6.04 Builder's Risk and Other Property Insurance

SC-6.04 Delete Paragraph 6.04.A of the General Conditions and substitute the following in its place:

A. Installation Floater

1. Contractor shall provide and maintain installation floater insurance on a broad form or "all risk" policy providing coverage for materials, supplies, machinery, fixtures, and equipment that will be incorporated into the Work ("Covered Property"). Coverage under the Contractor's installation floater will include loss from covered "all risk" causes (perils) to Covered Property:
 - a. of the Contractor, and Covered Property of others that is in Contractor's care, custody, and control;
 - b. while in transit to the Site, including while at temporary storage sites;
 - c. while at the Site awaiting and during installation, erection, and testing;
 - d. continuing at least until the installation or erection of the Covered Property is completed, and the Work into which it is incorporated is accepted by Owner.
2. The installation floater coverage cannot be contingent on an external cause or risk, or limited to property for which the Contractor is legally liable.
3. The installation floater coverage will be in an amount sufficient to protect Contractor's interest in the Covered Property. The Contractor will be solely responsible for any deductible carried under this coverage.
4. This policy will include a waiver of subrogation applicable to Owner, Contractor, Engineer, all Subcontractors, and the officers, directors, partners, employees, agents and other consultants and subcontractors of any of them.

ARTICLE 7—CONTRACTOR’S RESPONSIBILITIES

7.03 Labor; Working Hours

SC-7.03 Add the following new subparagraphs immediately after Paragraph 7.03.C:

1. No Work shall be done between 6:00pm and 7:00am without permission of Owner. However, emergency work may be done without prior permission.
2. Night Work may be undertaken as a regular procedure with the permission of Owner; such permission, however, may be revoked at any time by Owner if Contractor fails to maintain adequate equipment and supervision for the proper prosecution and control of the Work at night.
3. Owner's legal holidays are: New Year’s Day, Good Friday, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, Friday after Thanksgiving, and Christmas Day.

SC-7.03 Amend the first and second sentences of Paragraph 7.03.C to state “...all Work at the Site must be performed during regular working hours, Monday through Saturday. Contractor will not perform Work on a Sunday, or any legal holiday.”

7.07 Concerning Subcontractors and Suppliers

SC-7.07 Add a new paragraph immediately after Paragraph 7.07.M:

- N. The Contractor shall not award work valued at more than fifty percent of the Contract Price to Subcontractor(s), without prior written approval of the Owner.*

7.10 Taxes

SC-7.10 Add a new paragraph immediately after Paragraph 7.10.A:

- A. Owner is exempt from payment of sales and compensating use taxes of the State of Iowa and of cities and counties thereof on all materials to be incorporated into the Work.
1. Owner will furnish the required certificates of tax exemption to Contractor for use in the purchase of supplies and materials to be incorporated into the Work.
 2. Owner’s exemption does not apply to construction tools, machinery, equipment, or other property purchased by or leased by Contractor, or to supplies or materials not incorporated into the Work.

ARTICLE 8— OTHER WORK AT THE SITE

ARTICLE 9—OWNER’S RESPONSIBILITIES

9.13 Owner’s Site Representative

SC-9.13 Add the following new paragraph immediately after Paragraph 9.12 of the General Conditions:

9.13 Owner's Site Representative

- A. Owner will furnish an "Owner's Site Representative" to represent Owner at the Site and assist Owner in observing the progress and quality of the Work.

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

No Supplementary Conditions in this Article.

ARTICLE 11—CHANGES TO THE CONTRACT

No Supplementary Conditions in this Article.

ARTICLE 12—CLAIMS

No Supplementary Conditions in this Article.

ARTICLE 13—COST OF WORK; ALLOWANCES, UNIT PRICE WORK

13.01 Cost of the Work

SC-13.01 Supplement Paragraph 13.01.B.5.c.(2) by adding the following sentence:

The equipment rental rate book that governs the included costs for the rental of machinery and equipment owned by Contractor (or a related entity) under the Cost of the Work provisions of this Contract is the most current edition of Rental Rate Blue Book for Construction Equipment.

SC-13.01 Supplement Paragraph 13.01.C.2 by adding the following definition of small tools and hand tools:

- a. For purposes of this paragraph, "small tools and hand tools" means any tool or equipment whose current price if it were purchased new at retail would be less than \$500.

SC-13.03 Delete Paragraph 13.03.E in its entirety and insert the following in its place:

E. Adjustments in Unit Price

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:
 - a. the extended price of a particular item of Unit Price Work amounts to five (5) percent or more of the Contract Price (based on estimated quantities at the time of Contract formation) and the variation in the quantity of that particular item of Unit Price Work actually furnished or performed by Contractor differs by more than 25 percent from the estimated quantity of such item indicated in the Agreement; and
 - b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.

2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.
3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

No Supplementary Conditions in this Article.

ARTICLE 15—PAYMENTS TO CONTRACTOR, SET OFFS; COMPLETIONS; CORRECTION PERIOD

15.01 Progress Payments

SC-15.01 Add the following new Paragraph 15.01.B:

- B. Contractor's Application for Progress Payment shall be prepared on the EJCDC C-620 form provided in the Contract Documents.

SC-15.01 Delete Paragraph 15.01.D.1 in its entirety and insert the following in its place:

1. The Application for Payment with Engineer's recommendations will be presented to the Owner for consideration. If the Owner find the Application for Payment acceptable, the recommended amount less any reduction under the provisions of Paragraph 15.01.E will become due thirty (30) days after the Application for Payment is accepted by resolution of the City Council, and the Owner will make payment to the Contractor.

SC-15.01 Add the following new Paragraph 15.01.F:

- F. For contracts in which the Contract Price is based on the Cost of Work, if Owner determines that progress payments made to date substantially exceed the actual progress of the Work (as measured by reference to the Schedule of Values), or present a potential conflict with the Guaranteed Maximum Price, then Owner may require that Contractor prepare and submit a plan for the remaining anticipated Applications for Payment that will bring payments and progress into closer alignment and take into account the Guaranteed Maximum Price (if any), through reductions in billings, increases in retainage, or other equitable measures. Owner will review the plan, discuss any necessary modifications, and implement the plan as modified for all remaining Applications for Payment.

SC-15.02.A Amend Paragraph 15.02.A by striking out the following text: "no later than seven days after the time of payment by Owner" and insert "no later than the time of payment by Owner."

15.03 Substantial Completion

SC-15.03 Add the following new subparagraph to Paragraph 15.03.B:

1. If some or all of the Work has been determined not to be at a point of Substantial Completion and will require re-inspection or re-testing by Engineer, the cost of such re-inspection or re-testing, including the cost of time, travel and living expenses, will be paid by Contractor to Owner. If Contractor does not pay, or the parties are unable to agree as to the amount owed, then Owner may impose a reasonable set-off against payments due under this Article 15.

15.06 Final Payment

SC-15.06 Delete Paragraph 15.06.E in its entirety and insert the following in its place:

- E. *Final Payment Becomes Due*: Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor on or before thirty (30) days after completion and acceptance by resolution of the City Council of the final Application for Payment from Engineer.

15.08 Correction Period

SC-15.08 Add the following new Paragraph 15.08.G:

- G. The correction period specified as one year after the date of Substantial Completion in Paragraph 15.08.A of the General Conditions is hereby revised to be the number of years set forth in SC-6.01.B.1; or if no such revision has been made in SC-6.01.B, then the correction period is hereby specified to be four (4) years after Substantial Completion.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

No Supplementary Conditions in this Article.

ARTICLE 17—FINAL RESOLUTIONS OF DISPUTES

SC-17.02 Add the following new paragraph immediately after Paragraph 17.01.

17.02 Attorneys' Fees

- A. For any matter subject to final resolution under this Article, the prevailing party shall be entitled to an award of its attorneys' fees incurred in the final resolution proceedings, in an equitable amount to be determined in the discretion of the court, arbitrator, arbitration panel, or other arbiter of the matter subject to final resolution, taking into account the parties' initial demand or defense positions in comparison with the final result.

ARTICLE 18—MISCELLANEOUS

No Supplementary Conditions in this Article.

ARTICLE 19—FEDERAL REQUIREMENTS

SC-19.01 Add Article 19 titled “FEDERAL REQUIREMENTS”

SC-19.02 Add Article 19.01 with the title “Conflict of Interest”:

19.01 Conflict of Interest

- A. Contractor may not knowingly contract with a supplier or manufacturer if the individual or entity who prepared the plans and specifications has a corporate or financial affiliation with the supplier or manufacturer. Owner’s officers, employees, or agents shall not engage in the award or administration of this Contract if a conflict of interest, real or apparent, would be involved. Such a conflict would arise when: (i) the employee, officer or agent; (ii) any member of their immediate family; (iii) their partner or (iv) an organization that employs, or is about to employ, any of the above, has a financial interest in Contractor. Owner’s officers, employees, or agents shall neither solicit nor accept gratuities, favors or anything of monetary value from Contractor or subcontractors.

SC-19.03 Add Article 19.02 with the title “Gratuities”:

Article 19.02 Gratuities

- A. If Owner finds after a notice and hearing that Contractor, or any of Contractor’s agents or representatives, offered or gave gratuities (in the form of entertainment, gifts, or otherwise) to any official, employee, or agent of Owner in an attempt to secure this Contract or favorable treatment in awarding, amending, or making any determinations related to the performance of this Contract, Owner may, by written notice to Contractor, terminate this Contract. Owner may also pursue other rights and remedies that the law or this Contract provides. However, the existence of the facts on which Owner bases such findings shall be an issue and may be reviewed in proceedings under the dispute resolution provisions of this Contract.
- B. In the event this Contract is terminated as provided in paragraph 19.02.A, Owner may pursue the same remedies against Contractor as it could pursue in the event of a breach of this Contract by Contractor. As a penalty, in addition to any other damages to which it may be entitled by law, Owner may pursue exemplary damages in an amount (as determined by Owner) which shall not be less than three nor more than ten times the costs Contractor incurs in providing any such gratuities to any such officer or employee.

SC-19.04 Add Article 19.03 with the title “Environmental Requirements”:

19.03 Environmental Requirements

- A. When constructing a Project involving trenching and/or other related earth excavations, Contractor shall comply with the following environmental

conditions:

1. Wetlands –When disposing of excess, spoil, or other construction materials on public or private property, Contractor shall not fill in or otherwise convert wetlands.
2. Floodplains –When disposing of excess, spoil, or other construction materials on public or private property, Contractor shall not fill in or otherwise convert 100-year floodplain areas (Standard Flood Hazard Area) delineated on the latest Federal Emergency Management Agency Floodplain Maps, or other appropriate maps, e.g., alluvial soils on NRCS Soil Survey Maps.
3. Historic Preservation – Any excavation by Contractor that uncovers an historical or archaeological artifact or human remains shall be immediately reported to Owner. Construction shall be temporarily halted pending the notification process and further directions issued by the State Historic Preservation Office (SHPO).
4. Endangered Species – Contractor shall comply with the Endangered Species Act, which provides for the protection of endangered and/or threatened species and critical habitat. Should any evidence of the presence of endangered and/or threatened species or their critical habitat be brought to the attention of Contractor, Contractor will immediately report this evidence to Owner. Construction shall be temporarily halted pending the notification process and further directions issued by the U.S. Fish and Wildlife Service.
5. Mitigation Measures – The following environmental mitigation measures are required on this Project: **NONE.**

EXHIBIT A— SOFTWARE REQUIREMENTS FOR ELECTRONIC DOCUMENT EXCHANGE

Item	Electronic Documents	Transmittal Means	Data Format	Note (1)
a.1	General communications, transmittal covers, meeting notices and responses to general information requests for which there is no specific prescribed form.	Email	Email	
a.2	Meeting agendas, meeting minutes, RFI's and responses to RFI's, and Contract forms.	Email w/ Attachment	PDF	(2)
a.3	Contactors Submittals (Shop Drawings, "or equal" requests, substitution requests, documentation accompanying Sample submittals and other submittals) to Owner and Engineer, and Owner's and Engineer's responses to Contractor's Submittals, Shop Drawings, correspondence, and Applications for Payment.	Email w/ Attachment	PDF	
a.4	Correspondence; milestone and final version Submittals of reports, layouts, Drawings, maps, calculations and spreadsheets, Specifications, Drawings and other Submittals from Contractor to Owner or Engineer and for responses from Engineer and Owner to Contractor regarding Submittals.	Email w/ Attachment or LFE	PDF	
a.5	Layouts and drawings to be submitted to Owner for future use and modification.	Email w/ Attachment or LFE	DWG	
a.6	Correspondence, reports and Specifications to be submitted to Owner for future word processing use and modification.	Email w/ Attachment or LFE	DOC	
a.7	Spreadsheets and data to be submitted to Owner for future data processing use and modification.	Email w/ Attachment or LFE	EXC	
a.8	Database files and data to be submitted to Owner for future data processing use and modification.	Email w/ Attachment or LFE	DB	
Notes				
(1)	All exchanges and uses of transmitted data are subject to the appropriate provisions of Contract Documents.			
(2)	Transmittal of written notices is governed by Paragraph 18.01 of the General Conditions.			
Key				
Email	Standard Email formats (.htm, .rtf, or .txt). Do not use stationery formatting or other features that impair legibility of content on screen or in printed copies			
LFE	Agreed upon Large File Exchange method (FTP, CD, DVD, hard drive)			
PDF	Portable Document Format readable by Adobe® Acrobat Reader Version 9.0 or later			
DWG	Autodesk® AutoCAD .dwg format Version 2015			
DOC	Microsoft® Word .docx format Version 2013			
EXC	Microsoft® Excel .xls or .xml format Version 2013			
DB	Microsoft® Access .mdb format Version 2013			

EXHIBIT B— FORESEEABLE BAD WEATHER DAYS

Month	Number of Foreseeable Bad Weather Days in Month Based on Precipitation as Rain Equivalent (inches) $\geq 1.67''$	Ambient Outdoor Air Temperature (degrees F)	
		Number of Foreseeable Bad Weather Days in Month Based on Low Temperature (at 11:00 a.m.) $\leq 35^{\circ}\text{F}$	Number of Foreseeable Bad Weather Days in Month Based on High Temperature (at 3:00 p.m.) $\geq 85^{\circ}\text{F}$
January	0	31	0
February	0	29	0
March	7	31	0
April	12	12	0
May	20	0	0
June	22	0	0
July	22	0	0
August	20	0	0
September	17	0	0
October	13	6	0
November	8	30	0
December	0	31	0
Notes:			
1. Two inches of sleet equal one inch of rain. Five inches of wet, heavy snow equal one inch of rain. Fifteen inches of "dry" powder snow equals one inch of rain.			

ADDITIONAL FORMS

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CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner: City of Marshalltown Owner's Project No.: ECO-20001
Engineer: Lee Chamberlin Consultant Engineers Engineer's Project No.: 19023
Contractor: Contractor's Project No.:
Project:
Contract Name:

This ☐ Preliminary ☐ Final Certificate of Substantial Completion applies to:

☐ All Work ☐ The following specified portions of the Work:

[Describe the portion of the work for which Certificate of Substantial Completion is issued]

Date of Substantial Completion: **[Enter date, as determined by Engineer]**

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Work or portion thereof designated above is hereby established, subject to the provisions of the Contract pertaining to Substantial Completion. The date of Substantial Completion in the final Certificate of Substantial Completion marks the commencement of the contractual correction period and applicable warranties required by the Contract.

A punch list of items to be completed or corrected is attached to this Certificate. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor; see Paragraph 15.03.D of the General Conditions.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work must be as provided in the Contract, except as amended as follows:

Amendments to Owner's Responsibilities: ☐ None ☐ As follows:

[List amendments to Owner's Responsibilities]

Amendments to Contractor's Responsibilities: ☐ None ☐ As follows:

[List amendments to Contractor's Responsibilities]

The following documents are attached to and made a part of this Certificate:

[List attachments such as punch list; other documents]

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents, nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract Documents.

Engineer

By (*signature*): _____

Name (*printed*): _____

Title: _____

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NOTICE OF ACCEPTABILITY OF WORK

Owner: City of Marshalltown

Owner's Project No.:

Engineer:

Engineer's Project No.:

Contractor:

Contractor's Project No.:

Project:

Contract Name:

Notice Date:

Effective Date of the Construction Contract:

The Engineer hereby gives notice to the Owner and Contractor that Engineer recommends final payment to Contractor, and that the Work furnished and performed by Contractor under the Construction Contract is acceptable, expressly subject to the provisions of the Construction Contract's Contract Documents ("Contract Documents") and of the Agreement between Owner and Engineer for Professional Services dated **[date of professional services agreement]** ("Owner-Engineer Agreement"). This Notice of Acceptability of Work (Notice) is made expressly subject to the following terms and conditions to which all who receive and rely on said Notice agree:

This Notice has been prepared with the skill and care ordinarily used by members of the engineering profession practicing under similar conditions at the same time and in the same locality.

This Notice reflects and is an expression of the Engineer's professional opinion.

This Notice has been prepared to the best of Engineer's knowledge, information, and belief as of the Notice Date.

This Notice is based entirely on and expressly limited by the scope of services Engineer has been employed by Owner to perform or furnish during construction of the Project (including observation of the Contractor's Work) under the Owner-Engineer Agreement, and applies only to facts that are within Engineer's knowledge or could reasonably have been ascertained by Engineer as a result of carrying out the responsibilities specifically assigned to Engineer under such Owner-Engineer Agreement.

This Notice is not a guarantee or warranty of Contractor's performance under the Construction Contract, an acceptance of Work that is not in accordance with the Contract Documents, including but not limited to defective Work discovered after final inspection, nor an assumption of responsibility for any failure of Contractor to furnish and perform the Work thereunder in accordance with the Contract Documents, or to otherwise comply with the Contract Documents or the terms of any special guarantees specified therein.

This Notice does not relieve Contractor of any surviving obligations under the Construction Contract, and is subject to Owner's reservations of rights with respect to completion and final payment.

Engineer

By (*signature*):

Name (*printed*):

Title:

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CONTRACTOR'S APPLICATION FOR PAYMENT

Owner: _____ Engineer: _____ Contractor: _____ Project: _____ Contract: _____	Owner's Project No.: _____ Engineer's Project No.: _____ Contractor's Project No.: _____
Application No.: _____ Application Date: _____ Application Period: From _____ to _____	

1. Original Contract Price	\$	-
2. Net change by Change Orders	\$	-
3. Current Contract Price (Line 1 + Line 2)	\$	-
4. Total Work completed and materials stored to date (Sum of Column G Lump Sum Total and Column J Unit Price Total)	\$	
5. Retainage		
a. _____ X \$ _____ Work Completed	\$	
b. _____ X \$ _____ Stored Materials	\$	
c. Total Retainage (Line 5.a + Line 5.b)	\$	
6. Amount eligible to date (Line 4 - Line 5.c)	\$	
7. Less previous payments (Line 6 from prior application)		
8. Amount due this application	\$	
9. Balance to finish, including retainage (Line 3 - Line 4)	\$	

Contractor's Certification

The undersigned Contractor certifies, to the best of its knowledge, the following:

(1) All previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with the Work covered by prior Applications for Payment;

(2) Title to all Work, materials and equipment incorporated in said Work, or otherwise listed in or covered by this Application for Payment, will pass to Owner at time of payment free and clear of all liens, security interests, and encumbrances (except such as are covered by a bond acceptable to Owner indemnifying Owner against any such liens, security interest, or encumbrances); and

(3) All the Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

Contractor: _____	
Signature: _____	Date: _____

Recommended by Engineer By: _____ Title: _____ Date: _____	Approved by Owner By: _____ Title: _____ Date: _____
Approved by Funding Agency By: _____ Title: _____ Date: _____	

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Contractor's Application for Payment

Owner:	_____	Owner's Project No.:	_____
Engineer:	_____	Engineer's Project No.:	_____
Contractor:	_____	Contractor's Project No.:	_____
Project:	_____		
Contract:	_____		

Application No.: _____ Application Period: From _____ to _____ Application Date: _____

A	B	C	D	E	F	G	H	I
Item No.	Description	Scheduled Value (\$)	Work Completed		Materials Currently Stored (not in D or E) (\$)	Work Completed and Materials Stored to Date (D + E + F) (\$)	% of Scheduled Value (G / C) (%)	Balance to Finish (C - G) (\$)
			(D + E) From Previous Application (\$)	This Period (\$)				
Original Contract								
Original Contract Totals		\$	\$	\$	\$	\$		\$
Change Orders								

Contractor's Application for Payment

Owner:	
Engineer:	
Contractor:	
Project:	
Contract:	

Owner's Project No.: _____
 Engineer's Project No.: _____
 Contractor's Project No.: _____

Application No.:	Application Period:	From	to	Application Date:
------------------	---------------------	------	----	-------------------

A	B	C	D	E	F	G	H	I
Item No.	Description	Scheduled Value (\$)	Work Completed		Materials Currently Stored (not in D or E) (\$)	Work Completed and Materials Stored to Date (D + E + F) (\$)	% of Scheduled Value (G / C) (%)	Balance to Finish (C - G) (\$)
			(D + E) From Previous Application (\$)	This Period (\$)				
Change Order Totals		\$	\$	\$	\$	\$		\$
Original Contract and Change Orders								
Project Totals		\$	\$	\$	\$	\$		\$

Progress Estimate - Unit Price Work

Contractor's Application for Payment

Owner: _____
 Engineer: _____
 Contractor: _____
 Project: _____
 Contract: _____

Owner's Project No.: _____
 Engineer's Project No.: _____
 Contractor's Project No.: _____

Application No.:	Application Period:	From	to	Application Date:
-------------------------	----------------------------	-------------	-----------	--------------------------

A	B	C	D	E	F	G	H	I	J	K	L
Bid Item No.	Description	Contract Information				Work Completed		Materials Currently Stored (not in G) (\$)	Work Completed and Materials Stored to Date (H + I) (\$)	% of Value of Item (J / F) (%)	Balance to Finish (F - J) (\$)
		Item Quantity	Units	Unit Price (\$)	Value of Bid Item (C X E) (\$)	Estimated Quantity Incorporated in the Work	Value of Work Completed to Date (E X G) (\$)				
Original Contract											
Original Contract Totals					\$	\$	\$	\$	\$		\$
Change Orders											

Progress Estimate - Unit Price Work

Contractor's Application for Payment

Owner: _____
Engineer: _____
Contractor: _____
Project: _____
Contract: _____

Owner's Project No.: _____
 Engineer's Project No.: _____
 Contractor's Project No.: _____

Application No.:	Application Period:	From	to	Application Date:
-------------------------	----------------------------	-------------	-----------	--------------------------

A	B	C	D	E	F	G	H	I	J	K	L
Bid Item No.	Description	Contract Information				Work Completed		Materials Currently Stored (not in G) (\$)	Work Completed and Materials Stored to Date (H + I) (\$)	% of Value of Item (J / F) (%)	Balance to Finish (F - J) (\$)
		Item Quantity	Units	Unit Price (\$)	Value of Bid Item (C X E) (\$)	Estimated Quantity Incorporated in the Work	Value of Work Completed to Date (E X G) (\$)				
Change Order Totals					\$	\$	\$	\$	\$		\$
Original Contract and Change Orders											
Project Totals					\$	\$	\$	\$	\$		\$

Contractor's Application for Payment

Owner:		Owner's Project No.:	
Engineer:		Engineer's Project No.:	
Contractor:		Contractor's Project No.:	
Project:			
Contract:			

Application No.: _____ **Application Period:** From _____ to _____ **Application Date:** _____

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CHANGE ORDER NO.: [#]

Owner: _____ Owner's Project No.: _____
 Engineer: _____ Engineer's Project No.: _____
 Contractor: _____ Contractor's Project No.: _____
 Project: _____
 Contract Name: _____
 Date Issued: _____ Effective Date of Change Order: _____

The Contract is modified as follows upon execution of this Change Order:

Description:

[Description of the change]

Attachments:

[List documents related to the change]

Change in Contract Price	Change in Contract Times [State Contract Times as either a specific date or a number of days]
Original Contract Price: \$ _____	Original Contract Times: Substantial Completion: _____ Ready for final payment: _____
[Increase] [Decrease] from previously approved Change Orders No. 1 to No. [Number of previous Change Order] : \$ _____	[Increase] [Decrease] from previously approved Change Orders No. 1 to No. [Number of previous Change Order] : Substantial Completion: _____ Ready for final payment: _____
Contract Price prior to this Change Order: \$ _____	Contract Times prior to this Change Order: Substantial Completion: _____ Ready for final payment: _____
[Increase] [Decrease] this Change Order: \$ _____	[Increase] [Decrease] this Change Order: Substantial Completion: _____ Ready for final payment: _____
Contract Price incorporating this Change Order: \$ _____	Contract Times with all approved Change Orders: Substantial Completion: _____ Ready for final payment: _____

Recommended by Engineer (if required) By: _____ Title: _____ Date: _____ Authorized by Owner By: _____ Title: _____ Date: _____	Accepted by Contractor _____ _____ Approved by Funding Agency (if applicable) _____ _____ _____
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FIELD ORDER NO.: [FO#]

Owner:

Owner's Project No.:

Engineer:

Engineer's Project No.:

Contractor:

Contractor's Project No.:

Project:

Contract Name:

Date Issued:

Effective Date of Field Order:

Contractor is hereby directed to promptly perform the Work described in this Field Order, issued in accordance with Paragraph 11.04 of the General Conditions, for minor changes in the Work without changes in Contract Price or Contract Times. If Contractor considers that a change in Contract Price or Contract Times is required, submit a Change Proposal before proceeding with this Work.

Reference:

Specification Section(s):

Drawing(s) / Details (s):

Description:

[Description of the change to the Work]

Attachments:

[List documents supporting change]

Issued by Engineer

By: _____

Title: _____

Date: _____

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PART II – TECHNICAL SPECIFICATIONS

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**CITY OF MARSHALLTOWN'S SUPPLEMENTAL
SPECIFICATIONS TO THE IOWA
STATEWIDE URBAN DESIGN AND SPECIFICATIONS**

**PREPARED BY:
PUBLIC WORKS/ENGINEERING DEPARTMENT
CITY OF MARSHALLTOWN
24 N. CENTER STREET
MARSHALLTOWN, IOWA 50158**

The City of Marshalltown has accepted the Iowa Statewide Urban Design and Specifications for all utility, street and sub-development construction. The City has made modifications to the documents and revisions are provided as Supplemental Specifications to the Iowa Statewide Urban Design and Specifications (SUDAS). The supplemental specifications shall take precedence over the SUDAS documents.

All subdivision development within the boundaries established by the City of Marshalltown shall utilize the Supplemental Specifications and SUDAS for construction.

The Supplemental Specifications are provided in the same order and format as the SUDAS documents. The SUDAS Documents are also included for reference. No context changes have been made to the SUDAS Documents. However, format changes have been made to be included in this document.

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SUPPLEMENTAL DIVISION 1 – GENERAL PROVISIONS AND COVENANTS

(DELETE) SECTION 1010 – DEFINITIONS

**(DELETE) SECTION 1020 - PROPOSAL REQUIREMENTS AND
CONDITION**

**(DELETE) SECTION 1030 - APPROVAL FOR AWARD AND AWARD OF
CONTRACT**

(DELETE) SECTION 1040 - SCOPE OF WORK

(DELETE) SECTION 1050 - CONTROL OF WORK

(DELETE) SECTION 1060 - CONTROL OF MATERIALS

**(DELETE) SECTION 1070 - LEGAL RELATIONS AND RESPONSIBILITY
TO THE PUBLIC**

(DELETE) SECTION 1080 - PROSECUTION AND PROGRESS

(DELETE) SECTION 1090 - MEASUREMENT AND PAYMENT

**(ADD) OFFICIAL NOTICE OF HEARING AND LETTING (CITY OF
MARSHALLTOWN).**

**(ADD) EJCDC C 200 INSTRUCTIONS TO BIDDERS FOR
CONSTRUCTION CONTRACT.**

(ADD) EJCDC C 410 BID FORM FOR CONSTRUCTION CONTRACT.

(ADD) EJCDC C 430 BID BOND (PENAL SUM FORM).

(ADD) EJCDC C 451 QUALIFICATIONS STATEMENT.

(ADD) EJCDC C 510 NOTICE OF AWARD.

**(ADD) EJCDC C 520 AGREEMENT BETWEEN OWNER AND
CONTRACTOR FOR CONSTRUCTION CONTRACT (STIPULATED
SUM).**

(ADD) EJCDC C 550 NOTICE TO PROCEED.

(ADD) EJCDC C 610 PERFORMANCE BOND.

(ADD) EJCDC C-615 PAYMENT BOND.

(ADD) EJCDC C 612 WARRANTY BOND.

**(ADD) EJCDC C 700 STANDARD GENERAL CONDITIONS OF THE
CONSTRUCTION CONTRACT.**

**(ADD) EJCDC C 800 SUPPLEMENTARY CONDITIONS OF THE
CONSTRUCTION CONTRACT.**

(ADD) EJCDC C 625 CERTIFICATE OF SUBSTANTIAL COMPLETION.

(ADD) EJCDC C 626 NOTICE OF ACCEPTABILITY OF WORK.

(ADD) EJCDC C 620 CONTRACTOR'S APPLICATION FOR PAYMENT.

(ADD) EJCDC C 940 WORK CHANGE DIRECTIVE.

(ADD) EJCDC C 941 CHANGE ORDER.

(ADD) EJCDC C 942 FIELD ORDER.

SECTION 01 11 00 - SUMMARY OF WORK (ADD)

PART 1 - GENERAL

1.01 GENERAL CONDITIONS AND SUPPLEMENTARY CONDITIONS

The General Conditions and the Supplementary Conditions which are attached to the specifications shall govern the work of all persons engaged in the performance of the contract and shall form a part of the contract.

1.02 DEFINITIONS

- A. The definitions shall be as presented in the General Conditions, Supplementary Conditions and as supplemented herein.
- B. "Project Engineer," "Engineer," "Architect" – Marshalltown Public Works Engineering Department, with a mailing address of 24 N. Center Street, Marshalltown, Iowa 501581; telephone number: (641) 754-5734.
- C. "Owner" or "City" – City of Marshalltown, Iowa, as represented by its proper authorities and with the mailing address of 24 N. Center Street, Marshalltown, Iowa 50158.
- D. "Written Notice" - Written notice or order shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm, or to an officer of the corporation for whom it is intended or if delivered at or sent by registered mail to the last known address of the addressee.

1.03 ARRANGEMENTS OF DETAILED SPECIFICATIONS AND DRAWINGS

- E. The detailed specifications arrangement is based upon the 2014 CSI and SUDAS Standard Specification format and incorporates the following Divisions:
 - 1. Division 1 - General Requirements
 - 2. Division 2 – Earthwork
 - 3. Division 3 – Trench and Trenchless Construction
 - 4. Division 4 – Sewers and Drains
 - 5. Division 6 – Structures for Sanitary and Storm Sewer
 - 6. Division 7 - Streets and Related Work
 - 7. Division 8 – Traffic Control
 - 8. Division 9 – Site Work and Landscaping
 - 9. Division 10 - Demolition
 - 10. Division 11 – Miscellaneous
- F. The contract drawings or plans, which depict the contract work of the project and upon which the contract is based are those drawings or sheets listed on Sheet 1 of the drawings.

- G. The drawings referred to above are supplemented by drawings bound in this book of specifications and by additional shop and dimension drawings to be prepared by the Contractor as set forth in the specifications.
- H. Division of Work as made by the contract drawings and specifications is for the purpose of specifying all work, which is required. There is no attempt to make complete classification according to trade or any agreements, which may exist between Contractors or groups of contractors and trade unions. Such division and classification of the work shall be the Contractor's responsibility. Refer to the General Conditions.

1.04 LOCATION OF THE WORK

The work under this contract is located in Marshalltown, Iowa in Marshall County, Iowa, on properties for which easements and/or title have been obtained by the Owner.

1.05 WORK BY OTHERS

Refer to the General and Supplementary Conditions.

1.06 CONTRACTOR'S RESPONSIBILITIES AND DUTIES

I. General:

1. Each Contractor must satisfy himself by personal examination of each site as to all local conditions affecting the performance of his contract. The Contractor is deemed to accept such conditions as found to exist.
2. All construction activities shall be confined within the areas shown on the drawings. Construction easements, as needed, have been obtained by the Owner. If additional area is needed, it shall be the Contractor's responsibility to obtain said area.

J. Continuous Operation:

1. The Contractor must receive the approval of the Owner prior to any scheduled intermittent, partial or complete shut-down of the existing facilities.
2. Each Contractor shall note that the Owner must continue the operation of the existing wastewater collection facilities.
3. Each Contractor shall schedule all required work so as to minimize the interruption of the continuous operation of the existing facilities and functions.
4. When it is necessary to take a certain portion of the existing facilities or systems out of service, the Contractor shall submit to the Engineer a description of the procedure and schedule of the work proposed. The schedule and procedure shall be reviewed and approved by the Engineer and the Owner prior to commencement of these operations.
5. Under any emergency condition or where partial shutdown of the existing facilities is involved, the modifications and connections shall be pursued on a 24-hour-per-day basis and 7 days per week schedule to minimize disruption of service unless otherwise provided in the technical specifications. The

Contractor shall provide at no additional cost to the Owner all temporary connections, parallel temporary lines or bypasses as may be required.

6. All materials shall be on the job and ready for installation for these items. All arrangements, measurements and planning shall be done in advance of taking existing facilities out of service.

K. Existing Underground Utilities:

1. Iowa One Call Locates: 1-800-292-8989
2. Water Lines: One Call – Marshalltown Water Works – Shelli Lovall
3. Sanitary Sewer: One Call – City of Marshalltown
4. Gas Lines: One Call – Alliant Energy / Consumers Energy
5. Electrical: One Call – Alliant Energy / Consumers Energy
6. Telephone/Cable: One Call – Century Link/Windstream/Mediacom.

L. Existing Structures:

1. The requirements relating to existing structures shall be as per the General Conditions and as supplemented herein.
2. Each Contractor shall take complete field measurements affecting all existing construction, wiring, piping, and equipment in this contract, and he shall be solely responsible for proper fit between his work and existing structures and other equipment. He shall examine all work to which he will connect; and if any misalignment is found, he shall so arrange his work that the misalignment is corrected to the satisfaction of the Engineer.

M. Dimensions given on the drawings related to the existing structures are based on existing construction drawings, and it shall be the responsibility of the Contractor to verify the accuracy of these dimensions. Any discrepancies shall be brought to the attention of the Engineer prior to start of new construction.

N. Each Contractor will be held responsible for any damage to existing structures, work, materials, or equipment because of his operations and shall repair or replace any damaged structures, work, materials, or equipment to the satisfaction of, and at no additional cost to, the Owner.

O. Each Contractor shall be responsible for all damage to streets, roads, curbs, sidewalks, highways, shoulders, ditches, embankments, culverts, bridges, or other public or private property, which may be caused by transporting equipment, materials, or men to or from work. The Contractor shall make satisfactory and acceptable arrangements with the agency having jurisdiction over the damaged property concerning its repair or replacement.

1.07 UNFAVORABLE CONSTRUCTION CONDITIONS:

During unfavorable weather, wet ground, or other unsuitable construction conditions, the Contractor shall confine his operations to work, which will not be affected adversely thereby. No portion of the work shall be constructed under conditions, which would affect adversely the quality efficiency thereof, unless special means or

precautions are taken by the Contractor to perform the work in a proper and satisfactory manner.

1.08 PRESERVATION OF MONUMENTS AND STAKES:

- P. Refer to the General Conditions and the Supplementary Conditions.
- Q. In case of his destruction thereof, the Contractor will be charged with the expense of replacement and shall be responsible for any mistake or loss of time that may be caused. The Contractor shall furnish materials and assistance for the proper replacement of such monuments or bench marks.

1.09 METHODS OF OPERATION:

- R. Each Contractor shall inform the Engineer in advance concerning his plans for carrying on each part of the work, but the contractor alone shall be responsible for the safety, adequacy, and efficiency of his plant, equipment, and methods.
- S. Any method of work suggested by the Owner or Engineer, but not specified, shall be used at the risk and responsibility of the Contractor. The Engineer and Owner will assume no responsibility therefore.
- T. Review by the Owner or Engineer of any plan or method of work proposed by the Contractor shall not relieve the Contractor of any responsibility therefor, and such review shall not be considered as an assumption of any risk or liability by the Owner, Engineer, or any officer, agent, or employee thereof. The Contractor shall have no claim on account of the failure or inefficiency of any plan or method so reviewed.

1.10 CONDUCT OF WORK:

- U. Each Contractor shall observe that the Owner reserves the right to do other work in connection with the project or adjacent thereto by contract or otherwise, and he shall at all times conduct his work so as to impose no hardship on the Owner or others engaged in the work, nor cause any unreasonable delay or hindrance thereto.
- V. Each Contractor shall be responsible to others engaged in the work or work adjacent thereto for all damage or injury to work, to persons or property, or for loss caused by failure to finish the work within the specified time for completion. He shall adjust, correct, and coordinate his work with the work of others so that no discrepancies shall result in the whole work.
- W. The work of this contract includes the furnishing and necessary installation of all tools, machinery, scaffolds, false work, forms and centers for the execution of the work, except as may be otherwise specified. Equipment provided shall be adequate. The Contractor shall obtain all necessary measurements for the work and shall check dimensions, levels, and construction and layout and supervise the construction for correctness of all of which he shall be responsible.
- X. Where work of one trade joins to, or is on other work, there shall be no discrepancy when the work is completed. The Contractor must anticipate relation of all parts of the work, and at the proper time provide and set required anchors

and blocking. Anchors, blocking, sleeves, and inserts necessary for each trade shall be a part of same except where stated otherwise. Assistance required by the Engineer in obtaining measurements or information on the work shall be furnished accurately and fully by the Contractor without additional cost to the Owner.

- Y. The work of this contract includes the furnishing and necessary operation of all tools and machinery for the execution of the work, except as may be otherwise specified. Equipment provided shall be in good condition and adequate for the work performed. The Contractor shall obtain all necessary measurements for the work, and shall check dimensions, levels, and construction layout. The Contractor shall supervise the construction for correctness of all work, which he/she shall be responsible.

1.11 PARTIAL OWNER OCCUPANCY

- Z. If portions of the facilities will be in operation before final construction is completed, the Owner reserves the right to utilize the facilities in the manner for which they were designed. This continued operation shall in no way indicate final acceptance prior to completion of the project.

AA. Refer also to the General Conditions and the Supplementary Conditions.

1.12 PERMITS AND REGULATIONS

Refer to the General Conditions and the Supplementary Conditions.

END OF SECTION

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SECTION 01 20 00 - MEASUREMENT AND PAYMENT (ADD)

PART 1 - GENERAL

1.01 GENERAL

- BB. The General Provisions of the Contract, including General and Supplementary Conditions shall apply to the Work covered in this Section.
- CC. The intention of the Proposal Form is to include full compensation for all labor, materials, equipment, supervision, and other incidental items necessary for the performing of and completion of the items of work in place, in accordance with the Contract Documents for payment therefore, and also to include all work which may be reasonably inferable from the Contract Documents as being necessary to produce the intended results. All items of work necessary to produce the intended results NOT specifically contained in the Proposal Form shall be considered incidental work to the Proposal Form item without allowance for separate, additional compensation.
- DD. All cost of all work described in Division 1, unless otherwise specified shall be considered incidental, with no separate measurement or payment.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 MEASUREMENT

- EE. The determination of final quantities of Work performed under the Contract will be made by the Engineer, based upon measurements made by him or his assistants. Measurement of completed work shall be in units as shown on the Proposal Form for unit price items or completion of Work items listed and shown on the accepted schedule of values for lump sum items.
- FF. The Contractor shall participate in the measurement of completed Work unless otherwise agreed.
- GG. Specific differences in measurement or classification of Work are to be resolved at the time of measurement.
- HH. All measurements shall be completed on a regular basis.

3.02 APPLICATION FOR PAYMENT

- II. The Contractor shall prepare and submit progress payment requests on forms provided by or approved by the Owner.
- JJ. All submissions shall be made in accordance with the requirements of the General Conditions and Supplementary Conditions as hereinafter modified:
1. Modifications: NONE

3.03 PAYMENT

KK. All payments shall be made in accordance with the requirements of the Contract Documents, General Conditions and Supplementary Conditions as hereinafter modified:

1. Modifications: NONE

LL. Payment will be made in accordance with the respective unit or lump sum prices as shown on the Proposal Form.

3.04 PAYMENTS TO BE WITHHELD

All payments due the Contractor including payment for stored material shall be subject to retainage and withholding due to uncompleted work in accordance with the provisions of the Contract Documents, General Conditions and Supplementary Conditions as hereinafter modified:

MM. Modifications: NONE

3.05 PAYMENT ITEMS

Payment items shall be as listed on the Proposal Form.

END OF SECTION

SECTION 01 25 00 - SUBSTITUTIONS (ADD)

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The general provisions of the Contract, including General Conditions and Supplementary Conditions shall apply to the Work covered in this Section.

1.02 SCOPE

This section provides a description of the general requirements for the submission, review, and acceptance of substitute items of material and equipment.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 GENERAL

NN. The procedures for requesting and reviewing substitute items of material and equipment shall be as required by the Instructions to Bidders, General Conditions and as supplemented herein.

OO. The Contractor shall be responsible for all costs that will result directly and indirectly from the acceptance of the substitute.

END OF SECTION

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SECTION 01 31 13 - COORDINATION (ADD)

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

PP. The general provisions of the contract, including General Conditions and Supplementary Conditions shall apply to the work covered in this Section.

QQ. Related requirements specified elsewhere.

1. Summary of Work - Section 01 11 00
2. Project Meetings and Job Site Administration - Section 01 31 19.

1.02 SCOPE AND DESCRIPTION

This section describes the general coordination required between each of the Contractors and the Owner. This section is not intended to cover every item or aspect of the necessary coordination.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 GENERAL

RR. All Contractors or subcontractors working on specific portions of the project shall schedule and conduct their Work as not to impede unnecessarily any Work being done by others on or adjacent to his Work.

SS. Each Contractor and Subcontractor shall be responsible for coordinating his Work with the appropriate representative of the Owner to avoid or minimize any interruption of the functions and facilities of said agency.

3.02 SITE WORK COORDINATION

TT. The location of all facilities, structures, piping and related appurtenances, both temporary and final shall be coordinated among Contractors, the Owner, and the Engineer.

UU. It shall be the responsibility of each Contractor to initiate the procedures necessary to coordinate his work with that of other Contractors and the Owner.

VV. Contractors completing initial Work shall temporarily cap piping and mark the location of all buried piping to facilitate completion of final Work.

PART 4 - MEASUREMENT AND PAYMENT

4.01 METHOD OF MEASUREMENT

Coordination is considered incidental Work with no separate measurement to be made.

4.02 BASIS OF PAYMENT

Coordination is considered incidental Work with no separate payment to be made.

END OF SECTION

SECTION 01 31 19 – PROJECT MEETINGS AND JOB SITE ADMINISTRATION (ADD)

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

WW. The general provisions of the Contract, including General Conditions and Supplementary Conditions shall apply to the Work covered in this Section.

XX. Related requirements specified elsewhere:

1. Coordination: Section 01 31 13

1.02 SCOPE

The intent of this Section is to provide a general description of the project meetings required of the Contractor.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 GENERAL

YY. All meetings shall be coordinated among the respective Contractors, Owner, Engineer and governmental agencies.

ZZ. The individual requesting the meeting shall contact the persons to be in attendance in writing providing the following:

1. Date, time and place of the meeting
2. Purpose of the meeting
3. Names of people invited to the meeting
4. Additional information as necessary

3.02 PRECONSTRUCTION CONFERENCE

AAA. The Engineer will arrange and schedule a pre-construction conference with the representatives of the contractors, subcontractors, together with representatives of all agencies and utilities that will be involved with the proposed Work in order to assure an efficient and workable method of scheduling the project.

BBB. General topics to be covered are as follows:

1. Contract and Legal Documents and Specifications
2. Drawings
3. General construction requirements
4. Coordination of different contractors
5. Pay request procedure
6. Shop drawing submittal

7. Project observation and testing
8. Coordination with affected governmental agencies and utility companies.

3.03 PROGRESS MEETINGS

Routine progress meetings will be scheduled on a basis and time to be selected by mutual agreement between the Owner, the Contractors, the Engineer, and affected governmental agencies. These meetings shall be to discuss the progress and the planning of the Work of the various parties. This meeting shall be under the direction of the Engineer and shall be attended by representatives of the various contractors and subcontractors whose Work may be in progress at the time or whose presence may be required for any purpose. Contractors shall be represented at these meetings as appropriate to assist in the necessary project scheduling and discussion of related problems. Scheduling of required attendance shall meet with the approval of the Engineer.

3.04 JOB SITE ADMINISTRATION

CCC. All job site administration will be handled by the Owner and Engineer.

DDD. All review of payrolls, compliance reports and compliance requirements of the Federal agencies involved shall be administered by and are the responsibility of the Owner.

PART 4 - MEASUREMENT AND PAYMENT

4.01 METHOD OF MEASUREMENT

Progress meetings and administration are considered incidental Work with no separate measurement to be made.

4.02 BASIS OF PAYMENT

Progress meetings and administration are considered incidental Work with no separate payment to be made.

END OF SECTION

SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA AND SAMPLES (ADD)

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

EEE. The general provisions of the Contract, including General and Supplementary Conditions as supplemented herein, shall apply to the work covered in this Section.

1.02 SCOPE

This Section covers the submission, review and distribution requirements of shop drawings, product data and samples.

PART 2 - PRODUCTS

2.01 SHOP DRAWINGS

The shop drawings submitted for review shall contain at a minimum all information as required by the General Conditions and as hereinafter required:

FFF. Additional information as specified in the individual technical specifications.

GGG. All shop drawings and materials shall be identified by reference to specification section and/or drawing detail number.

HHH. Minimum drawing size shall be 8-1/2" x 11".

2.02 PRODUCT DATA

III. Manufacturer's standard schematic drawings shall be identified by reference to Section number and modified to delete information, which is not applicable to the Work. Standard information shall be supplemented to provide additional information applicable to the Work.

JJJ. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data that are submitted for review shall be clearly marked to identify pertinent materials, products or models, show dimensions and clearances required, show performance characteristics and capacities, and show wiring diagrams and controls.

2.03 SAMPLES

All samples submitted for review shall be identified by reference to section number and shall provide all information as required by the General Conditions of the Contract Documents.

PART 3 - EXECUTION

3.01 SHOP DRAWING AND PRODUCT DATA

KKK. The review and submittal process for shop drawings and product data shall be in accordance with the requirements of the General Conditions:

LLL. Shop drawings may be submitted in digital PDF format for review by the Engineer. Shop drawings will be returned digitally.

MMM. All shop drawings shall be submitted through the prime Contractor and be accompanied by a letter of transmittal. The prime Contractor shall approve all shop drawings before transmitting them for approval.

NNN. All shop drawings shall be submitted and approved prior to installation with no exceptions.

OOO. All resubmittals of shop drawings shall be in accordance with 3.01 A through D.

3.02 SAMPLES

PPP. Submit in accordance with the requirements of the General Conditions a minimum of four (4) samples of materials, finishes, colors, etc., as identified in the technical specifications for review.

QQQ. If the Contractor requires more than two (2) samples of material to be returned, additional samples shall be submitted.

PART 4 - MEASUREMENT AND PAYMENT

4.01 METHOD OF MEASUREMENT

Shop drawings, product data and samples are considered incidental Work with no separate measurement to be made.

4.02 BASIS OF PAYMENT

Shop drawings, product data and samples are considered incidental Work with no separate payment to be made.

END OF SECTION

SECTION 01 35 13 - SPECIAL PROJECT PROCEDURES (ADD)

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

RRR. The general provisions of the Contract, including General and Supplementary Conditions apply to the Work specified in this Section.

SSS. The provisions of the Storm Water Discharge Permit normally issued by the Iowa Department of Natural Resources (IDNR) to the Marshalltown, Iowa under General Permit No. 2 shall apply to all portions of the work.

TTT. The provisions of the Temporary Dewatering Permit (if required) normally issued by the IDNR to the Contractor under General Permit 9 (GP9) covers dewatering discharges to surface waters of the state and to the ground surface. Contractor may need to file a notice of intent.

UUU. The provisions of the U. S. Army Corps of Engineers Nationwide Permit #14 Linear Transportation Projects shall apply to all portions of the work.

1.02 SCOPE

VVV. This Section identifies the special project conditions and procedures required by the above referenced permits.

WWW. The Contractor shall be responsible for implementing and conforming to all special project procedures and requirements as identified herein.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 STORM WATER DISCHARGE PERMIT REQUIREMENTS

XXX. For information regarding the requirements of the General Permit No. 2, the permit information may be found at <https://www.iowadnr.gov/Portals/idnr/uploads/water/npdes/gp2.pdf> and <https://www.iowadnr.gov/Portals/idnr/uploads/water/stormwater/guidanceno2.pdf?ver=2019-06-26-092224-590> on the Iowa Department of Natural Resources web site.

YYY. The Contractor shall prepare a Storm Water Pollution Prevention Plan as per Section 9040 and be required to complete and submit a Notice of Intent for Coverage Under General Permit No. 2.

3.02 TEMPORARY DEWATERING PERMIT REQUIREMENTS

In the event a Temporary Dewatering Permit is required, the Contractor shall be responsible for making application for the necessary permit. For information regarding the need for and requirements of a Temporary Dewatering Permit, the

information may be found at: <http://www.iowadnr.gov/LinkClick.aspx?fileticket=m-nVfGXIYP0%3d&portalid=3>

3.03 CORPS OF ENGINEERS 404 PERMIT REQUIREMENTS

U. S. Army Corps of Engineers Nationwide Permit #14 Linear Transportation Projects shall apply to all work on this project. The requirements of the permit are provided below:

ZZZ. Linear Transportation Projects. Activities required for crossings of waters of the United States associated with the construction, expansion, modification, or improvement of linear transportation projects (e.g., roads, highways, railways, trails, airport runways, and taxiways) in waters of the United States. For linear transportation projects in non-tidal waters, the discharge cannot cause the loss of greater than 1/2-acre of waters of the United States. For linear transportation projects in tidal waters, the discharge cannot cause the loss of greater than 1/3-acre of waters of the United States. Any stream channel modification, including bank stabilization, is limited to the minimum necessary to construct or protect the linear transportation project; such modifications must be in the immediate vicinity of the project.

AAAA. This NWP also authorizes temporary structures, fills, and work, including the use of temporary mats, necessary to construct the linear transportation project. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable, when temporary structures, work, and discharges, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Temporary fills must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. Temporary fills must be removed in their entirety and the affected areas returned to Pre-construction elevations. The areas affected by temporary fills must be revegetated, as appropriate.

BBBB. This NWP cannot be used to authorize non-linear features commonly associated with transportation projects, such as vehicle maintenance or storage buildings, parking lots, train stations, or aircraft hangars.

CCCC. Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity if: (1) The loss of waters of the United States exceeds 1/10-acre; or (2) there is a discharge in a special aquatic site, including wetlands. (See general condition 32.) (Authorities: Sections 10 and 404)

DDDD. Note 1: For linear transportation projects crossing a single waterbody more than one time at separate and distant locations, or multiple waterbodies at separate and distant locations, each crossing is considered a single and complete project for purposes of NWP authorization. Linear transportation projects must comply with 33 CFR 330.6(d).

EEEE. Note 2: Some discharges for the construction of farm roads or forest roads, or temporary roads for moving mining equipment, may qualify for an exemption under section 404(f) of the Clean Water Act (see 33 CFR 323.4).

FFFF. Note 3: For NWP 14 activities that require pre-construction notification, the PCN must include any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings that require Department of the Army authorization but do not require Pre-construction notification (see paragraph (b) of general condition 32). The district engineer will evaluate the PCN in accordance with Section D, "District Engineer's Decision." The district engineer may require mitigation to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see general condition 23).

PART 4 - MEASUREMENT AND PAYMENT

4.01 METHOD OF MEASUREMENT

Permits are considered incidental Work with no separate measurement to be made.

4.02 BASIS OF PAYMENT

No additional compensation shall be made for costs of applying for or complying with the provisions of any Permit, if required. All costs associated with the application for and compliance with shall be considered incidental to the project cost.

END OF SECTION

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SECTION 01 45 00 - QUALITY CONTROL (ADD)

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

GGGG. The general provisions of the Contract, including General and Supplementary Conditions shall apply to the Work covered in this Section.

HHHH. Specific requirements are also presented in the detailed sections of these specifications.

1.02 SCOPE

This Section is intended to describe the Contractor's responsibilities regarding quality control.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 TESTING LABORATORY SERVICES

IIII. The Owner/Engineer will provide field testing of concrete materials. All other testing will be the responsibility of the Contractor.

JJJJ. The Contractor shall employ and arrange for, at his expense, the services of an approved independent testing laboratory, satisfactory to the Owner and Engineer, to perform the tests or inspections utilizing recognized standard procedures and criteria.

KKKK. The Contractor shall submit reports and certificates of all inspections and tests in triplicate to the Engineer. The reports and certificates shall become the property of the Owner.

LLLL. The Contractor shall furnish all sample materials required for these tests and shall deliver same to the testing laboratory or other designated agency when and where directed by them.

MMMM. Any additional tests necessary beyond these required under this specification may be ordered by the Engineer to settle disagreements with the Contractor regarding quality of work done. If the Work is defective, the Contractor shall pay all costs of the extra tests and shall correct the Work. If Work is satisfactory, Owner will pay for extra tests.

3.02 FACTORY TESTS

NNNN. Factory tests of mechanical and electrical equipment relative to performance, capacity, rating, efficiency, function, or special requirements shall be conducted in the factory or shop for each item when this type of test is specified and/or required by the Engineer. These tests shall be performed in accordance with applicable standards and test codes.

OOOO. Factory tests shall be set up and accomplished by the equipment manufacturer who shall provide all shop space, tools, equipment, instruments, personnel, and other facilities required for the satisfactory completion of each test.

PPPP. Factory tests may be witnessed by representatives of the Owner and such witnessing, unless otherwise specified in the technical specifications, will be paid for by the Owner.

QQQQ. Where factory tests are required or specified for process equipment under other headings of this specification, reports of the test results shall be submitted to the Engineer for review prior to shipment of the equipment.

3.03 FIELD TESTS

Refer to the General Conditions, Supplementary Conditions, and the Technical Specifications.

PART 4 - MEASUREMENT AND PAYMENT

4.01 METHOD OF MEASUREMENT

Quality control is considered incidental Work with no separate measurement to be made.

4.02 BASIS OF PAYMENT

Quality control is considered incidental Work with no separate payment to be made.

END OF SECTION

SECTION 01 50 00 - TEMPORARY FACILITIES (ADD)

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The general provisions of the Contract, including General and Supplementary Conditions shall apply to the Work covered in this Section.

1.02 SCOPE

This section describes the temporary facilities to be provided by the Contractor during the Work.

1.03 PAYMENT

Refer to Section 01 20 00 - Measurement and Payment

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 TEMPORARY ELECTRICAL

It will be the Contractor's responsibility to make arrangements for, provide, obtain, and pay for temporary construction power as required for lighting and construction needs.

3.02 TEMPORARY WATER

RRRR. It will be the Contractor's responsibility to provide, obtain and pay for all water required for potable consumption and construction, flushing, testing, disinfection and other needs as may be required.

SSSS.All potable water facilities shall conform to the Federal, State, and Local health regulations.

3.03 TEMPORARY SANITARY FACILITIES

TTTT. The Contractor shall provide and maintain in a sanitary condition, suitable temporary toilet facilities on the site for use by all persons. Temporary sanitary facilities shall be removed from the site when no longer necessary.

UUUU. Each temporary toilet shall be equipped, constructed, and maintained in a manner that will conform to the applicable Federal, State and local regulations and requirements.

VVVV.Provisions for routinely servicing and cleaning all toilets and disposing of the sewage shall be established before placing toilet facilities into operation. The method of sewage disposal and location selected shall be in accordance with Federal, State, and Local health regulations.

3.04 ROADS

WWWW. Each Contractor shall maintain the existing roads in usable condition during his construction of the facilities.

XXXX. The Contractor shall obtain the approval of the appropriate township, county, state, or federal officials prior to constructing any temporary roads. All construction shall conform to the requirements of said officials.

3.05 SIGNS

No signs, billboards, or other advertisements shall be erected on the premises by the General Contractor or the subcontractors without Engineer's permission. Each General Contractor shall furnish and maintain all necessary temporary signs required for the prosecution of the Work such as "Office," "Men," "Danger," "High Voltage," etc.

3.06 TEMPORARY ENCLOSURES, LIGHTING, AND HEAT

YYYY. Each Contractor shall provide temporary enclosures and closures in order to retain heat so that specified temperatures can be maintained and the Work can proceed. He shall provide temporary closures over wall and floor openings, etc., to enclose the Work. Temperature inside the enclosures and/or enclosed part or parts of the structure shall be; not less than 60 degrees F for 48 hours prior to and during the time when and where concrete work, cement finish, or masonry work are being done or cured; not less than 50 degrees F where only other trades, such as electricians, plumbers, etc., are working.

ZZZZ. Each contractor shall pay for any additional temporary heating facilities necessary to meet the above requirements, and the fuel, and the attendance required, until the structure is enclosed.

AAAAA. Each Contractor shall provide all temporary lighting as may be required to illuminate the Work area.

BBBBB. The lighting shall meet all safety codes and regulations. Lighting shall be not less than 20-foot candles. Additional light shall be installed for hazardous areas, for security applications, and for construction processes where visual acuity is required.

CCCCC. All temporary lighting and power shall use UL approved devices and all systems shall meet safety requirements of the National Electrical Code and other applicable ordinances.

3.07 TEMPORARY FENCES/GATES

DDDDD. The Contractor shall be required to utilize all existing gates and fence openings so far as practical during the construction process.

EEEE. All existing fences, which interfere with the Work, shall be maintained by the Contractor unless permission is obtained in writing from the tenant to dismantle the fence for any agreed period of time. Where temporary gates are required, they shall be kept closed at all times.

FFFFF. On completion of the Work across any tract of land, the Contractor shall restore all fences to their original or to a better condition and quality as approved by the Owner and the tenant. New material to replace all materials lost, damaged, or destroyed shall be purchased and installed as required.

GGGGG. Temporary gates installed by the Contractor in any fence line may be left in place with the permission of the Owner and tenant of such fence.

HHHHH. All gates shall be left in the condition found, open or closed. If any doubt arises, gates shall be closed.

IIIII. All loss of livestock due to negligence shall be the responsibility of the contractor.

3.08 TEMPORARY OPERATIONS

When it becomes necessary to utilize temporary pumping or other mechanical arrangements during construction, the Contractor shall provide qualified supervision at the plant site at all times. The Contractor shall be fully responsible for the operation and maintenance of all temporary equipment and all associated costs shall be included in the prices bid.

3.09 SITE CLEANUP

JJJJJ. Each Contractor shall clean the working area each day, shall remove all trash and waste materials, and shall maintain the site in a neat and orderly condition throughout the construction period.

KKKKK. At the completion of the project, each Contractor shall clean out all pits, pipes, chambers, or conduits; shall remove all temporary structures built by him; and shall remove all rubbish from the areas which he has occupied, leaving them in a clean condition.

PART 4 -MEASUREMENT AND PAYMENT

4.01 METHOD OF MEASUREMENT

LLLLL. Quality control is considered incidental Work with no separate measurement to be made.

MMMMM. Refer to Section 01 52 13 - Field Offices and Sheds

4.02 BASIS OF PAYMENT

Quality control is considered incidental Work with no separate payment to be made.

END OF SECTION

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SECTION 01 57 00 - TEMPORARY CONTROLS (ADD)

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The general provisions of the Contract, including General and Supplementary Conditions shall apply to the Work covered on this Section.

1.02 SCOPE

This section is intended to describe the temporary controls to be provided by the Contractor.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 GENERAL

The Contractor shall be responsible for maintaining the site and environment at an acceptable standard throughout the duration of the project.

3.02 NOISE CONTROL

Each Contractor shall maintain all equipment, particularly the muffling systems on internal combustion engines, so that acceptable noise levels are not exceeded. Each Contractor shall make every effort to locate noise-producing equipment in areas where the sound will be least offensive. Sound barriers are to be provided if needed.

3.03 DUST CONTROL

Each Contractor will provide dust control operations at the time, location, and in such manner that will prevent, or at least minimize, the production of dust in a harmful or annoying amount. Water or dust preventative shall be used for dust control as required.

3.04 WATER CONTROL

NNNNN. Each Contractor shall make the appropriate provisions for the proper drainage of the site. Standing pools of surface water and excavations shall be drained as soon as practical. Disposal of said water shall be in accordance with all applicable local, state, and federal laws and regulations.

OOOOO. Flushing water or water pumped from dewatering of various elements of the Work which may be necessary during construction shall be conducted by temporary pipelines or wood or metal flumes away from the work area to natural drainageways. Flushing or drainage shall not be conducted in such a manner as to cause erosion or flooding of adjacent land not owned or controlled by the Owner, except by special permission in writing by the Owner and affected land owner.

PPPPP. The Contractor shall assure that water discharged to any location during construction does not damage the natural environment or wildlife. The Contractor shall be responsible for any environmental damage which results from his activities.

3.05 EROSION AND SEDIMENT CONTROL - See Section 9040.

PART 4 - MEASUREMENT AND PAYMENT

4.01 METHOD OF MEASUREMENT

QQQQQ. Temporary controls are considered incidental Work with no separate measurement to be made.

RRRRR. See Section 9040 for Erosion Control.

4.02 BASIS OF PAYMENT

SSSSS. Temporary controls are considered incidental Work with no separate payment to be made.

TTTTT. See Section 9040 for Erosion Control.

END OF SECTION

SECTION 01 77 00 - CLOSEOUT PROCEDURES (ADD)

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

The general provisions of the Contract, including General and Supplementary Conditions shall apply to the Work covered in this Section.

1.02 SCOPE

This Section is intended to describe the procedures and Contractor's responsibilities for substantial and final completion of the Work and final closeout of the Project.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 CLEANUP

UUUUU. The requirements shall conform to the General Conditions and as supplemented herein.

VVVVV. The Contractor shall leave the site clean and ready for occupancy by the Owner. Early acceptance of process equipment shall not waive cleanup prior to final acceptance.

WWWWW. Flushing water or water pumped from dewatering of various elements of the Work which may be necessary during construction shall be conducted by temporary pipelines or wood or metal flumes away from the work area to natural drainage ways. Flushing or drainage shall not be conducted in such a manner as to cause erosion or flooding of adjacent land not owned or controlled by the Owner, except by special permission in writing by the Owner and affected landowner.

XXXXX. The Contractor shall assure that water discharged to any location during construction does not damage the natural environment or wildlife. The Contractor shall be responsible for any environmental damage that results from his activities.

YYYYY. Each Contractor shall provide cleaning of all surfaces, systems, and fixtures, including removal of labels, tags, grease, oil, dirt stains, etc., prior to final acceptance of the work.

3.02 PROJECT RECORDS

ZZZZZ. All documents shall be filed in a neat, orderly manner, which allows ready access and inspection.

AAAAA. All documents shall be available to Engineer and shall be delivered to him for the Owner upon completion of the project. Quality and completeness of all drawings and records must be such that the Engineer may accurately transfer the information to a complete set of drawings of construction records.

3.03 FINAL INSPECTION

BBBBBB. After the cleaning up of the work, premises, manholes, and all other areas and structures connected with the performance of the contract, the work as a whole shall be inspected by the Engineer, and any workmanship or materials found not meeting the requirements of the specifications shall be removed by and at the expense of the Contractor and good and satisfactory workmanship or material substituted therefore. All settlement, defects, or damage upon any part of the work shall be remedied and made good by the Contractor.

CCCCCC. The Contractor shall submit written requests to the Owner for final inspections for all or any portion of the Project if acceptable to the Owner.

DDDDDD. The final inspection shall be scheduled at times such that the Engineer, Contractor, Owner, representatives of all applicable governing agencies and the Resident Project Representative shall have an opportunity to be in attendance.

EEEEEE. Any costs and expenses incurred by the Engineer or Resident Project Representative in conducting additional inspections due to the Contractor's knowingly misrepresenting the project or any portion thereof as being ready for final inspection shall be compensated for by the Contractor prior to final payment.

FFFFFF. Any deficiencies identified after the final inspection and acceptance, such as backfill settlement, shall be considered after the fact and shall be recognized as maintenance under the Contractor's maintenance requirements.

GGGGGG. Refer also to the General Conditions and Supplementary Conditions for the procedures covering requests for final inspection, application for payments, etc.

3.04 GUARANTEE

HHHHHH. Refer to the Contract Documents, General Conditions, and Supplementary Conditions.

IIIIII. Guarantee on equipment placed into operation prior to final acceptance shall start from the date of written acceptance by the Engineer and Owner.

JJJJJJ. The Contractor shall be responsible for any and all damage claims filed with or court actions brought against the Owner for an on account of any damage(s) directly or indirectly caused by said backfill settlement or erosion.

KKKKKK. The Contractor shall make or cause to be made all necessary backfill replacement and repairs or replacement appurtenant thereto, within seven (7) days from and after due notification by the Owner or Engineer of backfill settlement or erosion and resulting damage at any designated location(s). Such replacements and repairs shall be made immediately upon due notification by the Engineer or Owner if the settlement or erosion is of a nature to endanger life or property.

LLLLLL. It is understood the repairs, due to faulty workmanship or materials, shall be covered by the Performance and Maintenance Bond. However, a break in the pipeline shall be deemed an emergency and must be repaired immediately. The

Contractor, prior to leaving the project, shall have an understanding and agreement by signed letter or appropriate entry in the Owner's minutes as to the procedure for making said emergency repairs and notification to the Contractor.

3.05 LIENS

MMMMMM. Refer to the General Conditions, Supplementary Conditions, and Specific Project Requirements.

NNNNNN. Neither the final payment nor any part of the retained percentage shall become due until the Contractor shall deliver to the Owner a complete release of all liens arising out of this Contract, or receipts in lieu thereof; and, if required in either case, an affidavit that so far as he has knowledge or information, the releases and receipts include all the labor and materials for which a lien can be filed. But Contractor may, if any subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the Owner to indemnify the Owner against any claim by lien or otherwise. If any lien and/or claim remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all moneys that the latter may be compelled to pay in discharging such lien and/or claim, including all costs and attorney's fees.

PART 4 - MEASUREMENT AND PAYMENT

4.01 METHOD OF MEASUREMENT

All costs incurred by the contractor for the execution of the Work specified herein are considered incidental Work with no separate measurement made.

4.02 BASIS OF PAYMENT

All costs incurred by the contractor for the execution of the Work specified herein are considered incidental Work with no separate payment made.

END OF SECTION

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SUPPLEMENTAL DIVISION 2 - EARTHWORK

DIVISION 2010 – EARTHWORK, SUBGRADE, AND SUBBASE SPECIAL PROVISIONS

PART 1 - GENERAL

1.03 through 1.07: (DELETE): Comply with Division 1 - General Provisions and Covenants (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

PART 2 - MATERIALS

2.04 FOUNDATION MATERIALS

5. Geogrid:

- a. (DELETE) **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.

- c. (ADD) Triangular geogrid shall be required on all streets and roadways. Geogrid shall be TriAx® TX140 Geogrid or approved equal.

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SUPPLEMENTAL DIVISION 3 - TRENCH AND TRENCHLESS CONSTRUCTION

SECTION 3010 - TRENCH EXCAVATION AND BACKFILL

PART 1 - GENERAL

1.03 through 1.06: (DELETE): Comply with Division 1 - General Provisions and Covenants (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

PART 3 – EXECUTION

3.06 (REVISE) PIPE BEDDING AND BACKFILL SEE DIVISION 4

SECTION 3020 - TRENCHLESS CONSTRUCTION (BORING, JACKING, AND TUNNELING)

PART 1 - GENERAL

1.03 through 1.06: (DELETE): Comply with Division 1 - General Provisions and Covenants (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

PART 2 – PRODUCTS

2.01 CARRIER PIPE

A. Carrier Pipe Installed within Casing Pipe:

- 1. Sanitary Sewer Gravity Main: (DELETE) Comply with Section 4010, 2.01.**
 - a. (ADD) All gravity piping installed in an encasement pipe or installed by boring shall be restrained joint pipe.
 - b. (ADD) Pipe and couplings shall be made from unplasticized PVC compounds meeting ASTM D2241 and have a minimum cell classification of 12454, as defined in ASTM D1784. Pipe joints shall meet the standards of ASTM D3212 and have elastomeric gaskets conforming to ASTM F477.
 - c. (ADD) Nominal outside diameters and wall thicknesses of thrust-restrained pipe shall conform to the requirements of ASTM D2241, SDR 21 pipe. Pipe shall be furnished in standard lengths of 10 or 20 feet. All pipe shall be marked with the following: Nominal pipe size, material code designation, DR, pressure rating, manufacturer's name or trademark, NSF seal and ASTM numbers.
 - d. (ADD) Pipe shall be joined:

- 1) (ADD) Using non-metallic couplings to form an integral system for maximum reliability and interchangeability. High-strength, flexible thermoplastic splines shall be inserted into mating, precision machined grooves in the pipe and coupling to provide full 360° restraint with evenly distributed loading.
- 2) (ADD) Push-Together restraint system with internal steel locking ring providing uniform circumferential contact.
- e. (ADD) Pre-Approved piping includes Certa-Flo® PVC Gravity Sewer Pipe with Certa-Lok® Restrained Joints, and Integral Bell; or Engineer approved equal.

2. Sanitary Sewer Force Main:

- b. Restrained Joint PVC Pipe: (DELETE) ~~Comply with Section 4010, 2.02.~~
 - 1) (ADD) All pressure piping installed in encasement pipe or installed by boring shall be restrained joint pipe.
 - 2) (ADD) Pipe and couplings shall be made from unplasticized PVC compounds having a minimum cell classification of 12454-B, as defined in ASTM D1784. The compound shall qualify for a Hydrostatic Design Basis (HDB) of 4000 psi for water at 73.4°F, in accordance with the requirements of ASTM D2837.
 - 3) (ADD) Nominal outside diameters and wall thicknesses of thrust-restrained pipe shall conform to the requirements of AWWA C900, DR18 pipe. Pipe shall be furnished in standard lengths of 20 feet. All pipe shall be marked with the following: Nominal pipe size, material code designation, DR, pressure rating, manufacturer's name or trademark, NSF seal and ASTM numbers.
 - 4) (ADD) Pipe shall be joined:
 - a) (ADD) Using non-metallic couplings to form an integral system for maximum reliability and interchangeability. High-strength, flexible thermoplastic splines shall be inserted into mating, precision machined grooves in the pipe and coupling to provide full 360° restraint with evenly distributed loading.
 - b) (ADD) Push-Together restraint system with internal steel locking ring providing uniform circumferential contact.
 - 7) (ADD) Couplings shall be designed for use at or above the rated pressures of the pipe with which they are utilized and shall incorporate twin elastomeric sealing gaskets meeting the requirements of ASTM F477. Joints shall be designed to meet the leakage test requirements of ASTM D3139.
 - 8) (ADD) Pre-Approved restrained joint piping is: Certa-Lok C900/RJ, C905/RJ piping; Diamond Lok-21; Eagle Loc900; or Engineer approved equal.

5. (DELETE) ~~Water Main:~~

- a. (DELETE) ~~Restrained Joint Ductile Iron Pipe: Comply with Section 5010, 2.01.~~
- b. (DELETE) ~~Restrained Joint PVC Pipe: Comply with Section 5010, 2.01.~~

B. Carrier Pipe Installed without a Casing Pipe:

1. Sanitary Sewer Gravity Main:

- b. (DELETE) ~~Vitrified Clay Pipe: Comply with Section 4010, 2.01.~~
- d. Restrained Joint PVC Pipe: Comply with (DELETE) Section 4010, 2.02 (ADD) 2.01.

2. Sanitary Sewer Force Main:

- b. Restrained Joint PVC Pipe: Comply with (DELETE) Section 4010, 2.02 (ADD) 2.01.

4. (DELETE) ~~Water Main:~~

- a. (DELETE) ~~Restrained Joint Ductile Iron Pipe: Comply with Section 5010, 2.01.~~
- b. (DELETE) ~~Restrained Joint PVC Pipe: Comply with Section 5010, 2.01.~~

2.02 CASING PIPE

D. (ADD) PVC Encasement Pipe:

- 1. (ADD) Meet the requirements of 2.02 for force main C900, DR 18 rated pipe.
- 2. (ADD) PVC encasement pipe shall be furnished with gasket joints conforming to ASTM D3139. Rubber gaskets shall conform to the requirement of ASTM F477.
- 3. (ADD) Minimum inside diameter as specified in the contract documents. If diameter is not specified, use a minimum inside casing diameter of at least 4 inches greater than the largest outside diameter of the carrier pipe, including pipe bells.

2.03 CASING SPACERS

- C. (ADD) Casing spacers will be required on all gravity sewer piping and on force main piping where encasement piping exceeds 20 feet in length.

2.06 CASING END SEAL

- C. (ADD) Casing end seals are required on all encasement pipes.

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SUPPLEMENTAL DIVISION 4 - SEWERS AND DRAINS

SECTION 4010 - SANITARY SEWERS

PART 1 - GENERAL

1.03 through 1.06: (DELETE): Comply with Division 1 - General Provisions and Covenants (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

1.08 MEASUREMENT AND PAYMENT

M. (ADD) Ductile Iron Fittings and Restraining Devices:

- 1. Measurement:** Each fitting and/or restraining device installed, including gaskets and fasteners, will be counted.
- 2. Payment:** Payment will be made at the unit price for each fitting and/or restraining device installed.

1.09 (ADD) ACCEPTANCE CHECKLIST & MAINTENANCE BOND

Prior to final acceptance of the work, the contractor shall file with the City Clerk of the City of Marshalltown a maintenance bond guaranteeing suitable repairs of any defects or failures due to deficiencies in materials or inadequacies in workmanship for a period of 4 years for all improvements following completion of construction. The bond shall be for a sum equal to the total amount of the project. The contractor shall also file with the City Engineer all other required acceptance checklist items including testing/inspection forms, lateral construction forms, as-built drawings, construction costs and engineering certificate of completion forms. The acceptance checklist and warranty bond form are provided at end of section.

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, ~~(DELETE) unless SDR 35 is specified.~~
2. Pipe stiffness per ASTM D 2412.
 - b. ~~(DELETE) SDR 35: Minimum pipe stiffness of 46 psi.~~

C. Corrugated Polyvinyl Chloride Pipe (PVC) 8 inch to 36 inch:

5. (ADD) This pipe shall not be used without prior approval by Engineer.

D. Closed Profile Polyvinyl Chloride Pipe (PVC) 21 inch to 36 inch:

5. (ADD) This pipe shall not be used without prior approval by Engineer.

E. Polyvinyl Chloride Composite Pipe (truss type PVC) 8 inch to 15 inch:

5. (ADD) This pipe shall not be used without prior approval by Engineer.

F. Reinforced Concrete Pipe (RCP) 18 inch to 144 inch:

3. (ADD) This pipe shall not be used without prior approval by Engineer.

H. Vitrified Clay Pipe (VCP) 8 inch to 42 inch:

4. (ADD) This pipe shall not be used without prior approval by Engineer.

I. Double Walled Polypropylene Pipe 12 inch to 30 inch:

4. (ADD) This pipe shall not be used without prior approval by Engineer.

J. Triple Walled Polypropylene Pipe 30 inch to 36 inch:

4. (ADD) This pipe shall not be used without prior approval by Engineer.

2.02 SANITARY SEWER FORCE MAINS

A. Ductile Iron Pipe (DIP) 4 inch to 54 inch: Comply with the DIP requirements in Section 4010, 2.01. (DELETE) ~~If joint restraints are specified, comply with Section 5010, 2.03.~~

B. Polyvinyl Chloride Pipe (PVC): (DELETE) ~~Comply with the requirements in Section 5010, 2.01 for PVC pipe.~~ Provide restrained joints when specified.

1. (ADD) Polyvinyl chloride pipe 4-inches to 24-inches shall be C 900, DR 18 rated pipe.
2. (ADD) Polyvinyl chloride pipe 2-inches to 3-inches shall be pressure Class 200, SDR 21 rated pipe.
3. (ADD) The pipe shall be made from Type 1, Grade 1, Class 12454-B compounds conforming to ASTM D 1784 with a hydrostatic design basis (HDB) of 4,000 psi as per ASTM D 2837.
4. (ADD) All pipe shall be marked with the following: Nominal pipe size, material code designation, DR, pressure rating, manufacturer's name or trademark, NSF seal and ASTM numbers. All sanitary sewer force main pipes shall be installed with a locating tape to distinguish force main sewer from potable water.
5. (ADD) The PVC pipe shall be furnished in 20-foot laying lengths. Longer lengths will be allowed only if the Contractor certifies that he will provide equipment on the project to fully support the pipe while being transported and distributed over the project.
6. (ADD) All PVC pipe shall be furnished with gasket joints conforming to ASTM D 3139. Rubber gaskets shall conform to the requirement of ASTM F 477.
7. (ADD) The ends of the pipe to be inserted into couplings or joints shall be factory marked to allow field checking of the depth of setting of the pipe in the joint socket.

C. Sewage Air Release Valve: (ADD) See Part 2.07.

1. (DELETE) ~~**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. (DELETE) Materials:

a. (DELETE) Body and Cover:

- 1) (DELETE) Stainless Steel: ASTM A 351.
- 2) (DELETE) Cast Iron: ASTM A 126, Grade B.
- 3) (DELETE) Ductile Iron: ASTM A 536, Grade 65-45-12. 4) Other corrosion resistant materials.

b. (DELETE) Internal Metal Components: Stainless steel.

c. (DELETE) Float: Stainless steel, ASTM A 240, Type 304 or Type 316, or foamed polypropylene.

d. (DELETE) Seal Plug Assembly: Stainless steel, foamed polypropylene, EPDM rubber, Nitrile (Buna-N) rubber, and reinforced nylon.

3. (DELETE) Tapping Saddle: Stainless steel or nylon.

4. (DELETE) Pit: Construct according to Figure 4010.202.

D. Tracer Wire: (DELETE) Comply with Section 5010, 2.05. (RETAIN) Tracer wire will be required on all force mains (ADD) and sewer services extending from the main to the property line.

1. (ADD) Tracer wire shall be 12-gauge solid copper or high strength stainless steel wire with a 45-mil polyethylene coating. Provide sufficient length to be continuous over each separate run of nonmetallic pipe.
2. (ADD) The splice kit shall be an 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.
3. (ADD) The ground rods shall be a 3/8 inch diameter, 60 inch steel rod uniformly coated with metallically bonded electrolytic copper.
4. (ADD) Wire shall be connected with a high-strength, corrosion-resistant copper alloy ground rod clamp.

E. Tracer Wire Station:

1. (DELETE) Two internal terminals with shunt.
2. (DELETE) Five to six foot plastic post (color as specified by the Jurisdiction).
3. (DELETE) Removable top cap with lock.

4. (DELETE) ~~Decals indicating "Sewer Force Main" or similar language.~~
1. (ADD) All tracer wires are to be connected to a cast iron or ABS/PVC tamper proof tracer wire access box. The cover is to be manufactured of cast iron and ABS/PVC components produced in the USA. Cast iron collar & cover is to be manufactured in accordance with ASTM A48 Class 25. The ABS is to be manufactured in accordance with ASTM D1788. The cover shall be lettered "Sewer" and shall have a standard AWWA size cast-in pentagonal bolt. Box will be a minimum of 3 inches in diameter.
2. (ADD) Tracer Wire Access Box shall be Valvco Pipe Tracer Wire Terminal Box or Engineer approved equal.

2.04 SANITARY SEWER SERVICE

E. Service Pipe: Use products as required by local plumbing code or regulations, if applicable. Otherwise, use the following:

1. PVC:
 - b. PVC plastic meeting ASTM D 1784, Cell Classification 12454. (ADD) (Rigid PVC or CPVC).

2.06 SANITARY SEWER CLEANOUT

A. Comply with (DELETE) ~~Figure 4010.203~~ (ADD) MP-4.

2.07 (ADD) AIR RELEASE AND COMBINATION VALVES

A. Sewage Air Release Valves:

1. Sewage Air Release Valves shall release accumulated air (gases) from the system while it is under pressure and operating. The valve's design will enable the separation of the liquid from the sealing mechanism and assures optimum working conditions.
2. The valve shall incorporate an air-gap separation between the sewage and sealing mechanism. This will be obtained by a single float. The valve will operate with working pressures of 0.2 – 10 bar. The valve shall withstand 230-psi test.
3. All internals shall be easily removed without removing the main valve from the lines.
4. The valve inlet shall be 2 inch N.P.T. All fittings to connect to force main shall be brass or stainless steel. A two (2) inch ball valve will be installed below the valve to allow for removal of valve without shutting down the system. Ball valve will be brass or stainless steel.
5. The body shall be Reinforced Nylon Composite, Cast Iron, Steel or Stainless Steel. Cast iron and steel valves shall be coated with a fusion bonded epoxy.
6. Internal metal materials shall be stainless steel. Float shall be a foamed polypropylene material.
7. The sewage air release valve shall be as manufactured by A.R.I. Flow Control

Accessories Models S-025 or S-020 or Engineer approved equal.

B. Combination Valves

1. Combination Valves shall have three components:
 - a. Air & vacuum component discharges large volumes of air during filling of the system.
 - b. Air & vacuum component admits large volumes of air during drainage and at water column separation.
 - c. The air release component releases entrapped air in pressurized systems.
2. The valve's design will enable the separation of the liquid from the sealing mechanism and assures optimum working conditions.
3. The valve shall incorporate an air-gap separation between the sewage and sealing mechanism. This will be obtained by a single float. The valve will operate with working pressures of 0.5 – 10 bar. Valves with working pressures lower than 0.5 bar and higher than 10 bar will be allowed. The valve shall withstand a minimum 215-psi test.
4. All internals shall be easily removed without removing the main valve from the lines.
5. The valve inlet shall be 2 inch N.P.T. All fittings to connect to force main shall be brass or stainless steel. A two (2) inch ball valve will be installed below the valve to allow for removal of valve without shutting down the system. Ball valve will be brass or stainless steel.
6. The body shall be Reinforced Nylon Composite, Cast Iron, Steel or Stainless Steel. Cast iron and steel valves shall be coated with a fusion bonded epoxy.
7. Internal metal materials shall be stainless steel. Float shall be a foamed polypropylene material.
8. The combination valve shall be as manufactured by A.R.I. Flow Control Models D-025, D-025L, D-26 or Engineer approved equal.

C. Tapping Saddle:

1. The body shall be made of high strength ductile iron per ASTM A536.
2. The clamping band shall be a double wide band with 5/8" UNC threaded bolts of 18-8 type 304 stainless steel with stainless steel spring tension washers under the nuts.
3. The gasket shall be EPDM rubber per ASTM-D2000.
4. The finish on saddle body shall be fusion bonded epoxy coating approximately 12 mils thick.
5. Pre-Approved saddles are as manufactured by: Ford Meter Box Co., style FC202; JCM Industries, Inc., Model No. 406; Mueller Company, DR 2; Style 202NS as manufactured by Romac Industries; or Engineer approved equal.

D. Construct Air Release/Combination Valve manhole in accordance with MP-3 details.

2.08 (ADD) GRAVITY PVC PIPE FITTINGS

A. Repair couplers, tees, wyes, and bends for Polyvinyl Chloride (PVC) gravity pipe fittings shall be manufactured from the same material as piping.

B. Gaskets for elastomeric joints shall conform to the requirements of ASTM F477.

C. Solvent Cement for solvent weld joints shall conform to the requirements of ASTM Specification D2564 and shall be applied in conformance with ASTM D2855. Solvent weld joints will be allowed on PVC cleanout risers only.

D. Sewer "Wyes" for service connections on new sewer piping shall be in-line sewer wyes. Saddle wyes will not be permitted for use without permission from Engineer.

E. Sewer "Wyes" for existing piping connections shall be: Romac "CB" Sewer Saddle by Romac Industries Inc.; Inserta-Tee by Fowler Manufacturing Co.; or Engineer approved equal.

2.09 (ADD) TRANSITION COUPLINGS (GRAVITY PIPING)

A. Gasket:

1. Manufactured to meet the material requirements of:

a. CSA B602 - mechanical couplings for drain, waste, vent pipe and sewer pipe

b. ASTM D5926 - Standard Specification for Poly Vinyl Chloride (PVC) Gaskets for Drain, Waste, and Vent (DWV), Sewer, Sanitary, and Storm Plumbing Systems

c. ASTM C1173 - Standard Specification for Flexible Transition Couplings for Underground Piping Systems

B. Clamps

1. Manufactured to the requirements of CSA B602

2. Clamp Housing 301 Stainless Steel

3. Clamp Band 301 Stainless Steel

4. Clamp Screw 305 Stainless Steel

5. Installation Torque 60 in-lbs

C. Shear Ring

1. 0.012" Thick, 300 Series Stainless Steel

2. Width manufactured according to coupling width (1.50", 2.13", or 4")

3. Length manufactured according to coupling diameter

4. Clamps spot welded in place

D. Coupling

1. Manufactured to conform to the performance requirements of:

- a. ASTM C1173 - standard specification for flexible transition couplings for underground piping systems
- b. CSA B602 - mechanical couplings for drain, waste, vent pipe and sewer pipe
- c. Maximum test pressure: 4.3 PSI (29.6KPA)
- d. Maximum operating temperature: 140° F non-consistent

E. (ADD) Pre-Approved transition couplers are Strong Back RC Series Repair Couplings manufactured by Fernco Inc. or Engineer approved equal.

2.10 (ADD) FITTINGS FOR PVC FORCE MAIN PIPE

A. All fitting shall be same materials as pipe supplied.

B. Repair couplers and gaskets shall be pressure rated same as piping and meet the following specifications, standards and approvals:

- 1. NSF Standards 14 & 61
- 2. ASTM D1784 materials
- 3. ASTM D3139 joints
- 4. DR 18 dimensions and pressure ratings per ASTM D2241 for C900 Pipe
- 5. SDR 21 dimensions and pressure ratings per ASTM D2241 for pressure class 200 pipe
- 6. ASTM F477 gaskets

C. All other fittings for use on four (4) inches and larger PVC pipe will be ductile iron fittings conforming to the requirements of paragraph 2.01 above, with the exception of transition couplers as specified in paragraph 2.11.

D. Fittings for use on 3" or smaller PVC pipe shall be gasket PVC push-on style fittings conforming to ASTM D2241, ASTM F477, and ASTM D3139. Fittings shall be made to the same quality as the piping furnished.

2.11 (ADD) TRANSITION COUPLINGS FOR FORCE MAIN PIPING

A. The couplings used for transitions between piping of different materials shall be a wide-range flexible coupler with a sleeve type design meeting the requirements of AWWA C219.

- 1. The coupling body shall be a center sleeve fabricated of high strength carbon steel tubing equivalent to ANSI/AWWA C200. The transition couplers will be readily available in nominal diameter ranges from 1.5 to 24 inches on all pipe classes.
- 2. Compression End Rings: One gasket compression end ring per coupling end. End rings to be of either one or two bolt designs, fabricated of carbon steel

- equivalent to ASTM A576. (One bolt per end in Nominal Size ranges of 2 to 12 inches and two bolts per end on the 16 to 24-inch nominal diameter coupling.)
3. Hydraulic Wide Range Gasket: Chloramine Resistant NSF-61 approved EPDM gasket designed with a multi-layered wide range removable outer layer. Gasket hydraulically actuated with a pressure-equalizing dam, pressure cavity and sealing lip for working pressure of 260 psi (1.5 to 16 inches) and 232 psi (18 to 24-inch nominal diameter coupling).
 4. Fasteners shall be grade 304 (A2) or 316 (A4) stainless steel with yield strengths that conform to all nationally recognized standards. Bolts to be coated with an anti-seize type coating to prevent galling.
 5. The interior and exterior coatings shall NSF-61 approved fusion bonded epoxy coating conforming to AWWA C213.
 6. When properly installed the coupling will provide a minimum deflection of 8 degrees, up to 260 psi working pressure and 3/8-inch longitudinal pipe movement without leakage. (Flanged adapters will provide half the longitudinal movement and deflection.)
 7. All products will be proof tested to a minimum of 1.5 times working pressure.
- B. Flanged couplers shall consist of one compression end and gasket, coupling center sleeve, and AWWA Class "D" Flange (per AWWA C207).
- C. Pre-Approved transition couplers are: Hymax-2000 Series wide range coupling; Hymax-2100 Series wide range flanged coupling adapter; "Macro" extended range coupling by Romac Industries, Inc.; or Engineer approved equal.

2.12 (ADD) FASTENERS

All fasteners in buried locations shall be Grade 304 (A2) or Grade 316 (A4) stainless steel. Anti-Seize shall be applied to all threads prior to installation.

2.13 (ADD) LUBRICANT FOR GASKETED PIPE

Lubricant shall be an emulsified polymer-based product, specifically formulated to be water-soluble without causing turbidity. Lubricant shall not transfer taste and/or odor to new water main installations. Lubricant must not promote bacterial growth and be safe for use on all metal and plastic pipes. Lubricant shall be easily flushed from the line and be non-reactive to chlorinated water. Lubricant should work easily on both wet and dry surfaces.

2.14 (ADD) POLYETHYLENE WRAP

All ductile fittings shall be wrapped with polyethylene plastic film having a minimum thickness of 0.008 inches or with a cross woven polyethylene plastic film having a minimum thickness of 0.004 inches.

2.15 (ADD) RESTRAINING DEVICES

- A. Restraint devices for use on ductile iron and C-900 PVC "push-on" joints shall be constructed of high strength ductile iron, ASTM A536, Grade 65-45-12 and shall

incorporate machined serrations on the inside diameter to provide positive restraint, exact fit, and support of the pipe in an even and uniform manner. Bolts and connecting hardware shall be 304 (A2) or 316 (A4) Stainless Steel. All devices shall have a safety factor of no less than 2:1 at the full rated pressure of the pipe on which it is installed. They shall be UL listed and Factory Mutual approved. Pre-Approved restraining devices are: Uni-Flange Block Buster Series 1390-C; Star Pipe Products Allgrip series 3600 and Pipe Restrainers Series 1200S; EBAA Iron, Inc. Mega-Lug Series 1700; or Engineer approved equal.

B. Restraint devices for use on mechanical joint to C-900 PVC, shall be constructed of high strength ductile iron, conforming to the requirements of ASTM A536, Grade 65-45-12, and shall incorporate machined serrations on the inside diameter to provide positive restraint, exact fit, and support of the pipe in an even and uniform manner. Bolts and connecting hardware shall be 304 (A2) or 316 (A4) Stainless Steel. All devices shall have a safety factor of no less than 2:1 at the full rated pressure of the pipe on which it is installed. They shall be UL listed and Factory Mutual approved. Pre-Approved restraining devices are: Uni-Flange Series 1500; Star Pipe Products, Allgrip Series 3600; Romac Industries, Inc. GripRing; Romac Industries, Inc. RomaGrip; EBAA Iron, Inc. Mega-Lug Series 2000; or Engineer approved equal.

C. Restraint devices for use on mechanical joint ductile iron, shall be constructed of high strength ductile iron, conforming to the requirements of ASTM A536, Grade 65-45-12, and shall incorporate machined serrations on the inside diameter to provide positive restraint, exact fit, and support of the pipe in an even and uniform manner. Bolts and connecting hardware shall be 304 (A2) or 316 (A4) Stainless Steel. All devices shall have a safety factor of no less than 2:1 at the full rated pressure of the pipe on which it is installed. They shall be UL listed and Factory Mutual approved. Pre-Approved restraining devices are: Uni-Flange Series 1300-C; Star Pipe Products, Allgrip Series 3600; Romac Industries, Inc. GripRing; EBAA Iron, Inc. Mega-Lug Series 1100; or Engineer approved equal.

2.16 (ADD) GATE VALVES

A. Gate valves shall be resilient wedge type manufactured to meet all applicable requirements of AWWA Standard for Resilient Seated Gate Valve C509 or C515.

B. All valves shall have non rising stems, opening by turning left and provided with standard 2-inch square nut operator (hand-wheel operator in manholes) with arrow cast in metal to indicate direction of opening.

C. Cast iron wedge shall have sealing surfaces of the wedge permanently bonded with resilient material to meet ASTM tests for rubber to metal bond ASTM D429. Each valve shall have a smooth unobstructed waterway free from any sediment pockets. Stuffing boxes shall be O Ring seal type with 2 rings located in stem above thrust collar. Low friction torque reduction thrust bearings shall be located both above and below the stem collar.

D. Body and cover bolts and nuts shall be Grade 304 (A2) or 316 (A4) stainless steel. Anti-Seize shall be applied to all threads prior to installation.

- E. Exterior and interior coatings in accordance with ANSI/AWWA C550 for potable water.
- F. Non rising stems shall be in full compliance with AWWA specification with cast integral stem collar and furnished of bronze conforming to ASTM B584 Alloy A. Stem nuts shall be independent of wedge and shall be made of solid bronze conforming to ASTM B62.
- G. Valves shall have hydrostatic shell test of 400 psi and shut-off test of 200 psi. At the 200-psi shut-off test, valve must be bubble tight with a zero (0) leakage allowance.
- H. Resilient wedge gate valves shall be the product of a manufacturer having a minimum of five (5) years' experience in the manufacture of water works and distribution valves.
- I. Pre-Approved resilient wedge gate valves are as manufactured by: American Darling Valve Co.; Mueller Company; Clow Valve Division; American AVK Company; or Engineer approved equal.

2.17 (ADD) VALVE BOXES

- A. Valve boxes shall be cast iron, 5 1/4" inside diameter, adjustable valve boxes of the screw type with sufficient length for the pipe bury as shown. Where the valve box is shown or required on control manholes, the length shall be sufficient to penetrate the valve marker and the Type II reinforced manhole cover. The cast iron cover of the valve box shall have an arrow indicating the direction of opening.
- B. Covers for sewer piping shall have the word "SEWER" cast on the top.
- C. Pre-Approved valve boxes and covers are as manufactured by: Tyler Pipe Utilities Division; Mueller Co.; or Engineer approved equal.
- D. Each valve box shall be furnished with valve box centering adaptor compatible with the valve boxes furnished.

3.05 FORCE MAIN INSTALLATION

- A. General: (DELETE) Install according to Section 5010.
 - 1. (ADD) The Contractor shall install restraining devices in accordance with the manufacturer's recommendations.
 - 2. (ADD) Restraining devices shall be installed on all mechanical joint fittings.
 - 3. (ADD) Joint restraining devices shall be installed on all joints within 30 feet of all fittings.
- B. Tracer Wire: (ADD) See 3.14 Below.
 - 1. Required for all force main installations and sanitary sewer services that extend from the main to the property line. (DELETE) Comply with Section 5010.
 - 2. (DELETE) Install tracer wire station at each end of the force main and at additional locations specified in the contract documents.

3. (DELETE) ~~Bury end of tracer wire station 2 feet and compact.~~

3.10 SANITARY SEWER CLEANOUT

- A. Provide cleanouts where specified in the contract documents. Comply with
(DELETE) ~~Figure 4010.203~~ (ADD) Standard Detail MP-4.

3.12 CONFLICTS

- A. Horizontal Separation of Gravity Sewers from Water Mains: Separate gravity sewer mains from water mains by a horizontal distance of at least 10 feet unless:
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, the sewers must be constructed of water main materials meeting the requirements of (DELETE) ~~Section 5010, 2.01~~ (ADD) 2.02. However, provide a linear separation of at least 2 feet.
- B. 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 (DELETE) ~~Section 5010, 2.01~~ (ADD) 2.02 and

3.14 (ADD) TRACER WIRE INSTALLATION

- A. Tracer wire shall be installed on all force main piping and sanitary sewer services in the trench at the same time as the pipe or immediately prior to starting the backfill of the trench.
- B. Install a continuous length of tracer wire for the full length of each run of nonmetallic pipe. Attach wire to top of pipe in such manner that it will not be displaced during construction operations.
- C. Splices will be allowed at pipeline intersections, manholes, bored crossings, locator boxes and at other locations as agreed upon by the Engineer. Splices in tracer wire will be made with split bolt or compression-type connectors. Wire nuts may not be used. A waterproof connection is necessary to prevent corrosion. Splices shall be completed in accordance with the manufacturer's recommendations.
- D. Install tracer wire on all sanitary sewer services from the main to the end of the service. Install ground rod at sewer wye and at service end. Connect wire to ground rods and extend wire to the ground surface and loop the wire in a tracer wire terminal box. These boxes shall be located at the connection to sewer service with at least two feet of extra wire inside the box. The tracer wire terminal box must be installed flush with the finished grade.
- E. Install tracer wire on all force main piping. A ground rod shall be installed at each end of the piping and at all tracer wire terminal boxes. Tracer wire terminal boxes shall be installed at each end of the force main piping and as directed by the Engineer.

F. Prior to final acceptance, all tracer wire shall be electrically tested for continuity from one exposed end to another.

G. See MP-1 and MP-2 for additional details.

3.15 (ADD) VALVE INSTALLATION

A. All valves shall be installed in locations as shown on the plans or as directed by the Engineer.

B. The valve and joints shall be installed in accordance with the manufacturer's recommendations.

C. All pipe bevels shall be removed prior to installation of any valve or ductile iron fitting.

3.16 (ADD) VALVE BOX INSTALLATION

A. All foreign material and debris shall be removed from the top of the valve operator prior to setting the valve box.

B. Valve box centering device shall be installed to center valve box on valve.

C. Valve boxes shall be centered and plumb over the operating nut of the valve and shall be set so that no shock or stress will be transmitted to the valve.

D. Tops of the valve boxes shall be set flush with the valve identification collar or manhole cover unless otherwise directed.

3.17 (ADD) MARSHALLTOWN STANDARD DETAILS

A. Added the following details:

1. MP-1 Typical Sanitary Sewer Service Detail
2. MP-2 Typical Sanitary Sewer Service with Riser Detail
3. MP-3 Typical Air Release/Combination Valve Manhole Detail
4. MP-4 Typical Service Line Cleanout Detail
5. MP-8 Typical Sanitary Sewer Utility Crossing Detail
6. MR-5 Typical Street Utility Section Detail

B. Deleted SUDAS Figures

1. 4010.201 Sanitary Sewer Service Stub
2. 4010.201 Sanitary Sewer Service Stub
3. 4010.202 Sewage Air Release Valve Pit
4. 4010.203 Sanitary Sewer Cleanout

MARSHALLTOWN SPECIAL PROVISIONS
FINAL ACCEPTANCE CHECKLIST

- A. Deflection/Mandrel Testing – all Flexible Sanitary Sewer Pipe
- B. Low Pressure Air Testing of Pipe – For Sanitary Sewer
- C. Lateral Construction Forms – All Sanitary Sewer Laterals
- D. Warranty Bond – Sanitary and Storm Sewers (See Specifications Part I)
- E. TV Inspection – For Sanitary and Storm Sewer Pipe.
- F. As-Built Drawings – For Sanitary and Storm Sewers
- G. Engineering Certificate of Completion in accordance with the Plans and Specifications – Sanitary and Storm Sewers
- H. Contractors Cost of Construction Report - This is to meet the financial reporting requirements of the city (GASB 34)

DEFLECTION TESTING OF FLEXIBLE PIPE

Deflection tests shall be performed on all flexible sanitary sewer pipes. The deflection test shall be conducted after the final backfill has been in place at least 30 days. No pipe shall exceed a deflection of 5%. If the deflection test is to be run using a rigid ball or mandrel, it shall have a diameter equal to 95% of the inside diameter of the pipe and the tests shall be performed without mechanical pulling devices.

PROJECT NAME: _____
 LOCATION: _____
 CONTRACTOR: _____

SECTION TESTED

Start Station: _____ MH Upstream _____ Pipe Diameter: _____
 End Station: _____ MH Downstream _____ Length: _____

Date Of Test: _____ Pass ☐
 Date Of Construction _____ Fail ☐

MANUFACTURER OF TEST DEVICE AND DIAMETER _____

Comments _____

Inspector _____

SECTION TESTED

Start Station: _____ MH Upstream _____ Pipe Diameter: _____
 End Station: _____ MH Downstream _____ Length: _____

Date Of Test: _____ Pass ☐
 Date Of Construction _____ Fail ☐

MANUFACTURER OF TEST DEVICE AND DIAMETER _____

Comments _____

Inspector _____

SECTION TESTED

Start Station: _____ MH Upstream _____ Pipe Diameter: _____
 End Station: _____ MH Downstream _____ Length: _____

Date Of Test: _____ Pass ☐
 Date Of Construction _____ Fail ☐

MANUFACTURER OF TEST DEVICE AND DIAMETER _____

Comments _____

Inspector _____

LOW PRESSURE TESTING OF SANITARY SEWER LINE (ASTM: F 1417)

PROJECT NAME: _____

LOCATION: _____

CONTRACTOR: _____

LIST SECTION TESTED: DATE: _____

Start Station.: _____ MH Upstream _____

End Station: _____ MH Downstream _____

Pipe Dia. _____ Length _____

Initial Pressure: _____ psi

Starting Test Pressure: _____ psi

Ending Test Pressure: _____ psi

Test Duration: _____ Min(s)

Comments: _____

TEST INFORMATION:

Constant Pressure Method:

Rotameter reading: _____ cf/min

Computed Air Loss: _____ cf/min

CONCLUSION: The section of pipe tested complies with
ASTM: F 1417, 8.2.1 for acceptance: Yes ___ No ___*Time-Pressure Drop Method*

Time for 1.0 psi drop: _____ Min(s) --OR--

Variance in Test Pressure: _____ psi

Variance allowed by local jurisdiction: _____ psi

CONCLUSION: The section of pipe tested complies with
ASTM: F 1417, 8.2.2 for acceptance: Yes ___ No ___

LIST SECTION TESTED: DATE: _____

Start Station.: _____ MH Upstream _____

End Station: _____ MH Downstream _____

Pipe Dia. _____ Length _____

Initial Pressure: _____ psi

Starting Test Pressure: _____ psi

Ending Test Pressure: _____ psi

Test Duration: _____ Min(s)

Comments: _____

TEST INFORMATION:

Constant Pressure Method:

Rotameter reading: _____ cf/min

Computed Air Loss: _____ cf/min

CONCLUSION: The section of pipe tested complies with
ASTM: F 1417, 8.2.1 for acceptance: Yes ___ No ___*Time-Pressure Drop Method*

Time for 1.0 psi drop: _____ Min(s) --OR--

Variance in Test Pressure: _____ psi

Variance allowed by local jurisdiction: _____ psi

CONCLUSION: The section of pipe tested complies with
ASTM: F 1417, 8.2.2 for acceptance: Yes ___ No ___

LIST SECTION TESTED: DATE: _____

Start Station.: _____ MH Upstream _____

End Station: _____ MH Downstream _____

Pipe Dia. _____ Length _____

Initial Pressure: _____ psi

Starting Test Pressure: _____ psi

Ending Test Pressure: _____ psi

Test Duration: _____ Min(s)

Comments: _____

TEST INFORMATION:

Constant Pressure Method:

Rotameter reading: _____ cf/min

Computed Air Loss: _____ cf/min

CONCLUSION: The section of pipe tested complies with
ASTM: F 1417, 8.2.1 for acceptance: Yes ___ No ___*Time-Pressure Drop Method*

Time for 1.0 psi drop: _____ Min(s) --OR--

Variance in Test Pressure: _____ psi

Variance allowed by local jurisdiction: _____ psi

CONCLUSION: The section of pipe tested complies with
ASTM: F 1417, 8.2.2 for acceptance: Yes ___ No ___Testing procedures observed and
Information recorded by:

Results reviewed and affirmed by:

Project Representative

Project Engineer

City of Marshalltown, Iowa

SANITARY SEWER LATERAL CONSTRUCTION FORM

Project Number _____

Date Wye Installed: 20____

4Date Service Installed: 20____ (NA) if no service

Street Address: (or) _____

General Location: _____

Upstream Manhole # _____ Downstream Manhole # _____

Service Status: _____ 1 - Active 2 - Inactive 3 - Abandoned

Connection Type: _____ 2 - Wye 3 - MH stub 4 - Tap

Diameter (inches): _____

Pipe Material: _____ 1 - VCP 2 - PVC 3 - Concrete 4 - RCP
5 - DIP 6 - CIP 7 - CMP

Slope/Fall (%): _____ Length (feet): _____

Source of Data: _____ 1 - Construction Inspection 2 - Superintendent

Direction from Main: _____ Distance from Upstream MH (feet): _____

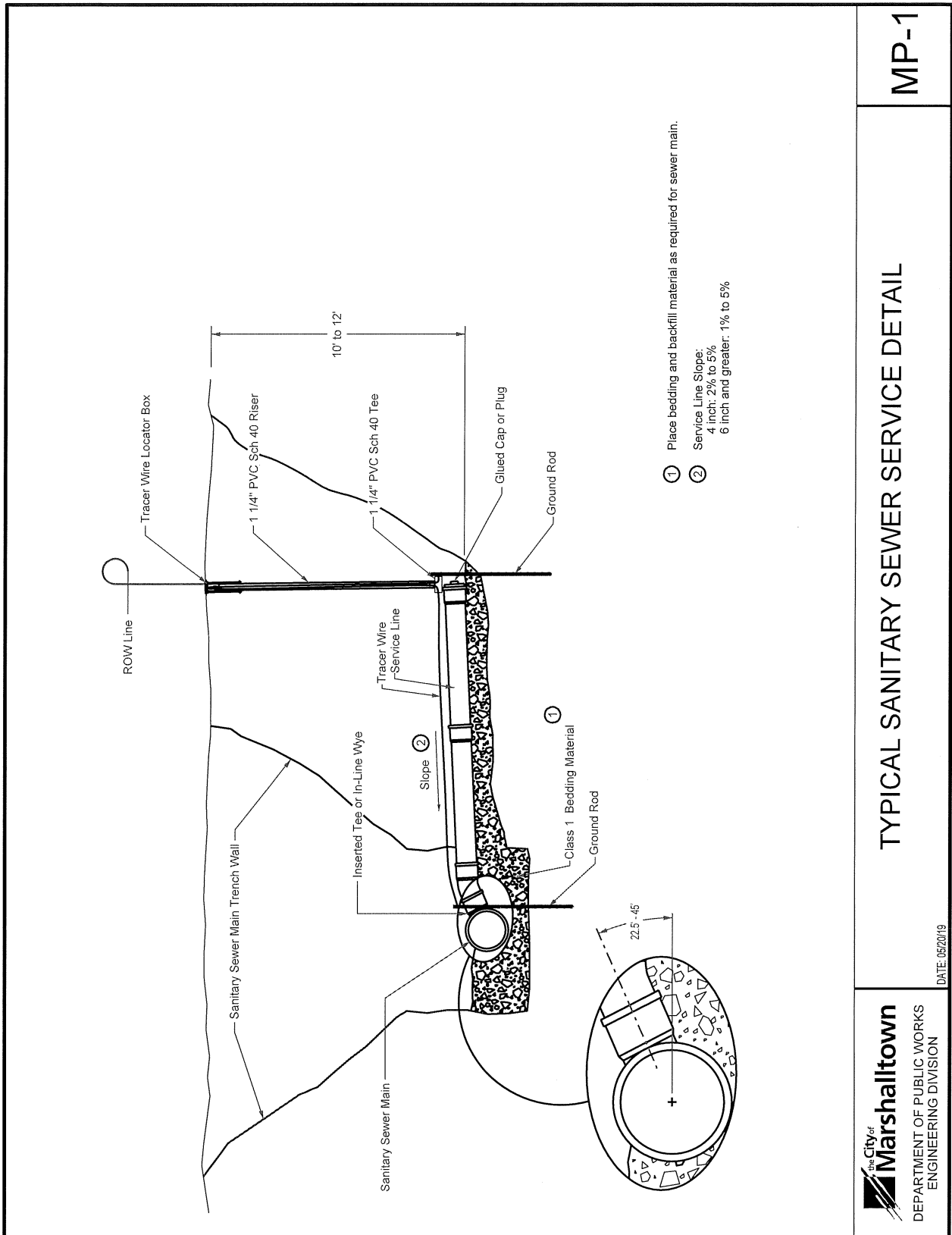
Depth at Main (feet): _____ Depth at Property Line (feet): _____

Depth at service end (feet): _____ (NA) if no service

Indicate North: ○ Upstream MH# _____ Station: _____ ----- ○ Downstream MH# _____ Station: _____ Wye Station: _____ Service end Station: _____ Service Offset Direction/Distance (feet): _____	
--	--

Inspector: _____

Department of Public Works
Engineering Division

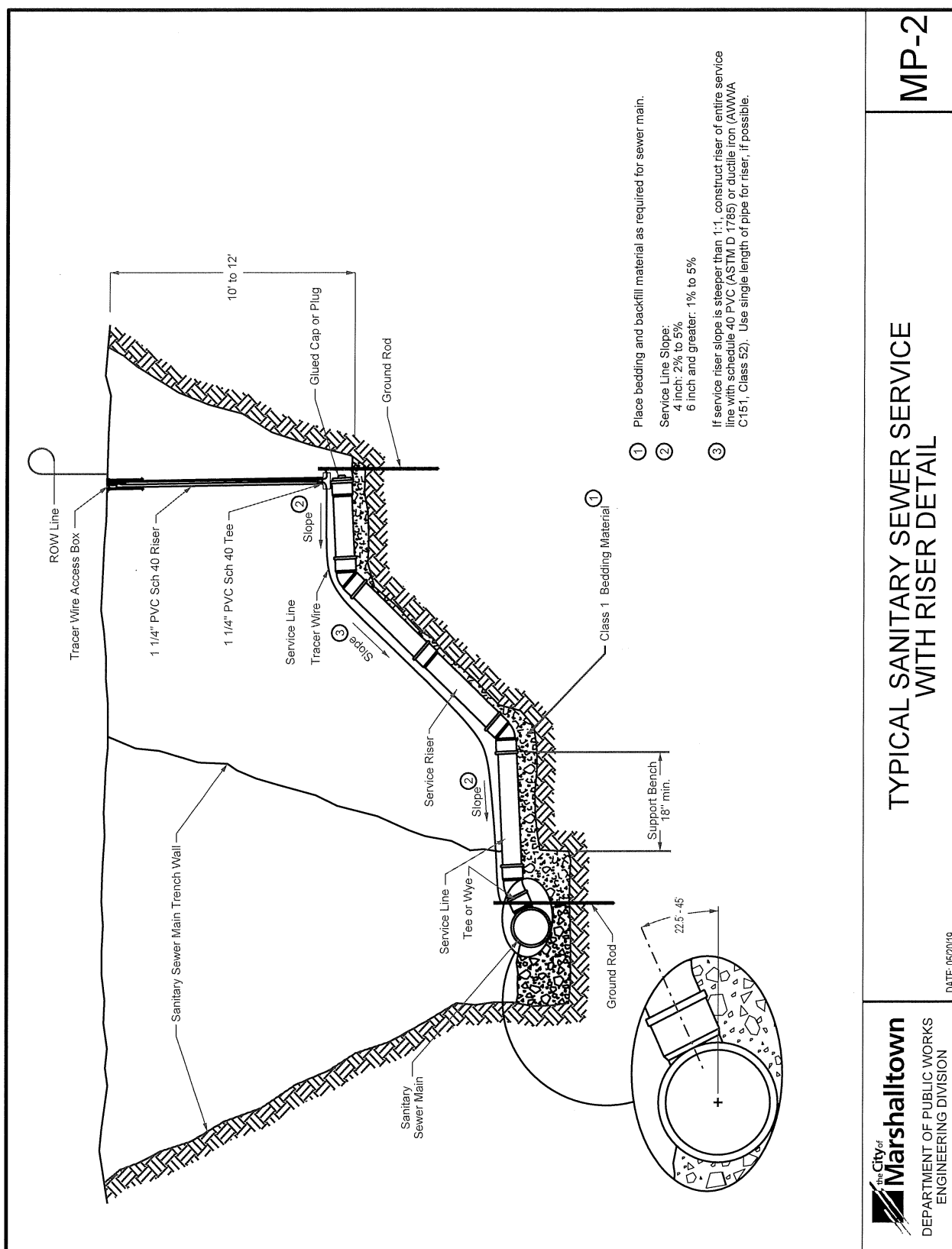


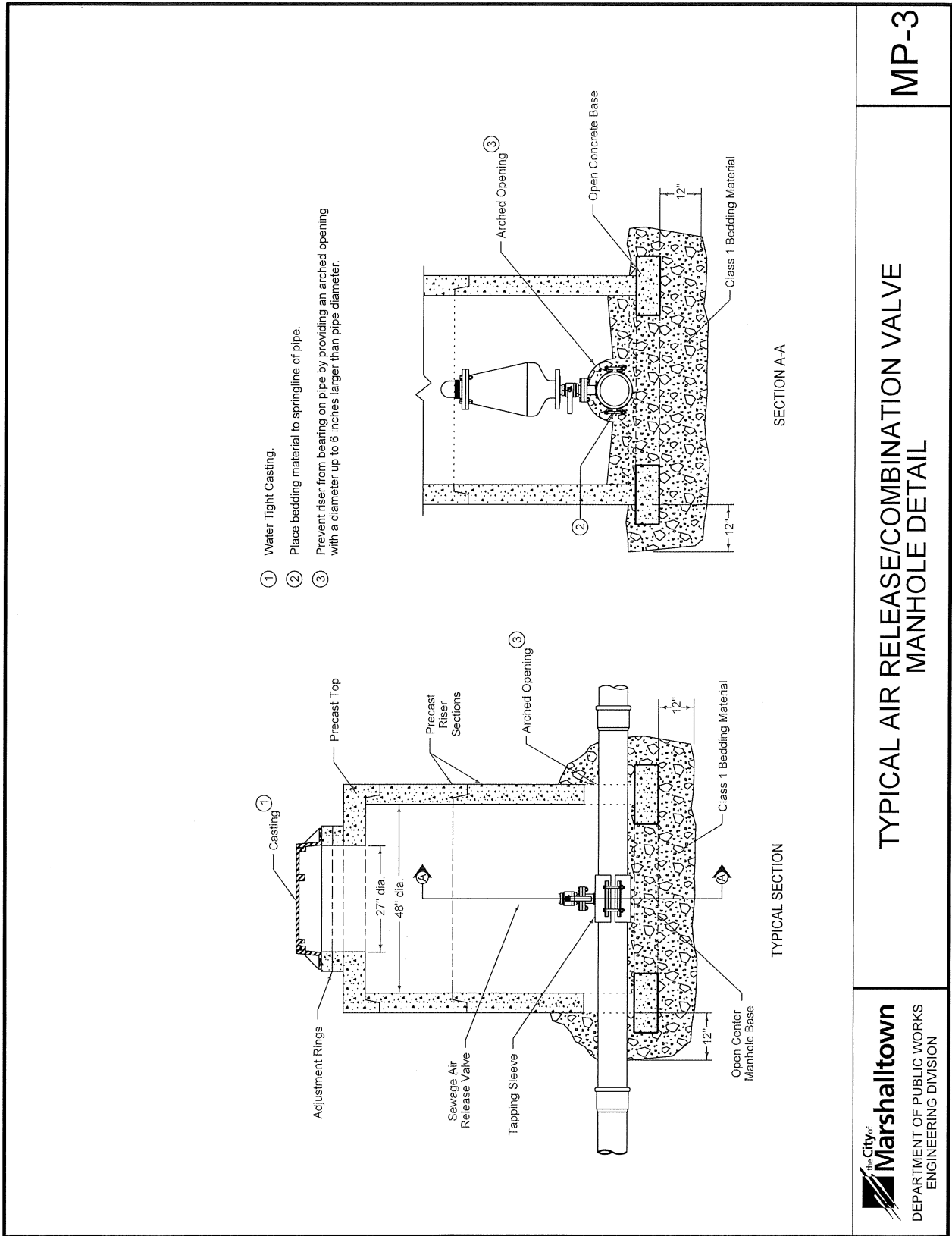
MP-1

TYPICAL SANITARY SEWER SERVICE DETAIL

City of Marshalltown
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

DATE: 05/20/19

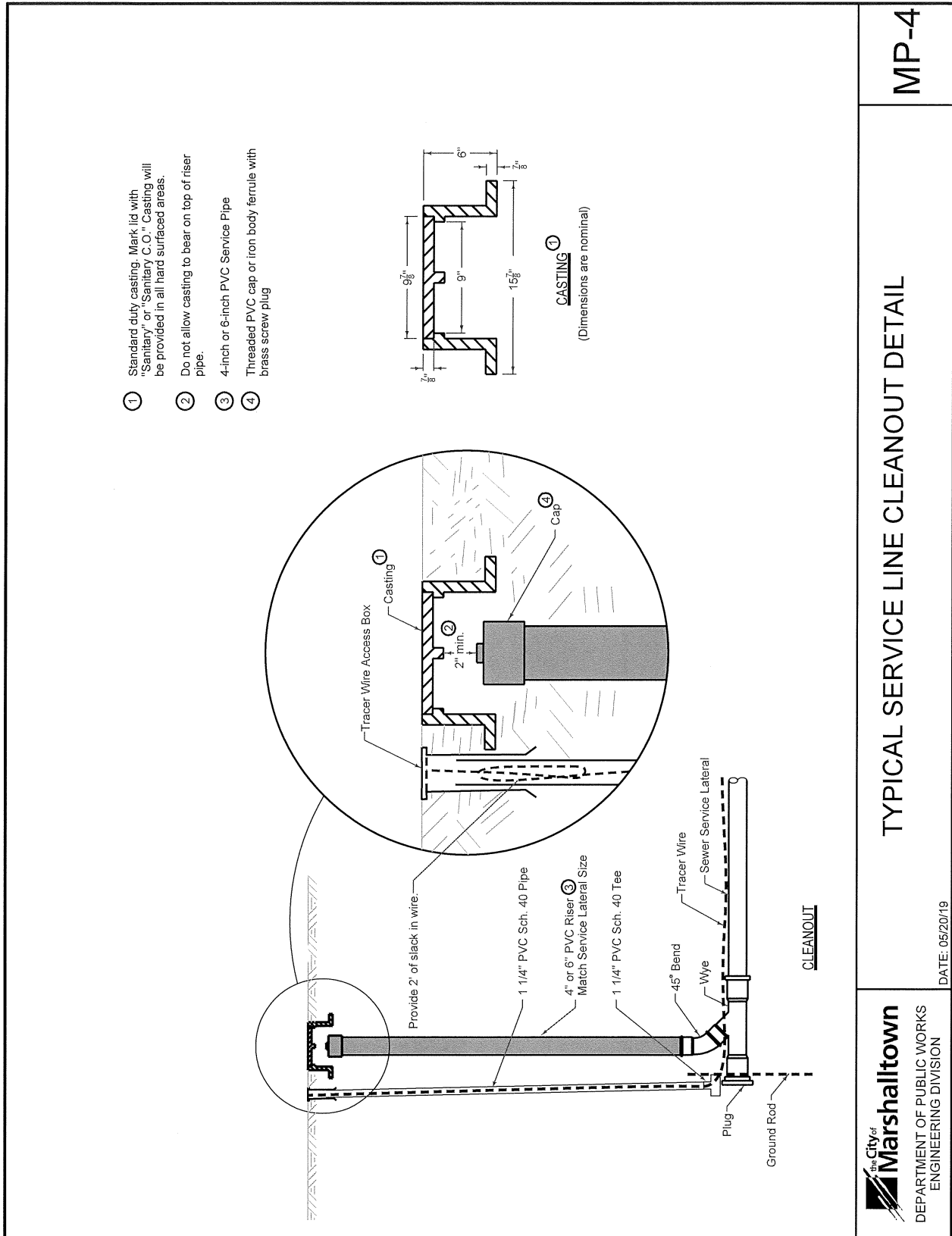


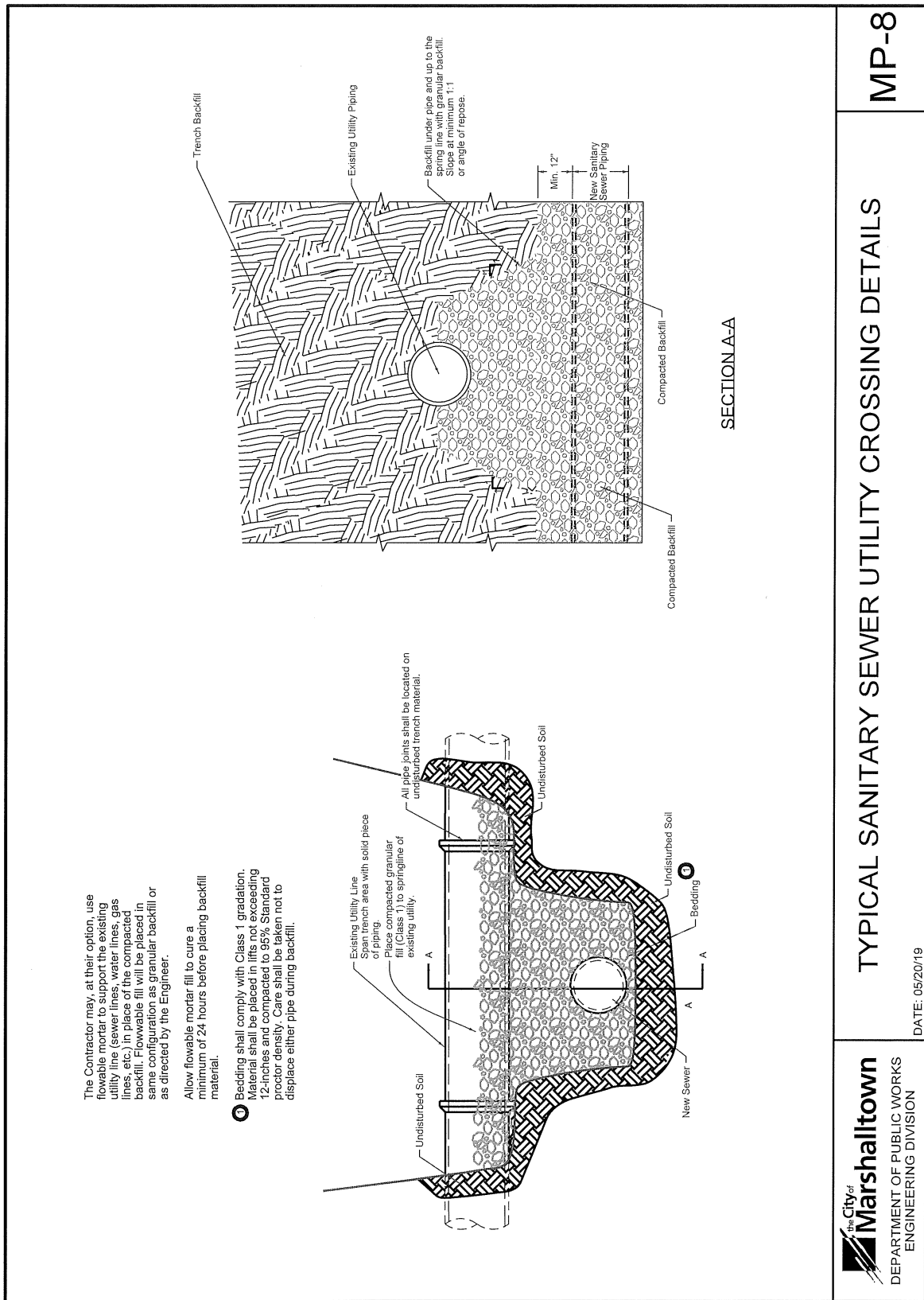


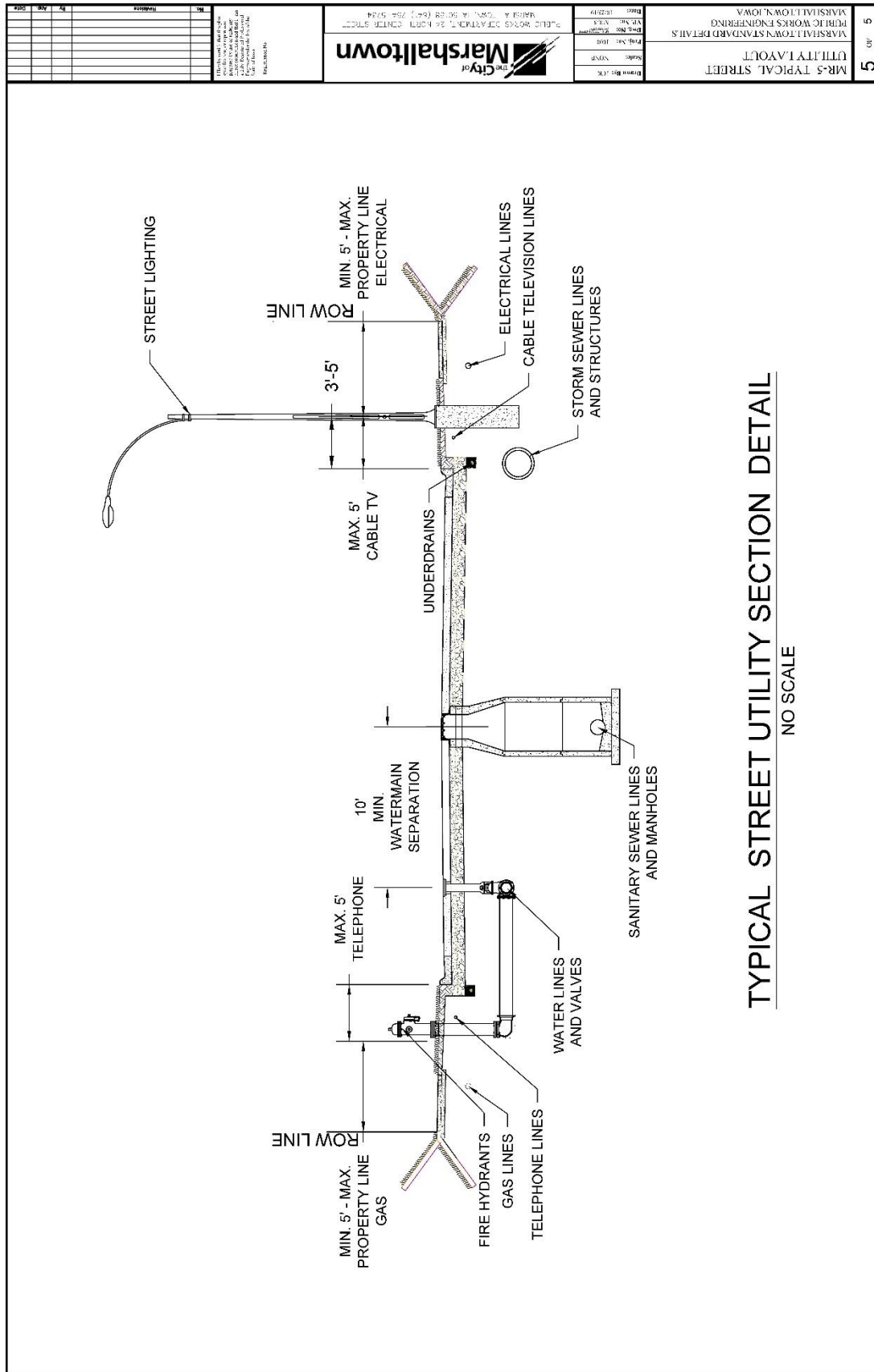
the City of Marshalltown
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

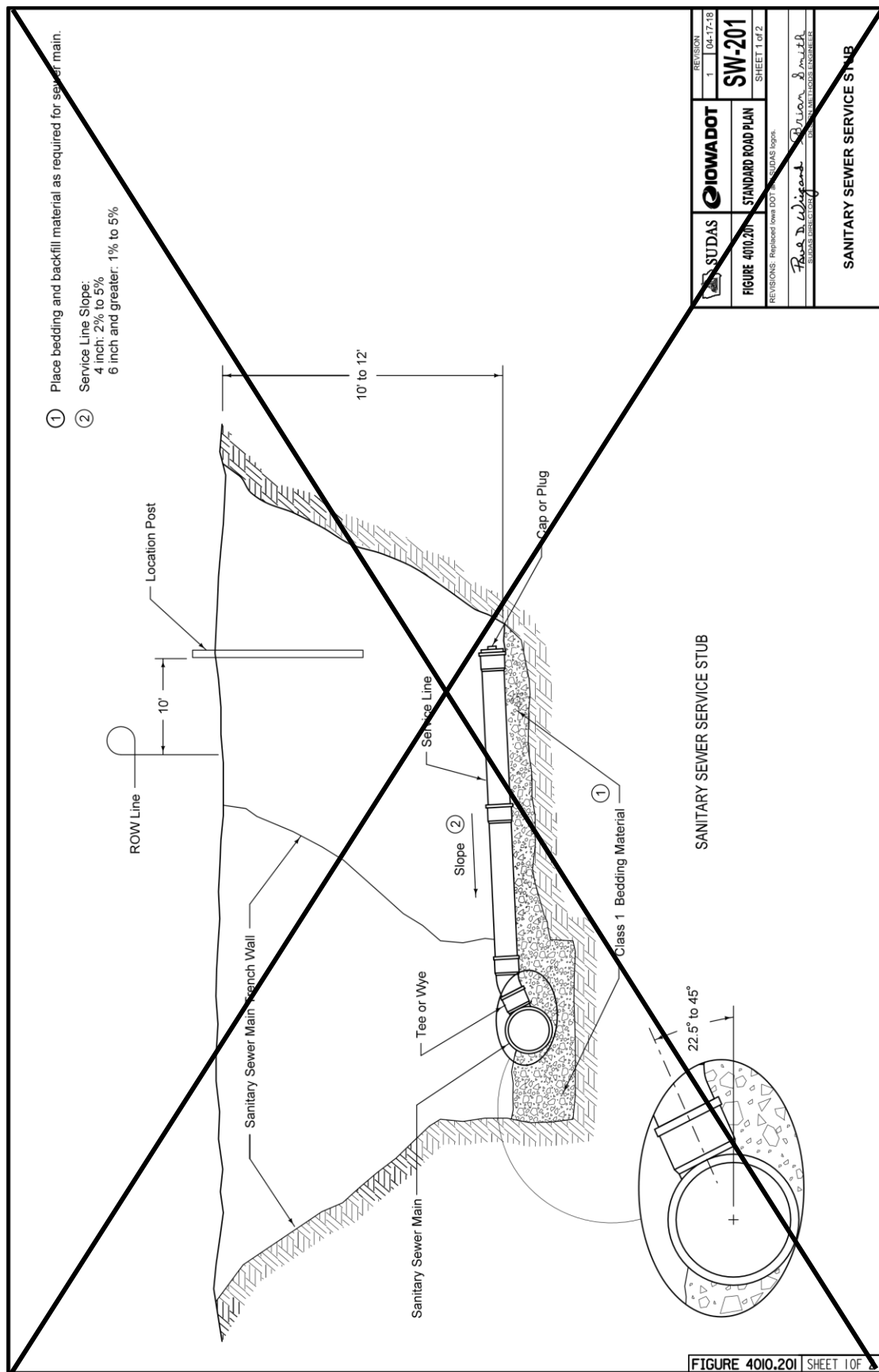
**TYPICAL AIR RELEASE/COMBINATION VALVE
MANHOLE DETAIL**

MP-3

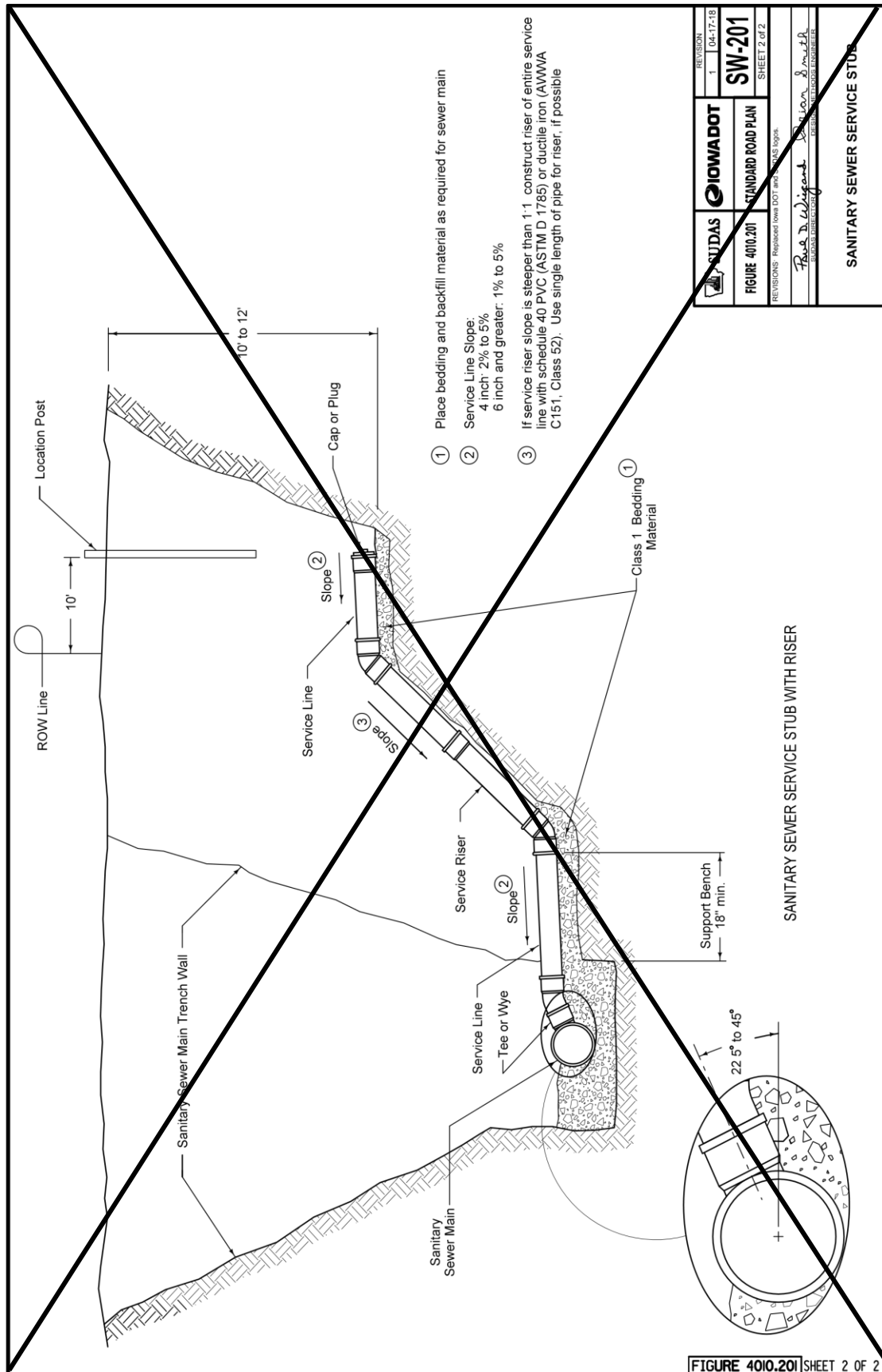




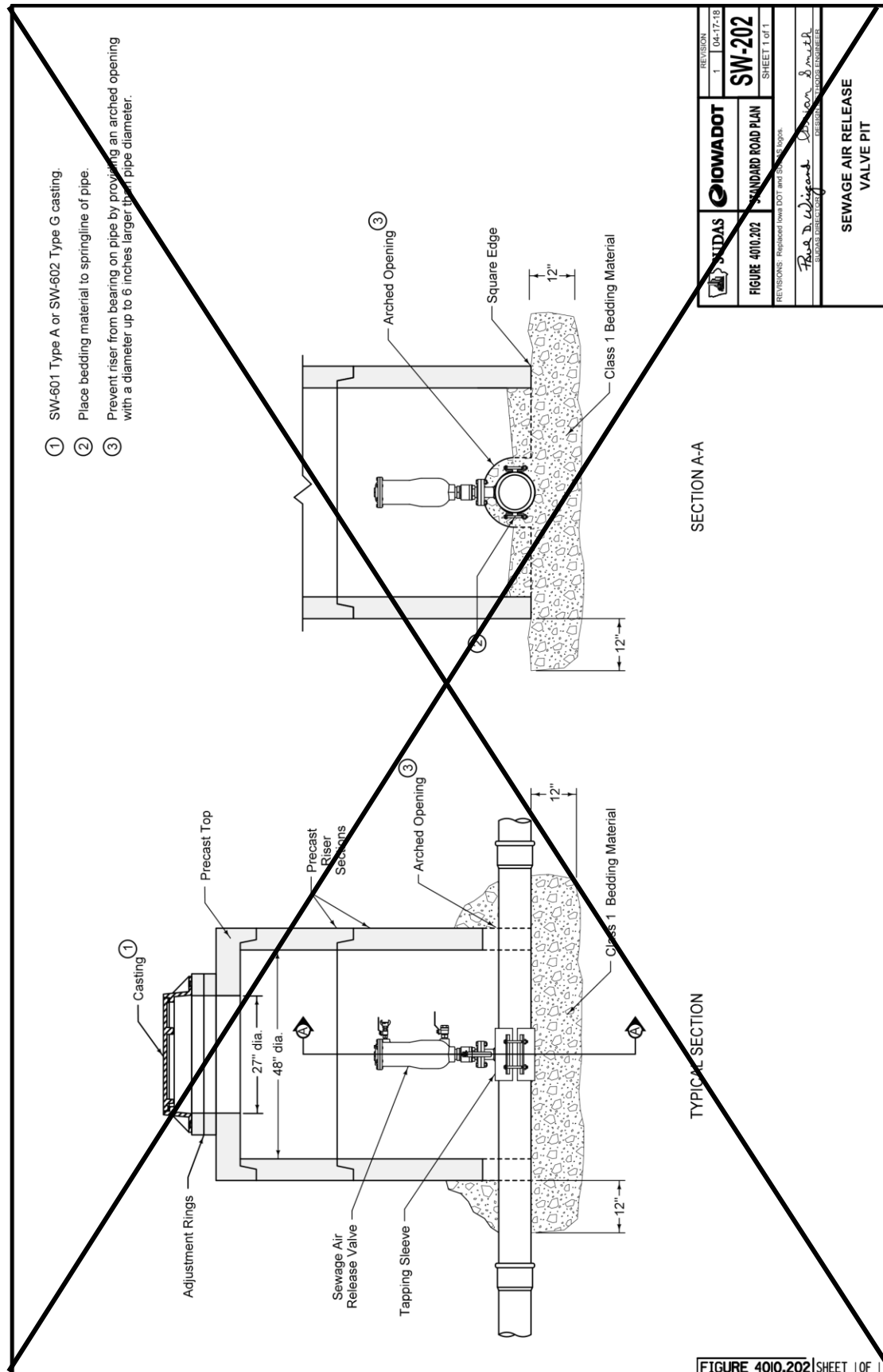


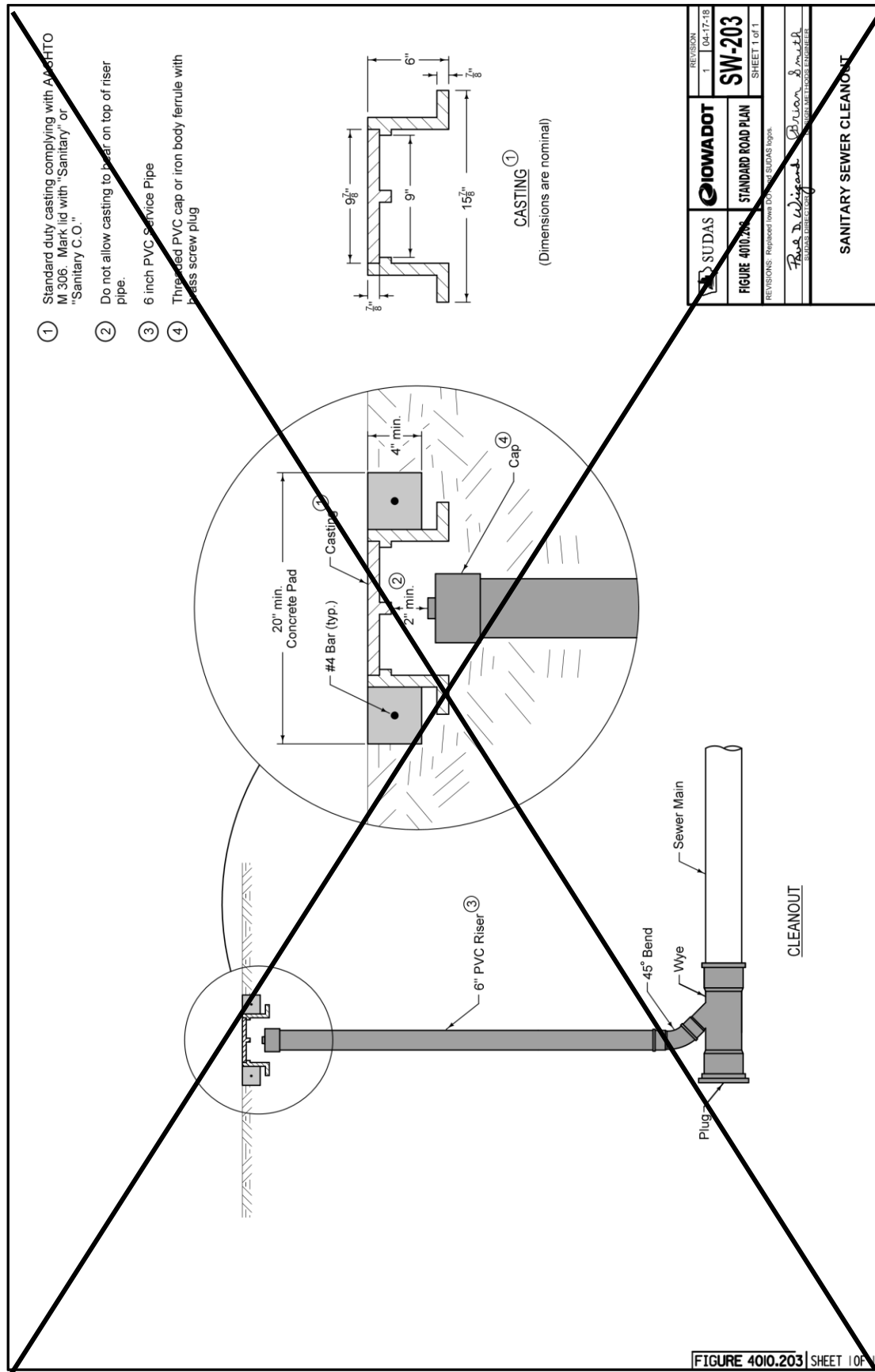


	SUDAS	IOWA DOT	REVISION	1	04-17-18
			SW-201		
FIGURE 4010.201		STANDARD ROAD PLAN		SHEET 1 of 2	
REVISIONS: Replaced Iowa DOT SUDAS logo.					
Rae D. Wiegand		R. Allen Smith			
DESIGN ENGINEER		REGISTERED PROFESSIONAL ENGINEER			
SANITARY SEWER SERVICE STUB					



REVISION	1	04-17-18
FIGURE 4010.201	STANDARD ROAD PLAN	SW-201
REVISIONS: Registered Iowa DOT and SUDAS logos		SHEET 2 of 2
Paul D. Wiegand	DESIGNER	
John D. Wiegand	CHECKED	
	APPROVED	
SANITARY SEWER SERVICE STUB		





REVISION	1	04-17-18
FIGURE 4010.203	SW-203	SHEET 1 of 1
FIGURE 4010.203	STANDARD ROAD PLAN	
REVISIONS: Replaced Iowa DOT SUDAS logo.		
Paul D. Wigand	Brian Smith	
DESIGN ENGINEER	PROJECT ENGINEER	
SANITARY SEWER CLEANOUT		

SECTION 04020 - STORM SEWERS

PART 1 - GENERAL

1.03 through 1.06: (DELETE): Comply with Division 1 - General Provisions and Covenants (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

1.09 (ADD) ACCEPTANCE CHECKLIST & MAINTENANCE BOND

Prior to final acceptance of the work, the contractor shall file with the City Clerk of the City of Marshalltown a maintenance bond guaranteeing suitable repairs of any defects or failures due to deficiencies in materials or inadequacies in workmanship for a period of 4 years for all improvements following completion of construction. The bond shall be for a sum equal to the total amount of the project. The contractor shall also file with the City Engineer all other required acceptance checklist items including testing/inspection forms, lateral construction forms, as-built drawings, construction costs and engineering certificate of completion forms. The acceptance checklist and warranty bond form are provided at end of section.

3.02 PIPE INSTALLATION

A. General:

8. (ADD) All lift holes in the pipe shall be filled with concrete.
9. (ADD) Protect utilities crossing the sewer main trench.

B. Trenched:

7. (ADD) No more than 300-feet of trench shall be left open at any time. Open trenches shall be properly marked and/or attended. Trenches shall be closed at the end of each day.

3.07 CONFLICTS

A. Horizontal Separation of Gravity Sewers from Water Mains:

2. 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, the sewers must be constructed of water main materials meeting the requirements of Section (DELETE) 5010, 2.01 (ADD) 4010, 2.02. However, provide a linear separation of at least 2 feet.

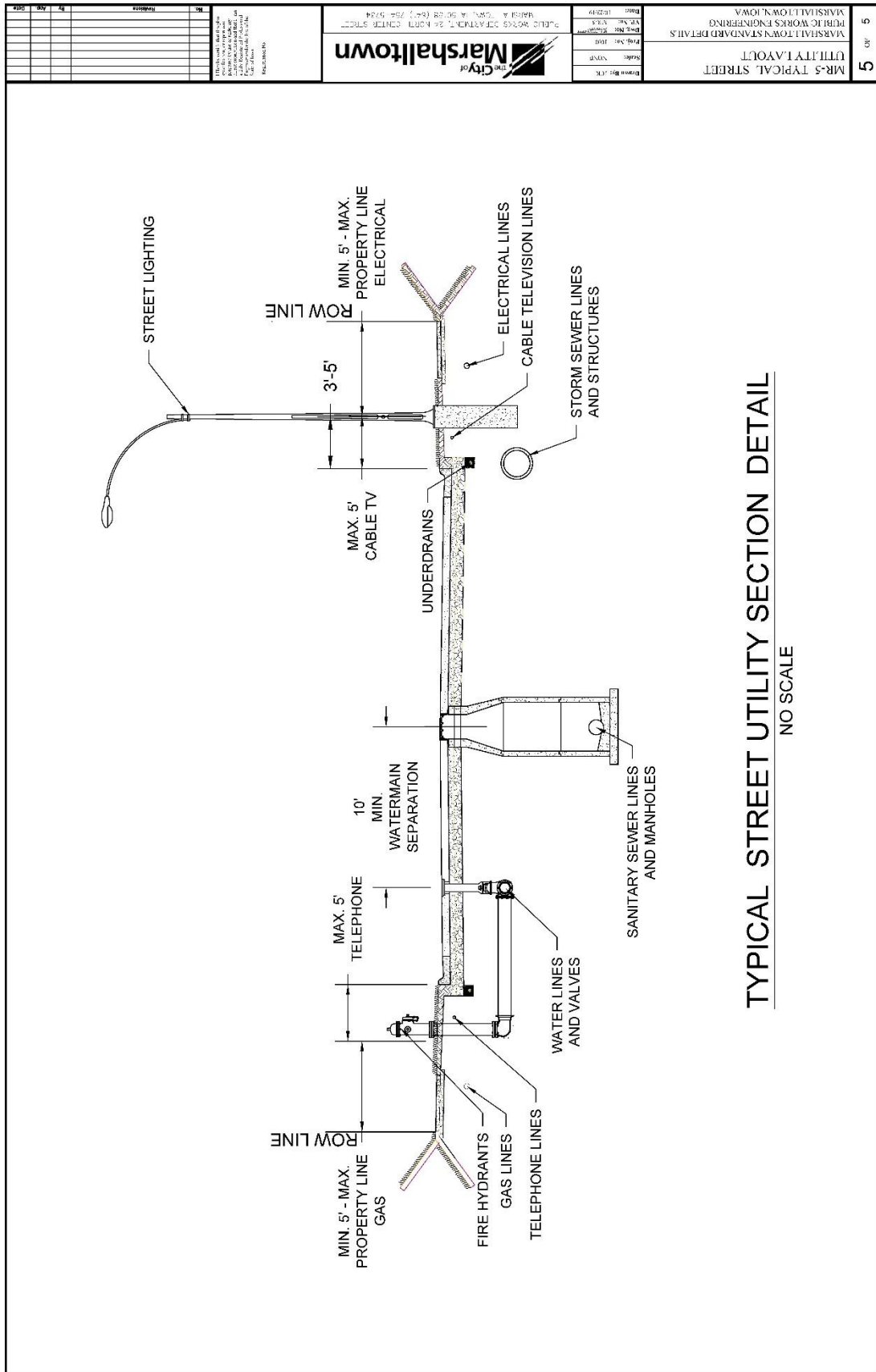
B. Separation of Sewer Force Mains from Water Mains: Separate storm sewer force mains and water mains by a horizontal distance of at least 10 feet unless:

1. The force main is constructed of water main materials meeting a minimum pressure rating of 150 psi and the requirements of (DELETE) 5010, 2.01 (ADD) 4010, 2.02. and

3.11 (ADD) MARSHALLTOWN STANDARD DETAILS

A. Added the following detail.

1. MR-5 Typical Street Utility Section Detail



SECTION 4030 - PIPE CULVERTS

PART 1 – GENERAL

1.03 through 1.06: (DELETE): Comply with Division 1 - General Provisions and Covenants (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

PART 2 - PRODUCTS

2.01 PIPE CULVERTS

B. Entrance Pipe Culverts: The following pipe culvert types described in Section 4020 may be used within right-of-way as entrance pipe culverts:

5. Corrugated Metal Pipe (CMP). (ADD) Use of this pipe material requires specific approval by the Engineer.
6. Spiral Rib Pipe. (ADD) Use of this pipe material requires specific approval by the Engineer.
7. Coated Corrugated Metal Pipe. (ADD) Use of this pipe material requires specific approval by the Engineer.
8. Corrugated Metal Arch Pipe. (ADD) Use of this pipe material requires specific approval by the Engineer.

C. Structural Plate Culverts: Structural plate culverts may be used in the right-of-way as roadway or entrance pipe culverts.

6. (ADD) Use of this pipe material requires specific approval by the Engineer.

D. Aluminum Structural Plate Culverts: Aluminum structural plate culverts may be used in the right-of-way as roadway or entrance pipe culverts.

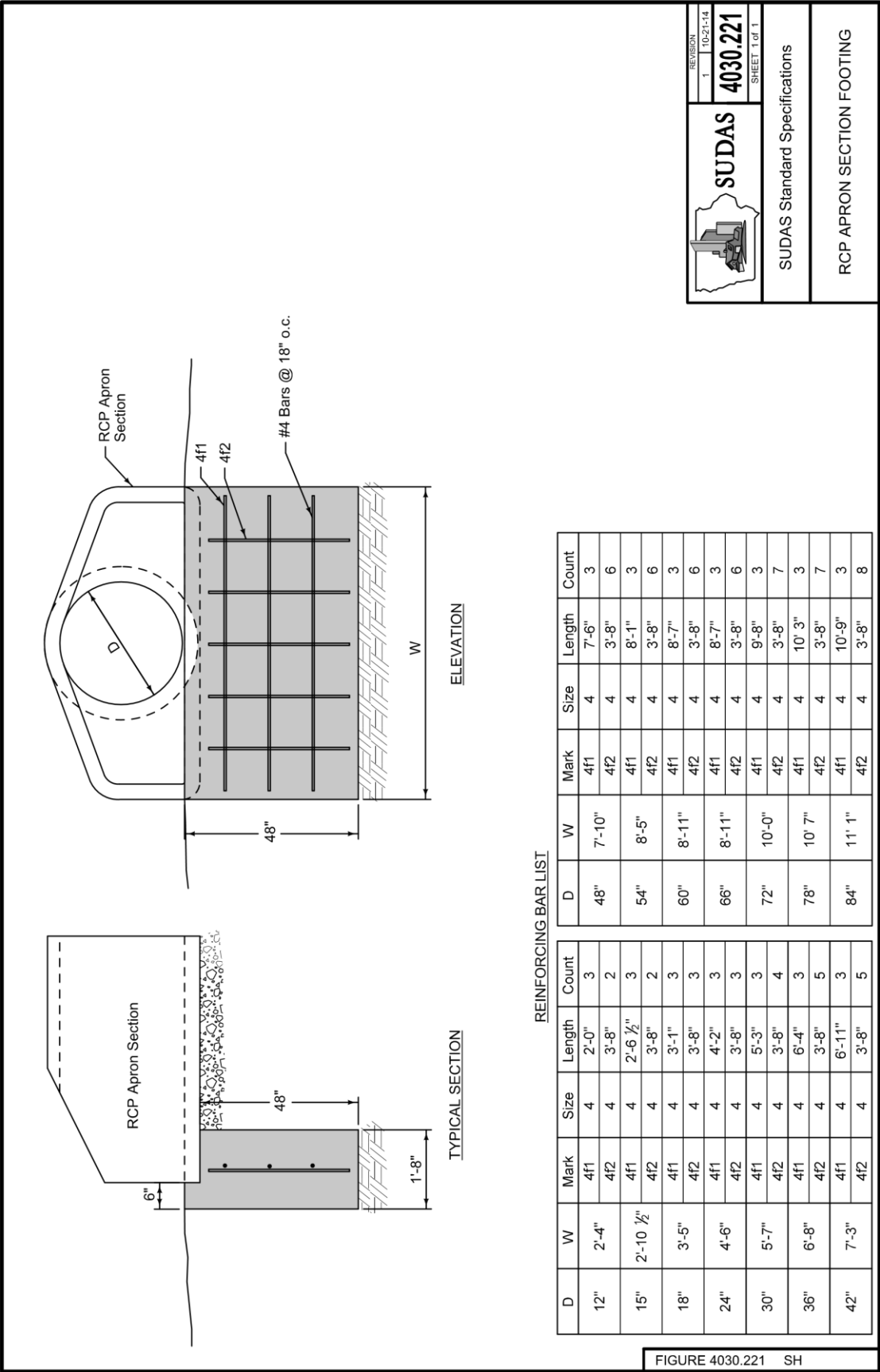
9. (ADD) Use of this pipe material requires specific approval by the Engineer.

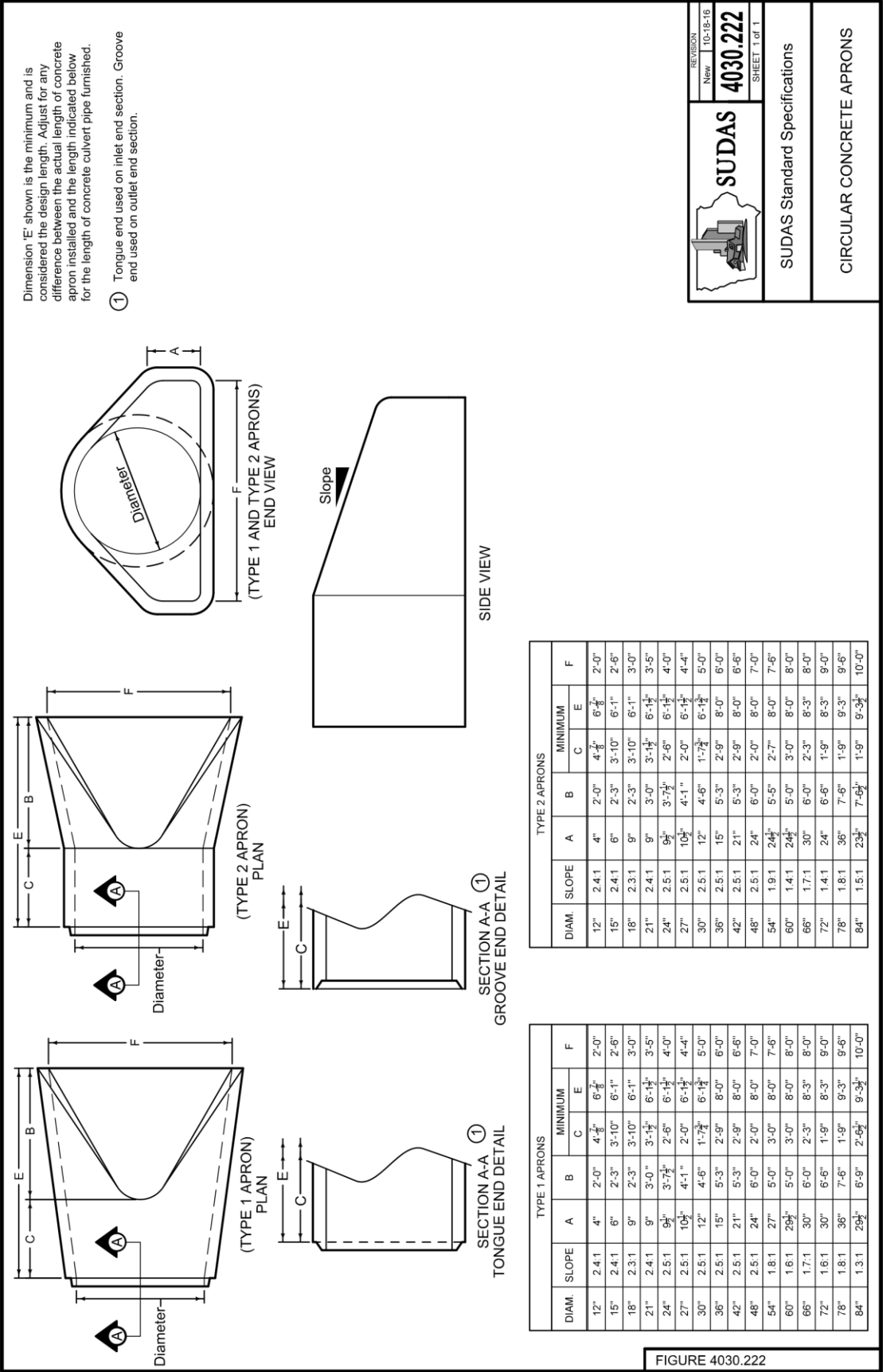
PART 3 - EXECUTION

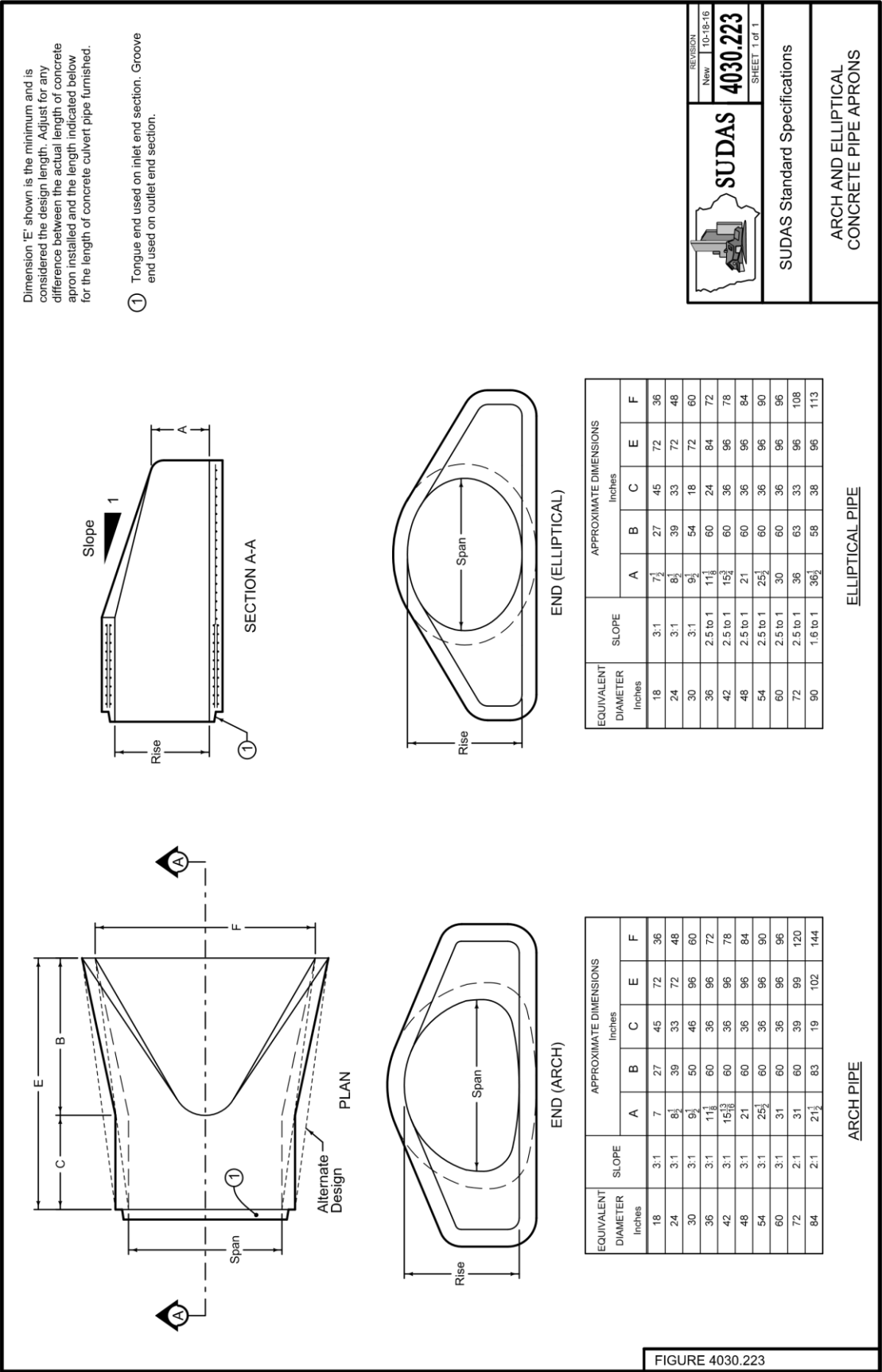
3.04 (ADD) IOWA DOT STANDARD ROAD PLANS

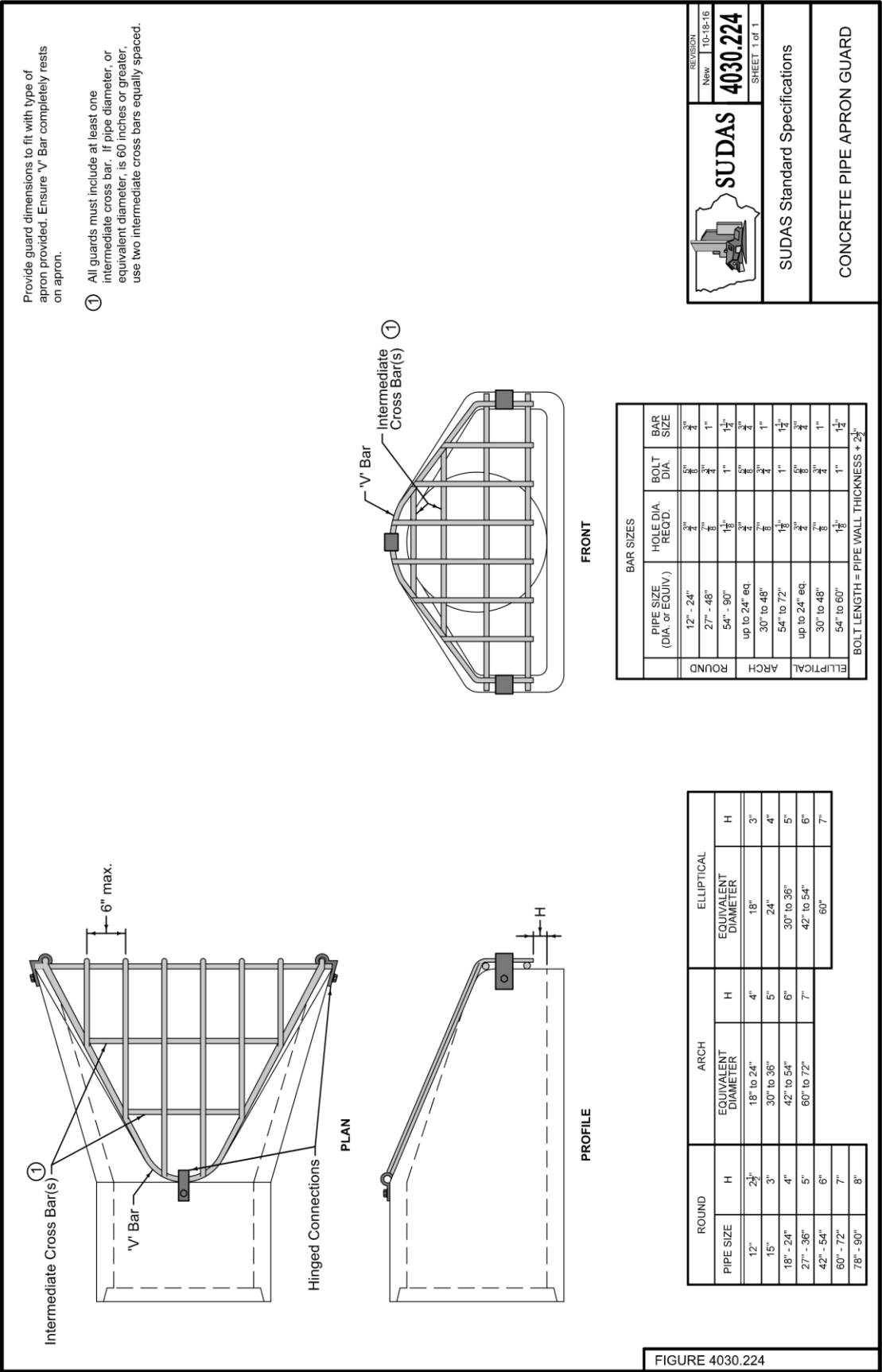
Add the following details:

- A. DR-121 Connected Pipe Joints
- B. DR-203 Metal Pipe Aprons and Beveled Ends
- C. DR-211 Metal Safety Slope Apron 6:1 Slope
- D. DR-212 Beveled Pipe and Guard











Wrap all joints on concrete roadway pipe culverts.

Use Type 3 Connectors on all culvert pipes, unless specified otherwise. Refer to Materials I.M. 445.01 for Connector requirements.

Minimum 2 threads showing at all threaded ends.

Connections not required on pipe sections installed by trenchless methods.

For belled concrete pipe joints, connectors may be installed on the inside of the pipe.

TYPE 1

One connector at the top of the pipe section.

TYPE 2 (Sealed Joint)

Two connectors near the top of the pipe section. For details of reinforced concrete pipe joints, refer to AASHTO M 170 for the class of pipe required. Refer to Materials I.M. 451.03 for seal requirements.

TYPE 3 (Non - Sealed Joint)

Two connectors near the top of the pipe section. For details of reinforcement, refer to AASHTO M 170 for the class of pipe required.

① If holes are field drilled, place a ribbon of butyl sealant around bolts before placing 3 in. x 3 in. x 1/4 in. plate on bolts through corrugated metal pipe and tightening nuts.

② 1 1/2 inch round x 3/8 inch thick washer or 3 in. x 3 in. x 1/4 in. square plate (equal to pipe radius).

③ Connectors with One Bend End and Bell End spacers allowed per Materials I.M. 451. Refer to Optional Bolts detail.

④ Engineering fabric for embankment erosion control.

Possible Tabulations:
104-3
104-5B

**SECTION OF PIPE CONNECTOR
(Concrete Pipe to Concrete Pipe)**

**SECTION OF PIPE CONNECTOR
(Concrete Pipe to Corrugated Pipe)**

**SECTION OF PIPE CONNECTOR
(Concrete Pipe to Corrugated Pipe)**

PIPE JOINT WRAPPING

OPTIONAL BOLTS/CONNECTORS

TYPE 1 CONNECTION

TYPE 1 CONNECTION

TYPE 1 CONNECTION

TYPE 1 CONNECTION

TYPE 1 CONNECTION

TYPE 1 CONNECTION

TYPE 1 CONNECTION

TYPE 1 CONNECTION

TYPE 1 CONNECTION

TYPE 1 CONNECTION

TYPE 1 CONNECTION

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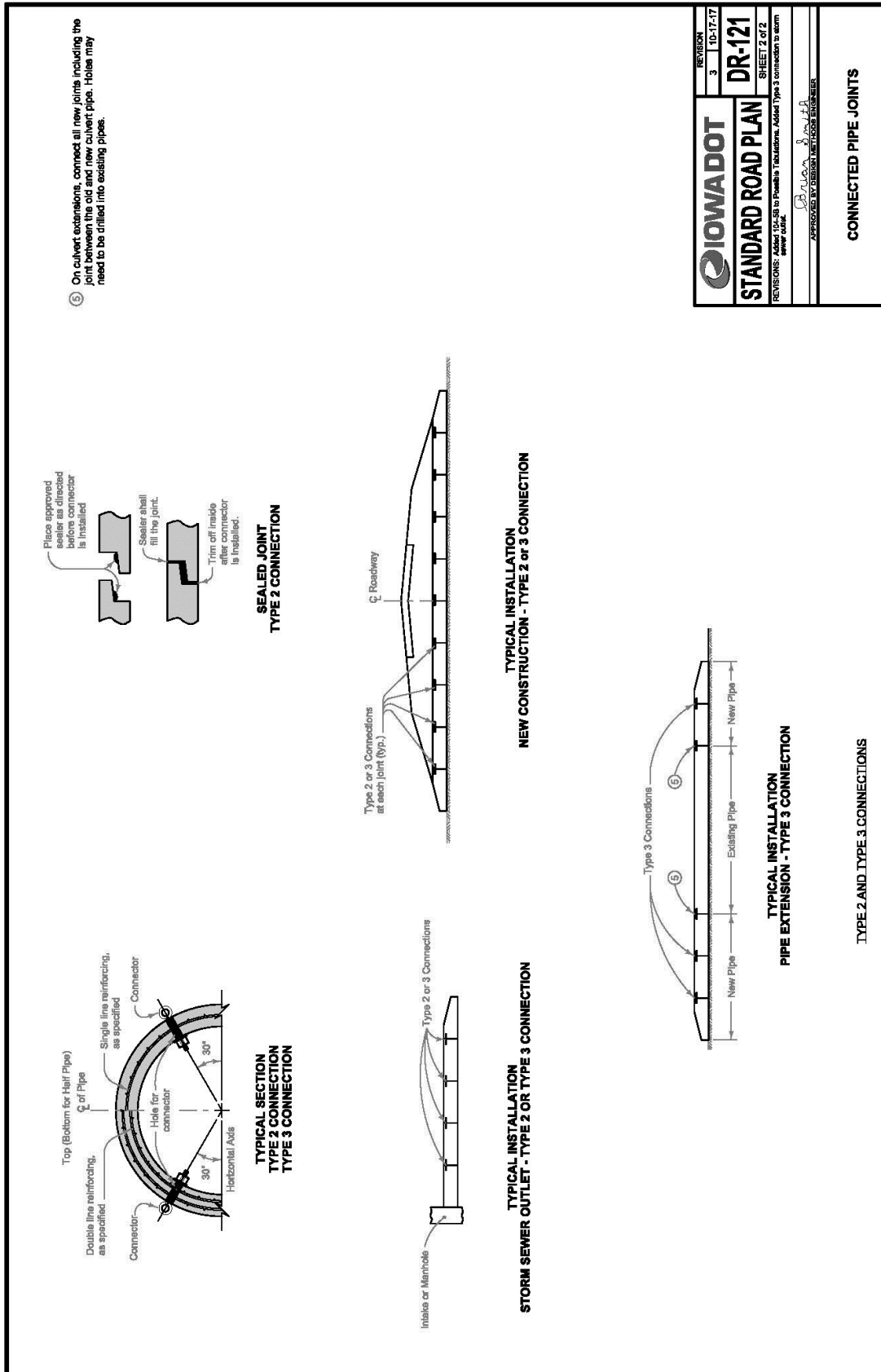
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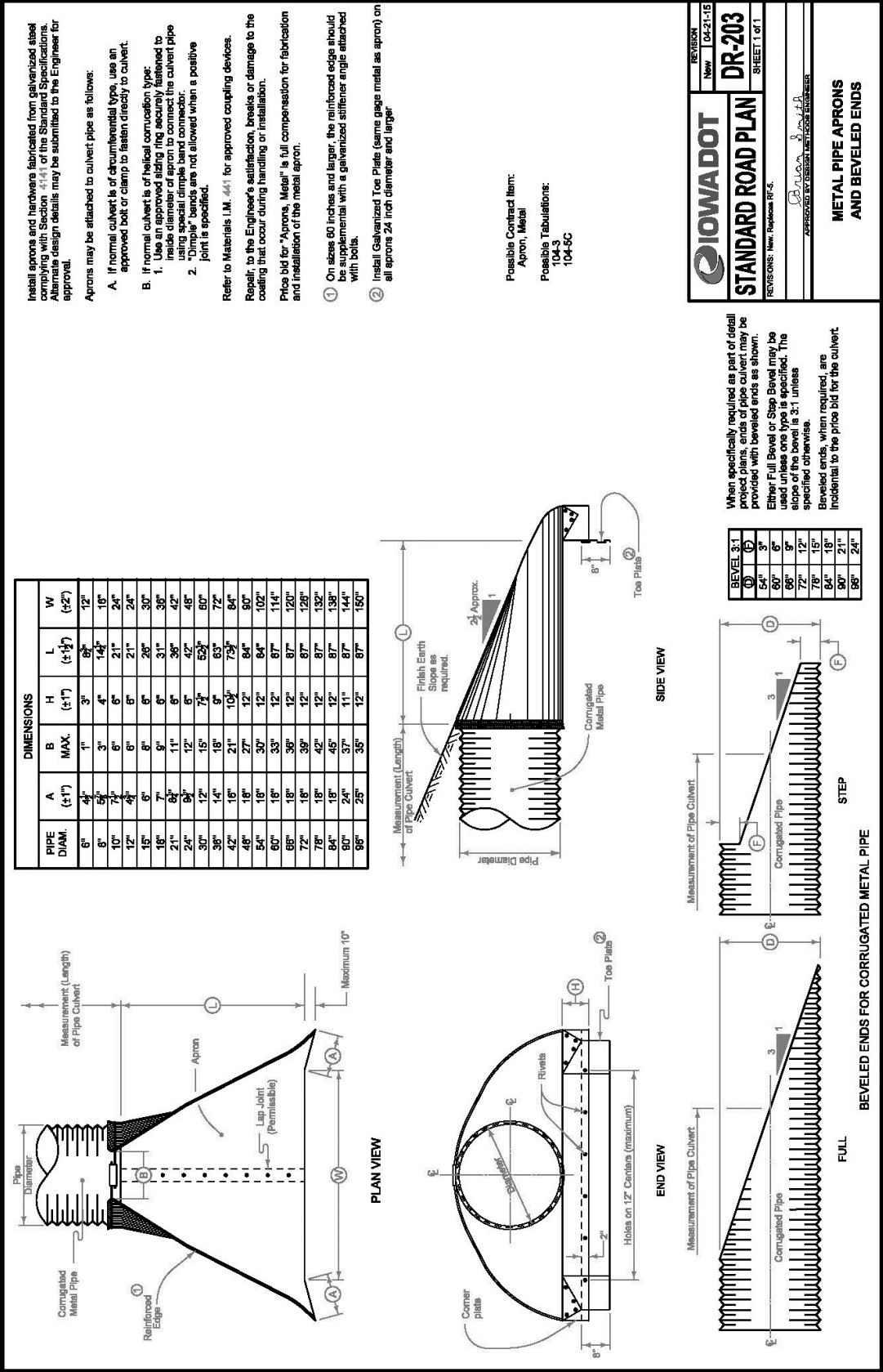
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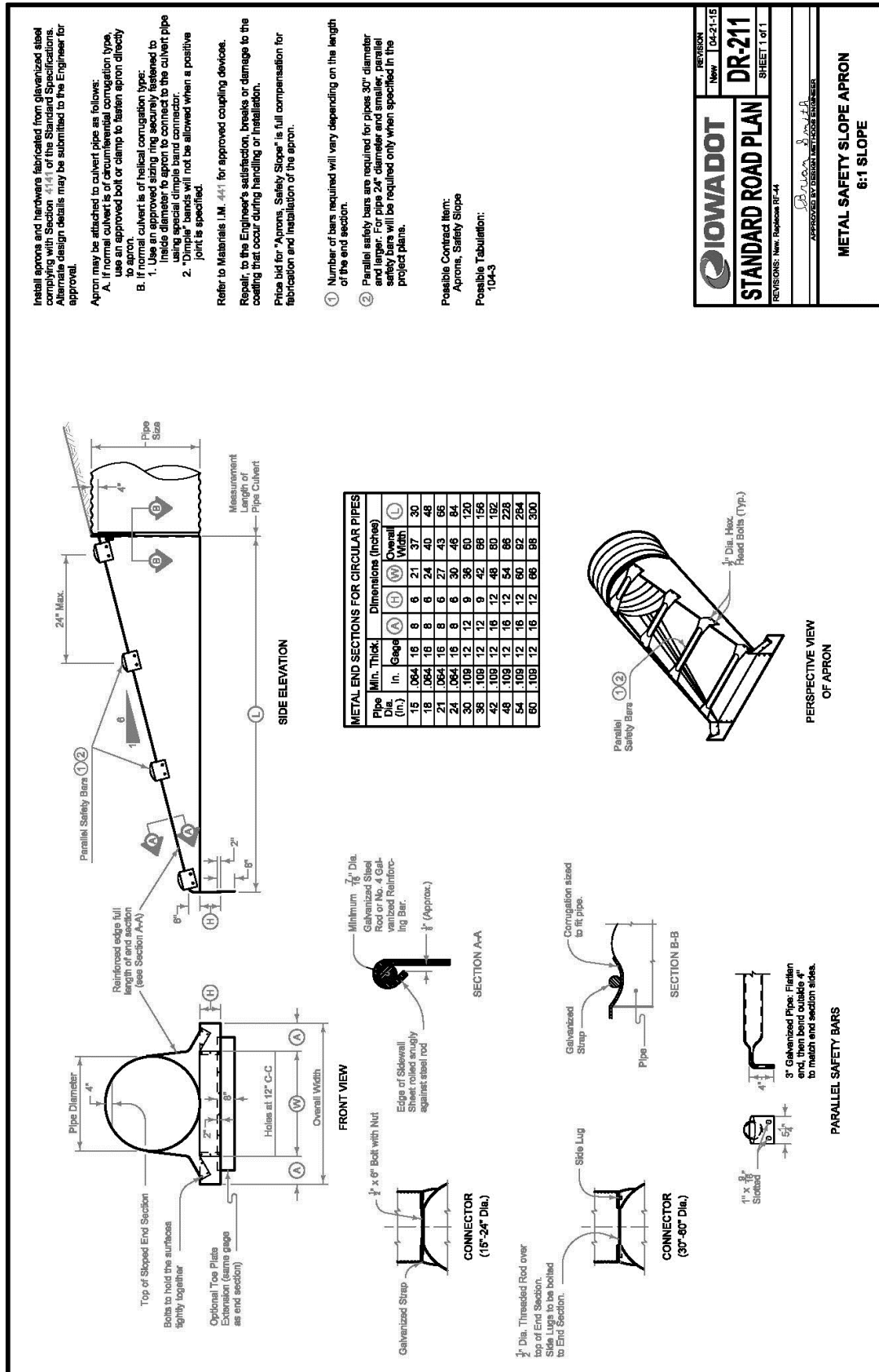
TYPE 1 CONNECTION

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For reinforcing steel used in construction of "Beveled Pipe and Guard", use deformed bars meeting the requirements of Article 4161.03 of the Standard Specifications and hot-dip galvanized according to ASTM A123.

Use Class 'C' Concrete in the construction of Beveled Pipe and Guard.

Cut the pipe to fit the foreslope. Cut slots into the pipe for placement of the No. 8 bars. After the foreslope has been placed, fit the No. 8 bars into the slots cut in the pipe so they will be in proper position when the concrete collar is poured.

Price bid for "Beveled Pipe and Guard," each, is full compensation for furnishing all materials and constructing the Beveled Pipe and Guard.

Special Note:

A self fence ditch check is required immediately upstream from the inlet. Refer to **SD-201** for construction details.

Possible Contract Item:
Beveled Pipe and Guard

Possible Tabulations:
104-3
112-8



STANDARD ROAD PLAN

REVISIONS: New, Revision RE-27

REVISION

New 04-21-15

DR-212

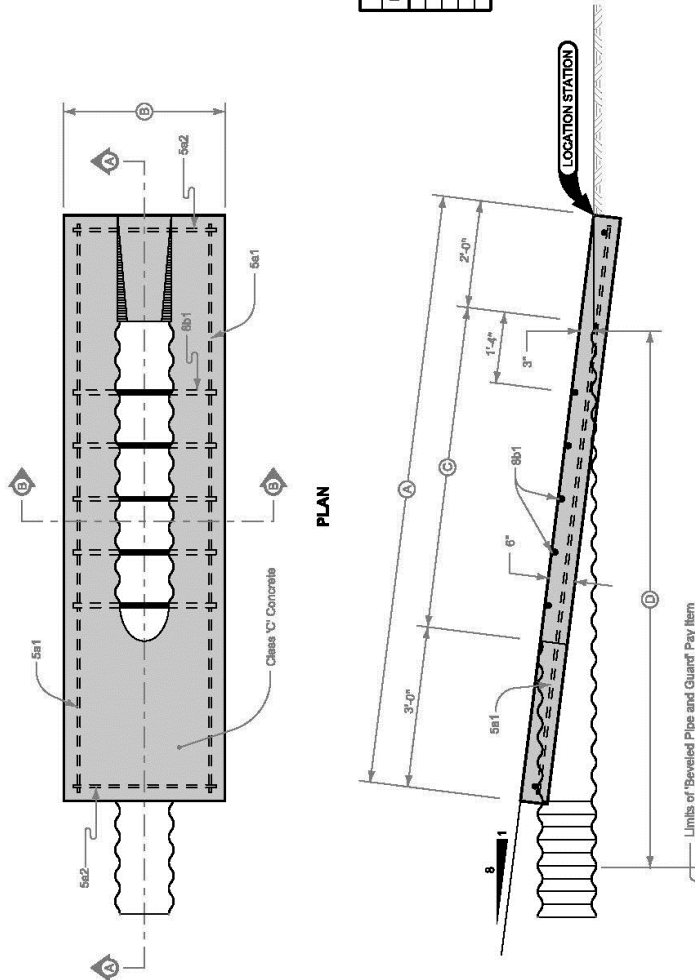
SHEET 1 of 1

APPROVED BY DESIGN TECHNICIAN ENGINEER

Brian Smith

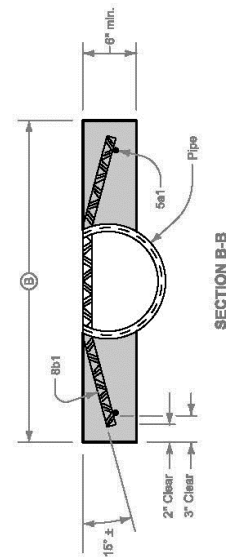
BEVELED PIPE AND GUARD

PIPE SIZE	(A)	(B)	(C)	(D)
12"	11'-0"	3'-0"	8'-0"	10'-0"
15"	13'-2"	3'-2"	8'-2"	12'-0"
18"	15'-4"	3'-4"	10'-4"	14'-0"
21"	17'-6"	3'-6"	12'-6"	16'-0"
24"	19'-8"	4'-0"	14'-8"	18'-0"



REINFORCING BAR LIST					TOTAL WEIGHT	
PIPE SIZE	BAR	LOCATION	SHAPE	COUNT	LIN. FT.	WEIGHT
12"	5a1	Base	—	2	10'-0"	22.3
	5a2	Base	—	2	2'-0"	5.8
	8b1	Base	—	5	2'-0"	37.9
15"	5a1	Base	—	2	12'-10"	28.7
	5a2	Base	—	2	2'-11"	6.2
	8b1	Base	—	7	2'-11"	21.6
18"	5a1	Base	—	2	15'-0"	30.0
	5a2	Base	—	2	3'-0"	6.4
	8b1	Base	—	9	3'-0"	30.0
21"	5a1	Base	—	2	17'-2"	34.4
	5a2	Base	—	2	3'-0"	6.9
	8b1	Base	—	11	3'-0"	38.5
24"	5a1	Base	—	2	19'-4"	38.7
	5a2	Base	—	2	3'-0"	7.4
	8b1	Base	—	13	3'-0"	48.9

SECTION A-A



SECTION B-B

SECTION 4040 - SUBDRAINS AND FOOTING DRAIN COLLECTORS

PART 1 - GENERAL

1.03 through 1.06: (DELETE): Comply with Division 1 - General Provisions and Covenants (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

PART 3 - EXECUTION

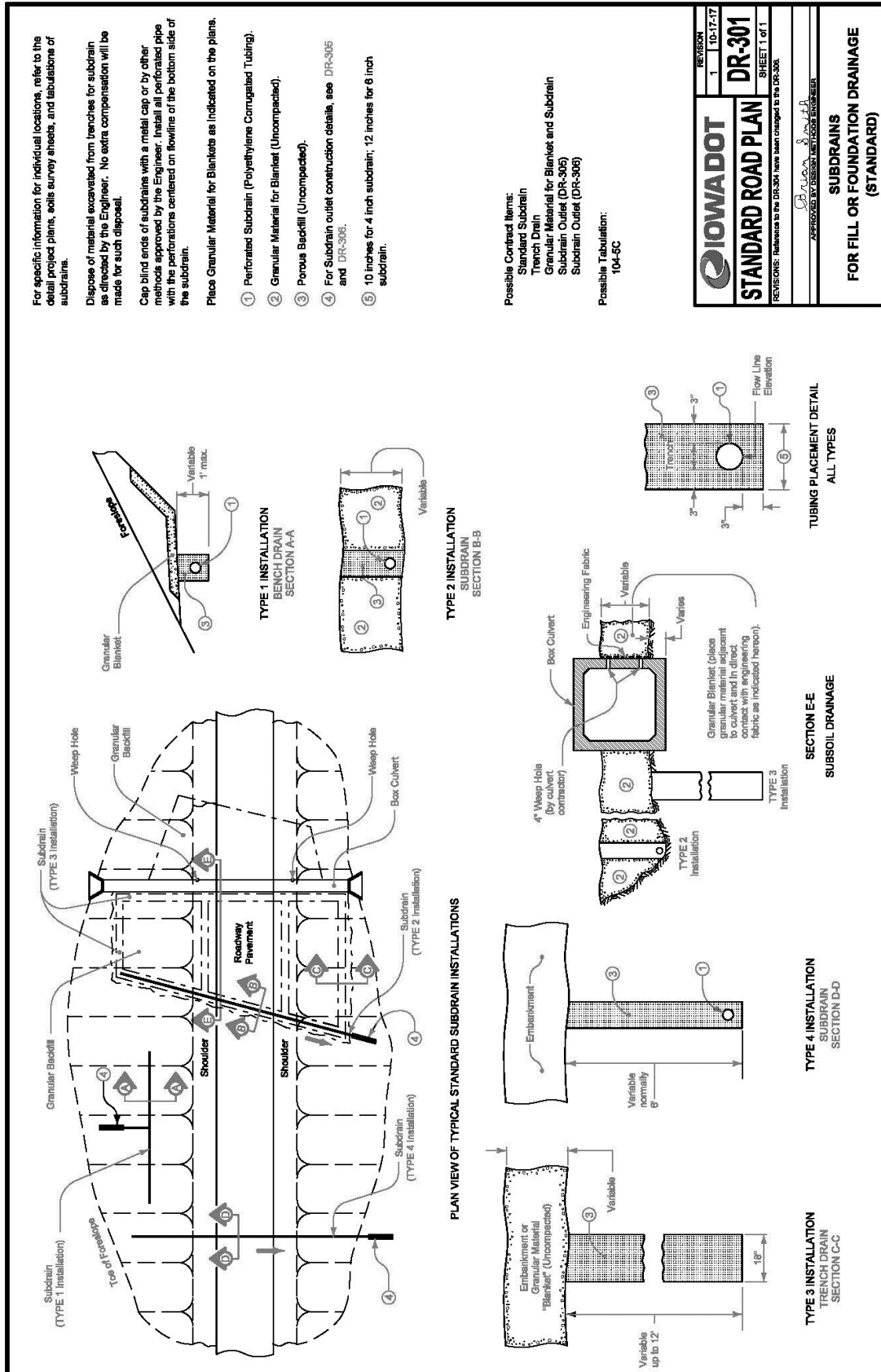
3.01 SUBDRAINS

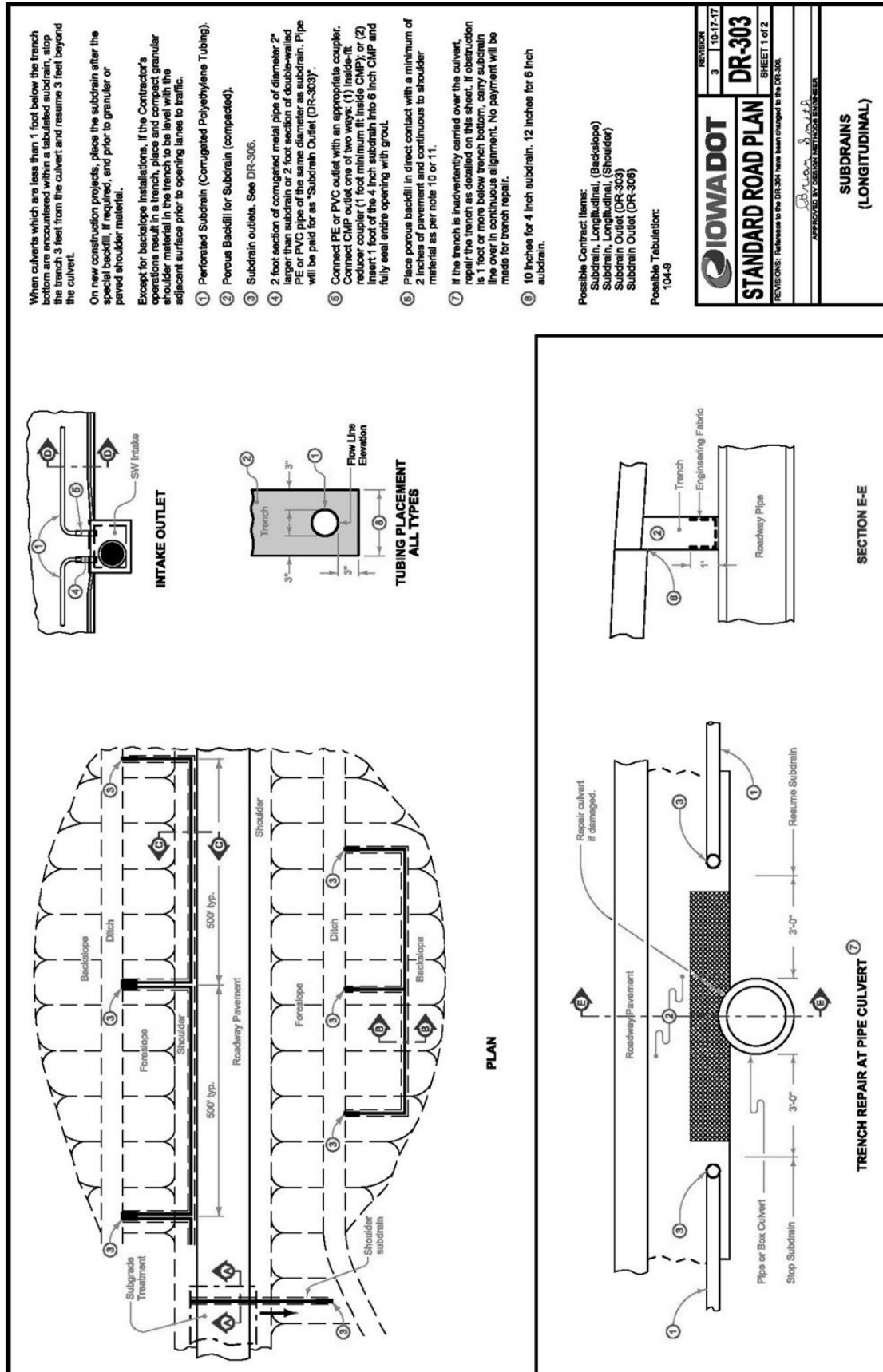
- A. Install Type 1 or Type 2 subdrain where specified in the contract documents. Comply with Figure 4040.231 (ADD), DR-301, and DR-303.
- C. Provide outlets where specified in the contract documents.
 - 3. (ADD) Comply with 4040.233 and DR-306 for outlets to grade.

3.04 (ADD) IOWA DOT STANDARD ROAD PLANS

A. Add the following details:

- 1. DR-301 Subdrains for Fill or Foundation Drainage (Standard)
- 2. DR-303 Subdrains (Longitudinal)
- 3. DR-306 Precast Concrete Headwall for Subdrain Outlets.





1 Perforated Subdrain (Corrugated Polyethylene Tubing).

2 Porous Backfill for Subdrain (compacted).

3 Place porous backfill in direct contact with a minimum of 2 inches of pavement and continuous to shoulder material as per note 11 or 12.

4 Install subdrain as cut proceeds.

5 On existing Granular or Earth Shoulders, replace with 4 inch minimum depth granular shoulder material.

6 On Paved Shoulders, refer to Section 2502 of the Standard Specifications for finishing shoulder.

7 Cut "V" notch just prior to subbase (if proposed) or pavement placement to assure unconfined contact.

8 Place top of subdrain trench at the bottom of pavement Backfill trench so that a wedge of porous backfill has a minimum vertical contact of 2 inches with the pavement.

IOWA DOT	REVISION	3	10-12-17
	DR-303		
STANDARD ROAD PLAN			
SHEET 2 of 2			
REVISIONS: Reference to the DR-301 have been changed to the DR-303.			
APPROVED BY DESIGN: <i>[Signature]</i>			
APPROVED BY DESIGN: <i>[Signature]</i>			
SUBDRAINS (LONGITUDINAL)			

TYPE 5 INSTALLATION
SECTION A-A
Subgrade Treatment Subdrain

TYPE 6 INSTALLATION
SECTION C-C
For Drain Placement Prior to Subbase or Pavement Placement

TYPE 7A INSTALLATION
SECTION C-C

TYPE 7B INSTALLATION
SECTION C-C

TYPE 8A INSTALLATION
SECTION C-C

TYPE 8B INSTALLATION
SECTION C-C

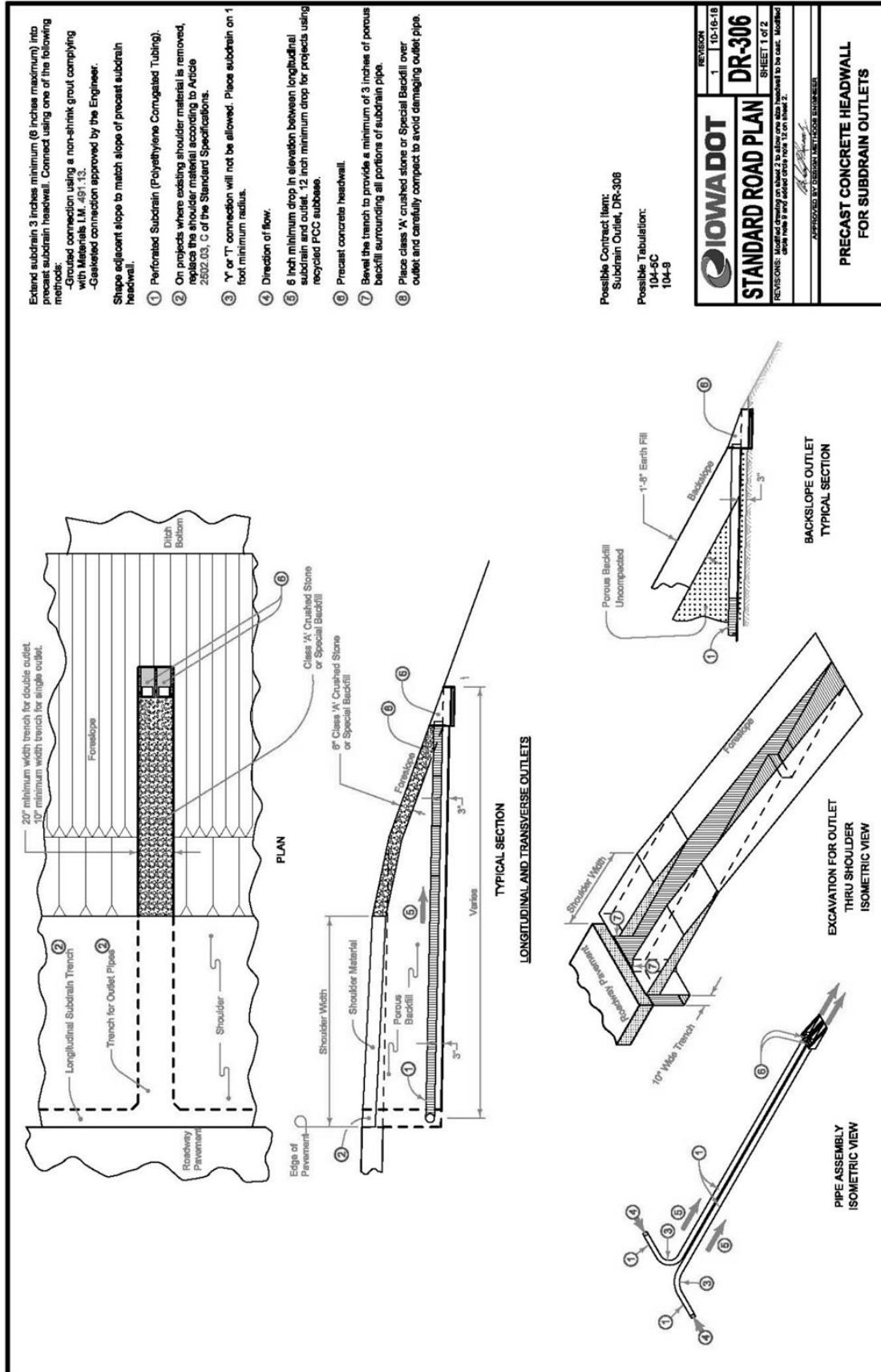
TYPE 9 INSTALLATION
SECTION C-C
Composite Pavement with Existing Shoulder

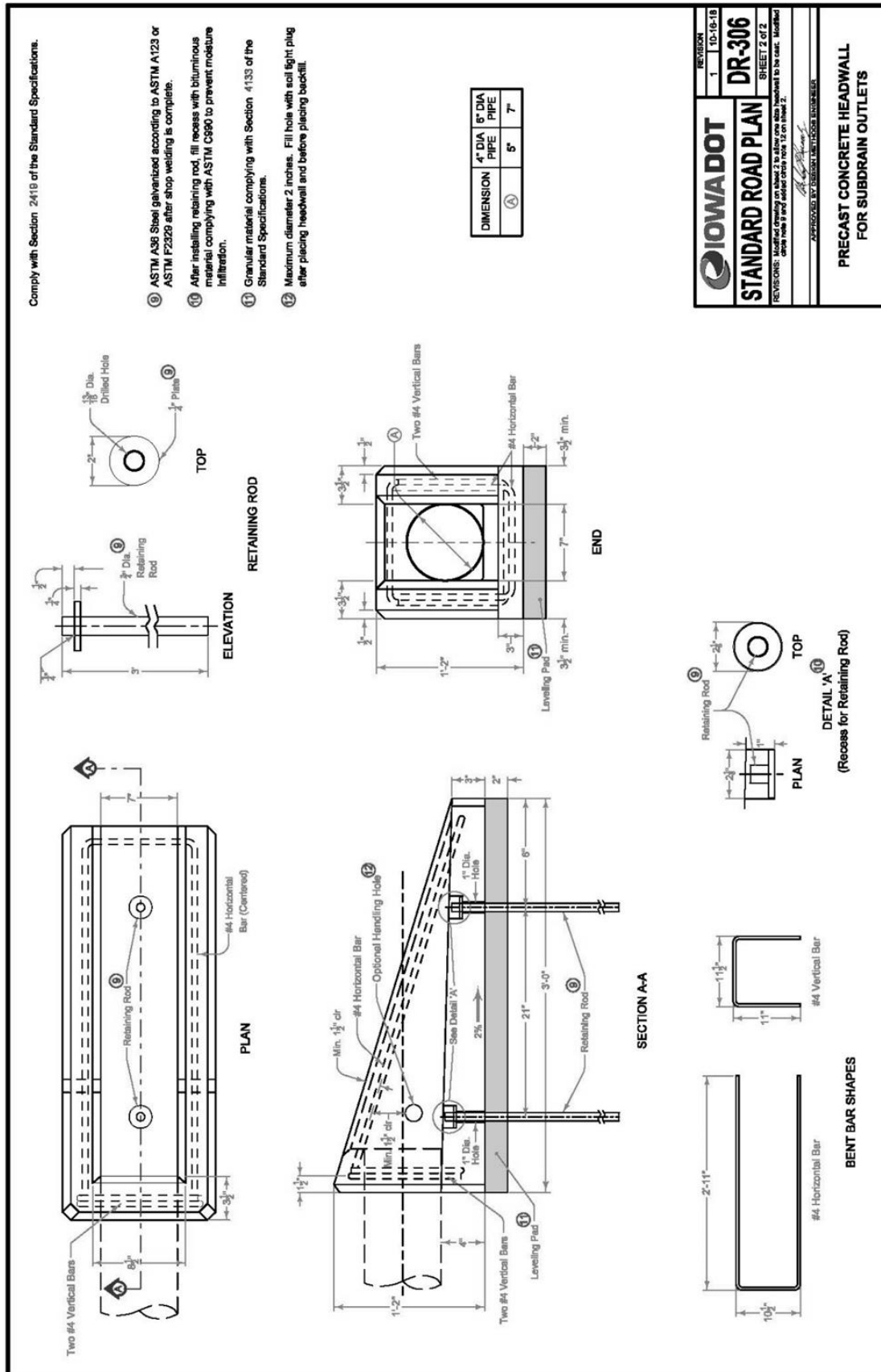
TYPE 11 INSTALLATION
SECTION B-B
Backslope

TYPE 12 INSTALLATION
SECTION D-D

TYPE 13 INSTALLATION
SECTION C-C
For New Widening Unit if Thinner than Existing Pavement

TYPE 14 INSTALLATION
SECTION C-C
For New Widening Unit if Thicker than Existing Pavement





SECTION 4050 - PIPE REHABILITATION

PART 1 - GENERAL

1.03 through 1.06: (DELETE): Comply with Division 1 - General Provisions and Covenants (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

SECTION 4060 - CLEANING, INSPECTION, AND TESTING OF SEWERS

PART 1 - GENERAL

1.03 through 1.06: (DELETE): Comply with Division 1 - General Provisions and Covenants (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

PART 2 - PRODUCTS

2.02 (ADD) FORCE MAIN CLEANING PIG

- A. The force main cleaning pigs shall be light-density crisscross pigs constructed of a minimum of two (2) pounds per cubic foot density foam and coated with polyurethane elastomer in crisscross pattern.
- B. The force main cleaning pigs shall have an open nose design for maximum jetting action and pressure equalization. The pigs shall have the ability to scratch, scrape, plow and jet to assist in cleaning and flushing debris from the force main. The pig units shall be sized to the pipe in accordance with the manufacturer's recommendations and shall have a length two times the diameter. The nose shall be parabolic shaped in order that it may better enter restrictions. The pigs shall have the ability to negotiate mitered and short radius bends, short radius elbows, tees, crosses, and multi-dimensional pipe sizes and valves.
- C. All pipeline pig ingredients shall be certified by the manufacturer as having been successfully used in similar applications and comply with these specifications.

PART 3 – EXECUTION

3.03 VIDEO INSPECTION

- A. (DELETE) ~~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 4010 for sanitary sewers and Section 4020 for storm~~

~~sewers.~~

~~4. Re-inspect sewers after any corrective action has been completed.~~

B. (DELETE) 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. (DELETE) 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.~~

A. (ADD) Prior to acceptance by the City, a television inspection on Sanitary Sewers shall be completed by the contractor. Said TV inspection shall be performed 30 days after backfilling. The TV inspection shall be with a pan & tilt color camera and a footage meter that accurately displays the camera's location on tape.

B. (ADD) The developer/contractor will be required to ensure that an informational meeting is set up between the entity performing the television inspection on the new construction and the City Engineer and/or Sewer Superintendent. The meeting is used to educate the entity's television operator on the proper inspection techniques while televising for the City of Marshalltown. Proper techniques are, but not limited to the following:

1. Identify each structure by proper structure number

2. Separate reports for each line segment televised

3. Pipe preparation before televising, to include cleaning or putting water down the line to show sags

4. Video tape procedures, including procedures for viewing laterals or connections

5. Timeliness in returning videos and paper reports

C. (ADD) All television inspections shall be provided in digital format (.MPEG, .MPG, or .WMV), PDF written report and in Wincan digital CD format. If not

provided in Wincan digital format, the contractor shall pay \$20 per line segment for the information to be data entered into the City system.

- D. (ADD) After review of the videos and written reports, the City of Marshalltown will contact the developer or contractor of a positive review or identify areas that need to be repaired prior to final acceptance. Any repairs will need to be re-televised.

3.07 (ADD) FORCE MAIN CLEANING

- A. All lines shall be thoroughly cleaned before acceptance until all traces of construction materials, soil or other foreign matter have been removed.
- B. The Contractor shall take all necessary measures to protect adjacent facilities and property. Damages caused by water or water carried material shall be the responsibility of the Contractor.
- C. All cleaning shall be completed prior to the initiation of the testing process described in Part 3.06.
- D. Force main cleaning shall be accomplished using a hydraulically propelled polyurethane pig, conforming to the requirements of Part 2 above, to remove all construction debris from the force main.

SUPPLEMENTAL DIVISION 5 – WATER MAINS AND APPURTENANCES

(SEE MARSHALLTOWN WATER WORKS RULES AND REGULATIONS)

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SUPPLEMENTAL DIVISION 6 - STRUCTURES FOR SANITARY AND STORM SEWER

SECTION 6010 - STRUCTURES FOR SANITARY AND STORM SEWERS

PART 1 - GENERAL

1.03 through 1.06: (DELETE): Comply with Division 1 - General Provisions and Covenants (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

1.08 MEASUREMENT AND PAYMENT

D. Casting Extension Rings:

1. Measurement: (DELETE) ~~Each casting extension ring will be counted~~ (ADD) None.
2. Payment: (DELETE) ~~Payment will be at the unit price for each casting extension ring~~ (ADD) Incidental to manhole.

1.09 (ADD) ACCEPTANCE CHECKLIST & WARRANTY BOND

Prior to final acceptance of the work, the contractor shall file with the City Clerk of the City of Marshalltown a maintenance bond guaranteeing suitable repairs of any defects or failures due to deficiencies in materials or inadequacies in workmanship for a period of 4 years for all improvements following completion of construction. The bond shall be for a sum equal to the total amount of the project. The contractor shall also file with the City Engineer all other required acceptance checklist items including testing/inspection forms, lateral construction forms, as-built drawings, construction costs and engineering certificate of completion forms. The acceptance checklist and warranty bond form are provided at end of section.

PART 2 - PRODUCTS

2.02 PRECAST

- B. (ADD) Pre-cast manholes or parts of pre-cast manholes are preferred in lieu of building on the site.

2.03 CAST-IN-PLACE

- C. (ADD) Manholes will be constructed with no lift holes in the manhole sections.
- D. (ADD) Manholes shall be provided with gasketed joints conforming to ASTM C-443 for rubber “O” ring joints or be sealed with a double layer of a cold-applied mastic joint sealing compound recommended by the manufacturer for the intended use and approved by the Engineer. Comply with ASTM C 990.

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. (ADD) Concrete adjustment rings will be sealed with a butyl mastic seal between each ring installed and between rings and casting.
2. High Density Polyethylene Adjustment Rings: Comply with ASTM D 1248 for recycled plastic.
 - d. Install adjustment rings on clean, flat surfaces according to the manufacturer's recommendations with the proper butyl rubber sealant/adhesive (ADD) between each ring and manhole structure/casting.
3. Expanded Polypropylene Adjustment Rings: Comply with ASTM D 4819 for expanded polypropylene when tested according to ASTM D 2375.
 - d. (ADD) EPP adjustment rings shall be sealed with a moisture curing, polyether adhesive/sealant approved by the manufacturer between each ring and manhole structure/casting.

2.10 CASTINGS (Ring, Cover, Grate, and Extensions)

D. Casting Types:

4. (ADD) Manhole castings shall be provided with a minimum 24-inches clear opening.
5. (ADD) Standard sanitary manhole castings shall meet the requirements of MP-7.1, Type A. Manhole covers shall be provided with a rubber gasket to provide a self-sealing water tight lid when installed. Lids will be furnished with concealed pick holes. Floating castings shall be Type B and may be used with paving projects. Pre-Approved Type A castings are Neenah Foundry Company R-1642, R-1796-E, and R-1900-C; Deeter Foundry Inc. 1247; and East Jordan Iron Works 1040. Pre-Approved Type B castings are Neenah Foundry Company R-1673-B; Deeter Foundry Inc. 1185; and East Jordan Iron Works 1795 and Selflevel 1205 and 3025.
6. (ADD) Castings for manholes in waterways and flood plain locations shall meet the requirements of MP-7.1, Type C. Pre-Approved Type C castings are Neenah Foundry Company R-1916-F, Deeter Foundry Inc. 1247-B, and East Jordan Iron Works 1040 bolted.

2.11 ADDITIONAL MATERIALS FOR SANITARY SEWER MANHOLES

A. Infiltration Barrier:

5. (ADD) Manhole castings with EPP and HDPE adjustment rings properly assembled and sealed will not be required to have a separate casting seal. Manhole castings with concrete adjustment rings will require a separate casting seal.

2.13 STEPS

- A. ~~(DELETE) Provide steps in all circular, precast manholes unless otherwise specified in the contract documents~~ (ADD) Manhole steps will not be installed

unless specifically called for on the detailed drawings. When called out on the plans, steps shall conform to the requirements shown thereon and as supplemented herein.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS FOR INSTALLATION OF MANHOLES AND INTAKES

F. Joint Sealant:

1. Sanitary Sewer Manholes:
 - a. Install rubber O-ring or profile gasket (precast structures) (ADD) or a double layer of a cold-applied mastic joint sealing compound.

3.08 (ADD) MARSHALLTOWN STANDARD DETAILS

A. Added the following details:

1. MP-5 Typical Sanitary Sewer Manhole Detail
2. MP-6 Typical Sanitary Sewer Drop Manhole Detail
3. MP-7.2 Typical Sanitary Sewer Manhole Casting Seal Detail

3.09 (ADD) DELETED SUDAS FIGURES

- A. 6010.306 Chimney Seals for Sanitary Sewer Manholes
- B. 6010.307 Drop Connection for Sanitary Sewer Manholes
- C. 6010.513 Open-sided Area Intake (Note: May be used with preapproval of Engineer if capacity cannot be matched by another inlet)

MARSHALLTOWN SPECIAL PROVISIONS
FINAL ACCEPTANCE CHECKLIST

- A. Manhole Vacuum testing – for Sanitary Sewers
- B. Warranty Bond – Storm Sewers (See Specifications Part I)
- C. TV Inspection – For Storm Sewer Pipe.
- D. As-Built Drawings – For Storm Sewers
- E. Engineering Certificate of Completion in accordance with the Plans and Specifications – Storm Sewers
- F. Contractors Cost of Construction Report - This is to meet the financial reporting requirements of the city (GASB 34)

LOW PRESSURE/VACUUM TESTING OF SANITARY MANHOLES

PROJECT NAME: _____

LOCATION: _____

CONTRACTOR: _____

LIST MANHOLE TESTED: DATE _____

Manhole No.: _____ Station: _____

Barrel Size: _____ or Dia.: _____

Depth: _____ (Rim to F/L)

Poured in Place _____ or Precast _____

No. of adjusting rings: _____

Manufacturer of Test Device: _____

Manufacturer's test procedure recommendations

TEST INFORMATION:

Low Pressure Method:

Initial Pressure: _____ psi

Starting Test Pressure: _____ psi

Ending Test Pressure: _____ psi

Test Duration: _____ Sec(s)

CONCLUSION: Complies: Yes _____ No _____

Vacuum Method

Initial Vacuum: _____ Hg

Starting Test Vacuum: _____ Hg

Ending Test Vacuum: _____ Hg

Test Duration: _____ Sec(s)

CONCLUSION: Complies: Yes _____ No _____

LIST MANHOLE TESTED: DATE _____

Manhole No.: _____ Station: _____

Barrel Size: _____ or Dia.: _____

Depth: _____ (Rim to F/L)

Poured in Place _____ or Precast _____

No. of adjusting rings: _____

Manufacturer of Test Device: _____

Manufacturer's test procedure recommendations

TEST INFORMATION:

Low Pressure Method:

Initial Pressure: _____ psi

Starting Test Pressure: _____ psi

Ending Test Pressure: _____ psi

Test Duration: _____ Sec(s)

CONCLUSION: Complies: Yes _____ No _____

Vacuum Method

Initial Vacuum: _____ Hg

Starting Test Vacuum: _____ Hg

Ending Test Vacuum: _____ Hg

Test Duration: _____ Sec(s)

CONCLUSION: Complies: Yes _____ No _____

LIST MANHOLE TESTED: DATE _____

Manhole No.: _____ Station: _____

Barrel Size: _____ or Dia.: _____

Depth: _____ (Rim to F/L)

Poured in Place _____ or Precast _____

No. of adjusting rings: _____

Manufacturer of Test Device: _____

Manufacturer's test procedure recommendations

TEST INFORMATION:

Low Pressure Method:

Initial Pressure: _____ psi

Starting Test Pressure: _____ psi

Ending Test Pressure: _____ psi

Test Duration: _____ Sec(s)

CONCLUSION: Complies: Yes _____ No _____

Vacuum Method

Initial Vacuum: _____ Hg

Starting Test Vacuum: _____ Hg

Ending Test Vacuum: _____ Hg

Test Duration: _____ Sec(s)

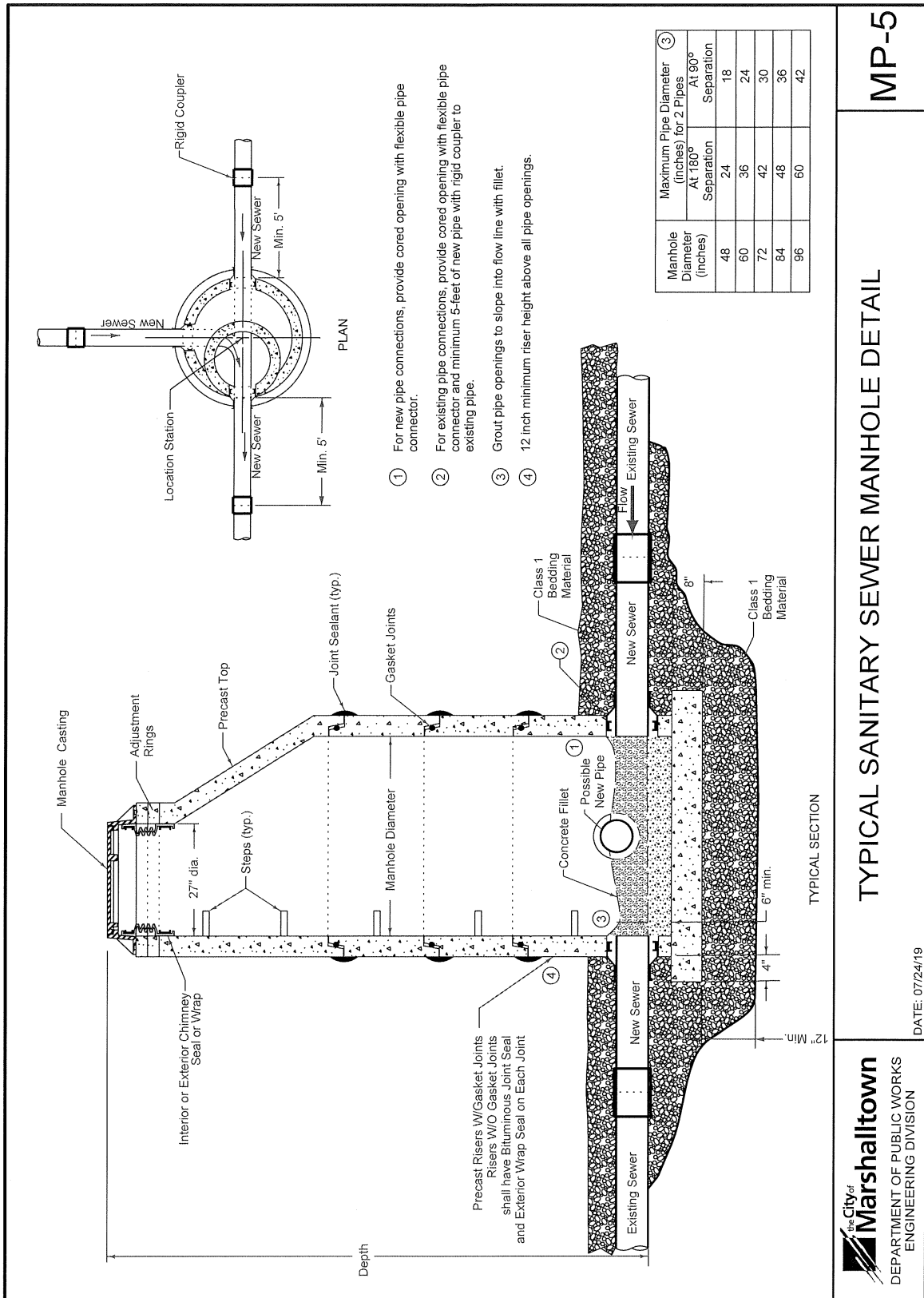
CONCLUSION: Complies: Yes _____ No _____

Testing procedures observed and
Information recorded by:

Results reviewed and affirmed by:

Project Representative

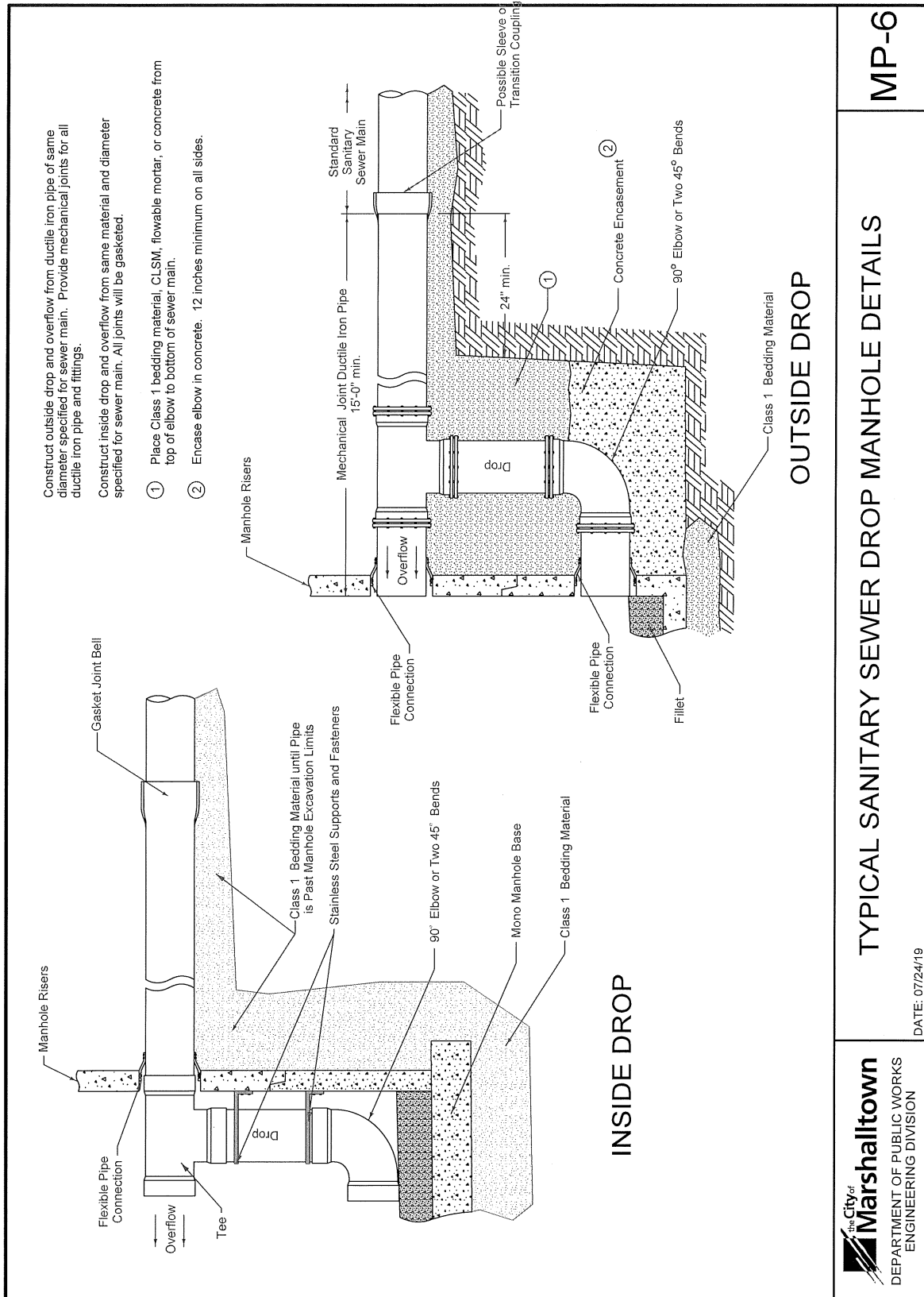
Project Engineer
City of Marshalltown, Iowa

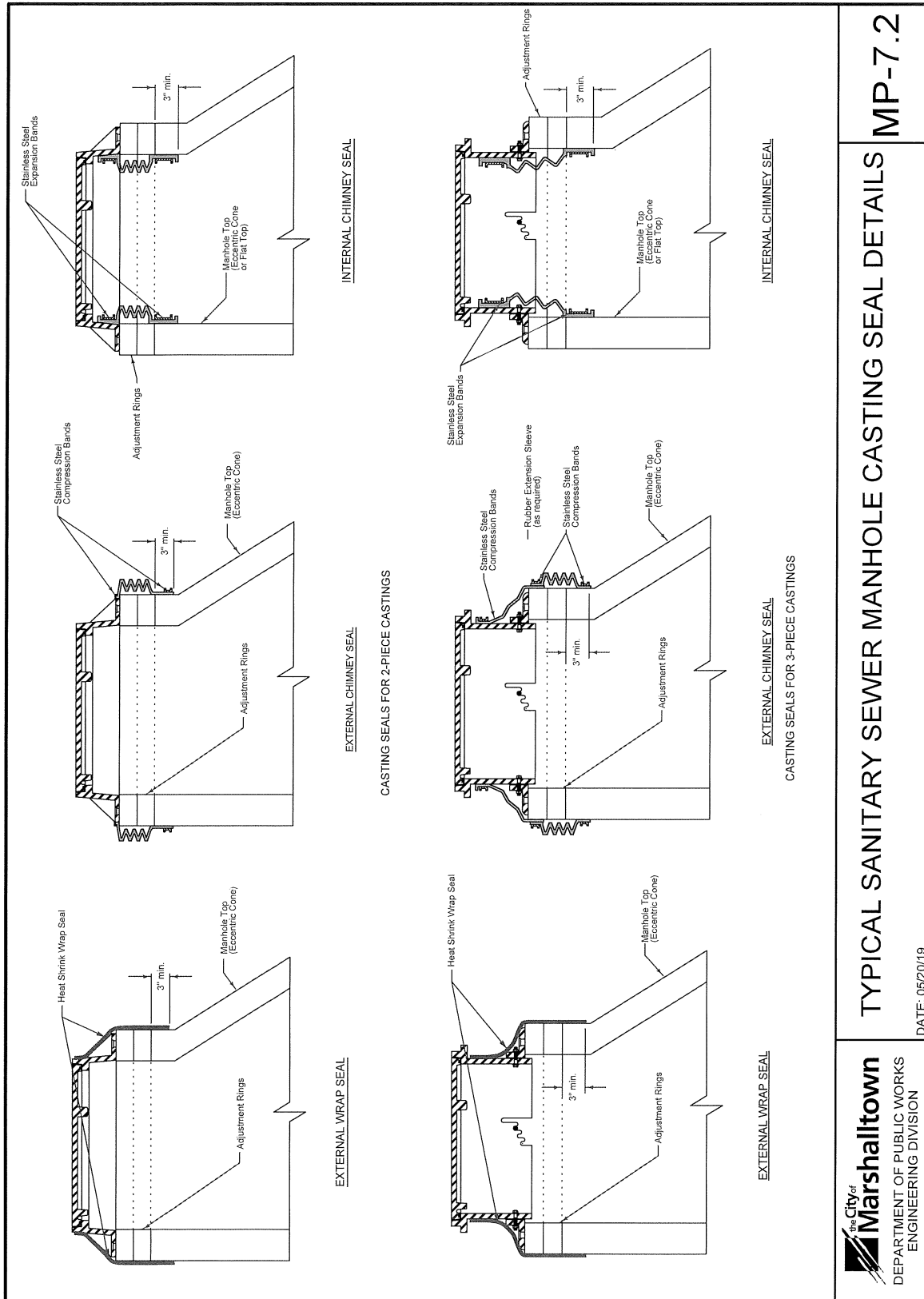


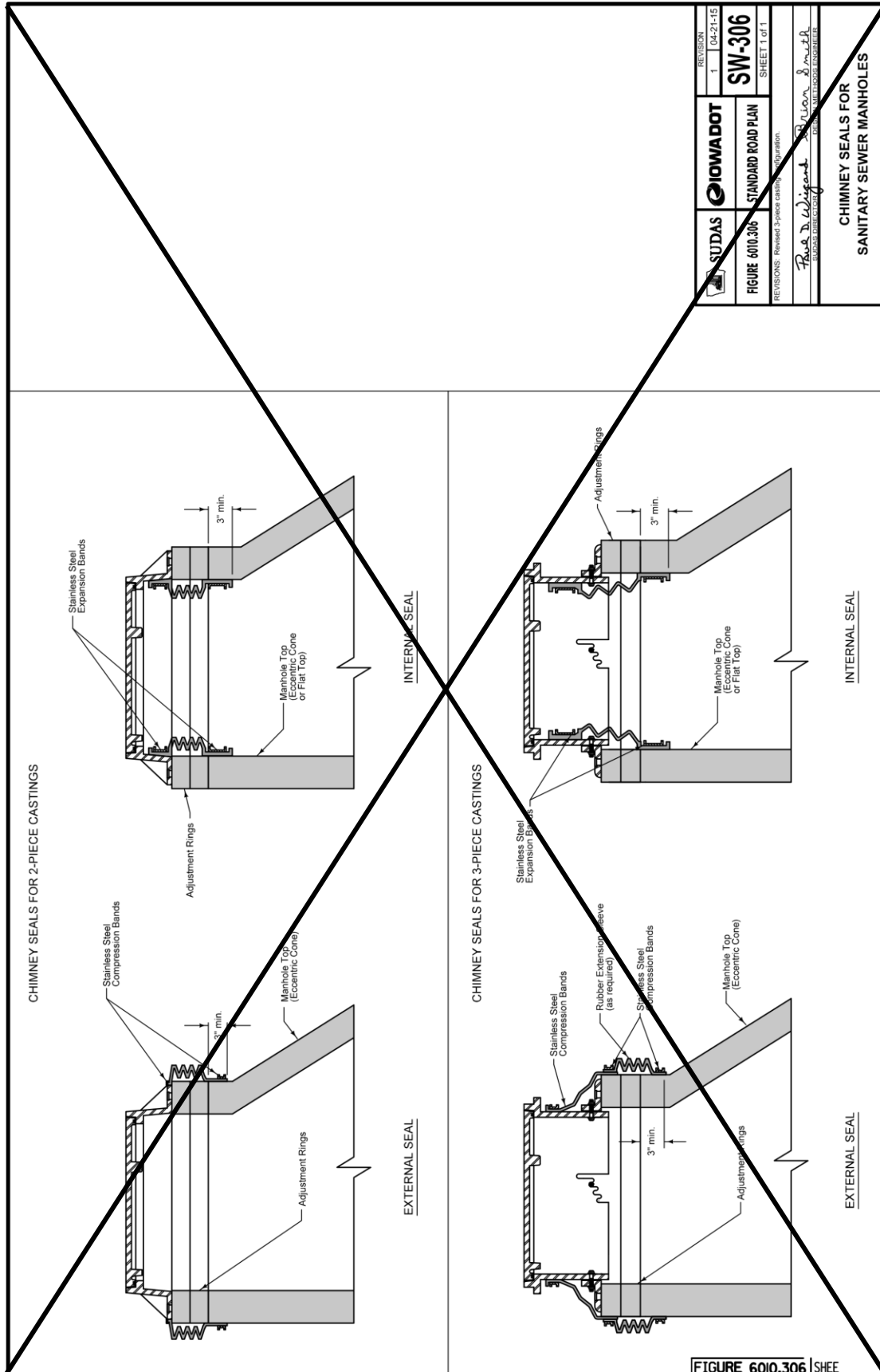
MP-5

TYPICAL SANITARY SEWER MANHOLE DETAIL

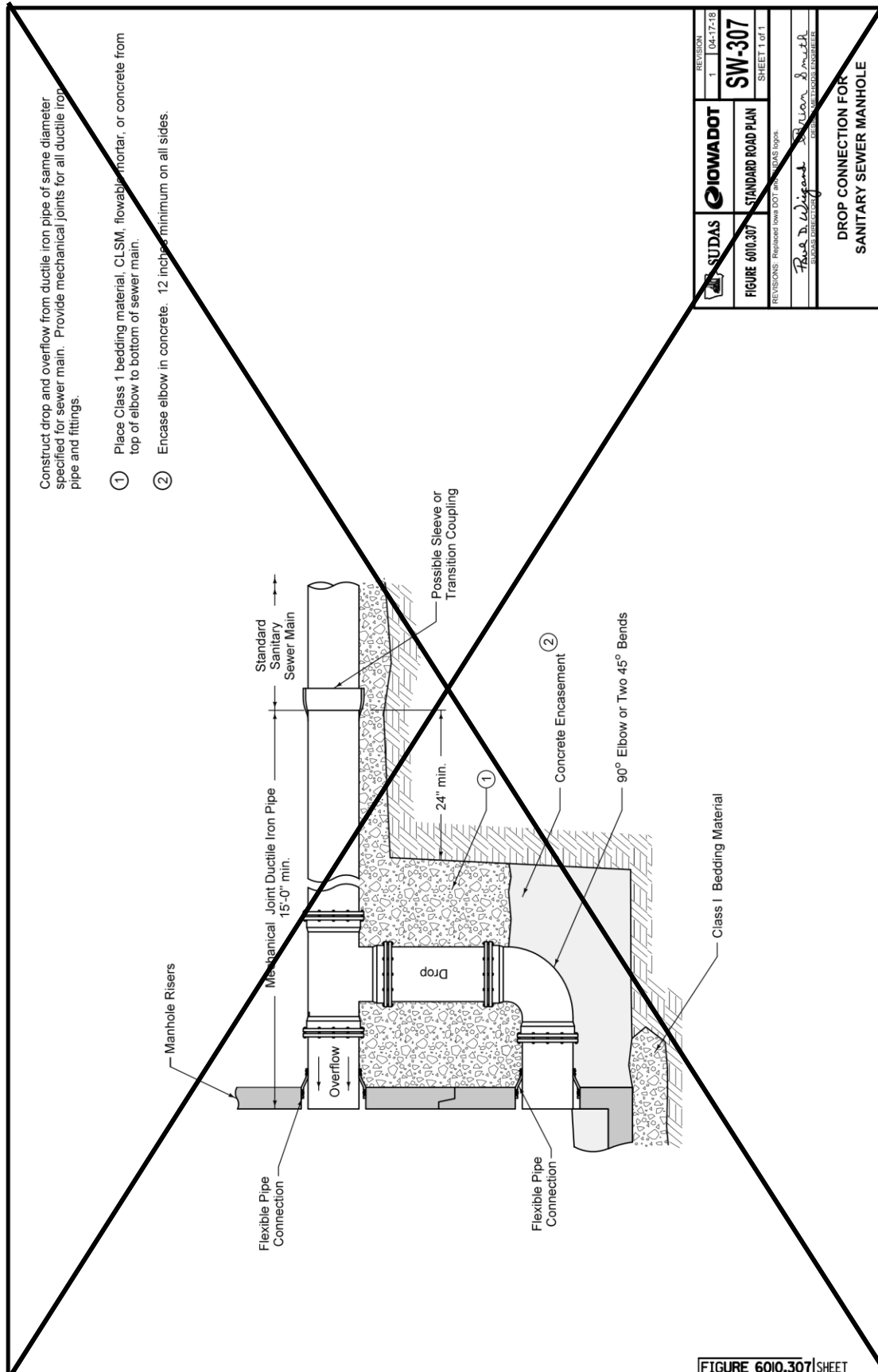
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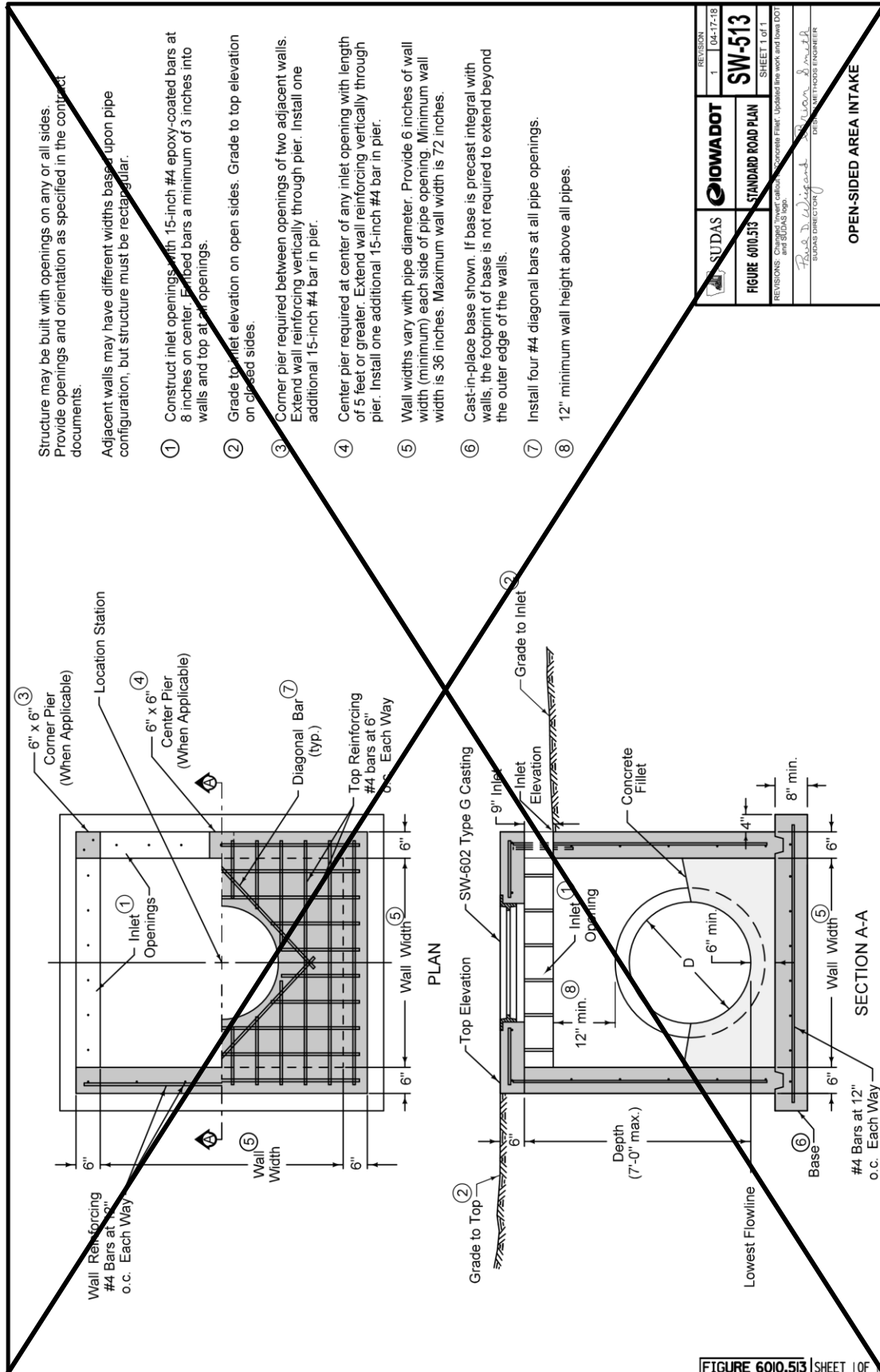






SUDAS	IOWA DOT	REVISION 1 04-21-15
FIGURE 6010.306	STANDARD ROAD PLAN	SW-306
REVISIONS: Revised 3-piece casting configuration		SHEET 1 of 1
Brad Wingard	Robert J. Smith	
PROJECT ENGINEER	PROJECT ENGINEER	
CHIMNEY SEALS FOR SANITARY SEWER MANHOLES		





SECTION 6020 - REHABILITATION OF EXISTING MANHOLES

PART 1 - GENERAL

1.03 through 1.06: (DELETE): ~~Comply with Division 1 - General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

SECTION 6030 - CLEANING, INSPECTION, AND TESTING OF STRUCTURES

PART 1 - GENERAL

1.03 through 1.06: (DELETE): ~~Comply with Division 1 - General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

SUPPLEMENTAL DIVISION 7 - STREETS AND RELATED WORK

SECTION 7010 -PORTLAND CEMENT CONCRETE PAVEMENT

PART 1 - GENERAL

1.03 through 1.06: (DELETE): ~~Comply with Division 1—General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

PART 3 - EXECUTION

3.02 PAVEMENT CONSTRUCTION

C. Surface Fixture Adjustment:

1. Adjust manhole frames and other fixtures within area to be paved to conform to finished surface. Comply with Section 6010 (DELETE), 3.04 (ADD) and 6020 for manhole adjustments (DELETE) and Section 5020, 3.04 for water fixture adjustments.

I. Finishing:

5. Surface Treatment:

- b. **(DELETE) 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.~~

3.03 CURB AND GUTTER CONSTRUCTION (DELETE) (See Figure 7010.102 (ADD) MD-2 Curb and Gutter Details.)

- B. Use a paving machine for curb and gutter. For curb and gutter sections less than 250 feet, hand finish methods may be used (ADD) if approved by the City Engineer.

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:

- 2) Stop mixing and placing when the air temperature is 38°F or less and falling or if the temperature stops rising and does not reach 38°F.
 - a) (ADD) When air temperature falls below 38°F, paving may continue if Contractor follows the requirements set forth in ACI 306 for cold weather concrete.
 - b) (ADD) ACI 306 will require specific temperatures of the concrete mixture for placement and curing. If these minimum temperatures cannot be maintained, concrete placement will not be allowed to continue.
 - c) (ADD) For reference, the temperature requirements are provided in the following table from ACI 306R-10:

(ADD) Table 5.1—Recommended Concrete Temperatures

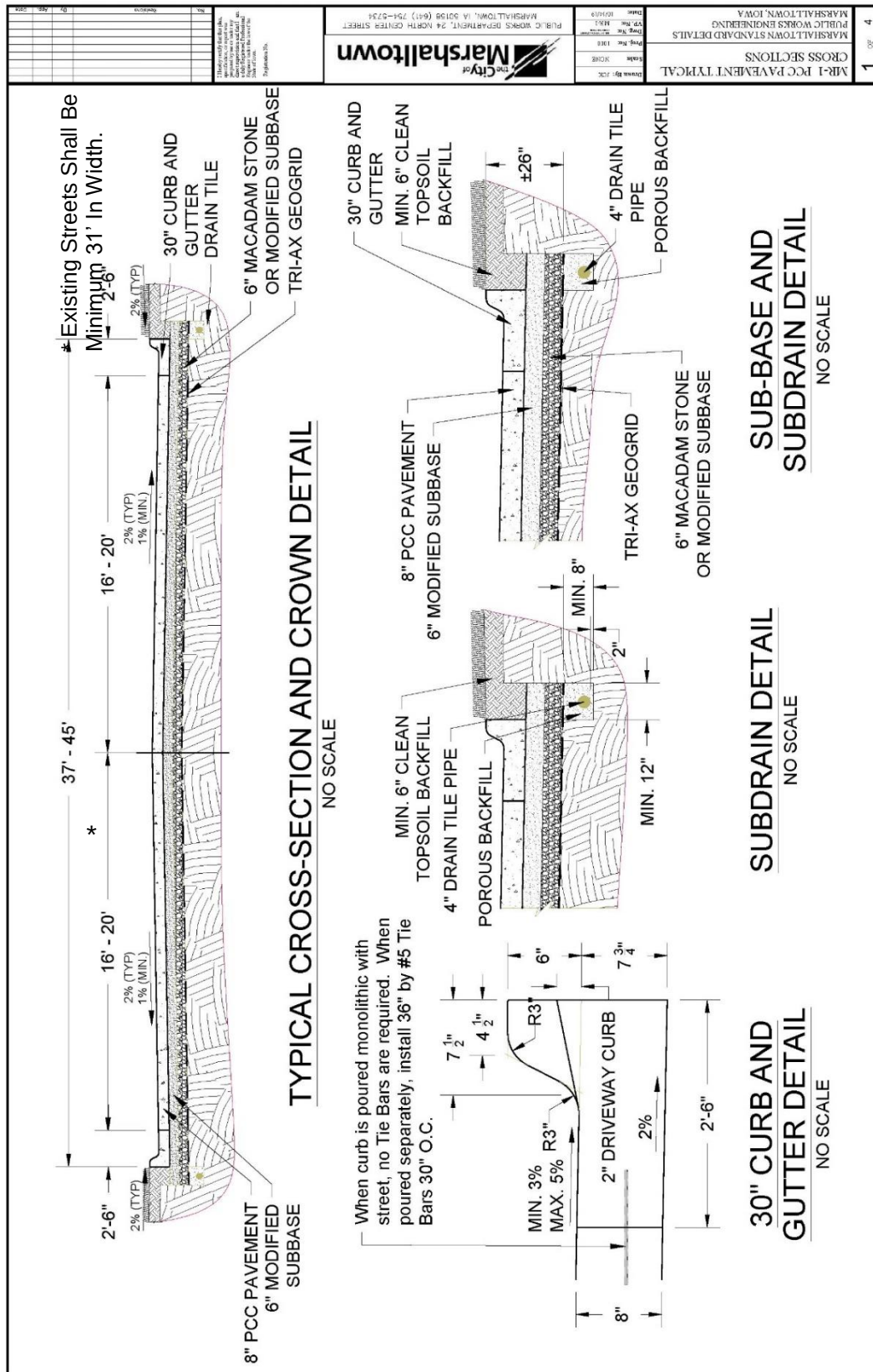
		Section size, minimum dimension			
		< 12 in. (300 mm)	12 to 36 in. (300 to 900 mm)	36 to 72 in. (900 to 1800 mm)	> 72 in. (1800 mm)
Line	Air Temperature	Minimum concrete temperature as placed and maintained			
1		55°F (13°C)	50°F (10°C)	45°F (7°C)	40°F (5°C)
		Minimum concrete temperature as mixed for indicated air temperature *			
2	Above 30°F (-1°C)	60°F (16°C)	55°F (13°C)	50°F (10°C)	45°F (7°C)
3	0 to 30°F (-18 to -1°C)	65°F (18°C)	60°F (16°C)	55°F (13°C)	50°F (10°C)
4	Below 0°F (-18°C)	70°F (21°C)	65°F (18°C)	60°F (16°C)	55°F (13°C)
5		Maximum allowable gradual temperature drop in first 24 hours after end of protection			
		50°F (28°C)	40° (22°C)	30°F (17°C)	20°F (11°C)

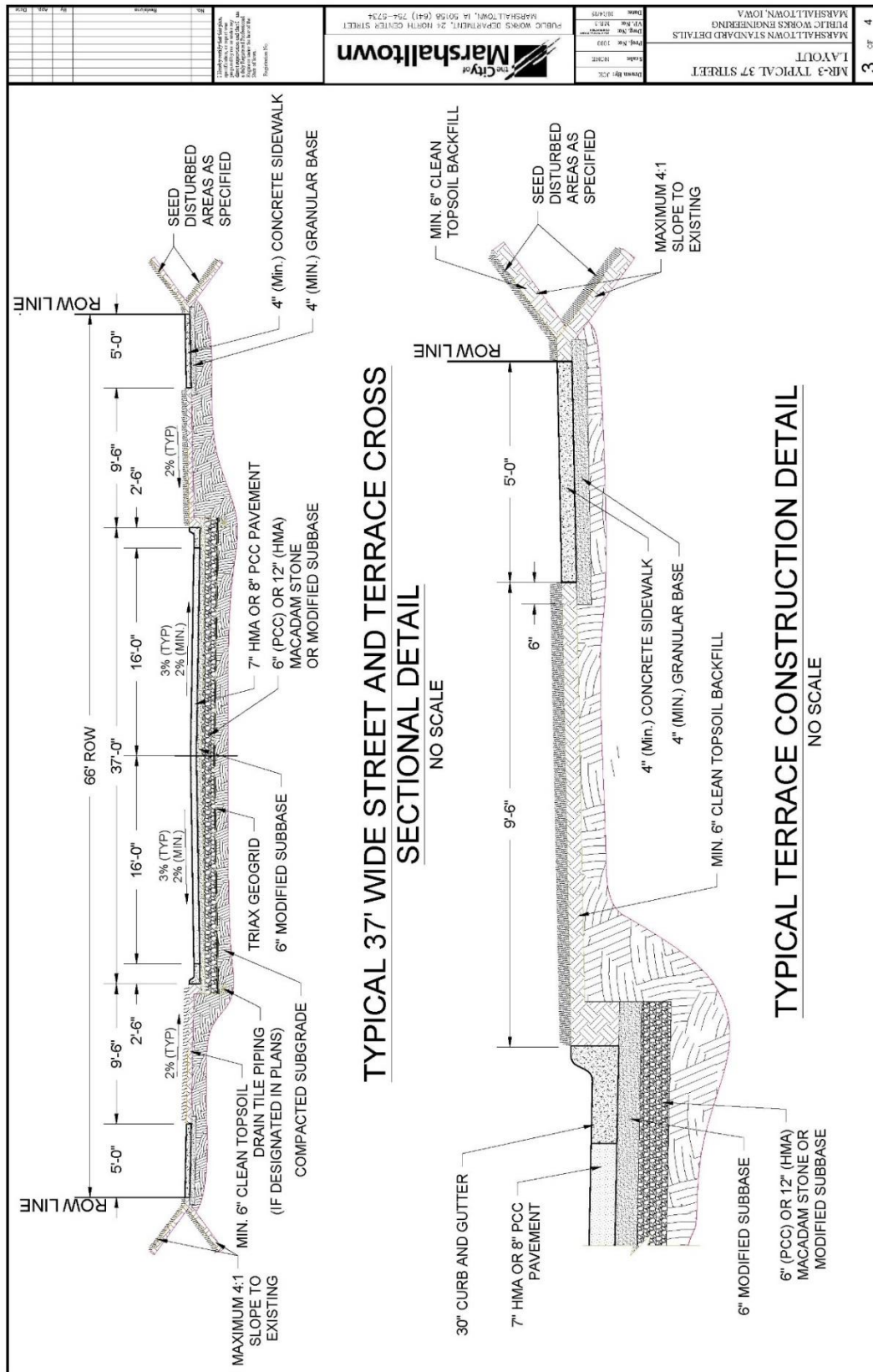
* For colder weather, a greater margin in temperature is provided between concrete as mixed and required minimum temperature of fresh concrete in place.

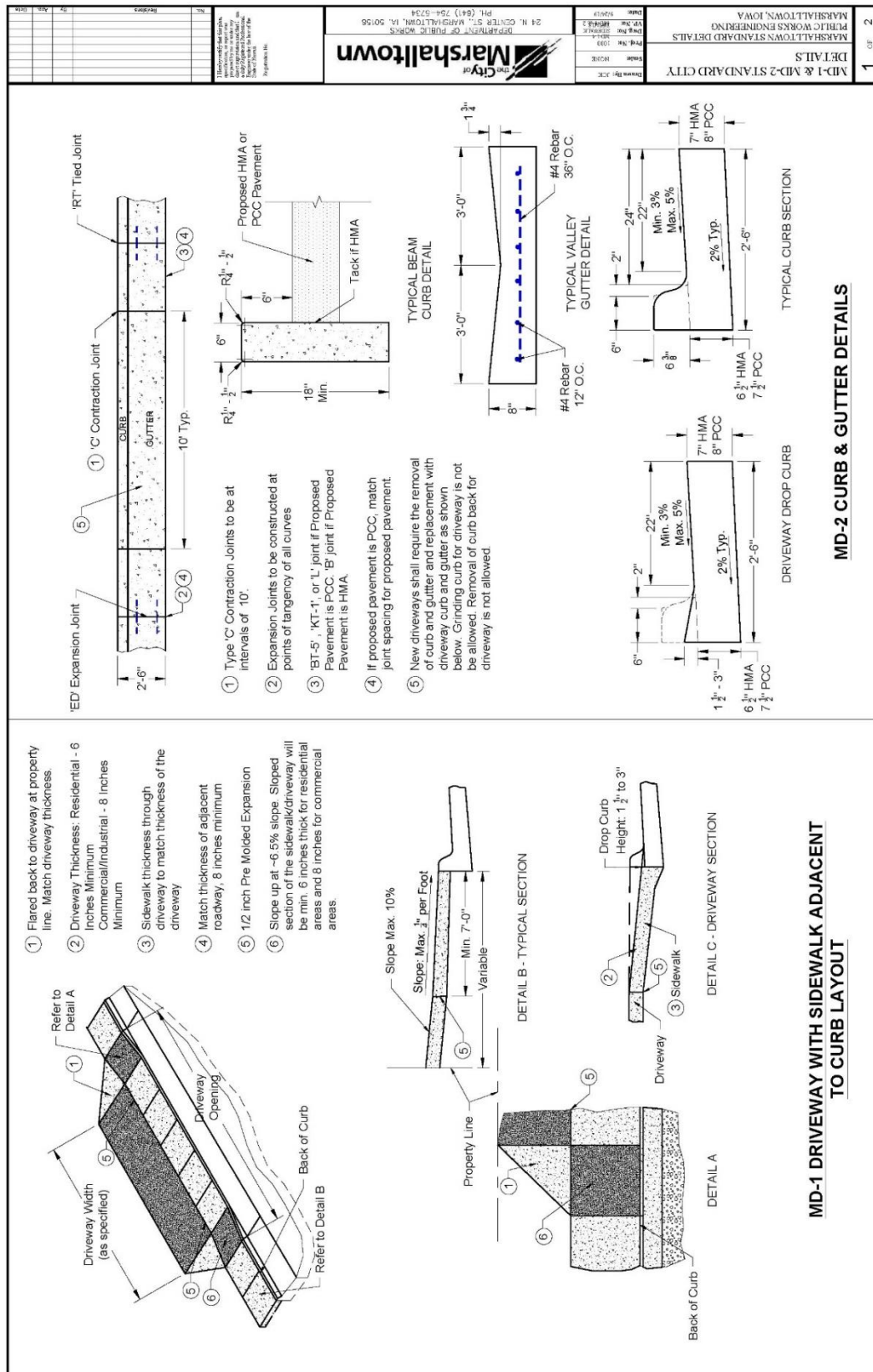
3.08 (ADD) MARSHALLTOWN STANDARD DETAILS

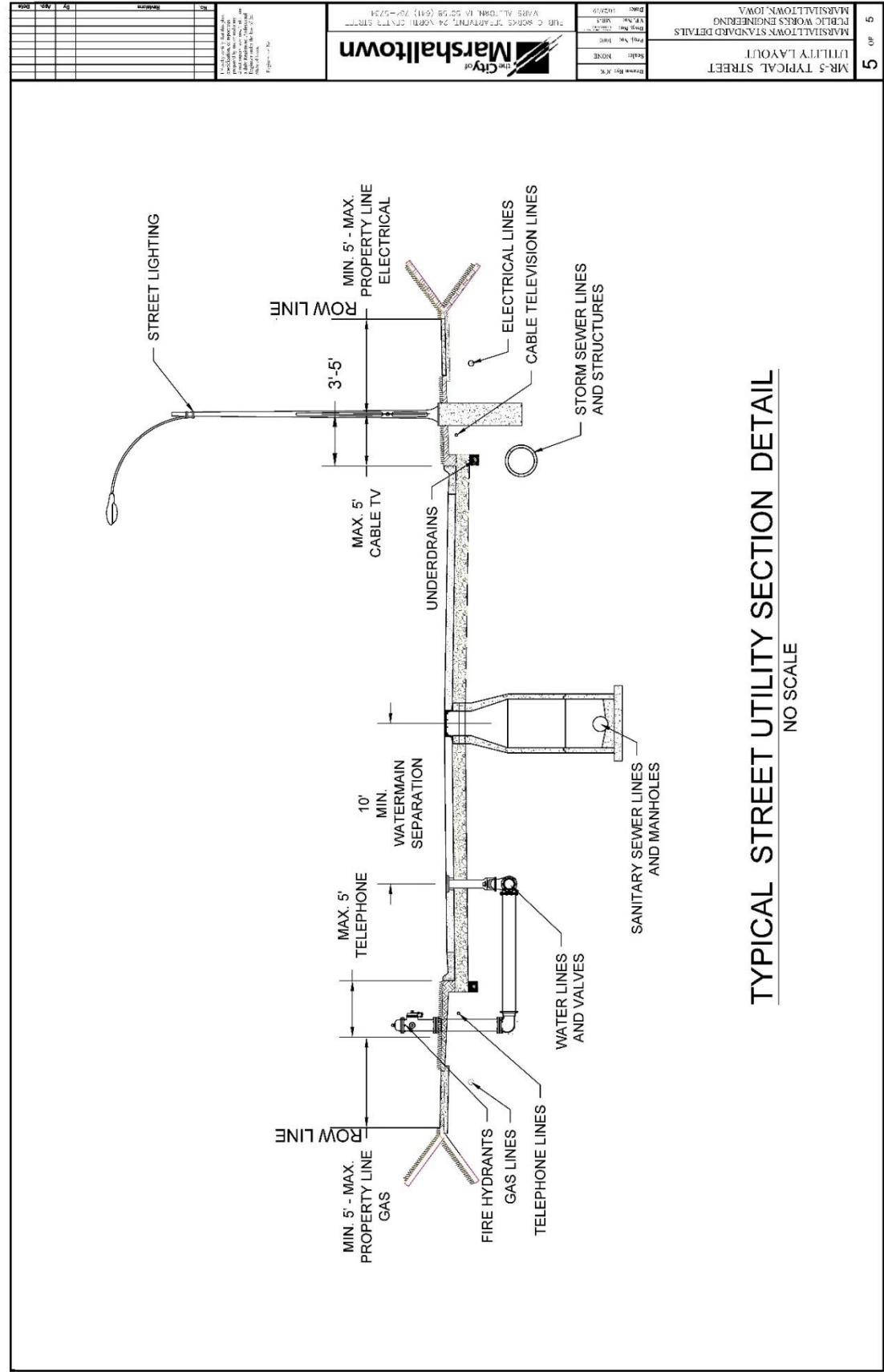
A. Added the following details:

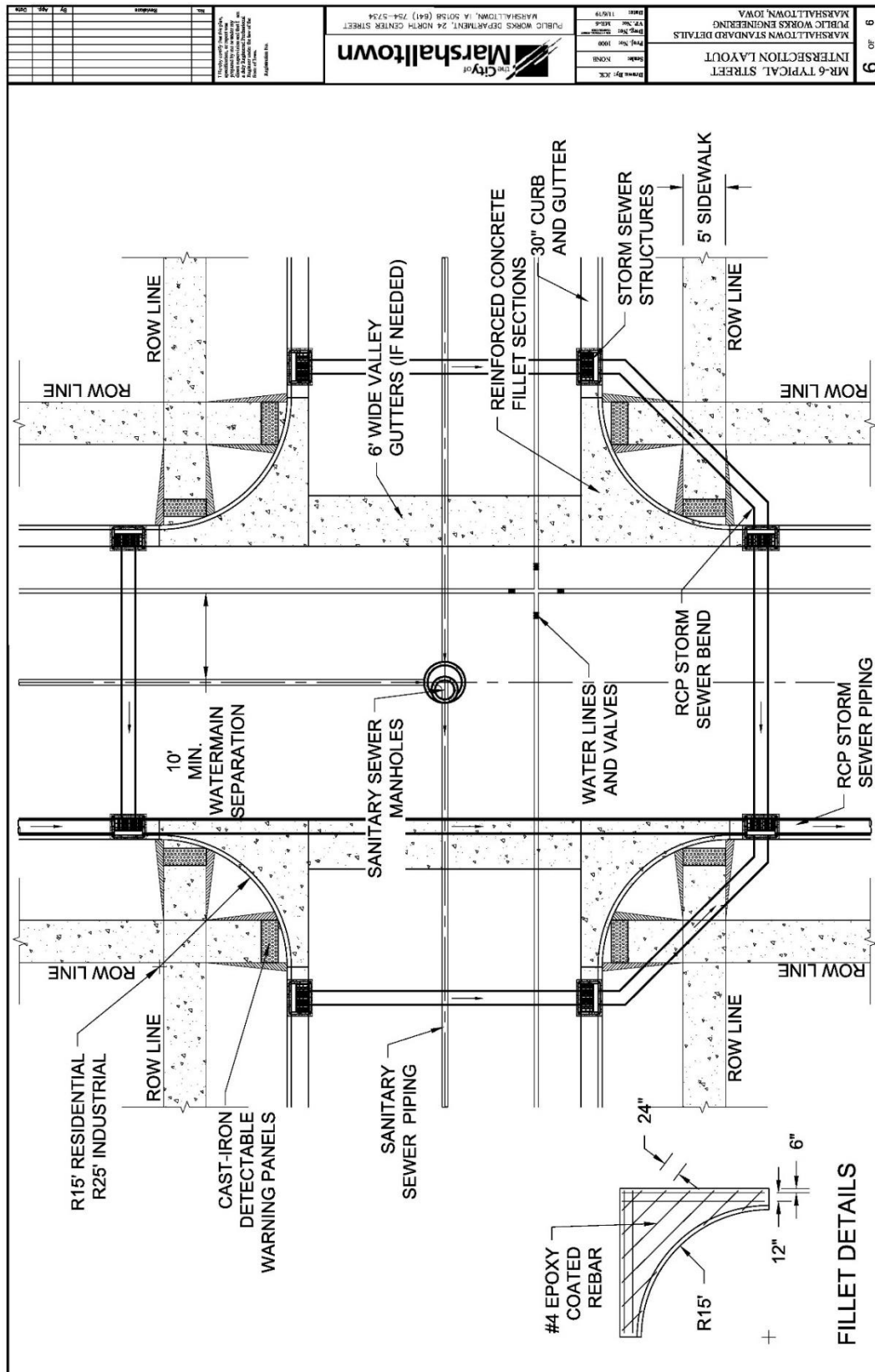
1. MR-1 PCC Pavement Typical Cross Sections
2. MR-3 Typical 37' Street Layout
3. MR-4 Typical 45' Street Layout
4. MD-2 Typical Curb and Gutter Details
5. MR-5 Typical Street Utility Section Detail
6. MR-6 Typical Street Intersection Detail











SECTION 7011 - PORTLAND CEMENT CONCRETE OVERLAYS

PART 1 - GENERAL

1.03 through 1.06: (DELETE): ~~Comply with Division 1 - General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

SECTION 7020 - HOT MIX ASPHALT PAVEMENT

PART 1 - GENERAL

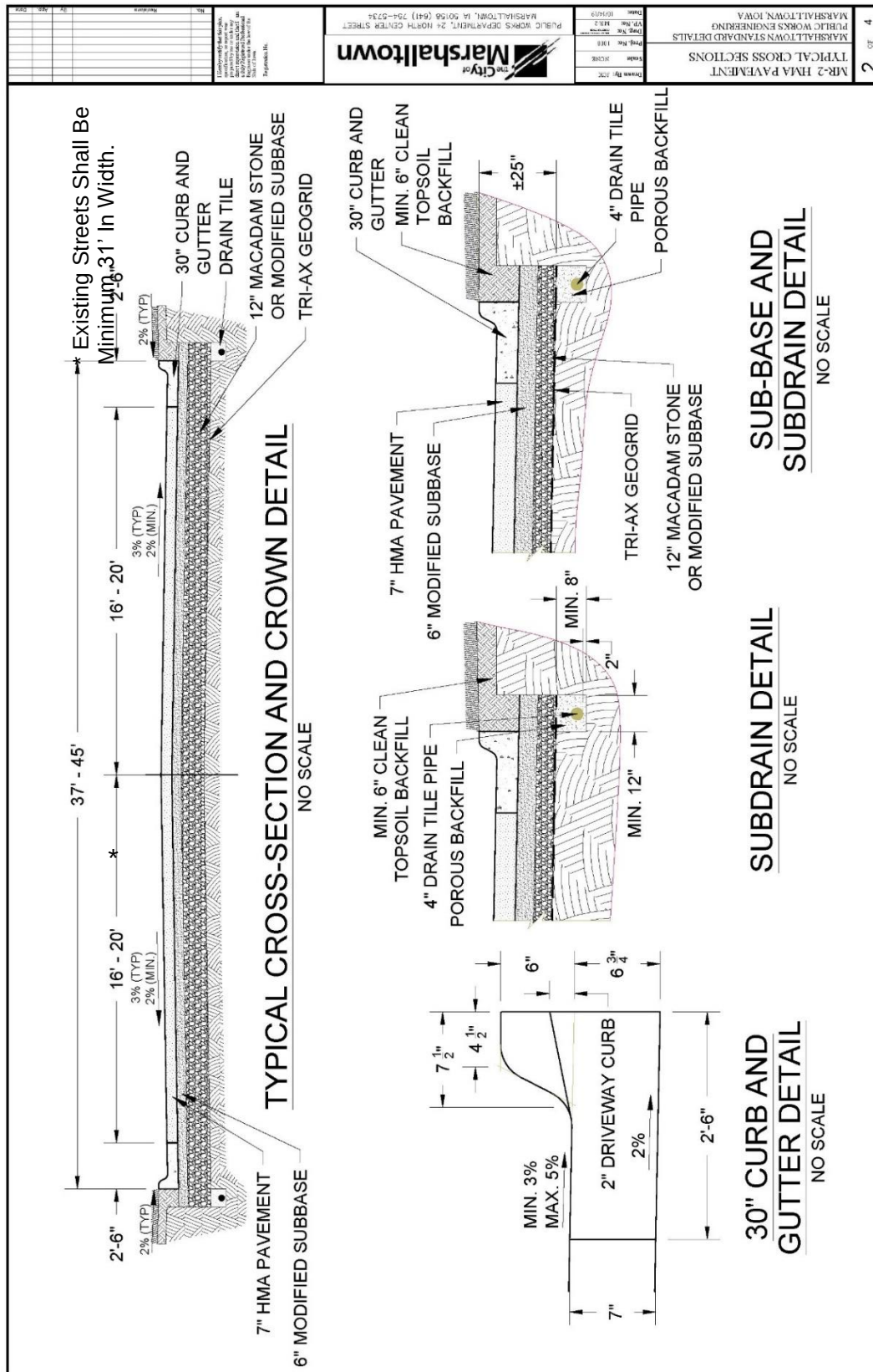
1.03 through 1.06: (DELETE): ~~Comply with Division 1 - General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

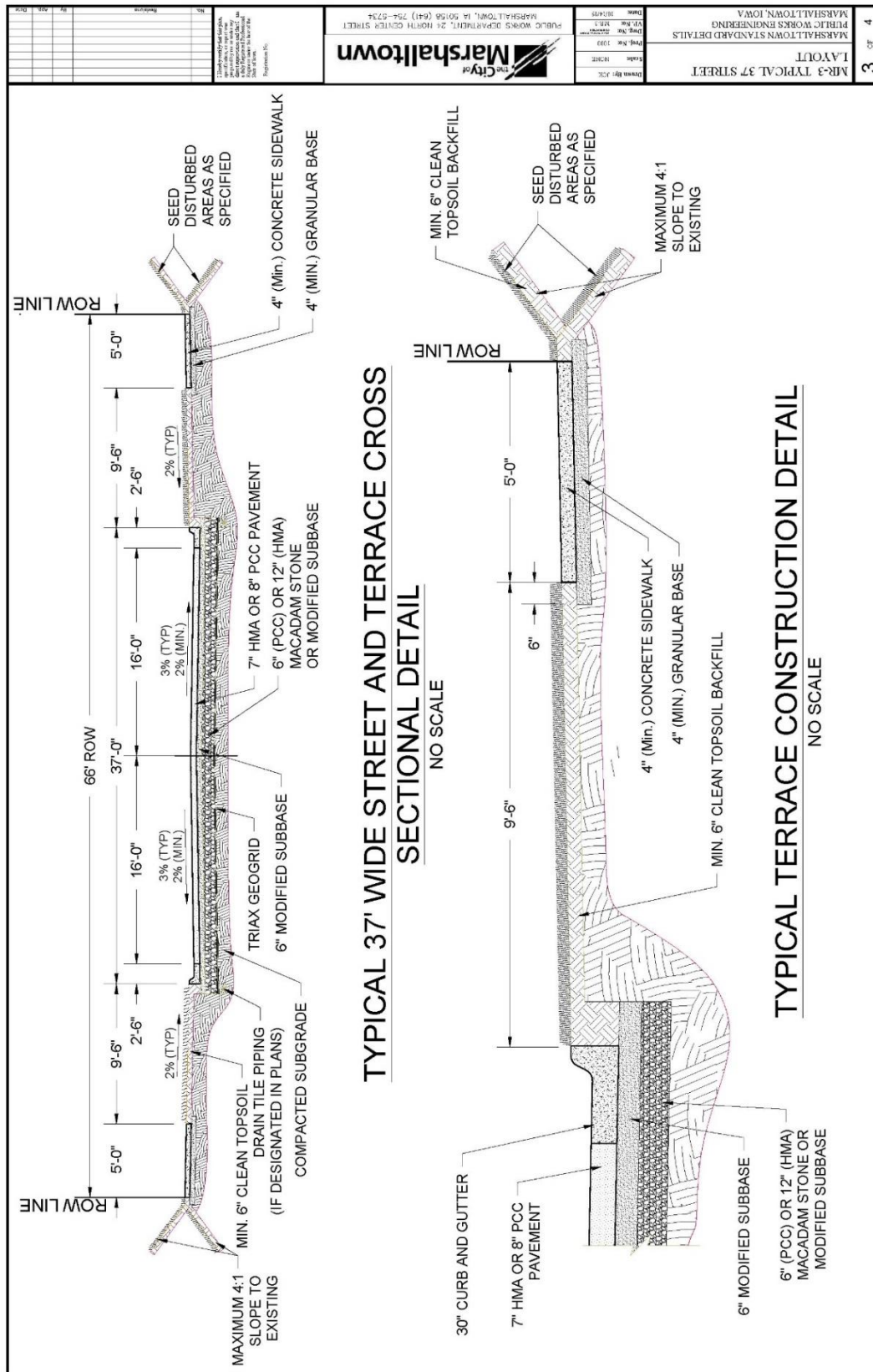
PART 3 - EXECUTION

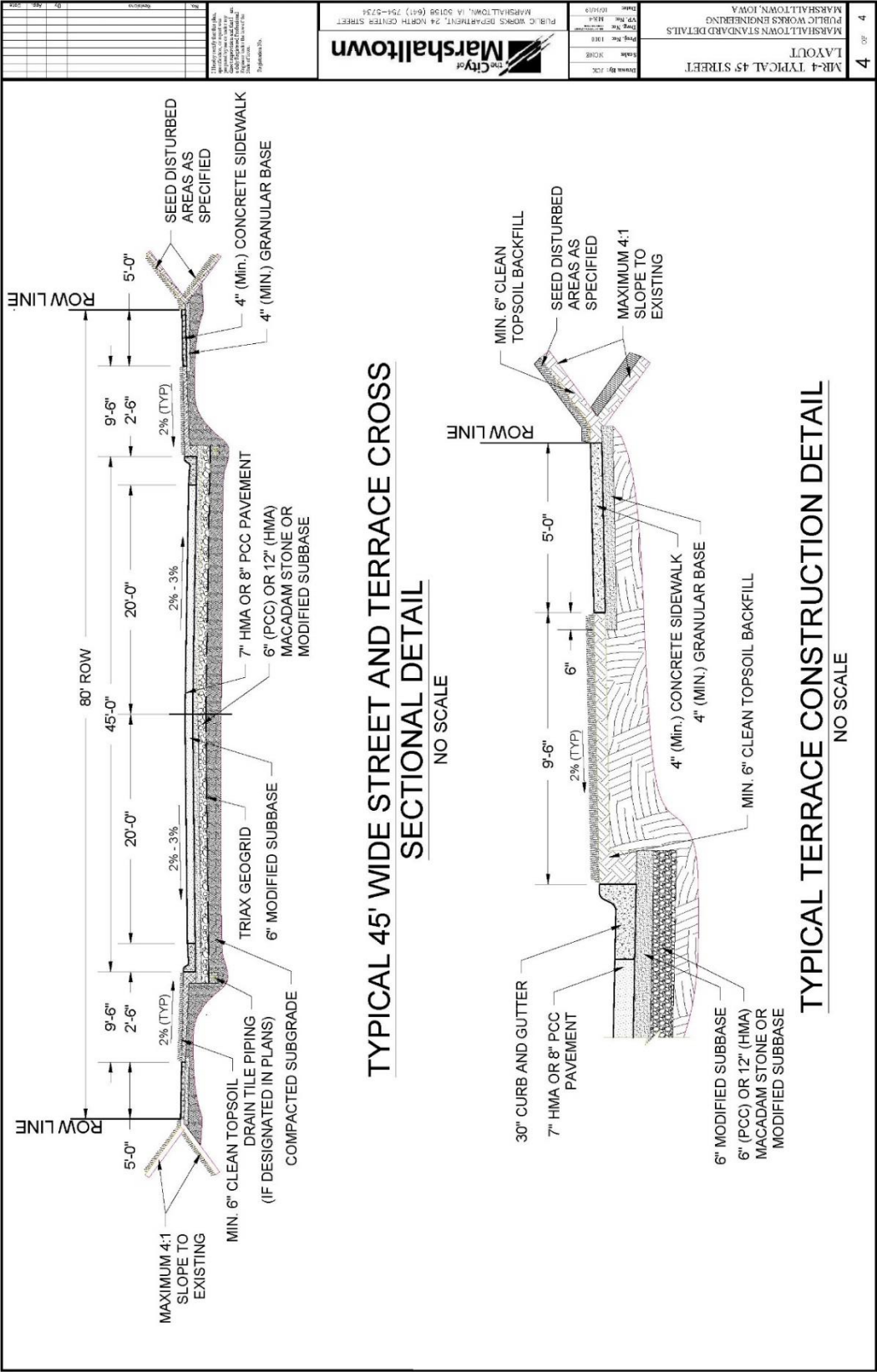
3.09 (ADD) MARSHALLTOWN STANDARD DETAILS

A. Added the following details:

1. MR-2 HMA Pavement Typical Cross Sections
2. MR-3 Typical 37' Street Layout
3. MR-4 Typical 45' Street Layout
4. MR-6 Typical Street Intersection Detail







SECTION 7021 - HOT MIX ASPHALT OVERLAYS

PART 1 - GENERAL

1.03 through 1.06: (DELETE): ~~Comply with Division 1 - General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

SECTION 7030 - SIDEWALKS, SHARED USE PATHS, AND DRIVEWAYS

PART 1 - GENERAL

1.03 through 1.06: (DELETE): ~~Comply with Division 1 - General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

PART 2 - PRODUCTS

2.01 PORTLAND CEMENT CONCRETE

- A. Class (DELETE) B or C concrete with materials complying with Section 7010. Use coarse aggregate of Class 2 durability or better.

Table 7030.01: PCC Mixes

Type of Concrete	Machine Finish	Hand Finish
	Class (DELETE) B or C	Class(DELETE) B 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%

2.07 DETECTABLE WARNINGS

- A. (DELETE) ~~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.~~
- A. (ADD) Detectable warning surfaces are a requirement of the Americans with Disabilities Act (ADA) and required when construction and altering curb ramps and street pavement. The Truncated domes are the only detectable warnings allowed by ADA.

- B. (ADD) Detectable warnings shall consist of cast-iron or steel panels with a minimum width of 24-inches and lengths of 24-inches and/or 30-inches. The panels shall be slip resistant and extend the full width of the curb ramp.
- C. (ADD) Panels shall be provided with anchors for casting into concrete surfacing.
- D. (ADD) Per ADA guidelines, the truncated domes shall be aligned in a square pattern and have a maximum 1.4-inch base diameter and a height of 0.2-inch. They shall be spaced 2.4-inches apart from one another and have a base-to-base spacing of at least 0.65-inch.
- E. (ADD) The visual contrast between adjoining surfaces shall be satisfied with a natural patina.

2.10 (ADD) CONCRETE CURING COMPOUND

A. General:

- 1. Comply with ASTM C 309. White pigmented compounds are typically used for most construction. However, clear compounds may be used adjacent to businesses and homes to reduce tracking problems.

B. Sprayability:

- 1. Use compounds of a consistency that they can be readily applied by spraying to a uniform coating at a material temperature above 40°F.
- 2. Moisture Retention:
- 3. White pigmented liquid curing compounds, when tested in accordance with ASTM C156 using an application rate of 200 square feet per gallon shall restrict the loss of water to not more than 0.20 kg/m² in 24 hours or 0.40 kg/m² in 72 hours.

C. Drying Time:

- 1. Use liquid curing compounds that:
 - a. Dry to the touch in no more than 4 hours, and
 - b. Do not track off the concrete when walked upon after 12 hours.

D. White Pigmented Compounds.

- 1. Use compounds consisting of finely ground white pigment and vehicle, ready mixed for use without alteration.
- 2. Ensure the pigment does not settle excessively or cake in the container, and thicken in storage to cause a change in consistency which may result in a non-uniform spray.
- 3. Use a compound that after being sprayed on a test slab and drying has an apparent daylight reflectance no less than 60% relative to magnesium oxide.
- 4. Agitate the compound just prior to it being removed from the container. Agitate it continuously during application.

E. Clear Compounds:

1. Apply the following in lieu of other requirements of this section:
2. Use clear liquid membrane curing compounds complying with the requirements of ASTM C309, Type 1-D, Class A. Use only one type of compound on a structure. Do not use different compounds on the same structure.
3. Agitate the compound just prior to it being removed from the container. Agitate it continuously during application.

2.11 (ADD) GRANULAR SUBBASE MATERIAL

A. Aggregate of the following types:

1. Crushed stone.
2. Gravels of which 30% or more of the particles retained on the 3/8-inch sieve have at least one fractured face as specified in Iowa DOT Materials I.M. 305.
3. Crushed PCC pavement meeting the requirements specified in Iowa DOT Materials I.M. 210, or
4. Uniformly blended combinations of these materials.

B. Gradation:

1. Crushed material: Meet the requirements for Gradation No. 12a of the Aggregate Gradation Table, specified in Iowa DOT Article 4109.02.
2. Gravel: Meet the requirements for Gradation No. 12b of the Aggregate Gradation Table, specified in Iowa DOT Article 4109.02.

C. Quality:

1. The requirements of the following table apply to the individual virgin aggregates before combining:

(ADD) Coarse Aggregate Quality (Virgin Material)

Coarse Aggregate Quality	Maximum Percent Allowed	Test Method
Abrasion	50	AASHTO T 96
Alumina ^(a)	1.5	Office of Materials Test Method No. Iowa 222
A Freeze	25	Office of Materials Test Method No. Iowa 211, Method A
(a) If the Alumina value fails, determine the A Freeze value for specification compliance. Office of Materials Test Method No. Iowa 222 does not apply to gravel.		

PART 3 - EXECUTION

3.04 PCC SIDEWALKS, SHARED USE PATHS, AND DRIVEWAYS

- A. Form Setting: Comply with Section 7010 with the following additional requirements and exceptions.
2. Wood forms are allowed. (ADD) Wood forms shall be full height of concrete depth, i.e., wood forms for 4-inches depth sidewalk shall not be a standard industry 1x4 or 2x4.
 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:
 - c. (ADD) The design cross slope of the sidewalk, turning space, or shared use path shall not exceed 2.0% or be less than 1.0%.
 - d. (ADD) The design cross slope of any driveway crossing a sidewalk or shared use path shall not exceed 2.0% or be less than 1.0%.
 - e. (ADD) The design cross slope of driveways located between the street and the sidewalk shall not be more than 10% nor less than 1.0%.
- B. Concrete Pavement Placement:
3. Driveways: Comply with Figures (ADD) MD-1, MD-2, 7030.101 and 7030.102 and Section 7010. The use of a paving machine is not required.
- E. Form Removal: Comply with Section 7010 (ADD) and.
1. (ADD) 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. (ADD) Honeycomb Repair:
 - a. When the forms are removed, fill honeycombs with mortar composed of one (1) part cement and two (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 City.
 3. (ADD) Remove all excess concrete from areas along forms and/or backfill area. No excess concrete shall be allowed along edges of sidewalks, trails or curbing.
 4. (ADD) In the area adjacent to the new concrete, 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 surfacing occurs. This may include check dams, pumping, etc.

5. (ADD) Material used for backfilling shall be free from spongy or vegetative substances, rocks, asphalt, broken concrete, frozen material or any other debris. The top six (6) inches shall be a soil suitable for growing grass.

F. Jointing:

2. Transverse Contraction Joints:

a. Shared Use Paths (ADD) and Sidewalks:

- 1) Space transverse joints equal to the width of the shared use path, or as specified in the contract documents.
- ~~2) (DELETE) Saw contraction joints according to Section 7010.~~
- 2) Saw contraction joints within 12-hours of placement with a 1/8-inch blade saw to a depth of 1/3 the pavement thickness.
- 3) Use a straightedge if joints are sawed with a hand-held saw.

b. ~~(DELETE) Sidewalks and Driveways:~~

- 1) ~~(DELETE) Space sidewalk contraction joints equal to the width of the sidewalk.~~ (ADD) Space driveway contraction joints to match sidewalk joints whenever possible. Joints shall be spaced to form rectangular panels where the long dimension does not exceed 1-½ times the short dimension. In no case will the panel length exceed 9-feet for 6-inches of concrete or 12-feet for 8-inches of concrete.
- 2) ~~(DELETE) Space driveway contraction joints so panel length does not exceed 12 feet.~~ (ADD) Contraction joints shall be sawn within 12-hours of placement with a 1/8-inch blade saw to a depth of 1/3 the pavement thickness.
- 3) ~~(DELETE) 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.~~ (ADD) Use a straightedge if joints are sawn 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.

- 1) (ADD) Longitudinal contraction joints will be placed when the width of the path/sidewalk exceeds 6-feet for 4-inches concrete or 9-feet for 6-inches concrete.
- 2) (ADD) Contraction joints shall be sawn 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 sawn with a hand-held saw.

b. Driveways:

- 1) (DELETE) ~~Space longitudinal contraction joints so panel width does not exceed 12 feet.~~ (ADD) Space longitudinal contraction joints so panel length or width does not exceed 9-feet for 6-inches of concrete or 12-feet for 8-inches of concrete.
- 2) (DELETE) ~~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.~~ (ADD) Contraction joints shall be sawn 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 sawn with a hand-held saw.

G. (ADD) Granular Base:

1. (ADD) Shared Use Paths and Sidewalks will be placed on a minimum of 4-inches of compacted granular base.
2. (ADD) Driveways shall be placed on a minimum of 6-inches of compacted granular base.
3. (ADD) Granular Base shall be compacted to a minimum 98% Standard proctor density at a moisture content of $\pm 3\%$ of optimum moisture as determined by ASTM D698.

3.13 (ADD) SIDEWALK GRADES

- A. All staking for sidewalk grades, grading subgrade preparation and form installation will be the full responsibility of the contractor. The City Engineers office will inspect the forms and subgrade preparation prior to concrete placement.
- B. When a new sidewalk is being constructed and the grade is different than the present adjoining sidewalks, the following shall apply:
- C. Beginning at the property line the slope of the sidewalk shall be a maximum 8.3% from the adjoining sidewalk to the grade of the new sidewalk. When the existing sidewalk cross slope does not meet requirements, a transition segment shall be installed to match existing slope. See SUDAS Figures 7030.204, 7030.206, 7030.207, 7030.208 and 7030.209.

3.14 (ADD) SIDEWALK ALIGNMENT:

- A. Unless otherwise approved by the City Engineer the back of the sidewalk shall match the adjoining property line.
- B. All private sidewalks joining the City Sidewalk will be built to the new sidewalk grade. Driveway sidewalks may remain at the present grade unless they are being replaced, and if they are being replaced they will be built to the proper grade.

- C. The Standard City Sidewalk grade is a quarter ($\frac{1}{4}$) inch per foot maximum across the sidewalk and half ($\frac{1}{2}$) inch per foot across the terrace to the street. Deviations from this standard grade will be allowed only with the approval of the City Engineer and only in areas where existing walks are at a nonstandard grade or where a standard grade will cause a severe hardship to the adjacent property owners.

3.15 (ADD) INSPECTIONS

When the Contractor is ready to pour the sidewalk, an inspection shall be requested from the City Engineer's office. Enough advance notice shall be given to provide ample time for the inspector to get to the job site and inspect the work so the contractor can make any changes required, before the concrete arrives.

3.16 (ADD) CURB CUTS

- A. It shall be unlawful for any person, firm, or corporation to cut or remove any curbing for any purpose without first securing a written permit from the City Engineer.
- B. Grinding of curbs for driveway entrances are not allowed. Removal of back of curb and extending driveway to gutter pan is not allowed.
- C. All curb cuts shall be made by removal of existing curb (if required) and replacement with either driveway curb (and gutter) or handicap curb (and gutter) as provided in the City of Marshalltown MD-1, MD-2 Details and SUDAS Figures 730.101R, 7030.102R, 7030.204, 7030.205, 7030.206, 7030.207, 7030.208 and 7030.209.

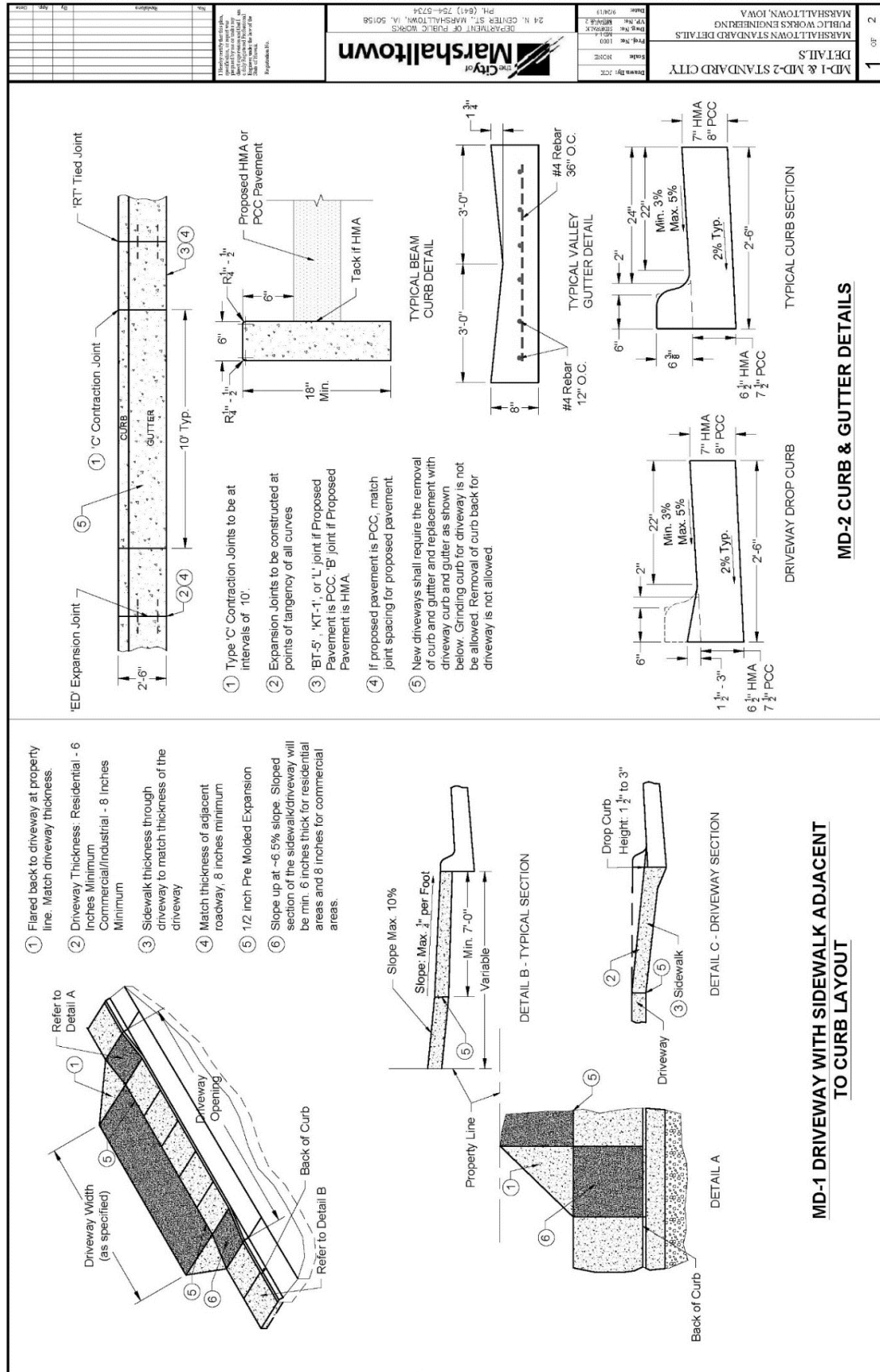
3.17 (ADD) CURB AND GUTTER CONSTRUCTION

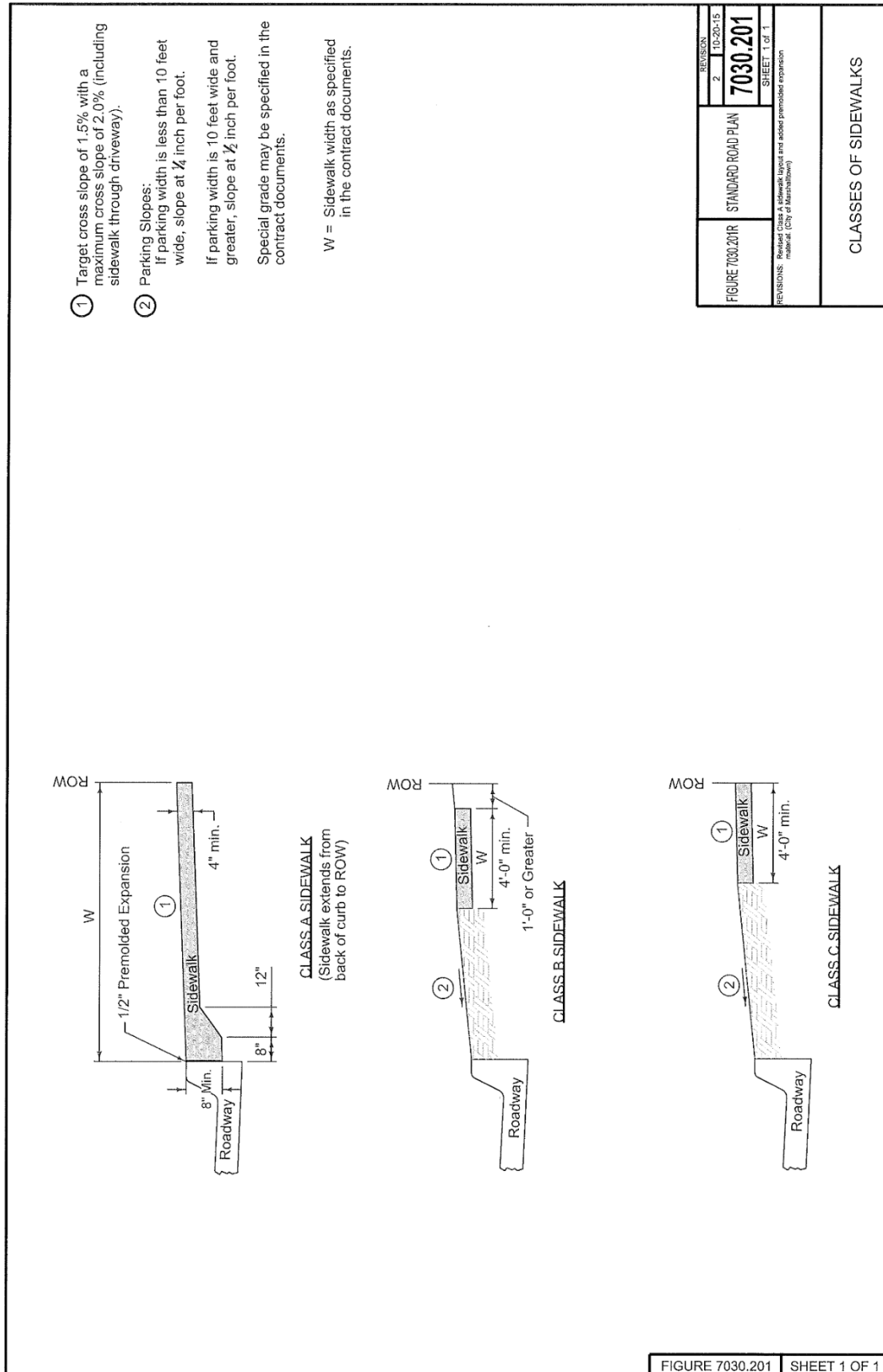
Comply with Section 7010, 3.03 and MD-2.

3.18 (ADD) MARSHALLTOWN STANDARD DETAILS

- A. Added the following details:
1. MD-1 Driveway with Sidewalk Adjacent to Curb Details
 2. MD-2 Curb & Gutter Details
 3. MD-3 Sidewalk over Utility Trench Detail
 4. MD-5 Sidewalk Trench Drain with Cover Plate
- B. See modifications to SUDAS Standard Details as listed on each detail and provided below:
1. Figure 7030.101 – Revised sidewalk adjacent to driveway to add section for transition. Added curb replacement for new driveways.
 2. Figure 7030.102 - Revised sidewalk adjacent to driveway to add section for transition. Added curb replacement for new driveways.
 3. Figure 7030.103 – Revision to sidewalk location and property line. Added target slope to sidewalk.

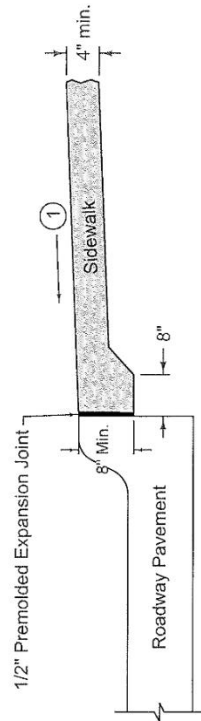
4. Figure 7030.201 – Revised Class A sidewalk layout and added premolded expansion material.
5. Figure 7030.202 – Removed Detail 1 and Revised Detail 2.
6. Figure 7030.206 – Change sidewalk/ramp width to 5'-0" min. Changed curb side sidewalk to min. 7'-0" width.
7. Figure 7030.207 – Added detail for preformed expansion joints.
8. Figure 7030.208 – Added detail for preformed expansion joints.
9. Figure 7030.209 – Changed minimum ramp and turning width to 5'-0".



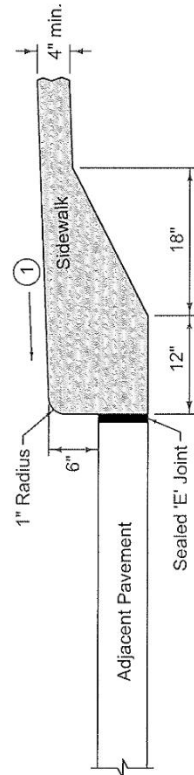


For new sidewalk with new curb and gutter, comply with Detail 2. Comply with Detail 3 for new sidewalk adjacent to existing pavement or when specified in the contract documents.

- ① Target cross slope of 1.5% with a maximum cross slope of 2.0%.

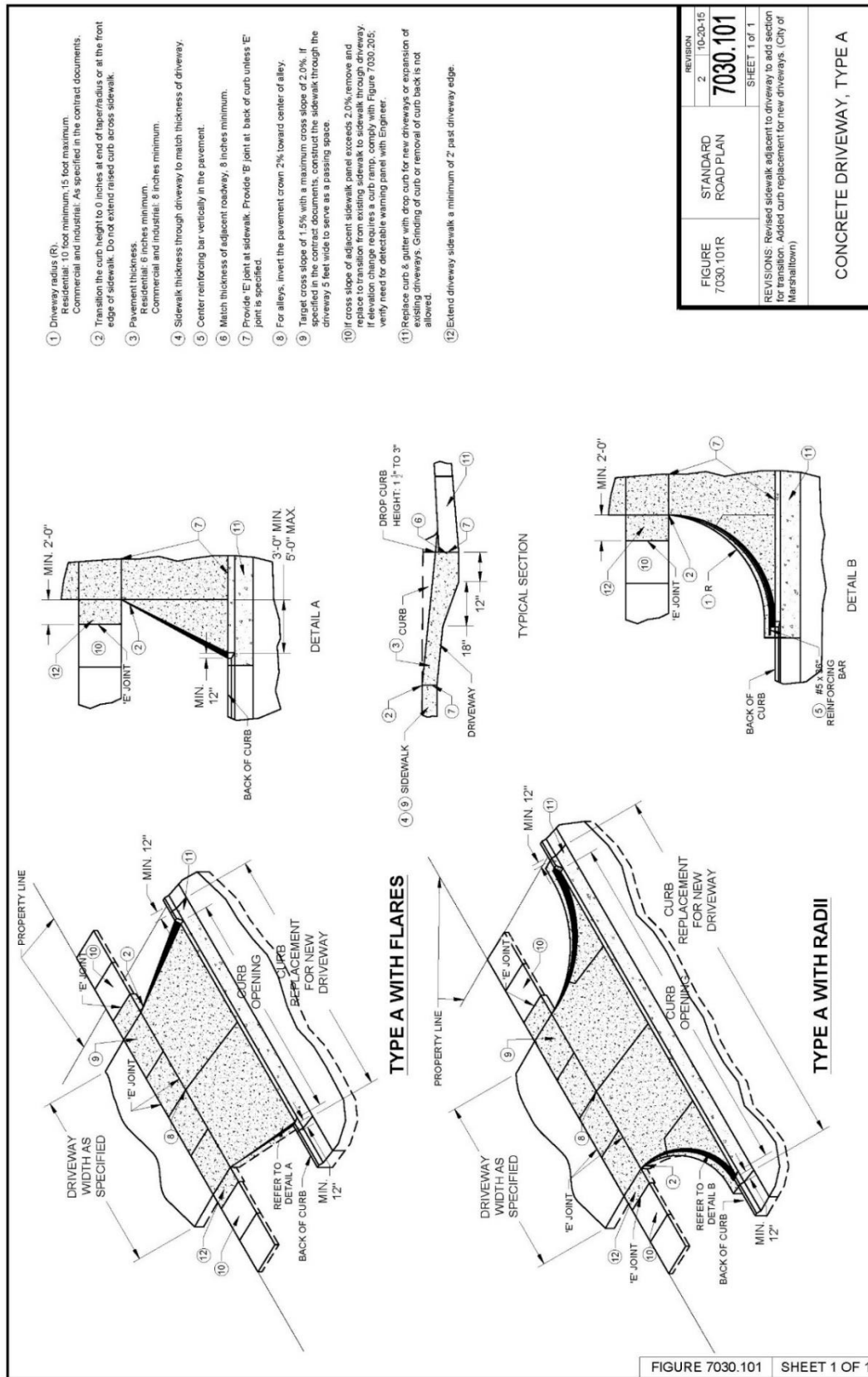


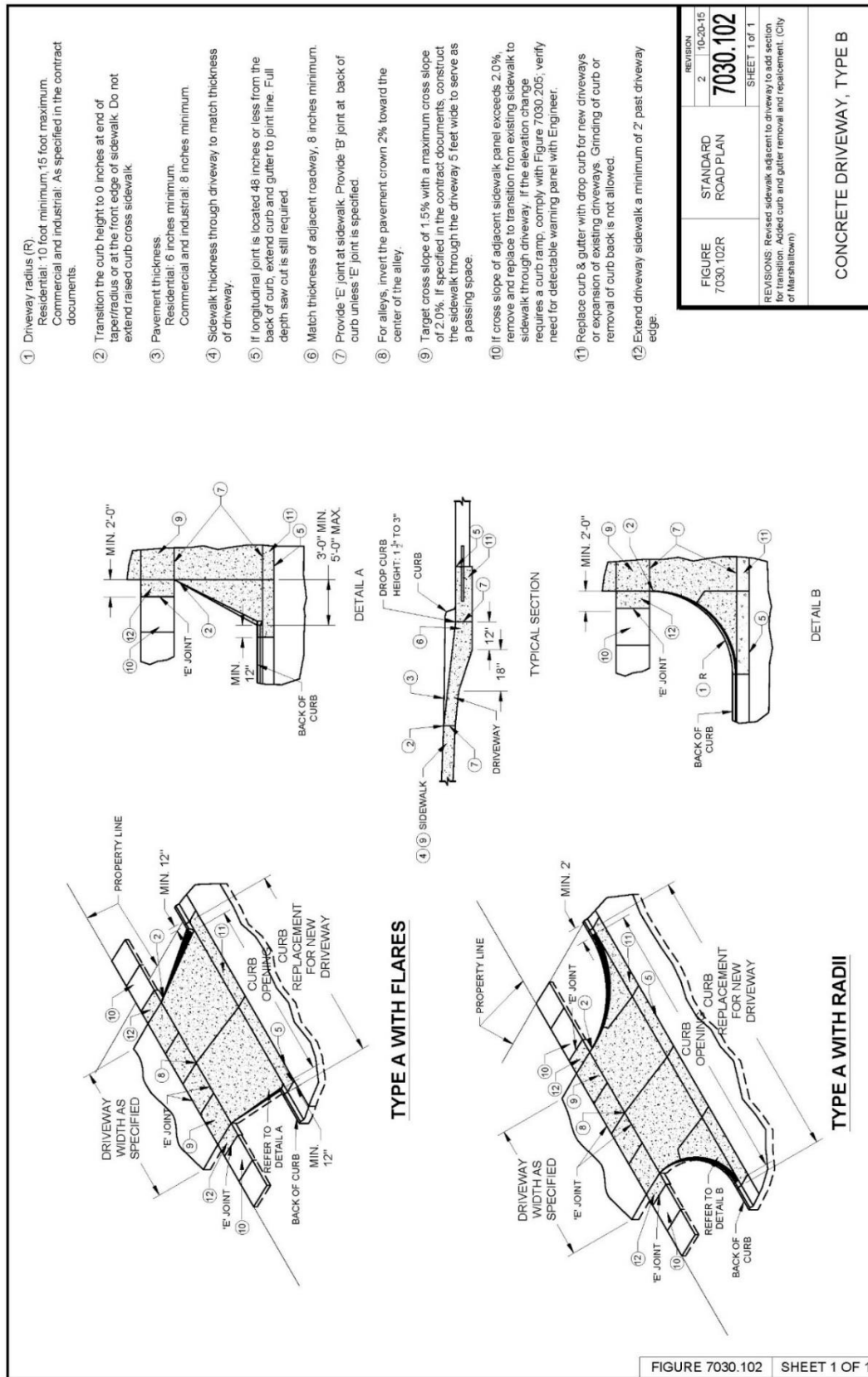
DETAIL 2

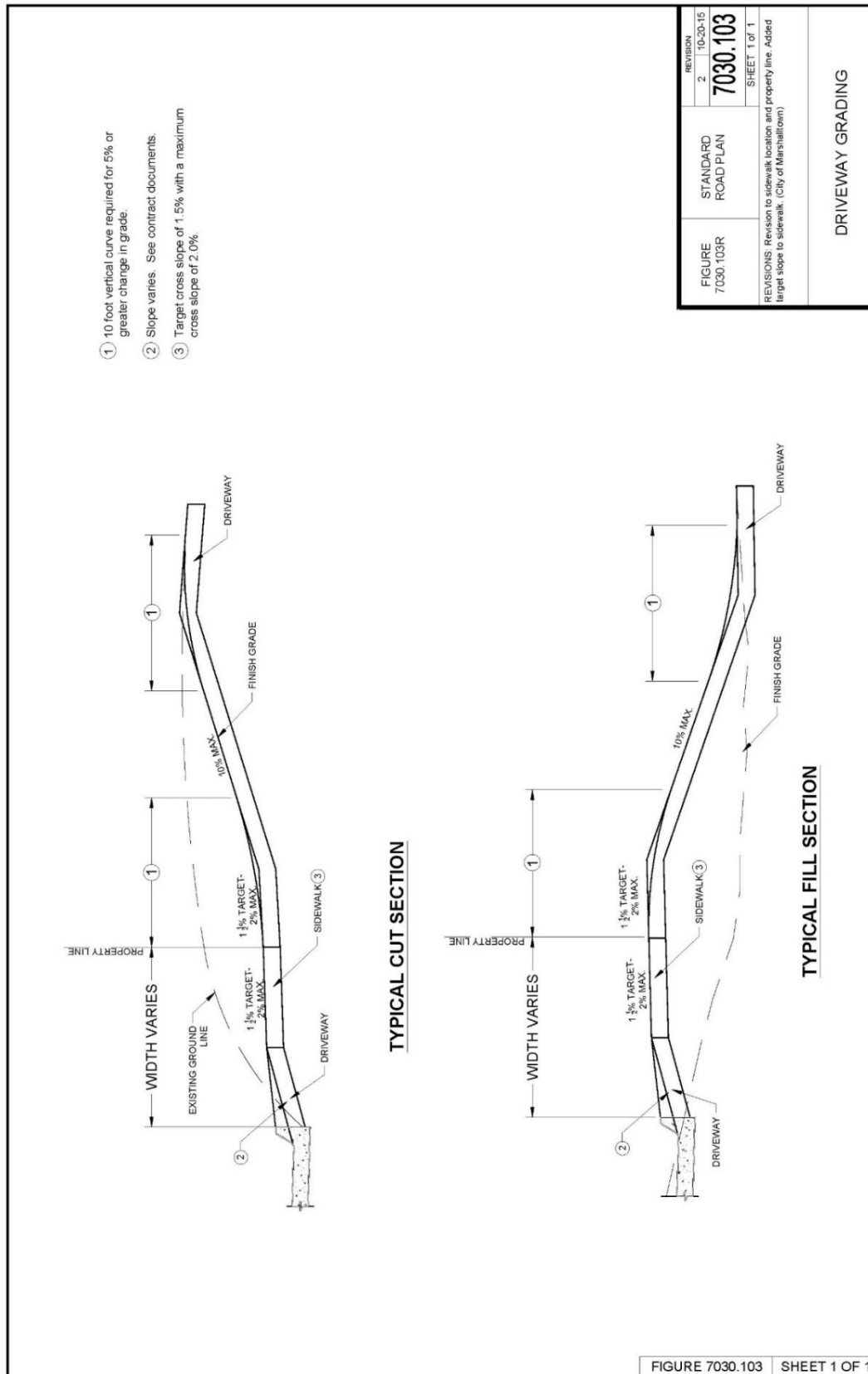


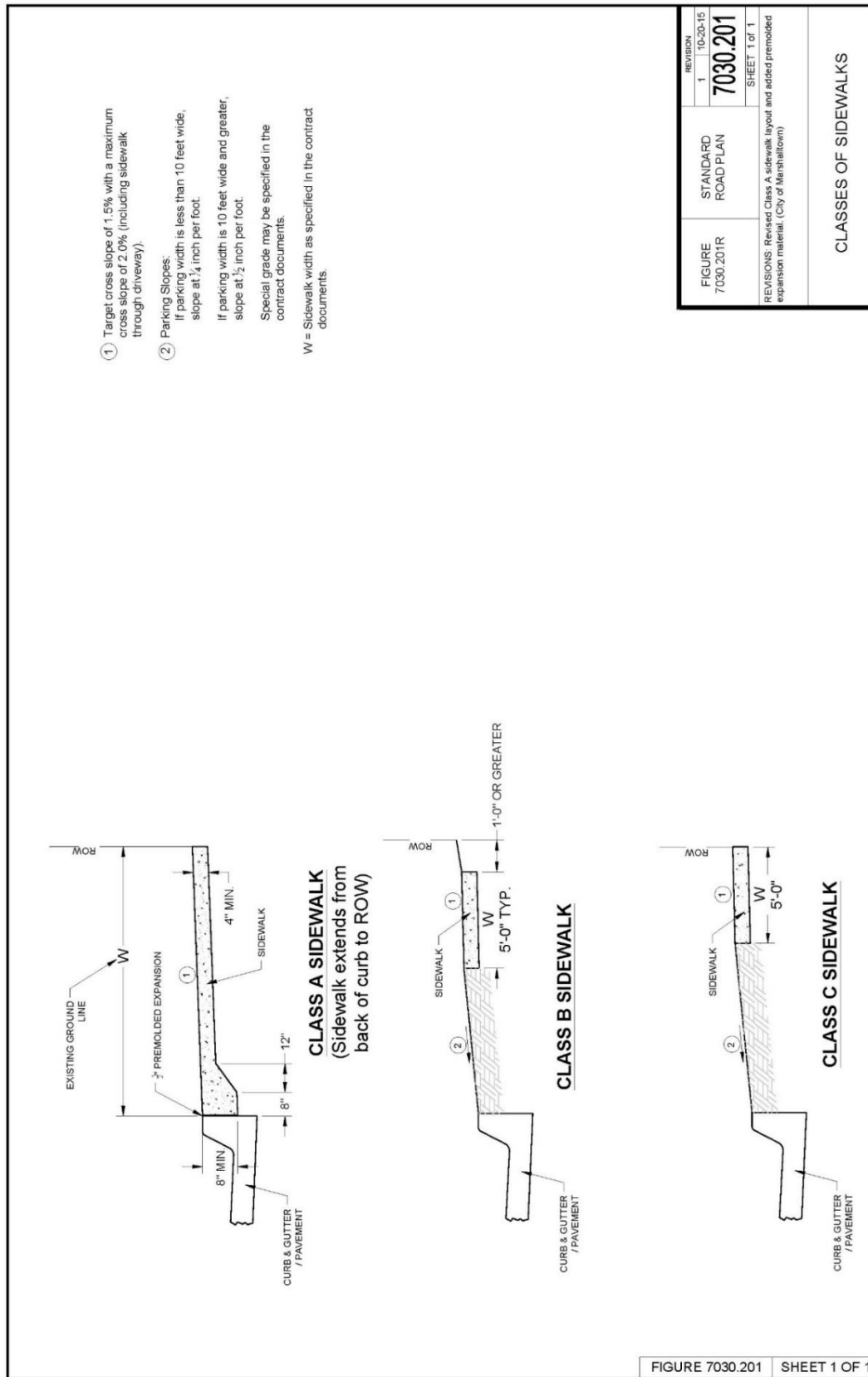
DETAIL 3

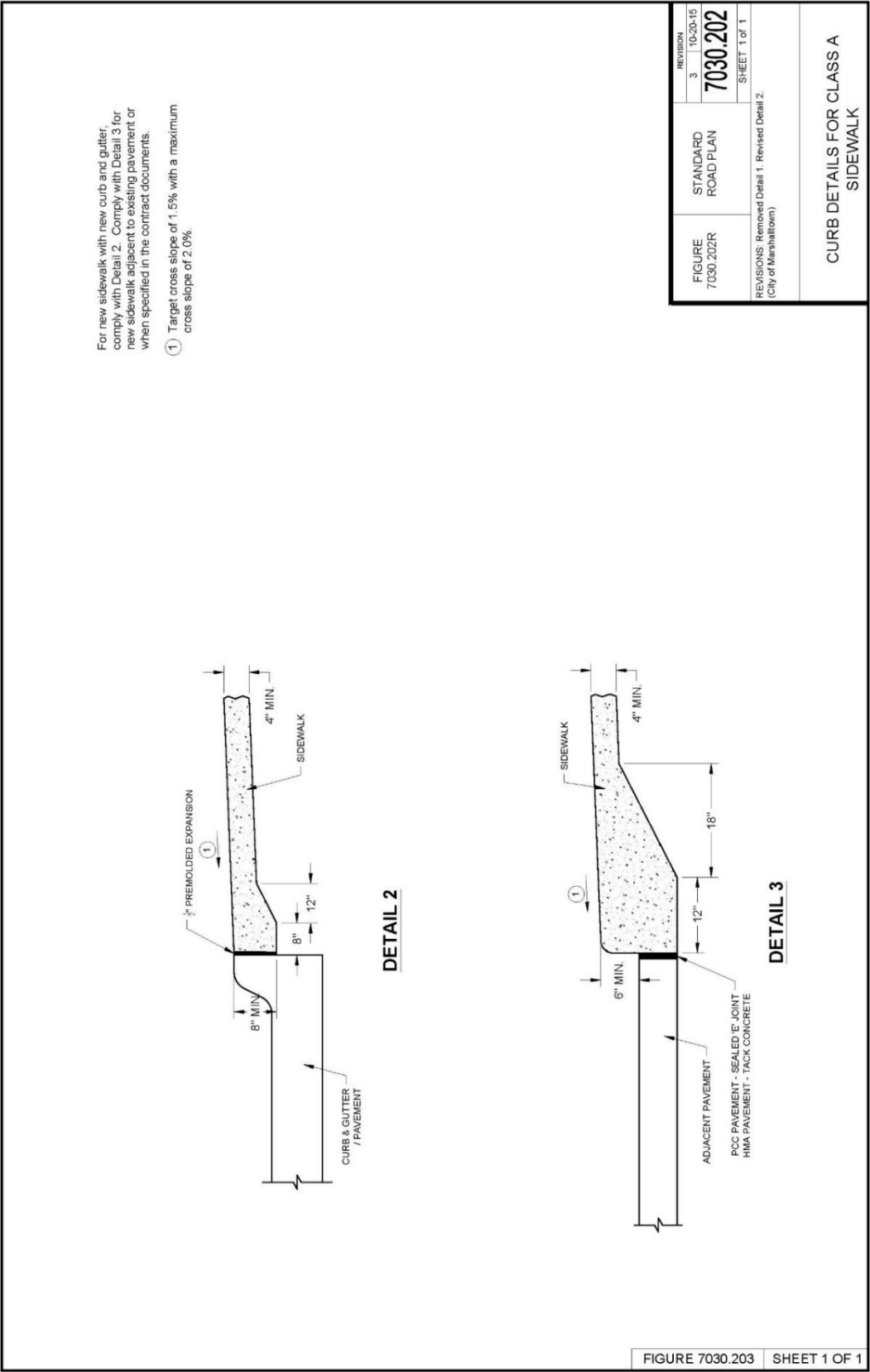
FIGURE 7030.202R	STANDARD ROAD PLAN	REVISION	3	10-20-15
		7030.202		
SHEET 1 of 1				
REVISIONS: Removed Detail 1, Revised Detail 2 (City of Marshalltown)				
CURB DETAILS FOR CLASS A SIDEWALK				

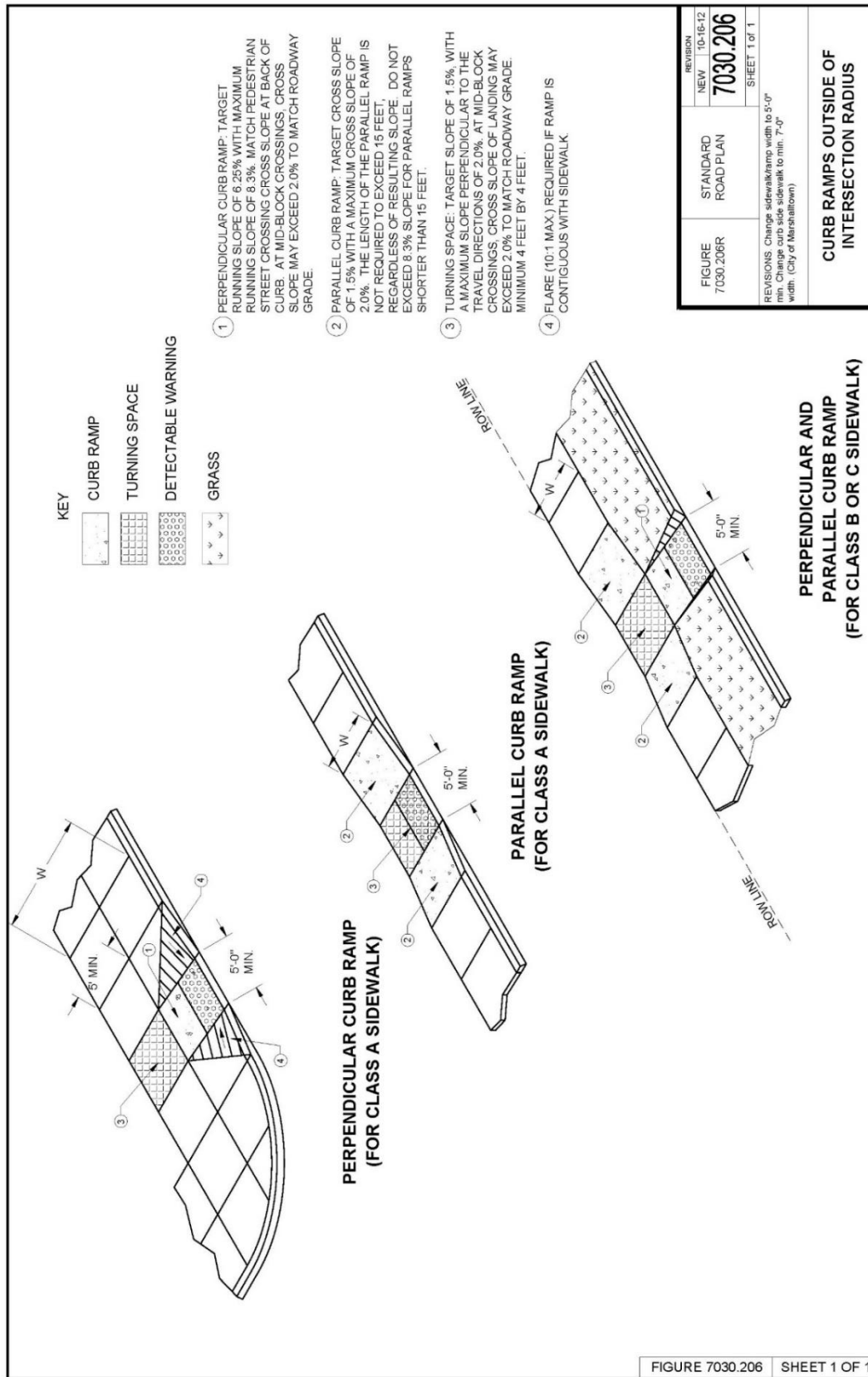


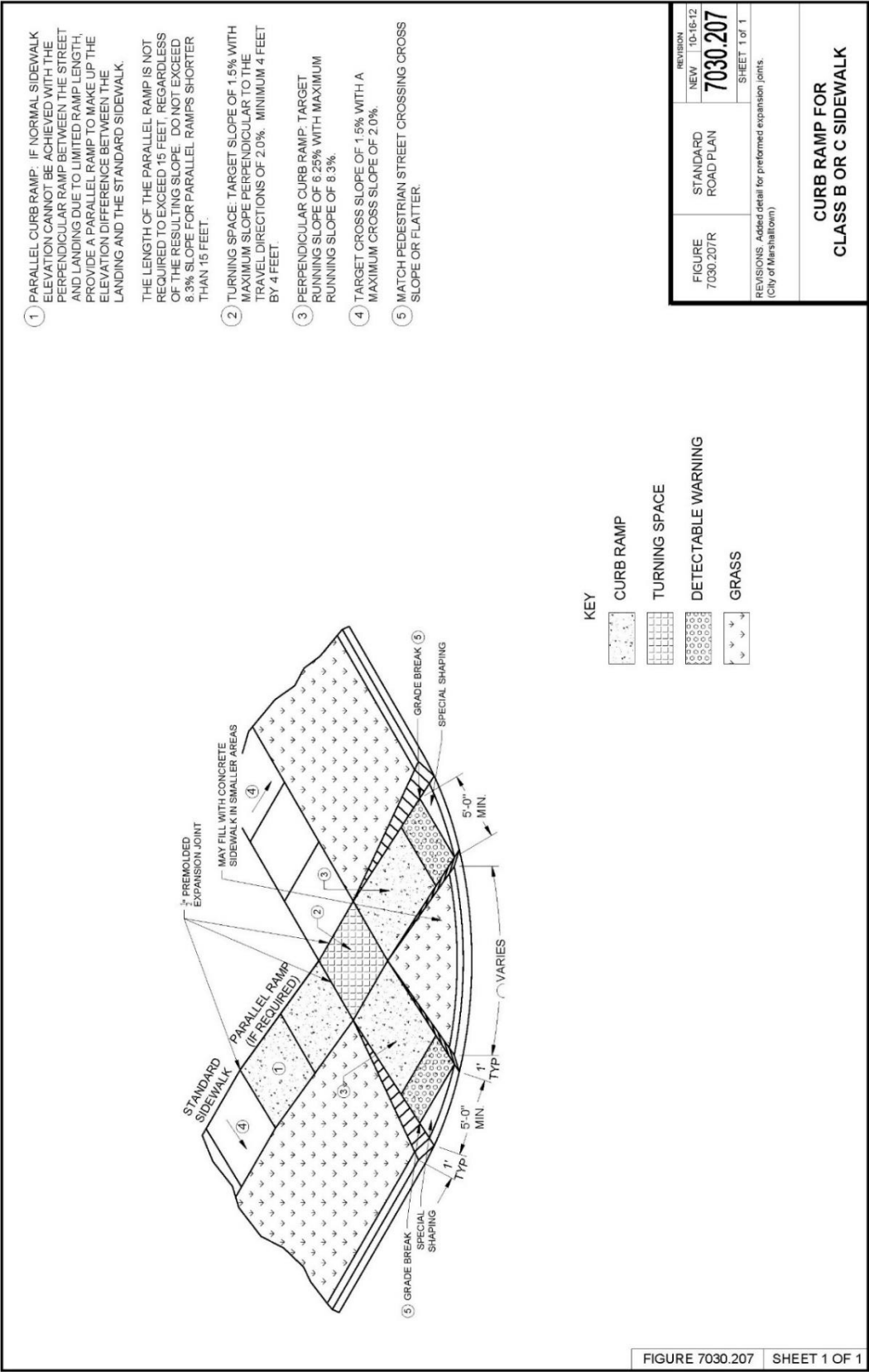












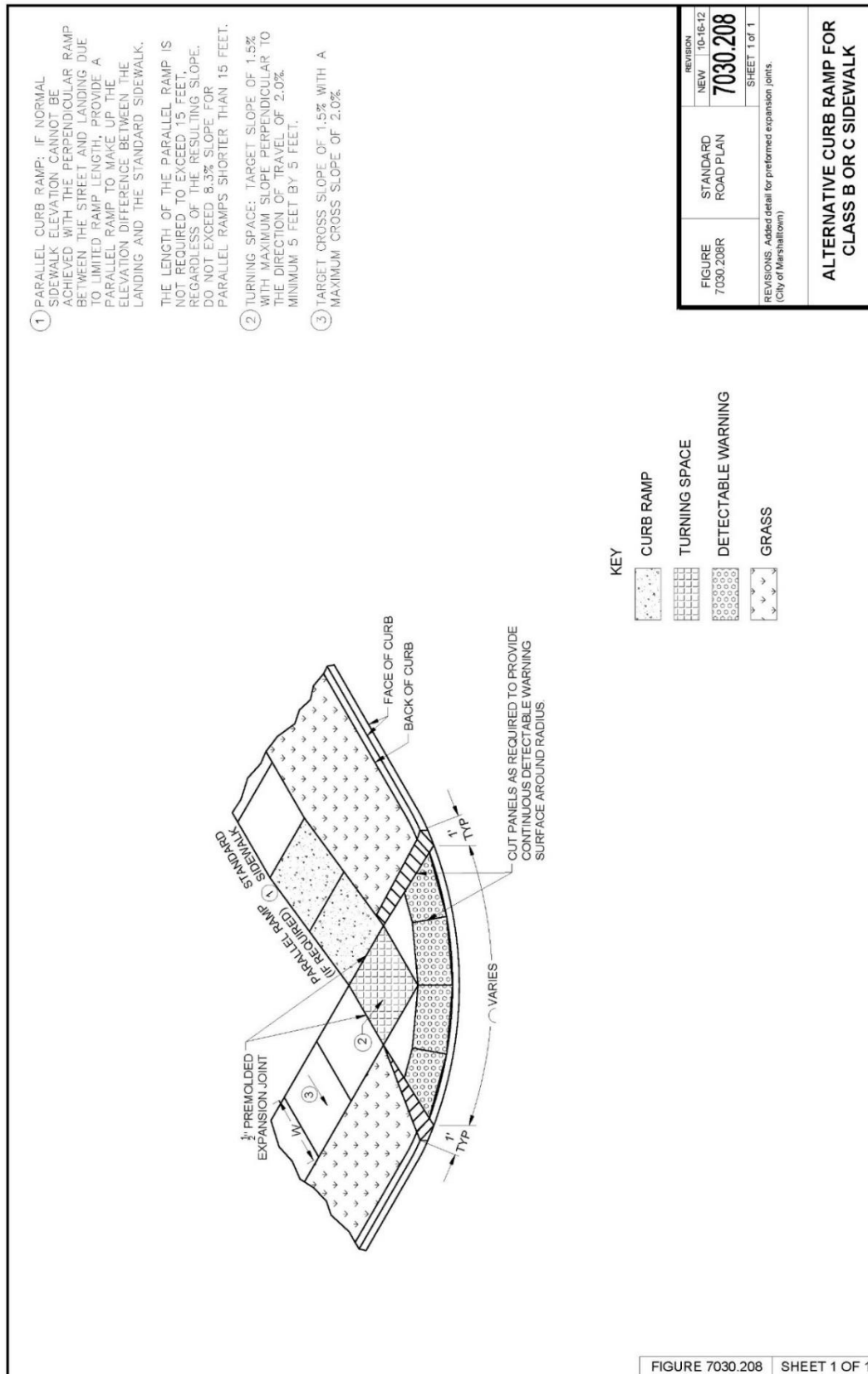
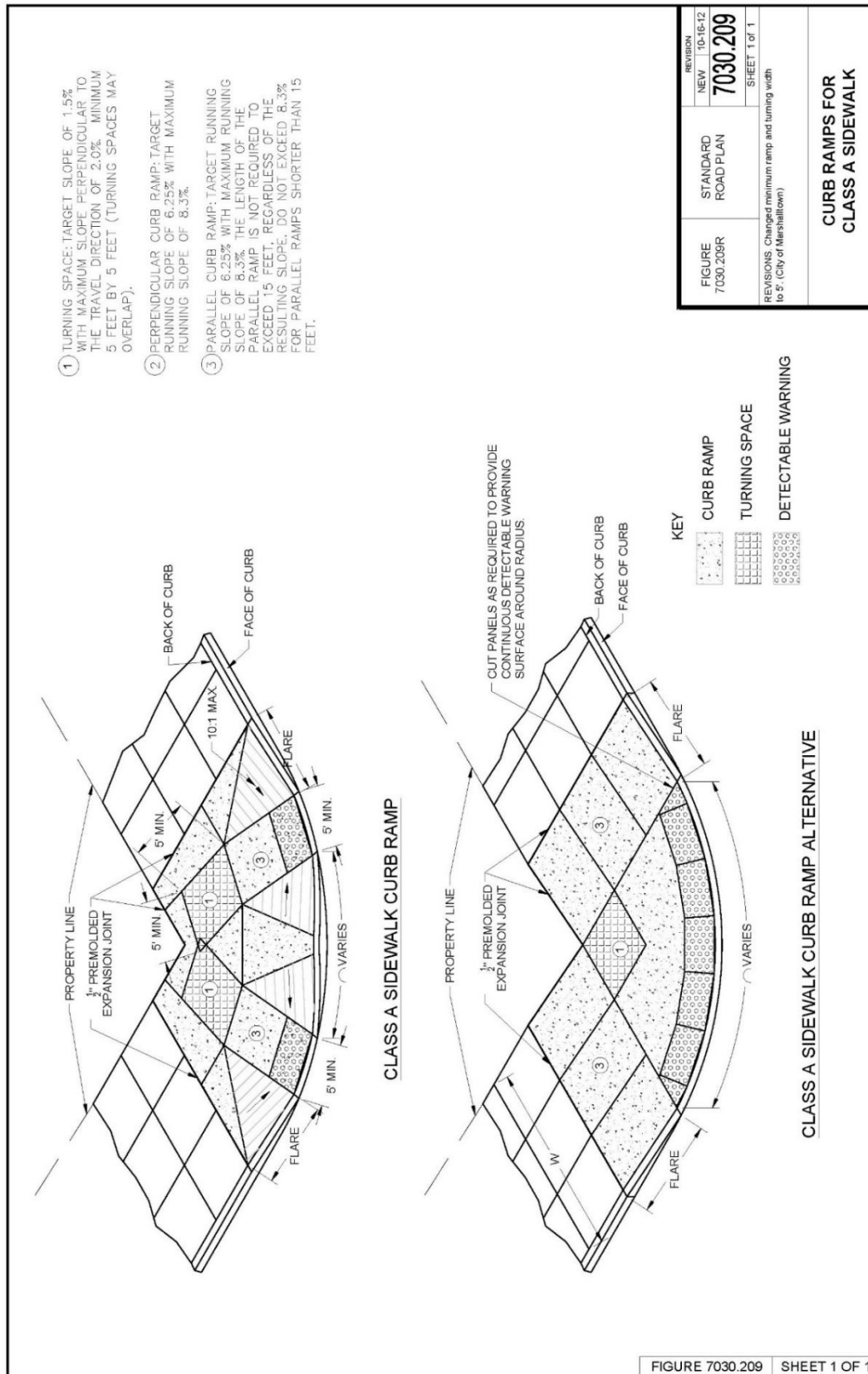


FIGURE 7030.208R	STANDARD ROAD PLAN	REVISION NEW 10-16-12
		7030.208
REVISIONS: Added detail for preformed expansion joints. (City of Marshalltown)		SHEET 1 of 1
ALTERNATIVE CURB RAMP FOR CLASS B OR C SIDEWALK		



SECTION 7040 - PAVEMENT REHABILITATION

PART 1 - GENERAL

1.03 through 1.06: (DELETE): ~~Comply with Division 1 - General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

1.08 MEASUREMENT AND PAYMENT

B. Subbase Over-excavation:

1. **Measurement:** Measurement will be in tons of subbase material placed for authorized over-excavation. (ADD) Measurement for geogrid shall be per 2010.1.08.H.
2. **Payment:** Payment will be made at the unit price per ton of subbase material. (ADD) Payment for geogrid shall be per 2010.1.08.H.

PART 2 - PRODUCTS

2.01 MATERIALS

A. PCC:

2. High Early Strength Patching: Use Class M mix complying with Section 7010. Do not use calcium chloride unless (DELETE) ~~otherwise specified in the contract documents~~ (ADD) approved by the City Engineer.

G. Subbase Material: Unless otherwise specified in the contract documents (DELETE) ~~, use modified subbase complying with Section 2010.~~ (ADD) See MS-4 Pavement Restoration for Subbase requirements.

PART 3 – EXECUTION

3.02 FULL DEPTH PATCHING

B. Restoring Subgrade or Subbase:

1. Excavate (DELETE) 2 (ADD) 12 to 18 inches below the bottom of the existing pavement. (DELETE) ~~If more than 2 inches is excavated,~~ (ADD) Install geogrid on subgrade and place and compact new subbase material as required to bring the subbase to (DELETE) ~~a level 2 inches below the bottom of the existing pavement.~~ Correct unauthorized over excavation at no additional cost to the Contracting Authority.
5. Place and compact new subbase material as required to bring the subbase to (DELETE) ~~a level 2 inches below the bottom of the existing pavement.~~

C. Placing PCC Patches:

2. **Tie Bars and Dowel Bars:** Comply with Section 7010 (ADD), Figures MS-1 and MS-2 in this section, and the figures in Sections 7010 and 7040.

3.11 (ADD) MARSHALLTOWN STANDARD DETAILS

Added the following details:

A. MS-1 & MS-2 Pavement Restoration Joint Layout

B. MS-3 Manhole Boxout Details

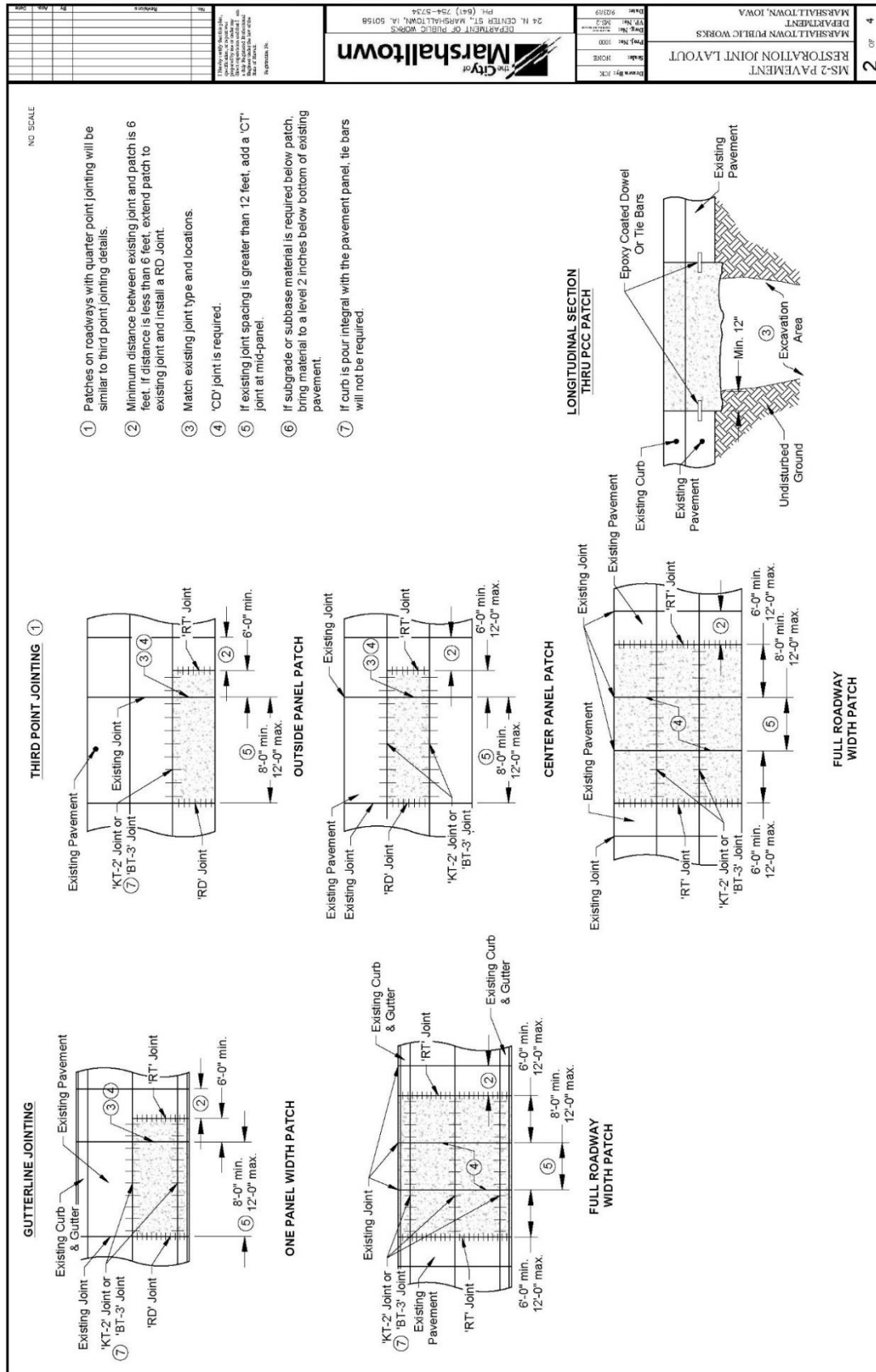
C. MS-4 Pavement Restoration Details

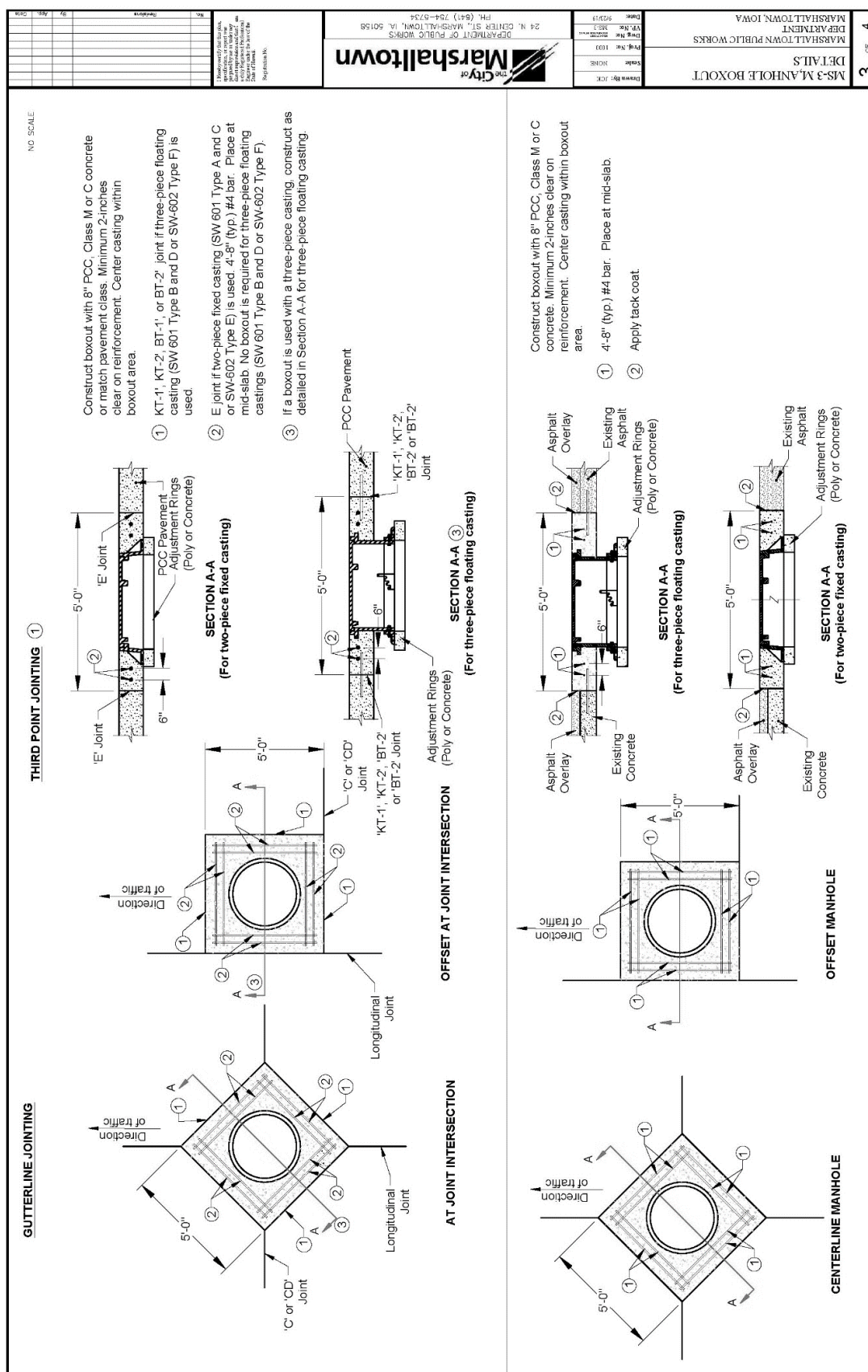
3.12 (ADD) DELETED SUDAS STANDARD DETAILS

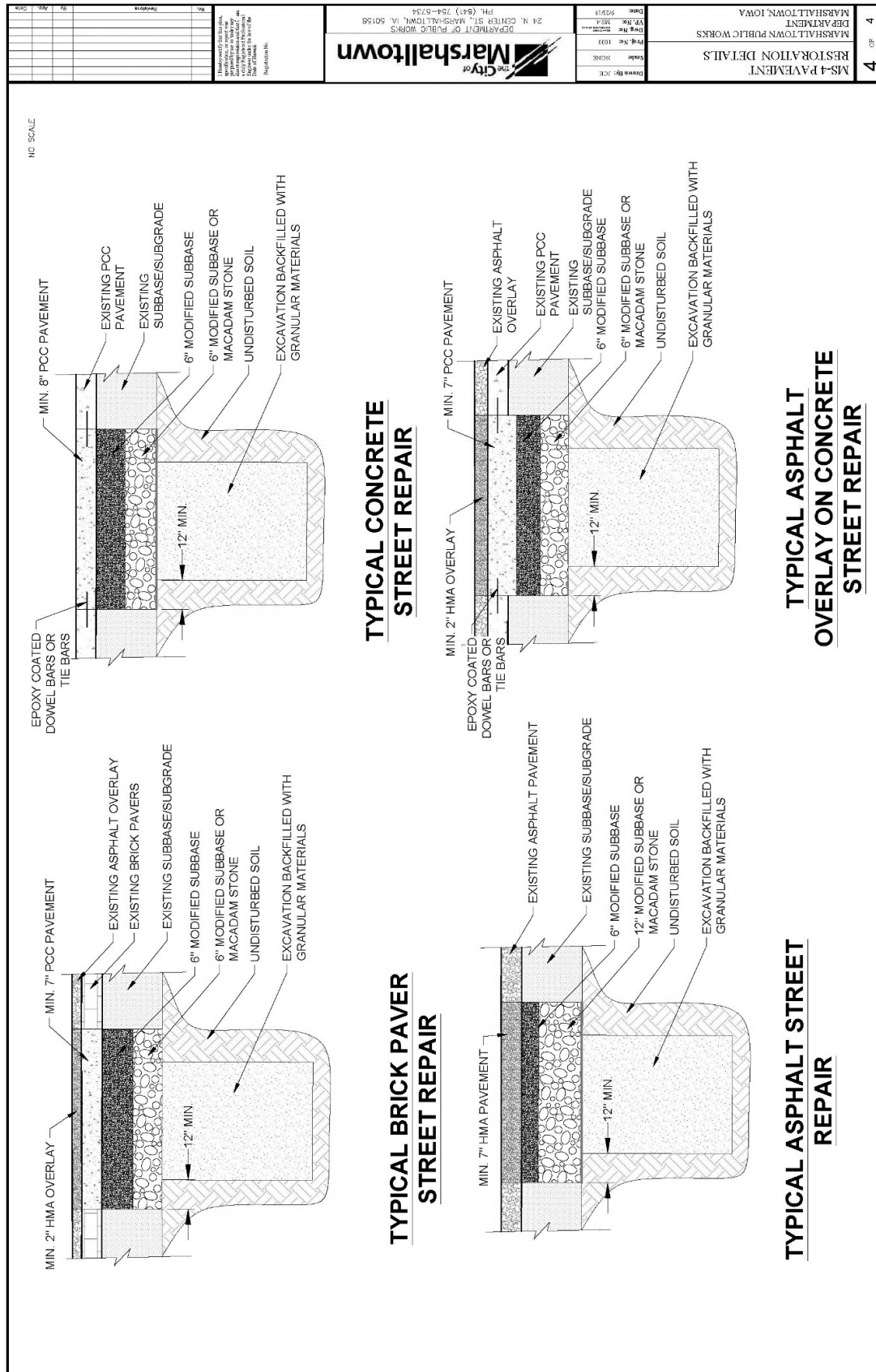
A. 7040.101 Full Depth PCC Patches Less Than or Equal to 15' Long

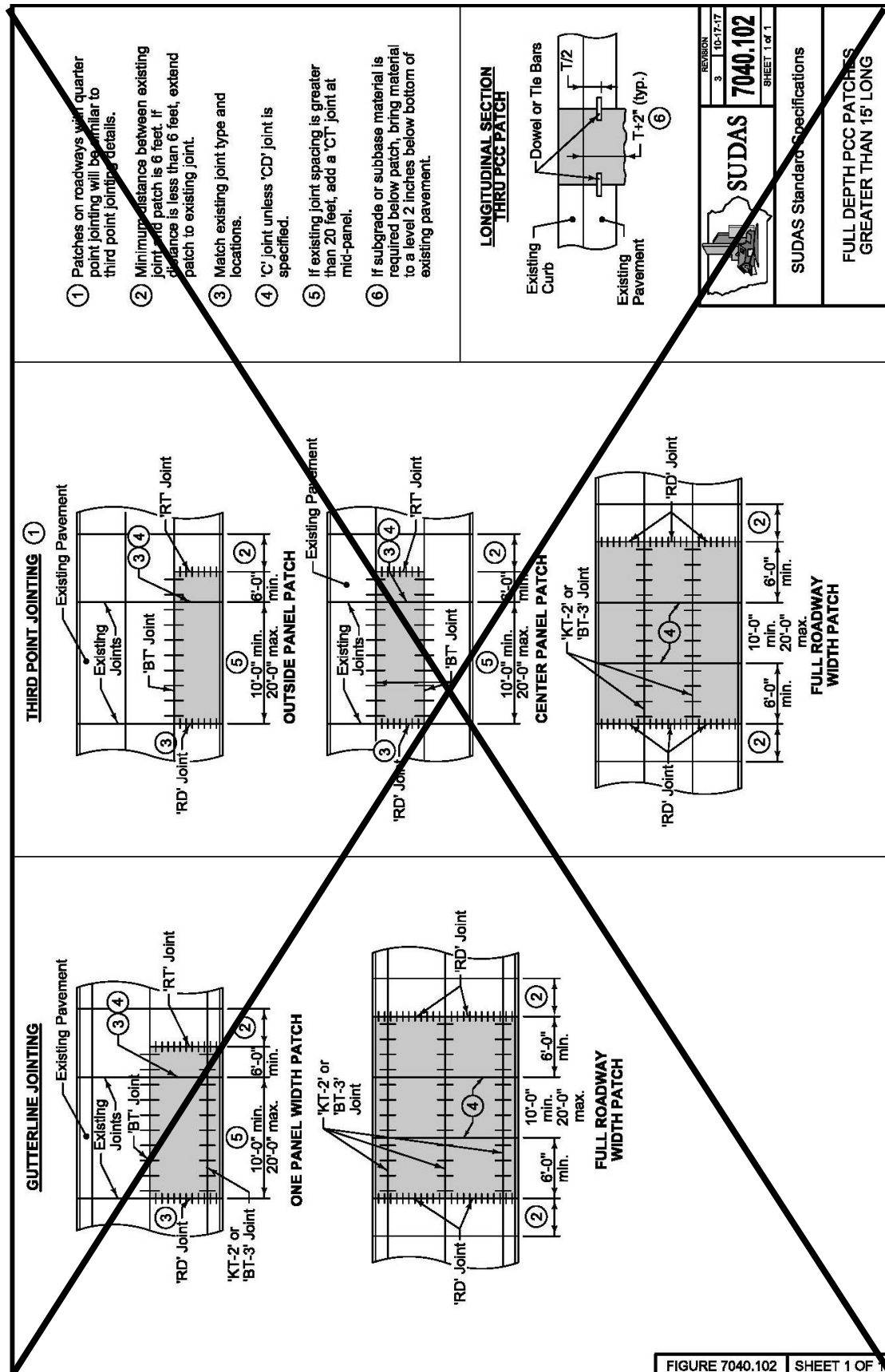
B. 7040.102 Full Depth PCC Patches Greater Than 15' Long

City of Marshalltown Supplementary Conditions to the Statewide Urban Design and Specifications (SUDAS)









SECTION 7050 - ASPHALT STABILIZATION

PART 1 - GENERAL

1.03 through 1.06: (DELETE): ~~Comply with Division 1 – General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

1.08 MEASUREMENT AND PAYMENT

B. Fixture Adjustment: Comply with Section 6010 (ADD) and 6020 for adjustment of manholes and intakes and (DELETE) ~~Section 5020~~ (ADD) Marshalltown Water Works Requirements for adjustment of water valves and fire hydrants.

SECTION 7060 - BITUMINOUS SEAL COAT

PART 1 - GENERAL

1.03 through 1.06: (DELETE): ~~Comply with Division 1 – General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

1.08 MEASUREMENT AND PAYMENT

A. Bituminous Seal Coat by Area:

3. Includes: Unit price includes, but is not limited to, surface preparation including protection of street fixtures; furnishing and placing of materials, including fillets at intersecting streets, driveways, and turnouts; (ADD) sweeping; fog seal; and final clean up.

C. (ADD) Bituminous Material Fog Seal: Unless the Engineer directs otherwise, use asphalt emulsion grade CQS-1, CQS-1H, CSS-1, or SS-1.

1. Dilute the asphalt emulsion with water prior to application to the pavement surface. The dilution rate is one part of asphalt emulsion to four parts water.
2. Dilute the asphalt emulsion with water prior to application to the pavement surface. The dilution rate is one part of asphalt emulsion to four parts water.
3. Uniformly apply dilute asphalt emulsion at the rate of 0.12 gallon per square yard of pavement surface.

PART 3 - EXECUTION

3.01 EQUIPMENT

C. Brooms: A power-driven (DELETE) ~~rotary or~~ pick-up broom is required for cleaning surfaces before the bitumen is applied (ADD), in between applications, and after final application.

3.06 TWO COURSE SEAL COATS

B. Second Course Construction:

4. (ADD) Complete rolling operations as specified in 3.05.
5. (ADD) After a minimum of 24 hours, lightly broom surface with power sweeper to remove excess aggregate. All aggregate shall be removed with a vacuum machine.

3.08 (ADD) BITUMINOUS FOG SEAL

- A. A bituminous fog seal shall be applied to all sealed streets after completion of the final seal coat layer.
- B. Immediately prior to placing the emulsion, clean the entire pavement surface. Use scrapers, compressed air, or other approved methods.
- C. Uniformly apply dilute asphalt emulsion at the rate of 0.12 gallon per square yard of pavement surface. The application rate may be reduced if directed by the Engineer. For excessive application rates, the Engineer may require a light coat of sand. The Engineer may require brooming of ponded areas prior to placing traffic on the pavement.

SECTION 7070 - EMULSIFIED ASPHALT SLURRY SEAL

PART 1 - GENERAL

- 1.03 through 1.06:** (DELETE): ~~Comply with Division 1—General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

SECTION 7080 - PERMEABLE INTERLOCKING PAVERS

PART 1 - GENERAL

- 1.03 through 1.06:** (DELETE): ~~Comply with Division 1—General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

SECTION 7090 - COLD-IN-PLACE PAVEMENT RECYCLING

PART 1 - GENERAL

- 1.03 through 1.06:** (DELETE): ~~Comply with Division 1—General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

SECTION 7091 - FULL DEPTH RECLAMATION

PART 1 - GENERAL

1.03 through 1.06: (DELETE): ~~Comply with Division 1 – General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

SUPPLEMENTAL DIVISION 8 – TRAFFIC CONTROL

SECTION 8010 - TRAFFIC SIGNALS

PART 1 - GENERAL

1.03 through 1.06: (DELETE): ~~Comply with Division 1 – General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

1.07 SPECIAL REQUIREMENTS

B. (ADD) Coordinate all design and construction work with the City of Marshalltown’s Public Works Electrical Superintendent.

SECTION 8020 - PAVEMENT MARKINGS

PART 1 - GENERAL

1.03 through 1.06: (DELETE): ~~Comply with Division 1 – General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

1.06 SCHEDULING AND CONFLICTS

B. (ADD) Schedule and coordinate all line markings with the Public Works Street Superintendent.

3.02 CONSTRUCTION

C. Painted Pavement Markings:

5. (ADD) Coordinate all painted pavement markings with Marshalltown’s Public Works Street Department. Paint markings shall be calibrated to the City’s standard marking spacing and widths.

SECTION 8030 - TEMPORARY TRAFFIC CONTROL

PART 1 - GENERAL

1.03 through 1.06: (DELETE): ~~Comply with Division 1 – General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

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SUPPLEMENTAL DIVISION 9 – SITE WORK AND LANDSCAPING

SECTION 9010 - SEEDING

PART 1 - GENERAL

1.03 through 1.06: (DELETE): ~~Comply with Division 1 – General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

1.08 MEASUREMENT AND PAYMENT

A. Conventional Seeding:

1. Seeding:
 - a. Measurement: Measurement will be in acres (ADD) or square yards for each type of seed.
 - b. Payment: Payment will be in unit price per acre (ADD) or square yards for each type of seed.
2. Fertilizing:
 - a. Measurement: Measurement will be in acres (ADD) or square yards of fertilizer.
 - b. Payment: Payment will be at unit price per acre (ADD) or square yards of fertilizer.
3. Mulching:
 - a. Measurement: Measurement will be in acres (ADD) or square yards of mulch.
 - b. Payment: Payment will be in unit price per acre (ADD) or square yards of mulch.

B. Seeding, Fertilizing, and Mulching for Hydraulic Seeding:

1. Measurement: Measurement will be in acres (ADD) or square yards for each type of seed.
2. Payment: Payment will be in unit price per acre (ADD) or square yards for each type of seed.

C. Seeding, Fertilizing, and Mulching for Pneumatic Seeding:

1. Measurement: Measurement will be in acres (ADD) or square yards for each type of seed.
2. Payment: Payment will be in unit price per acre (ADD) or square yards for each type of seed.

PART 2 - PRODUCTS

2.02 SEED MIXTURES AND SEEDING DATES

- 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. (ADD) Dormant seeding from September 30 to freeze-up will be allowed if approved by City Engineer. Type 1 seed mixture will be used in all terrace or boulevard areas within the City of Marshalltown.

PART 3 - EXECUTION

3.05 HYDRAULIC SEEDING

A. **Seed Application, Fertilizing, and Mulching:**

8. Hydromulching (ADD) is required (DELETE) ~~may be done~~ over conventional seeding and/or fertilizing, (ADD) unless straw mulch is (DELETE) if approved by the Engineer.

SECTION 9020 - SODDING

PART 1 - GENERAL

- 1.03 through 1.06:** (DELETE): ~~Comply with Division 1—General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

SECTION 9030 - PLANT MATERIAL AND PLANTING

PART 1 - GENERAL

1.03 SUBMITTALS

(DELETE) ~~Comply with Division 1—General Provisions and Covenants~~ (ADD) Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division, as well as the following:

- F. (ADD) Provide trees and shrubs planted in terrace areas in accordance with the City of Marshalltown’s Code of Ordinances, Chapter 58 – Vegetation. A list of prohibited trees and recommended trees is provided in Table 1 at the end of this section.
- G. (ADD) The placement of trees shall be in accordance with Chapter 10B-1 of the SUDAS Design Manual.

- 1.04 through 1.06:** (DELETE): ~~Comply with Division 1—General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

PART 3 - EXECUTION

3.06 PLANTING

A. Bare Root Plants: (ADD) Not allowed without written approval of the City Engineer.

Table 1 - Tree List for Planting on Terrace or Other Public Right-of-Way

Prohibited Species

- All evergreen trees and shrub species except those with a mature height of 12 inches or less.
- All deciduous shrubs
- All Poplars (*Populus* spp.), including, but not limited to Cottonwood, White Poplar, Lombardy Poplar, and hybrids thereof
- American Elm (*Ulmus americana*) & Elm hybrids
- Birch (*Betula* spp.)
- Blue Ash (*Fraxinus quadrangulata*)
- Green Ash and cultivars (*Fraxinus pennsylvanica lanceolata*)
- White Ash and cultivars (*Fraxinus Americana*)
- Box Elder (*Acer negundo*)
- Bradford Pear (*Pyrus calleryana* 'Bradford')
- Catalpa (*Catalpa speciosa*)
- Crab Apples with exception of Spring Snow or male sterile varieties
- Female Ginkgo (*Ginkgo biloba*).
- Hawthorn (*Crataegus* spp.)(except thornless cutlivars)
- Honey Locust (*Gleditsia triacanthos*) and all cultivars
- Japanese Tree Lilac (*Syringa reticulata*)
- Oriental Elms (*Ulmus pumila* & *U. parvifolia*)
- Pin Oak (*Quercus palustris*)
- Purple Leaf Plum (*Prunus cerasifera*)
- Red Mulberry, White Mulberry (*Morus rubra* & *Morus alba*)
- Russian Olive (*Elaeagnus angnstifolia*)
- Serviceberry (*Amelanchier* spp.)
- Silver Maple – Autumn Blaze Maple (*Acer saccharinum*) and all cultivars including Freeman cultivars

- Sycamore (*Plantanus* spp) and all cultivars
- Willow (*Salix* spp.)

Suggested trees for terrace area 8' wide or greater

- Basswood/Linden (*Tilia* spp.)
- Kentucky Coffeetree (*Gymnocladus dioicus*)
- White Oak (*Quercus alba*)
- Bur Oak (*Quercus macrocarpa*)
- Swamp White Oak (*Quercus bicolor*)
- Northern Red Oak (*Quercus rubra*)
- Sugar Maple (*Acer saccharum*)
- Red Maple (*Acer rubrum*)
- Black Maple (*Acer nigrum*)
- Hackberry (*Celtis occidentalis*)
- Male Ginkgo (*Ginkgo biloba*)

Suggested trees for terrace area less than 8' in width

- Amur Maple (*Acer ginnala*) (Tree form only)
- Tatarian Maple (*Acer tataricum*)
- American Hophornbeam (*Ostrya virginiana*)
- Thornless Cockspur Hawthorn (*Crataegus crus-galli inermis*)
- American Hornbeam (*Carpinus caroliniana*)
- Crabapple (*Malus* sp.) (Male sterile varieties only)
- Red Bud (*Cercis Canadensis*)

SECTION 9040 - EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.03 through 1.06: (DELETE): ~~Comply with Division 1 - General Provisions and Covenants~~ (ADD) "Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1"

PART 3 - EXECUTION

3.13 RIP RAP (Figures 9040.110 and 9040.111)

- B. (ADD) Contractor shall construct an anchor trench along the toe of the slope prior to placement of riprap. Anchor trench shall be 2' deep, 4' wide, and extend along the entire length of slope.

SECTION 9050 - GABIONS AND REVET MATTRESSES

PART 1 - GENERAL

- 1.03 through 1.06:** (DELETE): ~~Comply with Division 1 – General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

SECTION 9060 - CHAIN LINK FENCE

PART 1 - GENERAL

- 1.03 through 1.06:** (DELETE): ~~Comply with Division 1 – General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

SECTION 9070 - LANDSCAPE RETAINING WALLS

PART 1 - GENERAL

- 1.03 through 1.06:** (DELETE): ~~Comply with Division 1 – General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

PART 3 - EXECUTION

3.02 INSTALLATION

B. Modular Block Retaining Wall:

3. Tieback Reinforcement Installation: Install tieback reinforcement (ADD) every 24” of elevation. Geogrid shall conform to the manufacturer’s requirements and be installed according to the manufacturer’s requirements.

3.03 (ADD) NOTES ADDED TO FIGURES

- A. SUDAS 9070.101 - Tie backs will be required for each 2-feet of vertical wall elevation constructed.
- B. SUDAS 9070.102 - Geogrid reinforcement will be required for each 2-feet of vertical wall elevation constructed.
- C. SUDAS 9070.103 - Geogrid reinforcement will be required for each 2-feet of vertical wall elevation constructed.

SECTION 9071 - SEGMENTAL BLOCK RETAINING WALLS

PART 1 - GENERAL

1.03 through 1.06: (DELETE): ~~Comply with Division 1 – General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

SECTION 9072 - COMBINED CONCRETE SIDEWALK AND RETAINING WALL

PART 1 - GENERAL

1.03 through 1.06: (DELETE): ~~Comply with Division 1 – General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

SECTION 9080 - CONCRETE STEPS, HANDRAILS, AND SAFETY RAIL

PART 1 - GENERAL

1.03 through 1.06: (DELETE): ~~Comply with Division 1 – General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

SUPPLEMENTAL DIVISION 10 – DEMOLITION

SECTION 10,010 - DEMOLITION OF BUILDING STRUCTURES

PART 1 - GENERAL

1.03 through 1.06: (DELETE): ~~Comply with Division 1 – General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

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SUPPLEMENTAL DIVISION 11 – MISCELLANEOUS

SECTION 11,010 - CONSTRUCTION SURVEY

PART 1 - GENERAL

1.03 through 1.06: (DELETE): ~~Comply with Division 1 – General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

SECTION 11,020 – MOBILIZATION

PART 1 - GENERAL

1.03 through 1.06: (DELETE): ~~Comply with Division 1 – General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

SECTION 11,030 - TEMPORARY SERVICES DURING CONSTRUCTION

PART 1 - GENERAL

1.03 through 1.06: (DELETE): ~~Comply with Division 1 – General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

SECTION 11,040 - TEMPORARY SIDEWALK ACCESS

PART 1 - GENERAL

1.03 through 1.06: (DELETE): ~~Comply with Division 1 – General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

SECTION 11,050 - CONCRETE WASHOUT

PART 1 - GENERAL

1.03 through 1.06: (DELETE): ~~Comply with Division 1 – General Provisions and Covenants~~ (ADD) “Comply with Part I - General Conditions and Supplementary Conditions and Part II Technical Specifications Division 1”

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SUDAS

Standard Specifications



Statewide Urban Design and Specifications Program

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DIVISION 1 – GENERAL PROVISIONS AND COVENANTS

DIVISION 1 IS NOT UTILIZED.

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DIVISION 2 – EARTHWORK

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SECTION 2010 - EARTHWORK, SUBGRADE, AND SUBBASE

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

- A. Comply with Division 1 - General Provisions and Covenants, as well as the following:
- B. Submit results of Standard Proctor and in-place density tests on compactions when required.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

If impractical, or if scheduling does not allow the removal of utilities before excavation, work around the utilities.

1.08 MEASUREMENT AND PAYMENT

- A. **Clearing and Grubbing by Units:** The quantity of clearing and grubbing will be the quantity, in units, shown in the contract documents.

1. Measurement:

- a. Trees 6 inches in diameter or greater will be counted and the circumference will be measured at a height of 18 inches above the ground. The diameter will be calculated by measuring the circumference to the nearest inch and dividing by 3.14. See Table 2010.01 for identification of units per tree for clearing, grubbing, and clearing and grubbing.

- b. Stumps 6 inches in diameter or greater will be counted and the diameter, in inches, calculated by determining the average diameter at cutoff. See Table 2010.01 for identification of units per stump for grubbing.
 - c. Logs and down timber 6 inches in diameter or greater will be measured at a point 18 inches from the end of the log with greatest diameter or 18 inches from the base of the tree for down timber for clearing.
 - d. Hedge rows will be measured in linear feet and converted to units using a rate of 30 units per 100 linear feet of hedge row.
 - e. Brush will be measured in square feet and converted to units by using a rate of 0.8 units per 100 square feet of brush.
 - f. Growing corn will be measured in square feet and converted to units by using a rate of 0.2 units per 100 square feet of growing corn.
 - g. Vegetation removal will not be measured for payment.
 - h. Field fence removal, included in clearing and grubbing, will be measured in stations and converted to units at a rate of 6.0 units per station of fence.
- B. For each tree or stump counted as identified in Items a, b, and c, units will be determined as identified in the following table:

Table 2010.01: Tabulation of Units for Removal of Trees and Stumps

Size Diameter	Unit		
	Clearing	Grubbing	Clearing and Grubbing
Over 6 in. to 9 in. incl.	1.1	2.8	3.9
Over 9 in. to 12 in. incl.	1.9	4.8	6.7
Over 12 in. to 15 in. incl.	2.8	6.6	9.4
Over 15 in. to 18 in. incl.	4.7	8.8	13.5
Over 18 in. to 24 in. incl.	8.4	13.6	22.0
Over 24 in. to 30 in. incl.	11.4	17.6	29.0
Over 30 in. to 36 in. incl.	22.0	28.0	50.0
Over 36 in. to 42 in. incl.	30.0	50.0	80.0
Over 42 in. to 48 in. incl.	40.0	80.0	120.0
Over 48 in. to 60 in. incl.	60.0	100.0	160.0
Over 60 in. to 72 in. incl.	80.0	120.0	200.0
Over 72 in.	120.0	160.0	280.0

- Payment:** Payment will be at the unit price per unit.
- Includes:** Unit price includes, but is not limited to, placement of backfill in area where roots have been removed, and removal and disposal of all materials.

C. Clearing and Grubbing by Area:

1. **Measurement:** Measurement will be the plan quantities for the total area of clearing and grubbing. If the limits for this item are not shown in the contract documents, they will be calculated from a need line or right-of-way line as indicated in the project plans.
2. **Payment:** Payment will be at the unit price per acre.
3. **Includes:** Unit price includes, but is not limited to, removal and disposal of all materials and placement of backfill in area where roots have been removed.

D. Clearing and Grubbing by Lump Sum:

1. **Measurement:** Lump sum item; no measurement will be made.
2. **Payment:** Payment will be the contract lump sum price.

E. Topsoil:**1. On-site Topsoil:**

- a. **Measurement:** Measurement will be in cubic yards of topsoil stripped, salvaged, and spread, and will be computed on the basis of a uniform 8 inch finished thickness, or as specified.
- b. **Payment:**
 - 1) Payment will be at the unit price per cubic yard.
 - 2) Topsoil salvaged from excavated areas and paid as topsoil will not be included in excavation quantities for which payment is made.
 - 3) Overhaul will not be paid.

2. Compost-amended Topsoil:

- a. **Measurement:** Measurement will be the same as for on-site topsoil.
- b. **Payment:** Payment will be the unit price per cubic yard.
- c. **Includes:** This work includes, but is not limited to, furnishing and incorporating compost.

3. Off-site Topsoil:

- a. **Measurement:** Measurement will be in cubic yards for furnishing, excavating, hauling, and incorporating the material.
- b. **Payment:** Payment will be at the unit price per cubic yard.

F. Class 10, Class 12, or Class 13 Excavation:**1. Measurement:**

- a. Measurement for Class 10, Class 12, and Class 13 material excavated from the project site and borrow areas will be the plan quantity in cubic yards, without final field measurement. Adjustments may be made to the plan quantities if agreed to by both the Engineer and the Contractor.

- b. If either the Contractor or the Engineer desires actual measurements rather than using contract document quantities, that party must provide written notice to the other party prior to starting work.
 - 1) If actual measurements are used, use cross-section surveys by the Engineer before and after work for the basis of computing the cubic yards of excavation. The extra survey cost will be paid by the party requesting the survey.
 - 2) When the Engineer determines it is impractical to make cross-section surveys, use the truck count method, with a shrinkage factor, resulting in volume per truck type and size determined by the Engineer. Unless otherwise specified, use a shrinkage factor of 1.35 for Class 10 and Class 13 excavation. No shrinkage factor will be used for Class 12.
- 2. **Payment:**
 - a. Payment will be at the unit price per cubic yard.
 - b. Payment will not be made for excavation work done prior to the staking and, if necessary, cross-sectioning.
- 3. **Includes, but is not limited to:**
 - a. Site preparation for, and the construction of, embankment, fills, shoulder backfill, and backfill behind curbs.
 - b. Overhaul.
 - c. Finishing the soil surface, including roadways, shoulders, behind curbs, side ditches, slopes, and borrow pits.
 - d. Repair or replacement of any fences that have been unnecessarily damaged or removed.
- 4. **Does not include:** Stripping, salvaging, and spreading 8 inches of topsoil, unless otherwise specified in the contract documents.
- G. **Below Grade Excavation (Core Out):** If unsuitable or unstable soil is encountered below the 12 inches of subgrade, measurement and payment for removal and replacement of such materials is as follows:
 - 1. **Measurement:** Will be measured and paid as extra work, unless otherwise specified in the contract documents.
 - 2. **Payment:** To be considered for payment, the Engineer must order the removal and replacement of the material. Payment will be considered only in previously undisturbed areas and not in existing embankments or following proof rolling operations.
 - 3. **Includes:** Payment includes, but is not limited to, equipment, tools, labor, disposal of unsuitable materials, dewatering, drying, furnishing, and placement of foundation materials as required by the Engineer, compaction and finishing of the excavated area, and all incidental work as may be required.

H. Subgrade Preparation:

1. **Measurement:** The area of the proposed pavement under which the subgrade preparation is performed, plus 2 feet on each side, will be measured in square yards.
2. **Payment:** Payment will be at the unit price per square yard.
3. **Includes:** Work includes, but is not limited to, excavating, manipulating, replacing, compacting, and trimming to the proper grade.

I. Subgrade Treatment:

1. **Measurement:** The area of the proposed pavement under which subgrade treatment is provided, plus 2 feet on each side, will be measured in square yards.
2. **Payment:**
 - a. Payment will be at the unit price per square yard for each type used.
 - b. Payment is in addition to subgrade preparation.
3. **Includes:** Work includes, but is not limited to, furnishing, placing, and incorporating the subgrade treatment material [cement, asphalt, fly ash, lime, geogrid (type), or geotextiles].

J. Subbase:

1. **Measurement:** The area of the proposed pavement under which subbase is provided, plus 2 feet on each side, will be measured in square yards.
2. **Payment:** Payment will be at the unit price per square yard.
3. **Includes:** Work includes, but is not limited to, furnishing, placing, compacting, and trimming to the proper grade.

K. Removals:**1. Structures:**

- a. **Measurement:** Each structure to be removed will be counted.
- b. **Payment:** Payment will be at the unit price for each specified structure removed.
- c. **Includes:** Unit price includes, but is not limited to, removal and disposal of structures.

2. Culverts:**a. Known Box Culverts:**

- 1) **Measurement:** Each type and size of box culvert removed will be measured in linear feet from end to end along the centerline of the flowline.
- 2) **Payment:** Payment will be at the unit price per linear foot for each type and size of box culvert removed.

- 3) **Includes:** Unit price includes, but is not limited to, removal and disposal of box culverts.
 - b. **Unknown Box Culverts:** Removal of unknown box culverts will be measured and paid as extra work.
 - c. **Known Pipe Culverts:**
 - 1) **Measurement:** Each type and size of pipe culvert removed will be measured in linear feet from end to end at the flow line.
 - 2) **Payment:** Payment will be at the unit price per linear foot for each type and size of pipe culvert removed.
 - 3) **Includes:** Unit price includes, but is not limited to, removal and disposal of pipe culverts.
 - d. **Unknown Pipe Culverts:** Removal of unknown pipe culverts will be measured and paid as extra work.
- 3. **Pipes and Conduits:**
 - a. **Known Pipes and Conduits:**
 - 1) **Measurement:** Each type and size of pipe and conduit removed will be measured in linear feet from end to end.
 - 2) **Payment:** Payment will be at the unit price per linear foot for each type and size of pipe and conduit removed.
 - 3) **Includes:** Unit price includes, but is not limited to, removal, disposal, and plugging, if specified, of pipes and conduits.
 - 4) **Abandoned Private Utilities:** Removal of all private utility lines is the responsibility of the respective utility agency, and will not be measured or paid.
 - b. **Unknown Pipes and Conduits:** Removal of unknown pipes and conduits will be measured and paid as extra work.
- 4. **Pavement: Comply with Section 7040.**
- L. **Filling and Plugging of Pipe Culverts, Pipes, and Conduits:**
 - 1. **Known Pipe Culverts, Pipes, and Conduits:**
 - a. **Measurement:** Each type and size of pipe culvert, pipe, and conduit filled and plugged will be measured in linear feet from end to end.
 - b. **Payment:** Payment will be at the unit price per linear foot for each type and size of pipe culvert, pipe, and conduit filled and plugged.
 - c. **Abandoned Private Utilities:** Filling and plugging of all private utility lines is the responsibility of the respective utility agency, and will not be measured or paid.
 - 2. **Unknown pipe culverts, pipes, and conduits:** Filling and plugging of unknown pipe culverts, pipes, and conduits will be measured and paid as extra work.

M. Compaction Testing:

1. The Contractor will not be responsible for compaction testing or payment unless otherwise specified in the contract documents.
2. If the contract documents specify that the Contractor is responsible for compaction testing, performed by an independent testing laboratory hired by the Contractor, measurement and payment will be as follows:
 - a. **Measurement:** Lump sum item; no measurement will be made.
 - b. **Payment:** Payment will be the contract lump sum price.
3. The Contractor will be responsible for payments associated with all retesting resulting from failure of initial tests.

PART 2 - PRODUCTS**2.01 TOPSOIL**

- A. 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.
- B. Use on-site topsoil, unless compost-amended or off-site topsoil is specified.
- C. 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.
- D. 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 9010, 2.07.
- E. 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 turf grass

- F. 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:

- a. Material encountered during excavation above or below grade that does not meet the suitable soil requirements in Section 2010, 2.03.
- b. Rubbish and debris, including trees, stumps, waste construction materials, scrap metals, and other materials that cannot be buried or used for backfill or topsoil.
- c. 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.
- 2. **Cohesive soils must meet all of the following requirements:**
 - a. 45% or less silt size fraction.
 - b. Density of 110 pcf or greater according to ASTM D 698 or AASHTO T 99 (Standard Proctor Density).
 - c. Plasticity index greater than 10.
 - d. A-6 or A-7-6 soils of glacial origin.
- 3. **Granular soils must meet all of the following requirements:**
 - a. Density of 110 pcf or greater according to ASTM D 698 or AASHTO T 99 (Standard Proctor Density).
 - b. 15% or less silt and clay.
 - c. Plasticity index of 3 or less. 4) A-1, A-2, or A-3 (0).
 - d. 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.
 - e. The Engineer may authorize a change in select subgrade materials subject to materials available locally at time of construction.

B. Granular Stabilization Materials:

- 1. 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

- The Engineer may authorize a change in gradation, subject to materials available locally at time of construction.

C. Subgrade Treatment:

- Cement:** Meet the requirements of AASHTO M 85 for Portland cement.
- Asphalt:** Meet the requirements of AASHTO M 140.
- 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.
- Lime:** Hydrated lime should meet requirements of ASTM C 207, Type N or AASHTO M 216, and others.
- Geogrid:**
 - 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 Patch				
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 ASTM D 4439.

D. Subbase:

1. Special Backfill:

- Comply with Iowa DOT Specifications Section 4132. The quality requirements of Iowa DOT Materials I.M. 210 for recycled pavements are waived.
- The Engineer may authorize a change in gradation subject to materials available locally at time of construction.

2. Granular Subbase:

- Comply with Iowa DOT Specifications Section 4121.
- The Engineer may authorize a change in gradation subject to materials available locally at time of construction.

3. Modified Subbase:

- Comply with Iowa DOT Specifications Section 4123.

- b. 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

Notification: Notify the Engineer prior to start of clearing and grubbing activities.

A. 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.

B. 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.

C. Disposal: Material from clearing and grubbing may be removed according to Iowa Code 335 and must meet local ordinances.

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 STRIPPING, SALVAGING, AND SPREADING TOPSOIL

A. Stripping and Salvaging Topsoil:

1. 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.
2. 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 or amended topsoil. The topsoil may be moved directly to an area where it is to be used, or may be stockpiled for future use.

B. Preparation for Topsoil Placement:

1. Finish excavation and embankment work according to the specified grades and cross- sections; grade and slope all surfaces to drain away from buildings and prevent ponding. Conform to the grading plan within ± 2 inches.
2. Loosen surface to a minimum depth of 4 inches to reduce compaction.

C. Topsoil Spreading and Finish Grading:

1. Place the topsoil after all grading and trenching activities in the area have been completed.
2. Place topsoil at least 8 inches deep; smooth and finished grade according to the contract documents. If topsoil is being amended with compost, thoroughly blend compost with on- site topsoil at the rate specified in Section 2010, 2.01.
3. After finish grading the topsoil, 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 Borrow:

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

Notification: Notify the Engineer prior to start of embankment activities.

A. 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.

B. 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, diking, 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 diking, 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.
6. 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.
7. 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.
- C. **Compaction with Moisture and Density Control:** Compact with moisture and density control, unless Type A compaction is specified in the contract documents. See Section 2010, 3.09 for moisture and density requirements.
- D. **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 sheepfoot-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

- A. Shape and consolidate subgrade in preparation for the placement of pavement.
- B. **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 2010, 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.
 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.
- C. Subgrade Stability:
 1. Perform proof rolling with a truck loaded to the maximum single legal axle gross weight of 20,000 pounds or the maximum tandem axle gross weight of 34,000 pounds. 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.
 2. If soft or yielding areas are located, remove unstable materials and replace with suitable foundation materials as approved by the Engineer, meeting Section 2010, 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.
- D. **Final Subgrade:** Complete final subgrade by excavation to grade by use of steel-shod template supported on side forms, support rollers, or by use of an automatically-controlled subgrade excavating machine.

- E. **Subgrade Check:** Check subgrade elevation and grade by method approved by Engineer prior to paving.
- F. **Ruts:** If ruts or other objectionable irregularities form in subgrade during construction, re- shape and re-roll subgrade before placing pavement. Fill ruts or other depressions with material similar to other subgrade material, and compact.

3.07 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 2010, 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 2922 and ASTM D 3017 (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

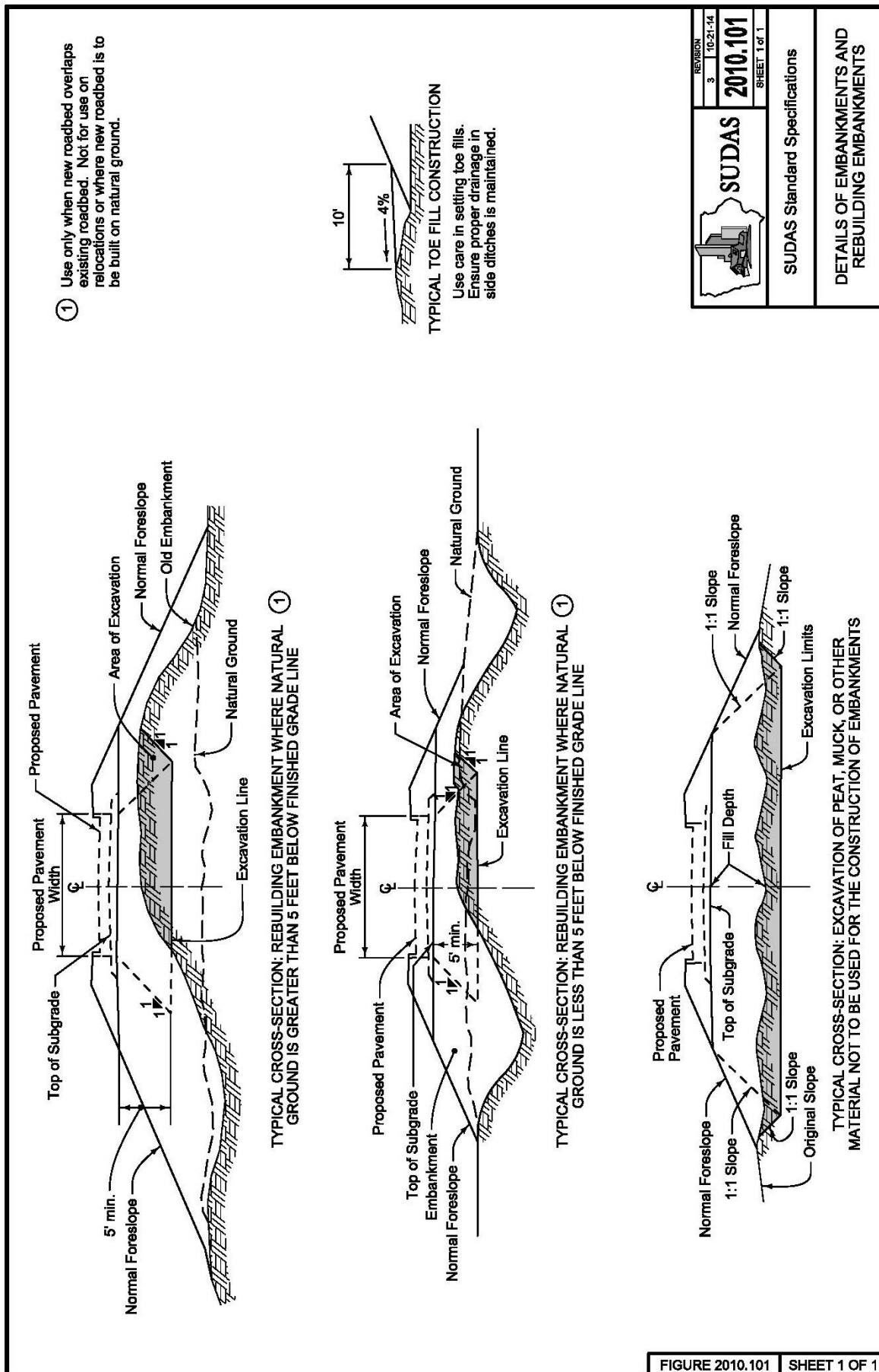
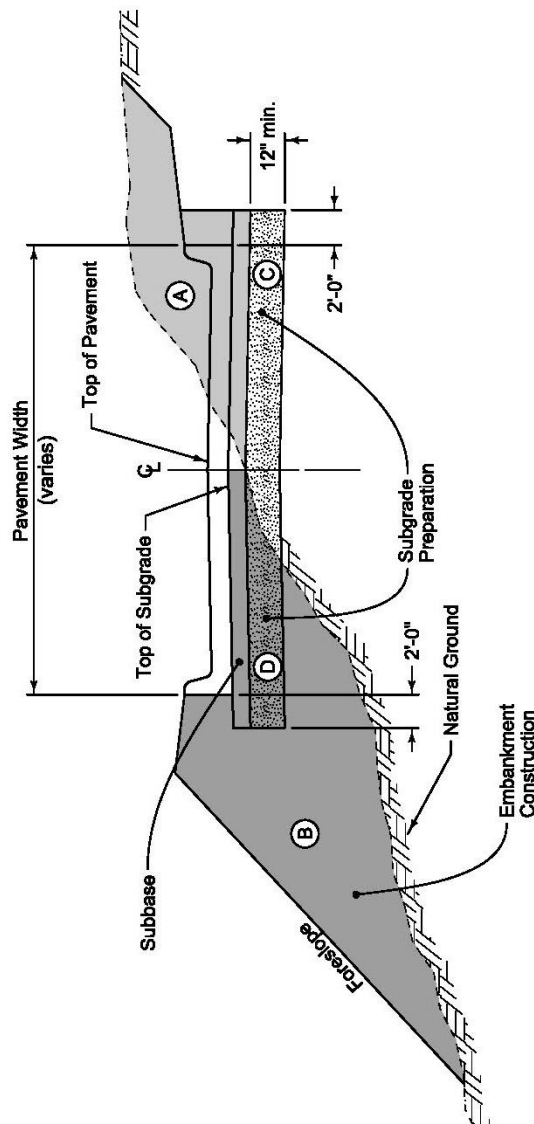
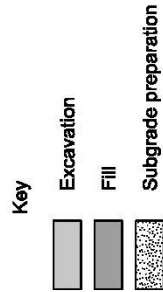


FIGURE 2010.101 SHEET 1 OF 1

- ① Embankment Construction: Compact with moisture and density control unless Type A Compaction is specified. Comply with Section 2010, 3.04.
- ② Subgrade Preparation: Construct subgrade according to Section 2010, 3.06.
- ③ Subbase Construction: Construct subbase according to Section 2010, 3.08.



Type of Work	Area	Payment Method
Excavation	(A)	Excavation
Fill	(B)	Included in Excavation or Borrow
Subgrade Preparation	(C & D)	Subgrade Preparation



SUDAS

2010.102

REVISION
1 10/21/14

SHEET 1 of 1

SUDAS Standard Specifications

DESIGNATION OF ROADWAY
EARTHWORK ITEMS

FIGURE 2010.102 SHEET 1 OF 1

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DIVISION 3 - TRENCH AND TRENCHLESS CONSTRUCTION

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SECTION 3010 - TRENCH EXCAVATION AND BACKFILL

PART 1 -GENERAL

1.01 SECTION INCLUDES

OOOOOO. Trench Excavation for Pipe Systems

PPPPPP. Trench Foundation Stabilization

QQQQQQ. Pipe Bedding and Backfill

1.02 DESCRIPTION OF WORK

RRRRRR. Excavate trench for pipe installation.

SSSSSS. Stabilize trench and install pipe bedding materials.

TTTTTT. Place backfill material in trench.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants, as well as the following:

UUUUUU. Gradation reports for bedding materials.

VVVVVV. Results of required testing.

WWWWWW. Dewatering plan.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT

XXXXXX. **General:** The following items are incidental to the underground utility being installed and will not be paid for separately:

1. Standard trench excavation.
2. Removal and disposal of unsuitable backfill material encountered during standard trench excavation.
3. Removal of abandoned private utilities encountered during trench excavation.
4. Furnishing and placing granular bedding material.
5. Placing and compacting backfill material.

6. Dewatering including, but not limited to, all equipment such as generators, pumps, rock for sump pits, discharge piping, and any extra excavation needed to facilitate dewatering according to stormwater regulations, as applicable.
7. Sheet piling, shoring, and bracing.
8. Adjusting the moisture content of excavated backfill material to the range specified for placement and compaction.
9. Temporary support for existing water, sewer, gas, telephone, electric, and other utilities or services that cross the trench.

YYYYYY. Rock Excavation:

1. **Measurement:** Measurement will be by cubic yards of rock removed.
2. **Payment:** Payment will be at the unit price per cubic yard for the quantity of rock removed.

ZZZZZZ. Trench Foundation:

1. **Measurement:** Measurement will be in tons for the quantity of stabilization material required to replace material removed by over-excavation. Measurement will be based on the scale tickets for the material delivered and incorporated into the project. Trench foundation required to correct unauthorized over-excavation will not be measured.
2. **Payment:** Payment will be at the unit price per ton for the quantity of stabilization material furnished and placed.
3. **Includes:** Unit price includes, but is not limited to, removal and disposal of over-excavated material required to stabilize trench foundation; and furnishing, hauling, and placing stabilization material.

AAAAAA. Replacement of Unsuitable Backfill Material:

1. **Measurement:** Measurement will be in cubic yards for the quantity of backfill material required to replace unsuitable backfill material removed during standard trench excavation. Measurement will be based on compacted material in place.
2. **Payment:** Payment will be at the unit price per cubic yard for the quantity of backfill material furnished.
3. **Includes:** Unit price includes, but is not limited to, furnishing, hauling, and placing backfill material.

BBBBBB. Special Pipe Embedment or Encasement:

1. **Measurement:** Measurement will be by the linear foot along the centerline of pipe for each type of special embedment or encasement.
2. **Payment:** Payment will be at the unit price per linear foot for each type of special pipe embedment or encasement.

3. **Includes:** Unit price includes, but is not limited to, furnishing and placing all required special pipe embedment or encasement materials.

CCCCCCC. **Trench Compaction Testing:** If the contract documents specify that the Contractor is responsible for trench compaction testing, measurement and payment will be as follows.

1. **Measurement:** Lump sum item; no measurement will be made.
2. **Payment:** Payment will be at the lump sum price for trench compaction testing.
3. **Includes:** Lump sum price includes, but is not limited to, all payments associated with retesting resulting from failure of initial tests.

PART 2 - PRODUCTS

2.01 MATERIALS EXCAVATED FROM A TRENCH

DDDDDDD. **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 3010, 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 3010, 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 3010, 2.03.

EEEEEEE. **Rock Excavation:** Boulders or sedimentary deposits that cannot be removed in trenches without continuous use of pneumatic tools or blasting.

FFFFFFF. **Over-excavation:** Excavation of unsuitable or unstable material in trenches below the pipe zone, comply with Figure 3010.101.

2.02 BEDDING MATERIAL

GGGGGGG. **Class I Material:** See Division 4 for pipe bedding information.

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

HHHHHHH. **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

Type	Soil Group Symbol ASTM D 2487	Description	Percentage Passing Sieve Sizes		
			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%

IIIIII. **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.
3. Class III materials may not be used from the base of the trench to 1' over the top of pipe with any flexible pipe installation.

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.

JJJJJJJ. 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
Fine-Grained Soils (inorganic)	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, silts with slight plasticity.
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clay, lean clay.

KKKKKKK. Class IVB Material:

1. Natural fine-grained inorganic (high elastic silts and plastic clays - fat clay) with a liquid limit greater than 50%. Class IVB 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

LLLLLLLL. 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

MMMMMMM. 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

NNNNNNN. If specified, meet Iowa DOT Section 4128 for Gradation No. 13 screened over a 1 inch screen or the Engineer may authorize a change in gradation depending on materials available locally at time of construction.

OOOOOOO. 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

PPPPPPP. Concrete Cradle, Arch, or Encasement: Use Iowa DOT Class C concrete.

QQQQQQQ. **Flowable Mortar:** Comply with Iowa DOT Article 2506.02.

RRRRRRR. 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.

SSSSSSS. Foamed Cellular Concrete:

1. If specified or approved by the Engineer, foamed cellular concrete may be substituted for flowable mortar.
2. Comply with Iowa DOT Article 2506.02.
3. Submit mix design to the Engineer. Include base cement slurry mix per cubic yard, expansion factor from the foaming agent, and wet density.

2.07 TRENCH EXCAVATION

TTTTTTT. Notify the Engineer prior to the start of excavation activities.

UUUUUUU. Remove topsoil to a minimum depth of 12 inches and stockpile.

VVVVVVV. Excavate trench to required elevations and dimensions. Comply with 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.

WWWWWWW. 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.

PART 3 - EXECUTION

3.01 TRENCH EXCAVATION

XXXXXXX. Notify the Engineer prior to the start of excavation activities.

YYYYYYY. Remove topsoil to a minimum depth of 12 inches and stockpile.

ZZZZZZZ. Excavate trench to required elevations and dimensions. Comply with 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.

AAAAAAA. 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

BBBBBBBB. Notify the Engineer prior to over-excavation.

CCCCCCCC. The Engineer will determine the need for over-excavation and trench foundation stabilization prior to installation of pipes and structures.

DDDDDDDD. Comply with Figure 3010.101 for over-excavation of rock and wet or soft foundations.

3.03 ROCK OR UNSTABLE SOILS IN TRENCH BOTTOM

EEEEEEEE. Notify the Engineer prior to over-excavation.

FFFFFFFF. The Engineer will determine the need for over-excavation and trench foundation stabilization prior to installation of pipes and structures.

GGGGGGGG. Comply with Figure 3010.101 for over-excavation of rock and wet or soft foundations.

3.04 TRENCH PROTECTION

HHHHHHHH. Install adequate trench protection (sheeting, shoring, and bracing) to prevent ground movement or damage to adjacent structures, pipelines, and utilities.

IIIIIII. Move trench boxes carefully to avoid disturbing pipe, bedding, or trench wall.

3.05 DEWATERING

JJJJJJJJ. Maintain water levels below the bottom of trench excavation.

KKKKKKKK. 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.

LLLLLLLL. Ensure operation of the dewatering system does not damage adjoining structures and facilities. Cease dewatering operations and notify the Engineer if damage is observed.

MMMMMMMM. 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.

3.06 PIPE BEDDING AND BACKFILL

NNNNNNNN. **General:** Comply with 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.

OOOOOOOO. 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 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 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.

PPPPPPPP. 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

QQQQQQQQ. 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.

RRRRRRRR. 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.

3.07 TRENCH COMPACTION TESTING

SSSSSSSS. 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.

TTTTTTTTT. 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).

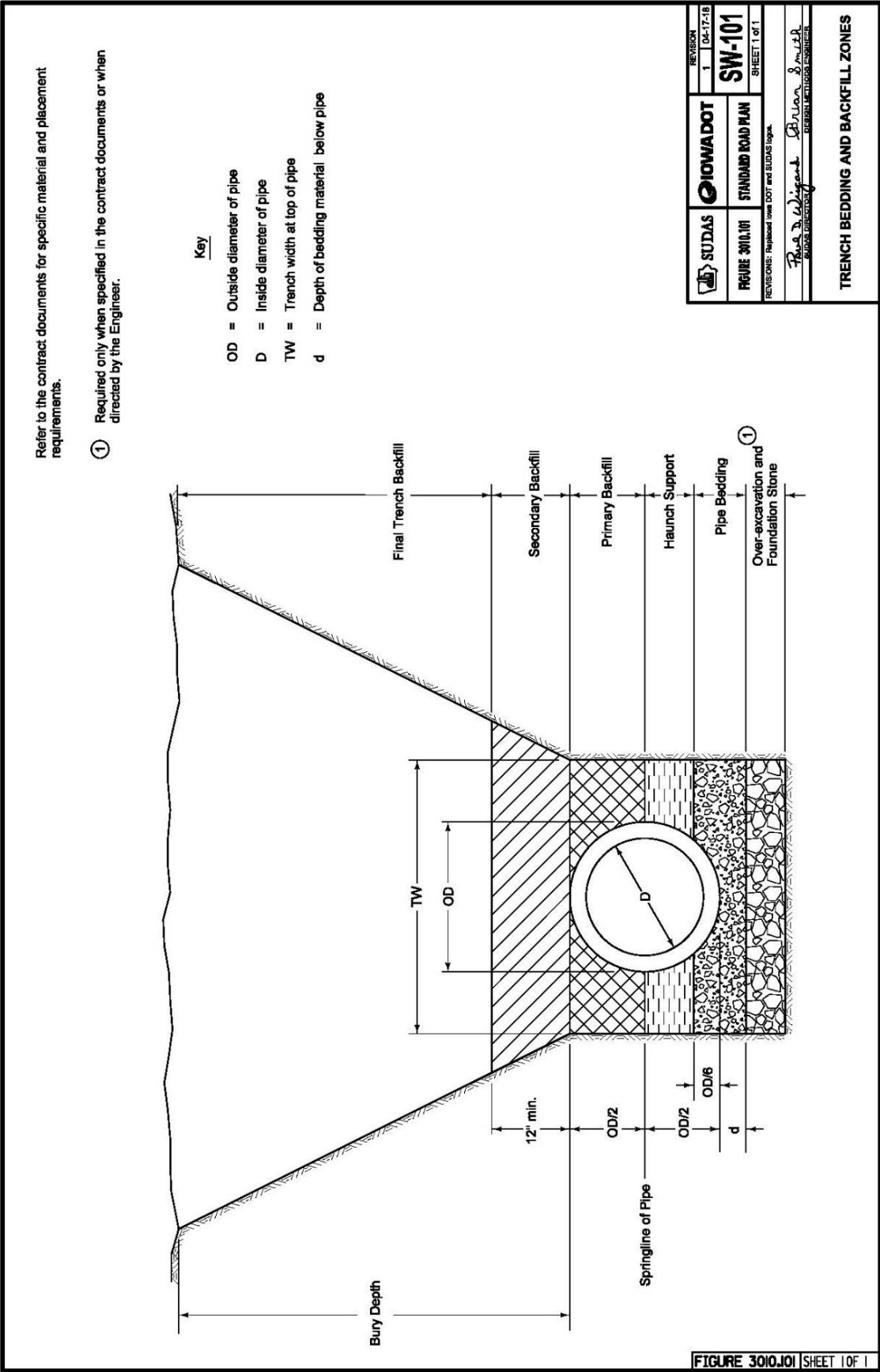
2. Cohesionless Soils:

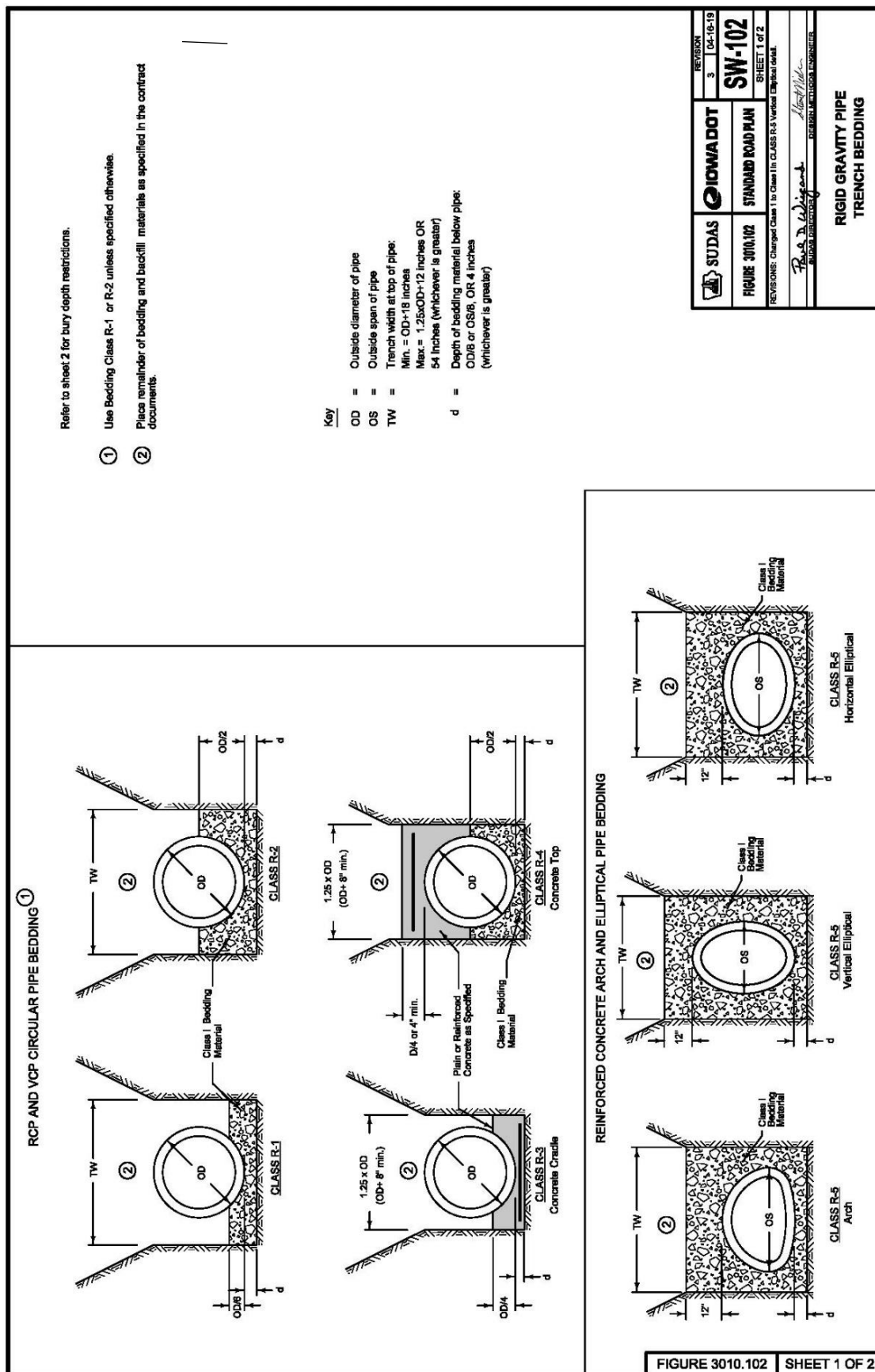
- a. Determine maximum and minimum index density and calculate relative density using ASTM D 4253 and ASTM D 4254.
- b. For Class I granular bedding material, determine gradation according to ASTM C 136.

UUUUUUUUU. Field Testing:

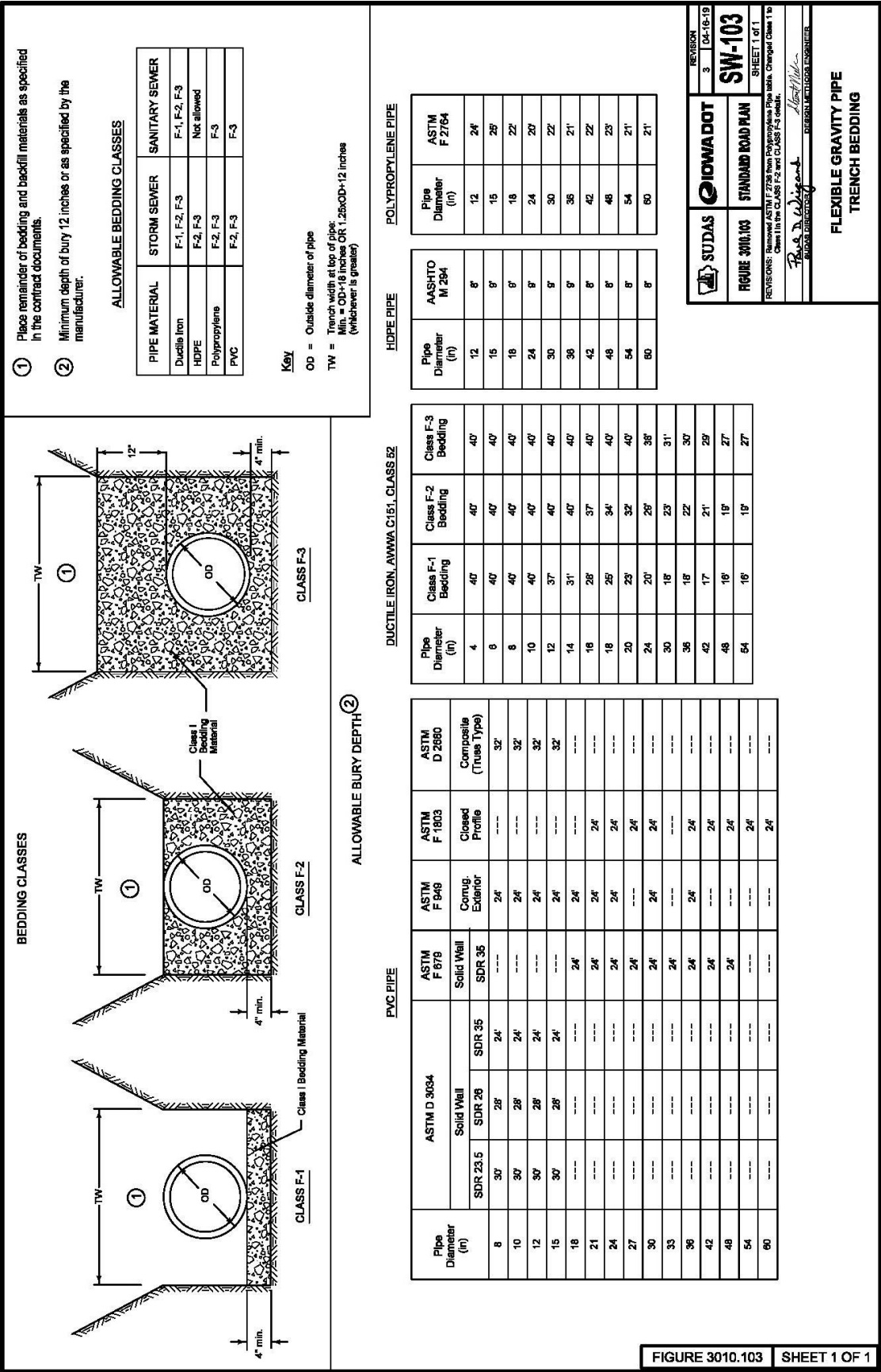
1. **Testing Frequency and Locations:** Perform testing of the final trench backfill, beginning at a depth of 2 feet above the top of the pipe, as follows:
 - a. Coordinate the timing of testing with the Engineer.
 - b. The Engineer will determine the location of testing.
 - c. For each 2 vertical feet 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.

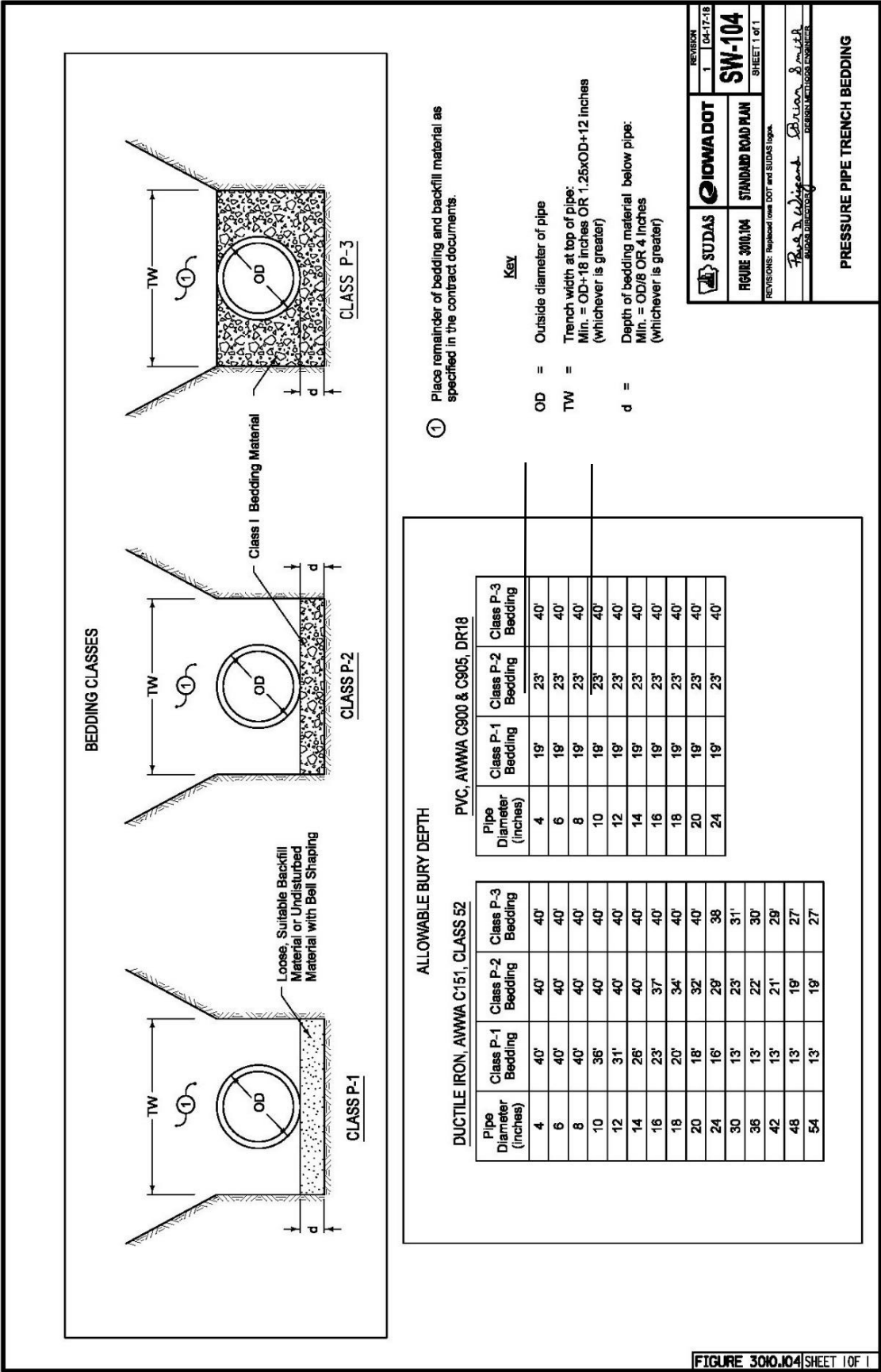
END OF SECTION

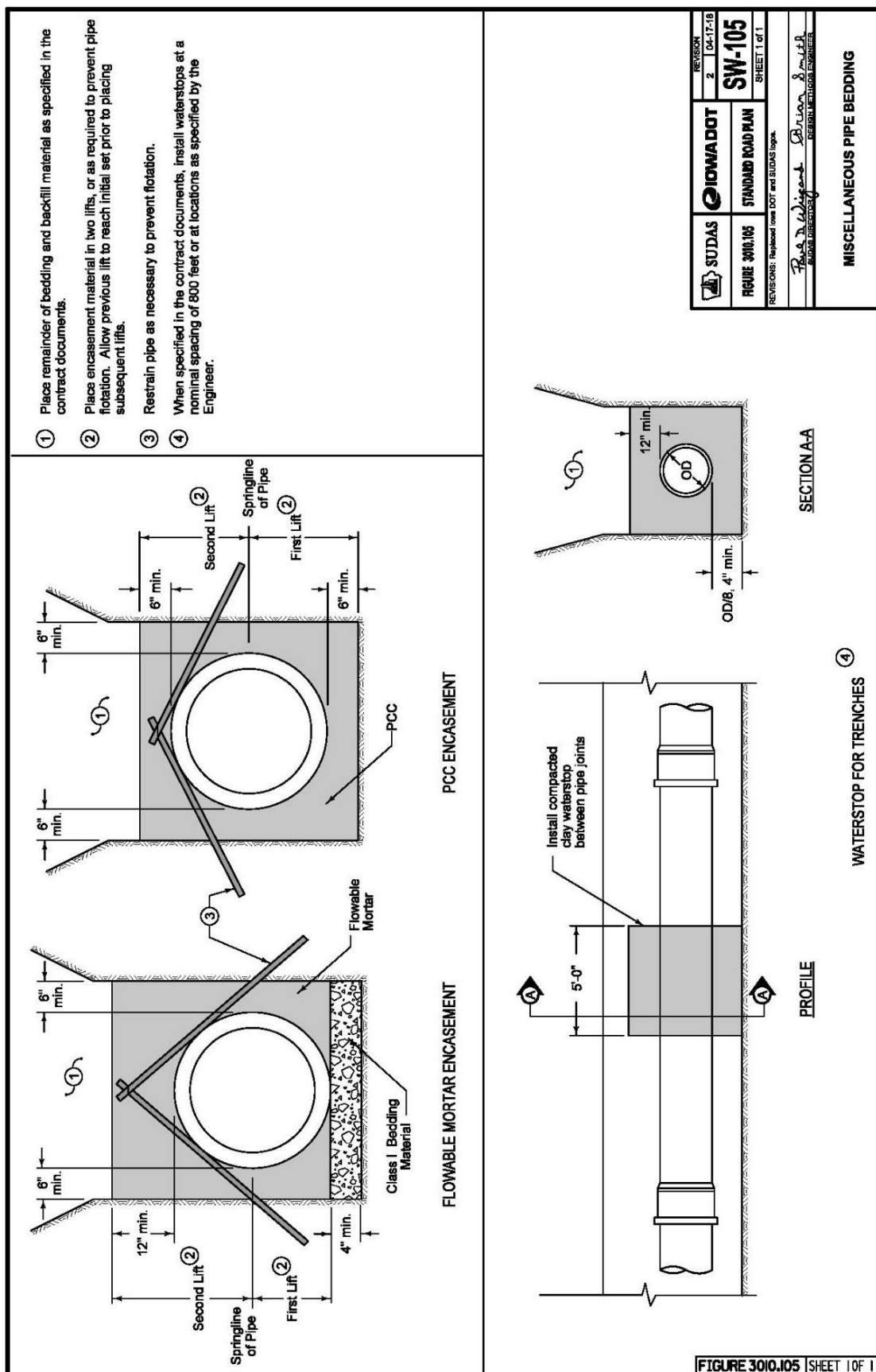


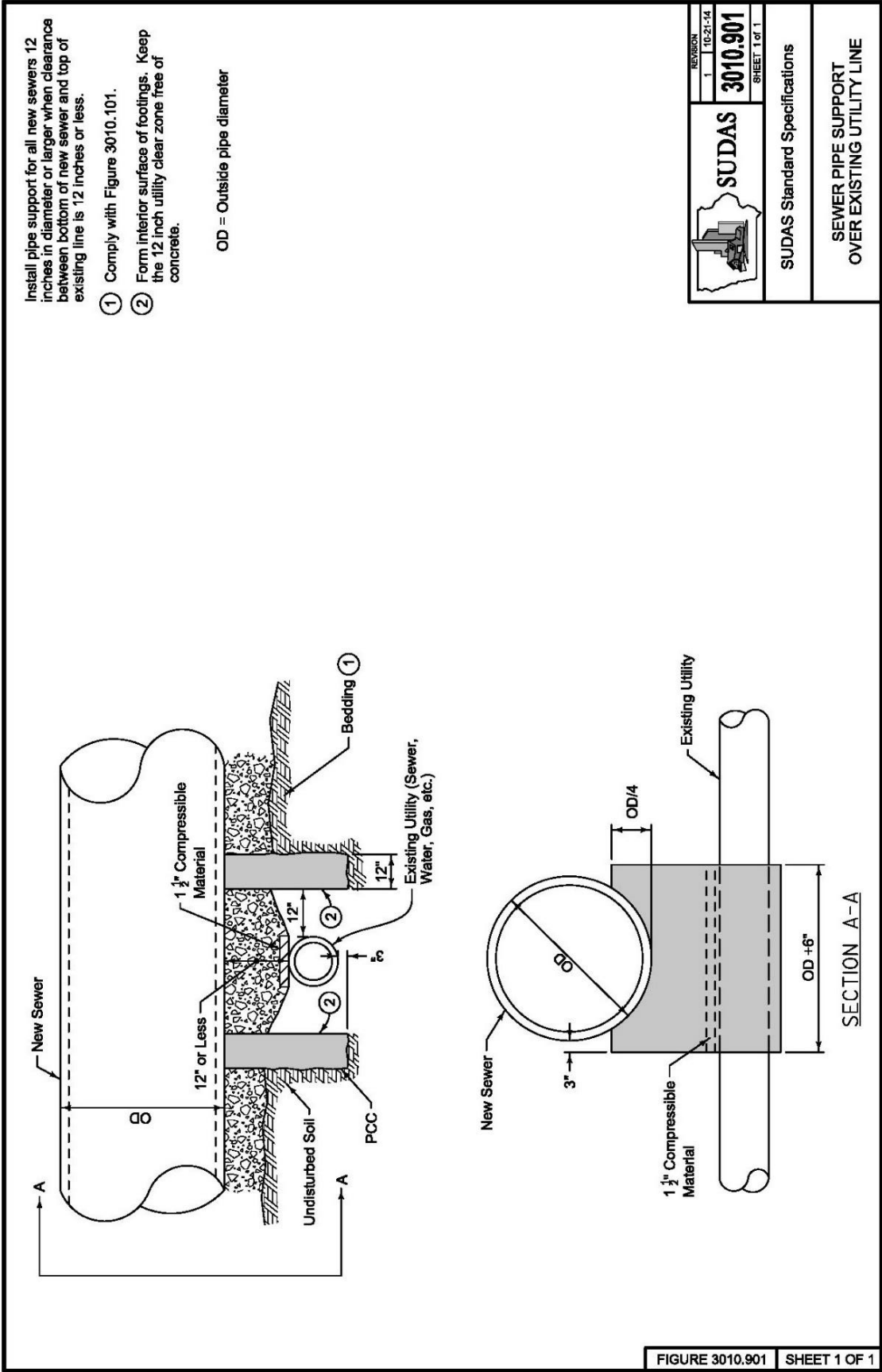


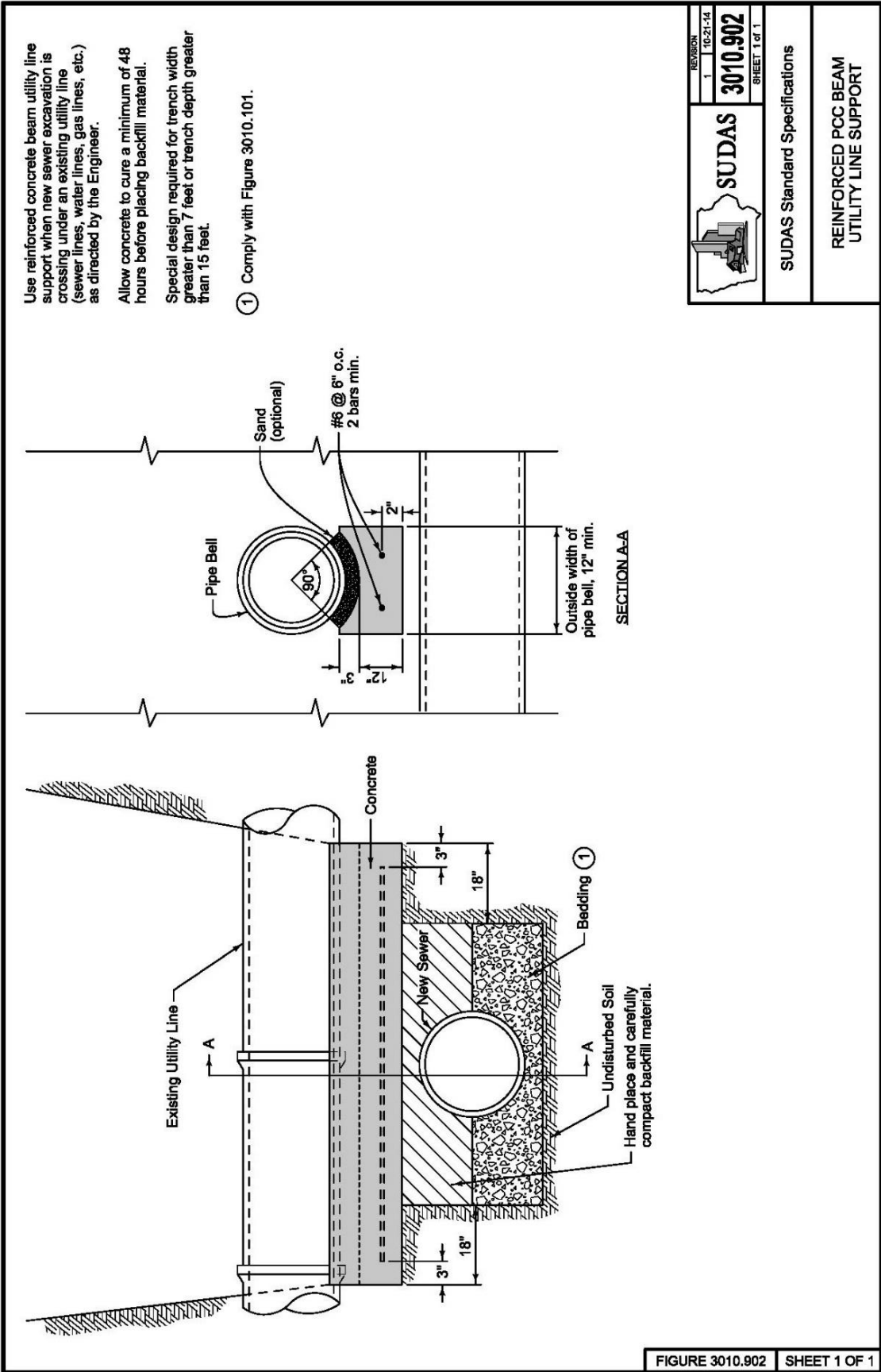
ALLOWABLE BURY DEPTH														
CLASS III RCP					CLASS IV RCP					CLASS V RCP				
Pipe Diameter (in)	Class R-1 Bedding	Class R-3 & R-4 Bedding		Pipe Diameter (in)	Class R-1 Bedding	Class R-3 & R-4 Bedding		Pipe Diameter (in)	Class R-1 Bedding	Class R-3 & R-4 Bedding				
		No Steel	As=0.4%			No Steel	As=0.4%			No Steel	As=0.4%			
12	7'	10'	15'	12	12'	15'	23'	12	18'	23'	35'			
15	8'	10'	16'	15	12'	18'	23'	15	18'	24'	40'			
18	8'	11'	16'	18	13'	16'	26'	18	18'	30'	40'			
21	8'	11'	18'	21	13'	18'	40'	21	25'	40'	40'			
24	8'	12'	23'	24	16'	23'	40'	24	34'	40'	40'			
27	10'	15'	30'	27	18'	30'	40'	27	40'	40'	40'			
30	11'	15'	29'	30	15'	25'	40'	30	40'	40'	40'			
33	11'	15'	28'	33	15'	28'	40'	33	40'	40'	40'			
36	11'	15'	27'	36	15'	28'	40'	36	40'	40'	40'			
42	11'	15'	26'	42	18'	27'	40'	42	37'	40'	40'			
48	11'	15'	26'	48	18'	26'	40'	48	35'	40'	40'			
54	11'	15'	25'	54	18'	25'	40'	54	33'	40'	40'			
60	11'	15'	25'	60	18'	25'	40'	60	32'	40'	40'			
66	11'	15'	24'	66	18'	25'	40'	66	31'	40'	40'			
72	11'	15'	24'	72	18'	24'	40'	72	31'	40'	40'			
As = Area of Steel Reinforcing														
EXTRA STRENGTH VCP														
Pipe Dia. (in)	Bedding Class		R-3 & R-4		Pipe Dia. (in)	Bedding Class		R-3 & R-4						
	R-1	R-2	No Steel	As=0.4%		R-1	R-2	No Steel	As=0.4%					
6	25'	30'	30'	30'	6	25'	30'	30'	30'					
8	20'	25'	30'	30'	8	20'	25'	30'	30'					
10	18'	23'	30'	30'	10	18'	23'	30'	30'					
12	16'	20'	30'	30'	12	16'	20'	30'	30'					
15	15'	19'	28'	30'	15	15'	19'	28'	30'					
18	14'	18'	30'	30'	18	14'	18'	30'	30'					
21	15'	22'	30'	30'	21	15'	22'	30'	30'					
24	16'	28'	30'	30'	24	16'	28'	30'	30'					
27	20'	30'	30'	30'	27	20'	30'	30'	30'					
30	19'	29'	30'	30'	30	19'	29'	30'	30'					
33	20'	30'	30'	30'	33	20'	30'	30'	30'					
36	20'	30'	30'	30'	36	20'	30'	30'	30'					
39	19'	29'	30'	30'	39	19'	29'	30'	30'					
42	18'	28'	30'	30'	42	18'	28'	30'	30'					
As = Area of Steel Reinforcing														
CONCRETE ARCH PIPE														
Pipe Size (in x in)	Equiv. Dia. (in)	Pipe Class		Pipe Size (in x in)	Equiv. Dia. (in)	Pipe Class								
		A-III	A-IV			HE-III	HE-IV							
18 x 11	15	6'	11'	14 x 23	18	12'	22'							
22 x 13	18	6'	11'	19 x 30	24	15'	28'							
28 x 15	21	6'	13'	22 x 34	27	15'	28'							
29 x 18	24	7'	15'	24 x 38	30	15'	27'							
36 x 22	30	8'	15'	27 x 42	33	15'	27'							
44 x 27	36	8'	14'	29 x 46	36	15'	28'							
51 x 31	42	8'	15'	32 x 49	39	15'	28'							
58 x 36	48	8'	15'	34 x 54	42	15'	25'							
65 x 40	54	8'	15'	38 x 60	48	15'	25'							
73 x 45	60	8'	14'	43 x 68	54	15'	24'							
88 x 54	72	8'	14'	48 x 78	60	15'	24'							
Based on Class R-5 bedding														
Based on Class R-6 bedding														
68 x 108	84	15'	23'	63 x 83	66	15'	24'							
Based on Class R-5 bedding														
Based on Class R-6 bedding														
108 x 68	84	15'	23'	81 x 89	72	15'	24'							
Based on Class R-5 bedding														
Based on Class R-6 bedding														
108 x 68	84	15'	23'	88 x 88	78	15'	23'							
Based on Class R-5 bedding														
Based on Class R-6 bedding														
108 x 68	84	15'	23'	108 x 68	84	15'	23'							
Based on Class R-5 bedding														
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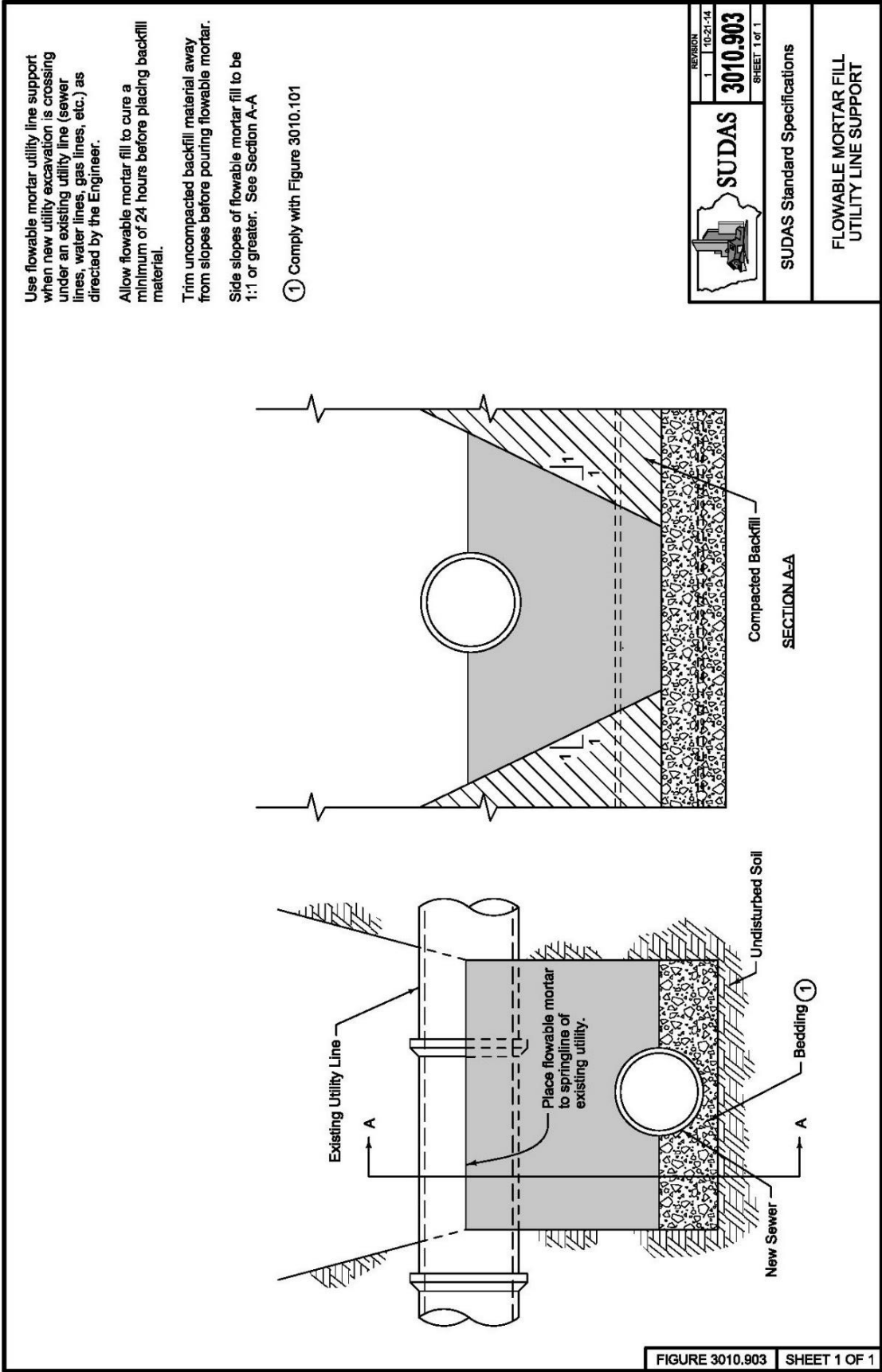












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SECTION 3020 - TRENCHLESS CONSTRUCTION (BORING, JACKING, AND TUNNELING)

PART 1 -GENERAL

1.01 SECTION INCLUDES

- A. Trenchless Installation of Carrier Pipe with Casing Pipe
- B. Trenchless Installation of Carrier Pipe without Casing Pipe

1.02 DESCRIPTION OF WORK

- A. Excavate launching and receiving pits.
- B. Install casing or carrier pipe by trenchless methods.
- C. Install carrier pipe inside casing pipe (if required).
- D. Place backfill material in excavations.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants, as well as the following:

- A. Proposed installation methods and equipment.
- B. Gradation reports for bedding materials if required.
- C. Shop drawings of casing spacers and proposed spacing.
- D. Dewatering plan (if required).

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT

All items of work contained in this section are incidental to the underground utility pipe being installed and will not be paid for separately.

PART 2 - PRODUCTS

2.01 CARRIER PIPE

- A. **Carrier Pipe Installed within Casing Pipe:**

1. **Sanitary Sewer Gravity Main:** Comply with Section 4010, 2.01.
 2. **Sanitary Sewer Force Main:**
 - a. **Restrained Joint Ductile Iron Pipe:** Comply with Section 4010, 2.02.
 - b. **Restrained Joint PVC Pipe:** Comply with Section 4010, 2.02.
 3. **Storm Sewer:** Comply with Section 4020, 2.01.
 4. **Culverts:** Comply with Section 4030, 2.01.
 5. **Water Main:**
 - a. **Restrained Joint Ductile Iron Pipe:** Comply with Section 5010, 2.01.
 - b. **Restrained Joint PVC Pipe:** Comply with Section 5010, 2.01.
- B. Carrier Pipe Installed without a Casing Pipe:**
1. **Sanitary Sewer Gravity Main:**
 - a. **Reinforced Concrete Pipe:** Comply with Section 4010, 2.01.
 - b. **Vitrified Clay Pipe:** Comply with Section 4010, 2.01.
 - c. **Restrained Joint Ductile Iron Pipe:** Comply with Section 4010, 2.02.
 - d. **Restrained Joint PVC Pipe:** Comply with Section 4010, 2.02.
 2. **Sanitary Sewer Force Main:**
 - a. **Restrained Joint Ductile Iron Pipe:** Comply with Section 4010, 2.02.
 - b. **Restrained Joint PVC Pipe:** Comply with Section 4010, 2.02.
 3. **Storm Sewer and Culverts:**
 - a. **Reinforced Concrete Pipe:** Comply with Section 4020, 2.01.
 - b. **Reinforced Concrete Arch Pipe:** Comply with Section 4020, 2.01.
 - c. **Reinforced Concrete Elliptical Pipe:** Comply with Section 4020, 2.01.
 - d. **Reinforced Concrete Low Head Pressure Pipe:** Comply with Section 4020, 2.01.
 4. **Water Main:**
 - a. **Restrained Joint Ductile Iron Pipe:** Comply with Section 5010, 2.01.
 - b. **Restrained Joint PVC Pipe:** Comply with Section 5010, 2.01.
- 2.02 CASING PIPE**
- A. Pipe:** Use only new, steel pipe meeting the requirements of ASTM A 139, Grade B; ASTM A 252, Grade 2; or ASTM A 53, Grade B. Pipe may be welded or seamless. Wall thickness will be as specified in the contract documents.
- B. Joints:**

1. Comply with American Welding Society Code D1.1. Weld all joints with full penetrating weld. Welders must be qualified according to Iowa DOT Article 2408.03, B. Welds must comply with Iowa DOT Materials I.M. 558.
 2. Upon approval of the Engineer, an interlocking casing pipe connection system may be used in lieu of field welding the sections of casing pipe.
- C. **Pipe Diameter:** Minimum inside diameter as specified in the contract documents. If diameter is not specified, use a minimum inside casing diameter of at least 4 inches greater than the largest outside diameter of the carrier pipe, including pipe bells.

2.03 CASING SPACERS

- A. Use manufactured casing spacers to position carrier pipe in casing. Do not use wood skids.
- B. Meet the following material requirements:
 1. HDPE Band/Panel and Riser: ASTM D 638.
 2. Stainless Steel or Carbon Steel Band/Panel and Riser: Type 304 stainless steel according to ASTM A 240 or carbon steel according to ASTM A 36.
 - a. Liner: Elastomeric PVC per ASTM D 149.
 - b. Spacer Skid/Runner: Abrasion resistant polymer with a low coefficient of friction.
 - c. Fasteners: Type 304 (18-8) stainless steel per ASTM A 193.

2.04 BACKFILL FOR ABANDONED TUNNELS

- A. Use Iowa DOT Class C concrete, approximately 4 inch slump.
- B. Flowable mortar, foamed cellular concrete, or CLSM according to Section 3010, 2.06.

2.05 BACKFILL MATERIAL

- A. **Excavated Materials:** Comply with Section 3010 for classification of excavated materials. Use only suitable material for backfill material.
- B. **Special Fill Materials:** For use where specified in the contract documents.
 1. PCC: Use Iowa DOT Class C concrete, approximately 4 inch slump.
 2. **Flowable Mortar:** Comply with Section 3010, 2.06.
 3. **CLSM:** Comply with Section 3010, 2.06.
 4. **Foamed Cellular Concrete:** Comply with Section 3010, 2.06

2.06 CASING END SEAL

- A. **Manufactured:** Minimum 1/8 inch thick manufactured synthetic rubber casing end seal with stainless steel bands and fasteners.

- B. **PCC:** Comply with Section 6010. Do not use PCC casing end seals with flexible carrier pipes.

PART 3 -EXECUTION

3.01 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 the minimum size pits necessary to safely and properly perform the work.
 - 1. Protect existing facilities, trees, and shrubs during excavation.
 - 2. Place excavated material away from trench.
 - 3. Grade and shape spoil piles to drain and protect adjacent areas from runoff. Do not allow spoil piles to obstruct drainage. Stabilize stockpiles with seeding and provide sediment control around stockpiles.
- D. Remove rock, rubbish, debris, and other materials not suitable for use as backfill.

3.02 SHEETING, SHORING, AND BRACING

Comply with Section 3010, 3.03.

3.03 DEWATERING

Comply with Section 3010, 3.04.

3.04 TRENCHLESS INSTALLATION

- A. **General:** Select a method of installation that is appropriate for the soil conditions anticipated and will 1) allow the pipe to be installed to the desired line and grade within the specified tolerances; 2) prevent heaving or settlement of the ground surface or damage to nearby facilities; and 3) prevent damage to the carrier pipe and any lining materials within the carrier pipe.
 - 1. **Installation Methods:**
 - a. **Auger Boring:** A method that utilizes a rotating cutting head to form the bore hole and a series of rotating augers inside a casing pipe to remove the spoil.
 - b. **Directional Drilling:** A method for installing pipe from a surface-launched drilling rig. A pilot bore is formed and then enlarged by back reaming and removing the spoil material. The pipe is then pulled in place.
 - c. **Open-ended Pipe Ramming:** A method that involves driving a steel casing pipe with a percussive hammer. The front end of the casing pipe is open-ended. Spoils are removed from the pipe.
 - d. **Pipe Jacking:** A method in which pipe is pushed into the ground with hydraulic jacks while soil is simultaneously excavated. Excavation is normally completed with a tunnel boring machine.

- e. **Microtunneling:** A method of pipe jacking using a remote controlled tunnel boring machine.
 - f. **Utility Tunneling:** A method of forming large diameter tunnels. As excavation takes place at the front of the tunnel, a liner is constructed to temporarily support the tunnel. Upon completion of the tunnel, the pipe is pushed in place.
 - g. **Other:** Other methods may be allowed with the Engineer's approval.
2. **Line and Grade:**
- a. Install pipe at line and grade that will allow the carrier pipe to be installed at its true starting elevation and grade within the specified maximum alignment deviation of the pipe centerline.
 - b. When no deviation tolerances are specified in the contract documents, apply the following maximum deviations to the carrier pipe.
 - 1) Gravity Pipe:
 - a) Horizontally: ± 1.0 foot per 100 feet;
 - b) Vertically: ± 0.2 feet up to 100 feet; an additional ± 0.1 foot per 100 feet thereafter. Backfall in pipe is not allowed.
 - 2) Pressurized Pipe:
 - a) Horizontally: ± 2.0 feet
 - b) Vertically: ± 1.0 foot. Maintain the minimum depth specified in the contract documents.
 - c. Greater deviation or interference with other identified facilities may be cause for rejection.
3. **Deviation from Line and Grade:**
- a. Provided adequate clearance remains for proper installation of the carrier pipe, the Contractor will be allowed to correct deviations in grade of a casing pipe in order to achieve design grade of the carrier pipe by:
 - Pouring an invert in the casing pipe, or
 - Shimming the carrier pipe with casing spacers to a uniform grade.
 - b. Installations deviating from the specified tolerances that cannot be adjusted to conform to the specified tolerances may be rejected by the Engineer. If non-conforming installation is not rejected, provide all additional fittings, manholes, or appurtenances needed to accommodate horizontal or vertical misalignment, at no additional cost to the Jurisdiction.
 - c. Abandon rejected installation and place special fill materials, at no additional cost to the Jurisdiction. Replace abandoned installations, including all additional fittings, manholes, or appurtenances required to replace rejected installations.

B. Casing Pipe or Un-cased Carrier Pipe Installation:

1. Install pipe by approved methods.
2. Use a jacking collar, timbers, and other means as necessary to protect the driven end of the pipe from damage.
3. Do not exceed the compressive or tensile strength capacity of the pipe during pushing or pulling operations.
4. Fully support bore hole at all times to prevent collapse. Insert pipe as soil is removed, or support bore with drilling fluid.
5. Fully weld all casing pipe joints. Use an interlocking connection system when approved by the Engineer.
6. Fill space between the inside of the bore hole and the outside of the pipe with special fill material if the space is greater than 1 inch.

C. Carrier Pipe Installation through Casing:

1. Clean dirt and debris from the interior of the casing pipe after installation.
2. Install casing spacers on carrier pipe sections as necessary to support the pipe barrel according to the pipe manufacturer's recommendations subject to the following minimum requirements:
 - a. Install a spacer within 1 foot of each side of the carrier pipe joint and at a maximum spacing of 6 feet.
 - b. Do not allow the pipe to be supported by joint bells.
 - c. Lubricate casing spacers with drilling mud or flax soap. Do not use petroleum-based lubricants or oils.
3. Ensure that thrust loads will not damage carrier pipe joints. Provide thrust collars between joint shoulders of concrete pipe.
4. Provide timbers for sufficient cushioning between the end of the pipe pushed and the jacking equipment to prevent damage to the pipe. Do not allow the steel jack face to thrust against the unprotected pipe end.
5. Position jacks so the resulting force is applied evenly to the entire end of the pipe.
6. Assemble pipe joints in the jacking pit before pushing the carrier pipe into the casing.
7. Close the end of the casing pipe around the carrier pipe with a casing end seal.

- D. Annular Space Grouting:** If specified, fill the annular space between the carrier pipe and the casing pipe with flowable mortar, foamed cellular concrete, or CLSM according to Section 3010. Batching, mixing, and placing may be started when the temperature is 34°F and rising. Cease mixing and placing when temperature is 38° F or less and falling.

1. **Flowable Mortar and CLSM:** Fill voids by staged grouting. Construct bulkheads at each end of the pipe. Ensure all voids are filled with flowable mortar by providing 2 feet of head when filling.
2. **Foamed Cellular Concrete:**
 - a. Construct bulkheads sufficient to withstand pressure of grouting operation at each end of the pipe.
 - b. Use sufficient grouting pressures to ensure all voids between the inner pipe and the casing pipe have been filled without collapsing or deforming the inner pipe by more than 5% of the diameter. Multiple grout lifts may be necessary. Follow manufacturer's recommendations.
 - c. Check wet density at the beginning of the placement and a minimum of every 2 hours thereafter. Provide test results to the Engineer.
 - d. If grout holes are utilized, insert cylindrical wood plugs or other approved plugs until grout has set. Fill holes with concrete after plugs have been removed.

3.05 PIT RESTORATION

- A. Remove installation equipment and unused materials from the launching and receiving pits.
- B. When the carrier pipe extends beyond the limits of trenchless installation and into the bore pit, place bedding and backfill material according to Section 3010, 3.05.
- C. Place suitable backfill material in the pit. Apply the testing requirements of Section 3010, 3.06.
- D. Restore the site to original condition or better.

END OF SECTION

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DIVISION 4 - SEWERS AND DRAINS

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SECTION 4010 - SANITARY SEWERS

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 Division 1 - General Provisions and Covenants.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT

A. Sanitary Sewer Gravity Main:

1. Trenched:

- a. **Measurement:** Each type and size of pipe installed in a trench will be measured in linear feet along the centerline of the pipe from center of manhole to center of manhole.
- b. **Payment:** Payment will be made at the unit price per linear foot for each type and size of pipe.
- c. **Includes:** Unit price includes, but is not limited to, trench excavation, dewatering, furnishing bedding material, placing bedding and backfill material, wyes and other fittings, pipe joints, pipe connections, testing, and inspection.

2. Trenchless:

- a. **Measurement:** Each type and size of pipe installed by trenchless methods will be measured in linear feet along the centerline of pipe.

- b. **Payment:** Payment will be made at the unit price per linear foot for each type and size of pipe.
- c. **Includes:** Unit price includes, but is not limited to, furnishing and installing pipe; trenchless installation materials and equipment; pit excavation, dewatering, and placing backfill material; pipe connections; testing; and inspection.

B. Sanitary Sewer Gravity Main with Casing Pipe:

1. Trenched:

- a. **Measurement:** Each type and size of pipe installed with a casing pipe in a trench will be measured in linear feet along the centerline of the casing pipe, from end of casing to end of casing.
- b. **Payment:** Payment will be made at the unit price per linear foot for each type and size of carrier pipe.
- c. **Includes:** Unit price includes, but is not limited to, furnishing and installing both carrier pipe and casing pipe, trench excavation, dewatering, furnishing bedding material, placing bedding and backfill material, furnishing and installing annular space fill material, casing spacers, pipe connections, testing, and inspection.

2. Trenchless:

- a. **Measurement:** Each type and size of pipe installed by trenchless methods with a casing pipe will be measured in linear feet along the centerline of the casing pipe from end of casing to end of casing.
- b. **Payment:** Payment will be made at the unit price per linear foot for each type and size of carrier pipe.
- c. **Includes:** Unit price includes, but is not limited to, furnishing and installing both carrier pipe and casing pipe; trenchless installation materials and equipment; pit excavation, dewatering, and placing backfill material; casing spacers; furnishing and installing annular space fill material; pipe connections; testing; and inspection.

C. Sanitary Sewer Force Main:

1. Trenched:

- a. **Measurement:** Each type and size of pipe installed in an open trench will be measured in linear feet along the centerline of the pipe from the outside wall of the pumping station to the center of manhole, or from the center of manhole to the center of manhole.
- b. **Payment:** Payment will be made at the unit price per linear foot for each type and size of pipe.
- c. **Includes:** Unit price includes, but is not limited to, trench excavation, dewatering, furnishing bedding material, placing bedding and backfill material, wyes and other fittings, pipe joints, testing, and inspection.

2. Trenchless:

- a. **Measurement:** Each type and size of pipe installed by trenchless methods will be measured in linear feet along the centerline of the pipe.
- b. **Payment:** Payment will be made at the unit price per linear foot for each type and size of pipe.
- c. **Includes:** Unit price includes, but is not limited to, furnishing and installing pipe; trenchless installation materials and equipment; pit excavation, dewatering, and placing backfill material; pipe connections; testing; and inspection.

D. Sanitary Sewer Force Main with Casing Pipe:**1. Trenched:**

- a. **Measurement:** Each type and size of pipe installed with a casing pipe in a trench will be measured in linear feet along the centerline of the casing pipe.
- b. **Payment:** Payment will be made at the unit price per linear foot for each type and size of pipe.
- c. **Includes:** Unit price includes, but is not limited to, furnishing and installing both carrier pipe and casing pipe, trench excavation, dewatering, furnishing bedding material, placing bedding and backfill material, furnishing and installing annular space fill material, casing spacers, pipe connections, testing, and inspection.

2. Trenchless:

- a. **Measurement:** Each type and size of pipe installed by trenchless methods with a casing pipe will be measured in linear feet along the centerline of the casing pipe.
- b. **Payment:** Payment will be made at the unit price per linear foot for each type and size of carrier pipe.
- c. **Includes:** Unit price includes, but is not limited to, furnishing and installing both carrier pipe and casing pipe; trenchless installation materials and equipment; pit excavation, dewatering, and placing backfill material; casing spacers; furnishing and installing annular space fill material; pipe connections; testing; and inspection.

E. Sanitary Sewer Service Stub: The portion of the sanitary sewer service from the main to a point 10 feet outside of the right-of-way line or as specified in the contract documents (comply with Figure 4010.201).

- 1. **Measurement:** Each type and size of pipe will be measured in linear feet along the centerline of the pipe from the end of the pipe to the centerline of the sewer main.
- 2. **Payment:** Payment will be made at the unit price per linear foot for each type and size of sanitary sewer service stub.

3. **Includes:** Unit price includes, but is not limited to, trench excavation, furnishing bedding material, placing bedding and backfill material, tap, fittings, testing, and inspection.
- F. **Sanitary Sewer Service Relocation:** The portion of an existing sanitary sewer service in a zone of conflict.
1. **Measurement:** Each completed relocation will be counted.
 2. **Payment:** Payment will be made at the unit price for each relocation.
 3. **Includes:** Unit price includes, but is not limited to, removal of existing pipe, trench excavation, furnishing new pipe and bedding material, placing bedding and backfill material, connection back to existing service, compaction, testing, and inspection.
- G. **Sewage Air Release Valve and Pit:**
1. **Measurement:** Each completed installation, including valve, accessories, and pit, will be counted.
 2. **Payment:** Payment will be made at the unit price for each sewage air release valve and pit.
 3. **Includes:** Unit price includes, but is not limited to, excavation, furnishing bedding material, placing bedding and backfill material, compaction, and testing.
- H. **Removal of Sanitary Sewer:**
1. **Measurement:** Each type and size of pipe removed will be measured in linear feet from end to end.
 2. **Payment:** Payment will be at the unit price per linear foot for each type and size of pipe.
 3. **Includes:** Unit price includes, but is not limited to, removal, disposal, and capping (if specified) of pipe; and furnishing and placing backfill material.
- I. **Sanitary Sewer Cleanout:**
1. **Measurement:** Each sanitary sewer cleanout will be counted.
 2. **Payment:** Payment will be made at the unit price for each cleanout.
 3. **Includes:** Unit price includes, but is not limited to, plug at the end of the main, fittings, riser pipe, cap with screw plug, casting, and concrete casting encasement.
- J. **Connection to Existing Manhole:** Comply with Section 6010, 1.08, G.
- K. **Sanitary Sewer Abandonment, Plug:**
1. **Measurement:** Each plug will be counted.
 2. **Payment:** Payment will be made at the unit price for each plug installed.

3. **Includes:** Unit price includes, but is not limited to, trench excavation (if necessary), cutting pipe (if required), furnishing and placing plug materials, and placing backfill.

L. Sanitary Sewer Abandonment, Fill and Plug:

1. **Measurement:** Each size of sanitary sewer to be abandoned by filling and plugging will be measured in linear feet.
2. **Payment:** Payment will be at the unit price per linear foot for each size of pipe filled and plugged.
3. **Includes:** Unit price includes but is not limited to, trench excavation (if necessary), cutting pipe (if required), furnishing and placing pipe fill material, furnishing and placing plug materials, and placing backfill.

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. Coat interior pipe barrel and all joint surfaces with two-component coal-tar epoxy-polyamide black paint or approved equal.
- b. Lining Material: Steel Structures Painting Council (SSPC) Specification No. 16, Table 1.
 - 1) Minimum epoxy resin content 34 to 35% by dry film weight.
 - 2) Minimum sag resistance 40 mils.
 - 3) Minimum solids 80% by volume.
- c. Apply according to lining material manufacturer's recommendations.

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 F477.

2.02 SANITARY SEWER FORCE MAINS

- A. Ductile Iron Pipe (DIP) 4 inch to 54 inch:** Comply with the DIP requirements in Section 4010, 2.01. If joint restraints are specified, comply with Section 5010, 2.03.

B. **Polyvinyl Chloride Pipe (PVC):** Comply with the requirements in Section 5010, 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 Figure 4010.202.

D. **Tracer Wire:** Comply with Section 5010, 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 3020, 2.02 for casing pipe requirements.

2.04 SANITARY SEWER SERVICE

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. PVC plastic meeting ASTM D 1785, Cell Classification 12454, Schedule 40.
 - d. 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.

D. **Connection to Existing Service:** Comply with Section 4050, 2.08.

2.05 SANITARY SEWER SERVICE RELOCATIONS

- A. Comply with Section 4010, 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 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 4010, 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 3010.
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 3020.

3.03 SANITARY SEWER INSTALLED WITHIN A CASING PIPE

Comply with Section 3020, 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 Figure 4020.211.

3.05 FORCE MAIN INSTALLATION

A. **General:** Install according to Section 5010.

B. Tracer Wire:

1. Required for all force main installations. Comply with Section 5010.
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 4010, 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 Figure 4010.201.
 1. Install according to Section 4010, 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 4010, 2.04.
 - c. Re-install the service according to Section 4010, 3.02.
 - d. Maintain a minimum 1% grade on relocated service.

3.08 SANITARY 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 3010) 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.

3.09 CONNECTION TO EXISTING MANHOLE

Comply with Section 6010, 3.05.

3.10 SANITARY SEWER CLEANOUT

Provide cleanouts where specified in the contract documents. Comply with Figure 4010.203.

3.11 TOLERANCES

Apply the following tolerances to utilities installed by open trench construction. For trenchless construction, comply with Section 3020.

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

- A. Horizontal Separation of Gravity Sewers from Water Mains:** Separate gravity 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, the sewers must be constructed of water main materials meeting the requirements of Section 5010, 2.01. However, provide a linear separation of at least 2 feet.

- B. 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 5010, 2.01 and
2. The sewer force main is laid at least 4 linear feet from the water main.

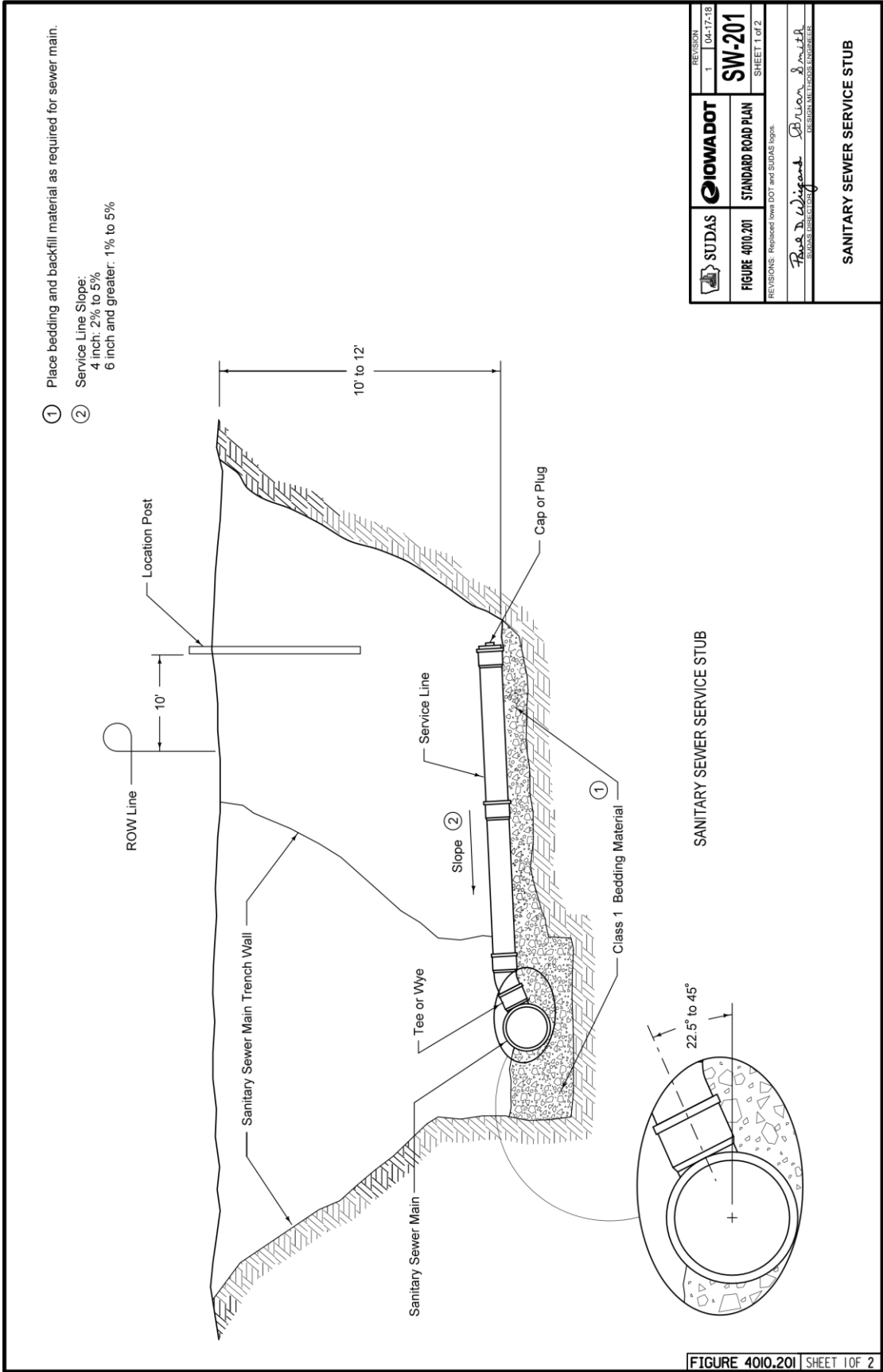
C. Separation of Sewer and Water Main Crossovers:

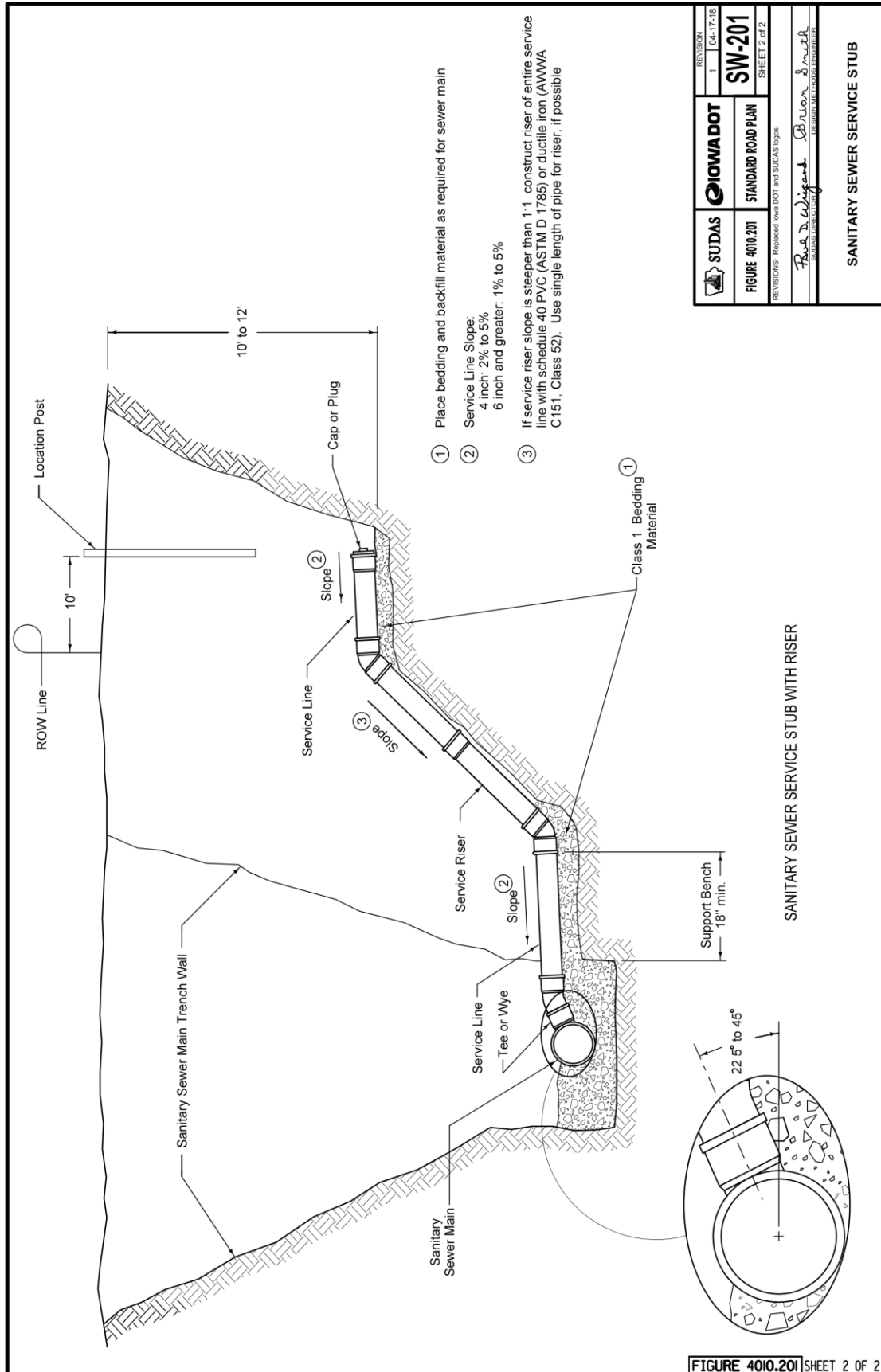
1. Vertical separation of sanitary sewers crossing under any water main should be at least 18 inches when measured from the top of the sewer to the bottom of the water main. If physical conditions prohibit the separation, the sewer may be placed not closer than 6 inches below a water main or 18 inches above a water main. Maintain the maximum feasible separation distance in all cases.
2. Where the sewer crosses over or less than 18 inches below a water main, locate one full length of sewer pipe of water main material so both joints are as far as possible from the water main. The sewer and water pipes must be adequately supported and have watertight joints. Use a low permeability soil for backfill material within 10 feet of the point of crossing.

3.13 CLEANING, INSPECTION, AND TESTING

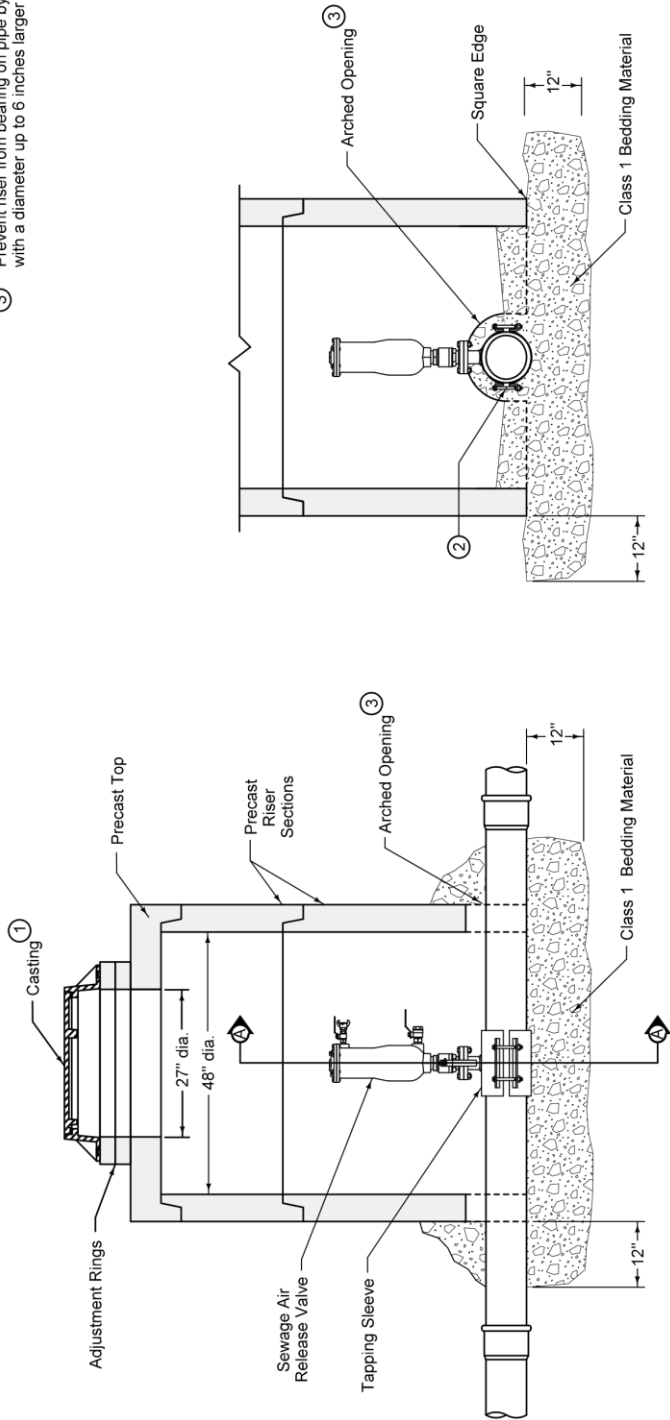
Clean, inspect, and test sanitary sewer per Section 4060.

END OF SECTION





- ① SW-601 Type A or SW-602 Type G casting.
- ② Place bedding material to springline of pipe.
- ③ Prevent riser from bearing on pipe by providing an arched opening with a diameter up to 6 inches larger than pipe diameter.

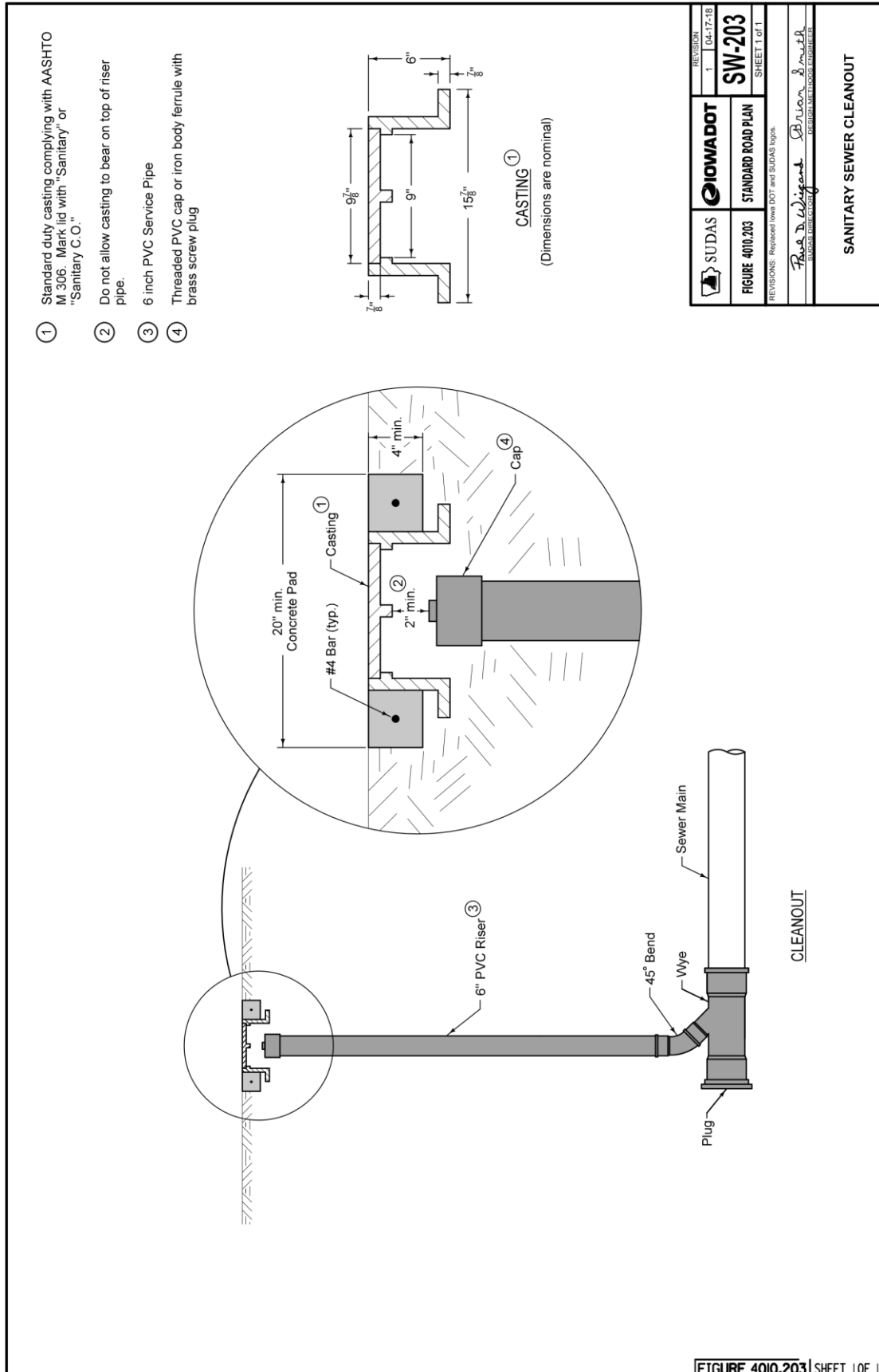


SECTION A-A

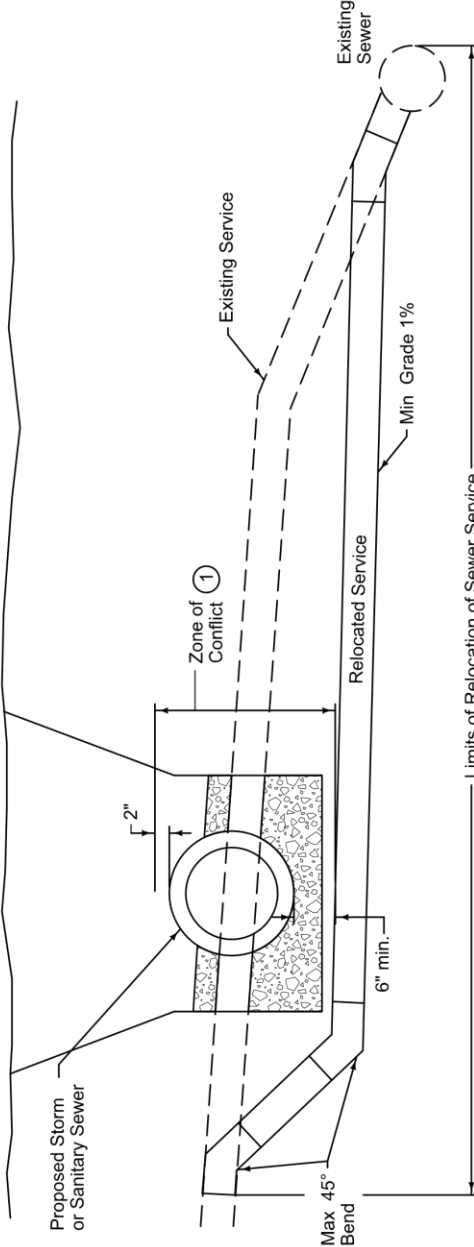
TYPICAL SECTION

FIGURE 4010.202 SHEET 1 OF 1

		REVISION 1 04-17-18
FIGURE 4010.202	STANDARD ROAD PLAN	SW-202
REVISIONS: Replaced Iowa DOT and SUDAS logos.		
DESIGN METHOD ENGINEER Brian Smith		
SEWAGE AIR RELEASE VALVE PIT		

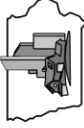


① Zone of conflict is from 6 inches below the bottom of sewer pipe to 2 inches above the top of pipe.



Service Status	Contractor's Responsibility	Compensation
1 Service located outside zone of conflict	Provide protection; if damaged, repair according to local government's plumbing code	Incidental to other work
2 Service located in zone of conflict	Relocate service according to Section 4010 3 07	Bid item: sanitary sewer service relocation
3 Service located in zone of conflict, but elevations do not allow simple relocation as detailed above - special design required	Relocate service as directed by the Engineer	Change order

FIGURE 4010.901 SHEET 1 OF 1



REVISION

110-21-14

SUDAS

4010.901

SHEET 1 of 1

SUDAS Standard Specifications

RELOCATE SANITARY SEWER
SERVICE IN CONFLICT
WITH NEW SEWER

SECTION 4020 - STORM SEWERS

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 Division 1 - General Provisions and Covenants.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT

A. Storm Sewer:

1. Trenched:

- a. **Measurement:** Each type and size of pipe installed in a trench will be measured in linear feet along the centerline of the pipe from center of intake or manhole to center of intake or manhole. Where the end of the pipe discharges to a ditch or waterway, measurement will be to the end of the pipe, exclusive of aprons. Lengths of elbows and tees will be included in the length of pipe measured.
- b. **Payment:** Payment will be made at the unit price per linear foot for each type and size of pipe.
- c. **Includes:** Unit price includes, but is not limited to, trench excavation, dewatering, furnishing bedding material, placing bedding and backfill material, joint wrapping, wyes and other fittings, pipe joints, pipe connections, testing, and inspection.

2. Trenchless:

- a. **Measurement:** Each type and size of pipe installed by trenchless methods will be measured in linear feet along the centerline of the pipe.
- b. **Payment:** Payment will be made at the unit price per linear foot for each type and size of pipe.
- c. **Includes:** Unit price includes, but is not limited to, furnishing and installing pipe; trenchless installation materials and equipment; pit excavation, dewatering, and placing backfill material; pipe connections; testing; and inspection.

B. Storm Sewer with Casing Pipe:

1. Trenched:

- a. **Measurement:** Each type and size of pipe installed with a casing pipe in a trench will be measured in linear feet along the centerline of the casing pipe from end of casing to end of casing.
- b. **Payment:** Payment will be made at the unit price per linear foot for each type and size of pipe.
- c. **Includes:** Unit price includes, but is not limited to, furnishing and installing both carrier pipe and casing pipe, trench excavation, dewatering, furnishing bedding material, placing bedding and backfill material, furnishing and installing annular space fill material, casing spacers, pipe connections, testing, and inspection.

2. Trenchless:

- a. **Measurement:** Each type and size of pipe installed by trenchless methods with a casing pipe will be measured in linear feet along the centerline of the casing pipe from end of casing to end of casing.
- b. **Payment:** Payment will be made at the unit price per linear foot for each type and size of carrier pipe.
- c. **Includes:** Unit price includes, but is not limited to, furnishing and installing both carrier pipe and casing pipe; trenchless installation materials and equipment; pit excavation, dewatering, and placing backfill material; casing spacers; furnishing and installing annular space fill material; pipe connections; testing; and inspection.

C. Removal of Storm Sewer:

1. **Measurement:** Each type and size of pipe removed will be measured in linear feet from end to end.
2. **Payment:** Payment will be made at the unit price per linear foot for each type and size of pipe removed.
3. **Includes:** Unit price includes, but is not limited to, removal, disposal, and capping (if specified) of pipe; and furnishing and placing backfill material.

D. Connection to Existing Manhole or Intake: Comply with Section 6010, 1.08, G.

E. Storm Sewer Abandonment, Plug:

1. **Measurement:** Each plug will be counted.
2. **Payment:** Payment will be made at the unit price for each plug installed.
3. **Includes:** Unit price includes, but is not limited to, trench excavation (if necessary), cutting pipe (if required), furnishing and placing plug materials, and placing backfill.

F. Storm Sewer Abandonment, Fill and Plug:

1. **Measurement:** Each size of storm sewer to be abandoned by filling and plugging will be measured in linear feet.
2. **Payment:** Payment will be at the unit price per linear foot for each size of pipe filled and plugged.
3. **Includes:** Unit price includes but is not limited to, trench excavation (if necessary), cutting pipe (if required), furnishing and placing pipe fill material, furnishing and placing plug materials, and placing backfill.

G. Aprons: Comply with Section 4030 for pipe aprons, apron footings, and apron guards.**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. ASTM D 3350 minimum resin Cell Classification 335420 C.
 - c. Minimum pipe stiffness at 5% deflection according to ASTM D 2412.
 - d. Integral bell and spigot joints with elastomeric seals complying with ASTM F 477.
 - e. Maximum 5% deflection of the average inside diameter by testing after installation according to Section 4060, 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 CASING PIPE

Comply with Section 3020, 2.02 for casing pipe requirements.

2.03 PIPE APRONS

Comply with the requirements of Section 4020, 2.01 and Section 4030, 2.01 for the pipe material of which the apron is constructed. Supply concrete pipe aprons according to Figure 4030.222 and Figure 4030.223. Supply CMP pipe aprons according to Figure 4030.225.

2.04 APRON FOOTINGS

Comply with the requirements of Section 6010 for reinforcing steel and structural concrete used in apron footings.

2.05 APRON GUARD

Use smooth or deformed steel bars, ASTM A 615, Grade 40 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 3010.
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 3020.

3.03 STORM SEWER INSTALLED WITHIN A CASING PIPE

Comply with Section 3020, 3.04 for installation of storm sewer within casing pipe.

3.04 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 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 Figure 4020.211.

3.05 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 6010 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 Figure 4030.224 or 4030.225. Repair any damage to the galvanized coating that occurs due to storage, handling, or installation.

3.06 TOLERANCES

The following tolerances apply to utilities installed by open trench construction. For trenchless construction, comply with Section 3020.

- 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"

3.07 CONFLICTS**A. Horizontal Separation of Gravity Sewers from Water Mains:**

- 1. Separate gravity storm sewer mains from water mains by a horizontal distance of at least 10 feet unless:
 - a. The top of a sewer main is at least 18 inches below the bottom of the water main, and
 - b. 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.
- 2. 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, the sewers must be constructed of water main materials meeting the requirements of Section 5010, 2.01. However, provide a linear separation of at least 2 feet.

B. Separation of Sewer Force Mains from Water Mains: Separate storm 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 5010, 2.01 and
- 2. The sewer force main is laid at least 4 linear feet from the water main.

C. Separation of Sewer and Water Main Crossovers:

- 1. Vertical separation of storm sewers crossing under any water main should be 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, the sewer may be placed not closer than 6 inches below a water main or 18 inches above a water main. Maintain the maximum feasible separation distance in all cases. The sewer and water pipes must be adequately supported and have watertight joints. Use a low permeability soil for backfill material within 10 feet of the point of crossing.

2. Where the storm sewer crosses over or less than 18 inches below a water main, locate one full length of sewer pipe of water main material or reinforced concrete pipe (RCP) with flexible gasket joints meeting ASTM C 443 so both joints are as far as possible from the water main.

3.08 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 3010) 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.

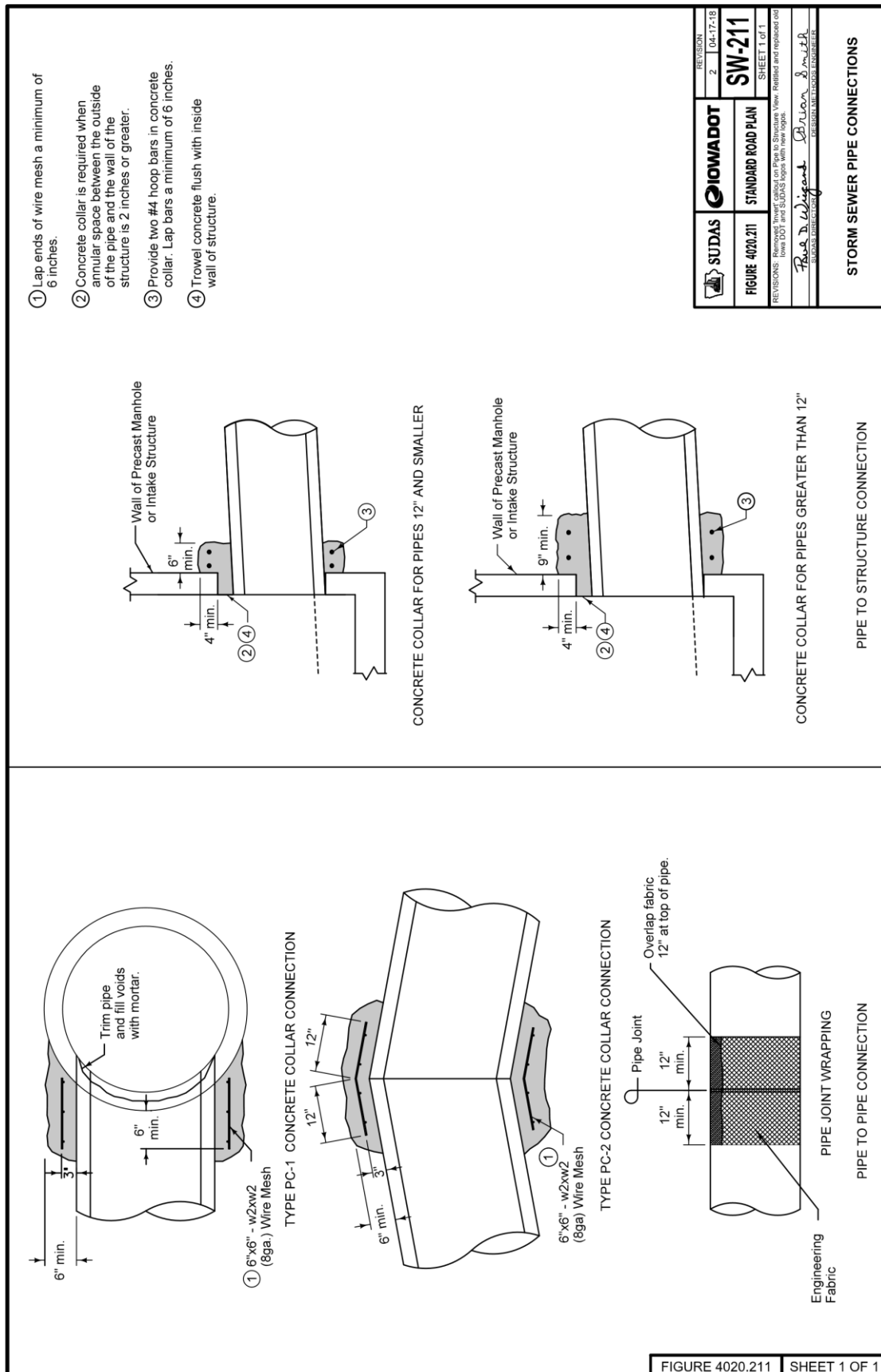
3.09 CONNECTION TO EXISTING MANHOLE OR INTAKE

Comply with Section 6010, 3.05.

3.10 CLEANING, INSPECTION, AND TESTING

Clean, inspect, and test according to Section 4060.

END OF SECTION



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SECTION 4030 - PIPE CULVERTS

PART 1 -GENERAL

1.01 SECTION INCLUDES

- A. Pipe Culverts
- B. Pipe Aprons and Beveled Ends
- C. Footings for Concrete Pipe Aprons
- D. Pipe Apron Guards

1.02 DESCRIPTION OF WORK

Construct pipe culverts, beveled ends, pipe aprons, and associated appurtenances.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT

A. Pipe Culverts:

1. Trenched:

- a. **Measurement:** Each type and size of pipe installed in a trench will be measured in linear feet from end of pipe to end of pipe along the centerline of pipe, exclusive of aprons. Lengths of elbows and tees will be included in length of pipe measured.
- b. **Payment:** Payment will be made at the unit price of each type and size of pipe.
- c. **Includes:** Unit price includes, but is not limited to, trench excavation, dewatering, furnishing bedding material, placing bedding and backfill material, connectors, testing, and inspection.

2. Trenchless:

- a. **Measurement:** Each type and size of pipe installed by trenchless methods will be measured in linear feet along the centerline of the casing pipe.
- b. **Payment:** Payment will be made at the unit price for each type and size of pipe.
- c. **Includes:** Unit price includes, but is not limited to, furnishing and installing pipe; trenchless installation materials and equipment; pit excavation, dewatering, and placing backfill materials; pipe connections; testing; and inspection.

B. Pipe Aprons:

1. **Measurement:** Each type and size of pipe apron will be counted.
2. **Payment:** Payment will be made at the unit price for each type and size of pipe apron.
3. **Includes:** Unit price includes, but is not limited to, trench excavation, dewatering, furnishing bedding material, placing bedding and backfill material, connectors, and other appurtenances.

C. Footings for Concrete Pipe Aprons:

1. **Measurement:** Each footing installed on a concrete pipe apron will be counted.
2. **Payment:** Payment will be made at the unit price for each footing.
3. **Includes:** Unit price includes, but is not limited to, excavation, dewatering, reinforcing steel, concrete, and placing bedding and backfill material.

D. Pipe Apron Guards:

1. **Measurement:** Each pipe apron guard will be counted.
2. **Payment:** Payment will be made at the unit price for each pipe apron guard.

PART 2 - PRODUCTS

2.01 PIPE CULVERTS

- A. **Roadway Pipe Culverts:** All storm sewer pipe materials specified for use in right-of-way in Section 4020 may be used within right-of-way as a roadway pipe culvert.
- B. **Entrance Pipe Culverts:** The following pipe culvert types described in Section 4020 may be used within right-of-way as entrance pipe culverts:
 1. Reinforced Concrete Pipe (RCP).
 2. Reinforced Concrete Arch Pipe (RCAP).
 3. Reinforced Concrete Elliptical Pipe (RCEP).
 4. Reinforced Concrete Low Head Pressure Pipe (RCPP).

5. Corrugated Metal Pipe (CMP).
 6. Spiral Rib Pipe.
 7. Coated Corrugated Metal Pipe.
 8. Corrugated Metal Arch Pipe.
- C. **Structural Plate Culverts:** Structural plate culverts may be used in the right-of-way as roadway or entrance pipe culverts.
1. Use a galvanized steel structural plate complying with AASHTO M 167.
 2. Use bolts and nuts complying with ASTM A 449 and galvanized per ASTM A 153, Class C.
 3. Assemble the structure according to the manufacturer's recommendations. Tighten the bolts using an applied torque of between 100 and 300 foot-pounds.
 4. Install the structure according to the contract documents, the manufacturers' recommendations, and AASHTO Standard Specifications for Highway Bridges, Division II, and Section 26.
 5. Conform the gage of the structure to Iowa DOT Standard Road Plan DR-104 or as specified in the contract documents.
- D. **Aluminum Structural Plate Culverts:** Aluminum structural plate culverts may be used in the right-of-way as roadway or entrance pipe culverts.
1. Comply with AASHTO M 219.
 2. Use a corrugation profile of 9 inches by 2 1/2 inches.
 3. Use aluminum complying with ASTM B 209.
 4. Use a minimum thickness of 0.100 inch. Gage of structure complying with manufacturer's requirements.
 5. Use bolts and nuts meeting ASTM A 307 or ASTM A 449 and galvanize per ASTM A 153.
 6. Assemble the structure according to the manufacturer's recommendations. Tighten the bolts using an applied torque of between 100 and 300 foot-pounds.
 7. Install the structure according to the contract documents, the manufacturer's recommendations, and AASHTO Standard Specifications for Highway Bridges, Division II, Section 26.
 8. Meet or exceed the AASHTO Standard Specifications for Highway Bridges, Division I, Section 12.8 for HS 20 loading.

2.02 PIPE APRONS

Comply with the requirements of Section 4020, 2.01 and Section 4030, 2.01 for the pipe material of which the apron is constructed. Supply concrete pipe aprons

according to Figure 4030.222 and Figure 4030.223. Supply CMP pipe aprons according to Figure 4030.225.

2.03 APRON FOOTINGS

Comply with the requirements of Figure 4030.221 and Section 6010 for reinforcing steel and structural concrete used in apron footings.

2.04 APRON GUARD

Use smooth or deformed steel bars, ASTM A 615, Grade 40 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 PIPE CULVERT INSTALLATION

A. Trenched:

1. Install pipe in a trench per Section 4020.
2. For culvert pipe installed in embankment, pipe may be installed at the Contractor's option per the contract documents and the following Iowa DOT Specifications sections:
 - a. Reinforced Concrete Pipe (circular, arched, and elliptical): Section 2416.
 - b. Corrugated Metal and Corrugated Plastic Pipe: Section 2417.
 - c. Structural Plate Culverts: Section 2420.

B. Trenchless: For trenchless installations, comply with Section 3020.

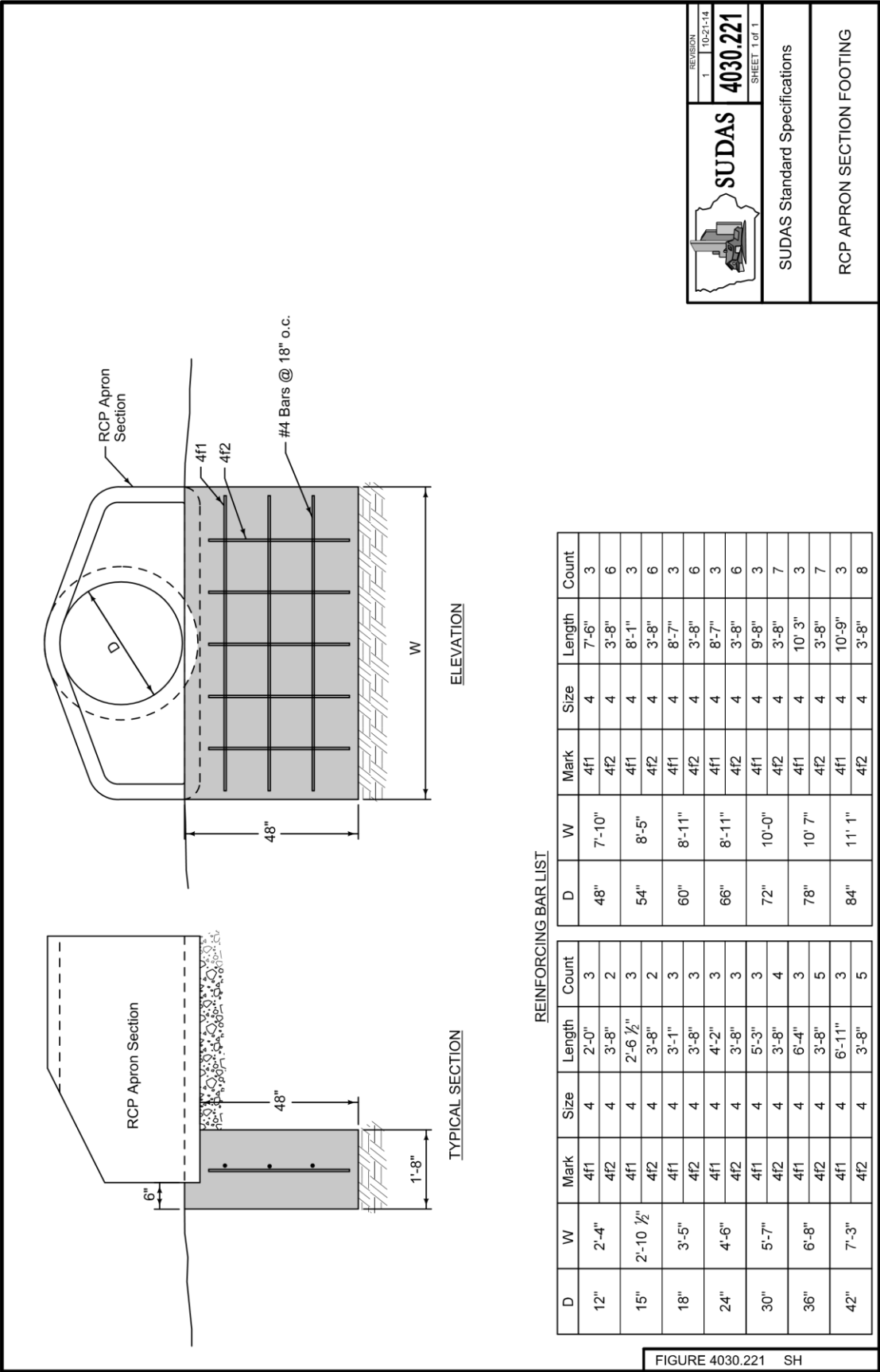
3.02 APRONS

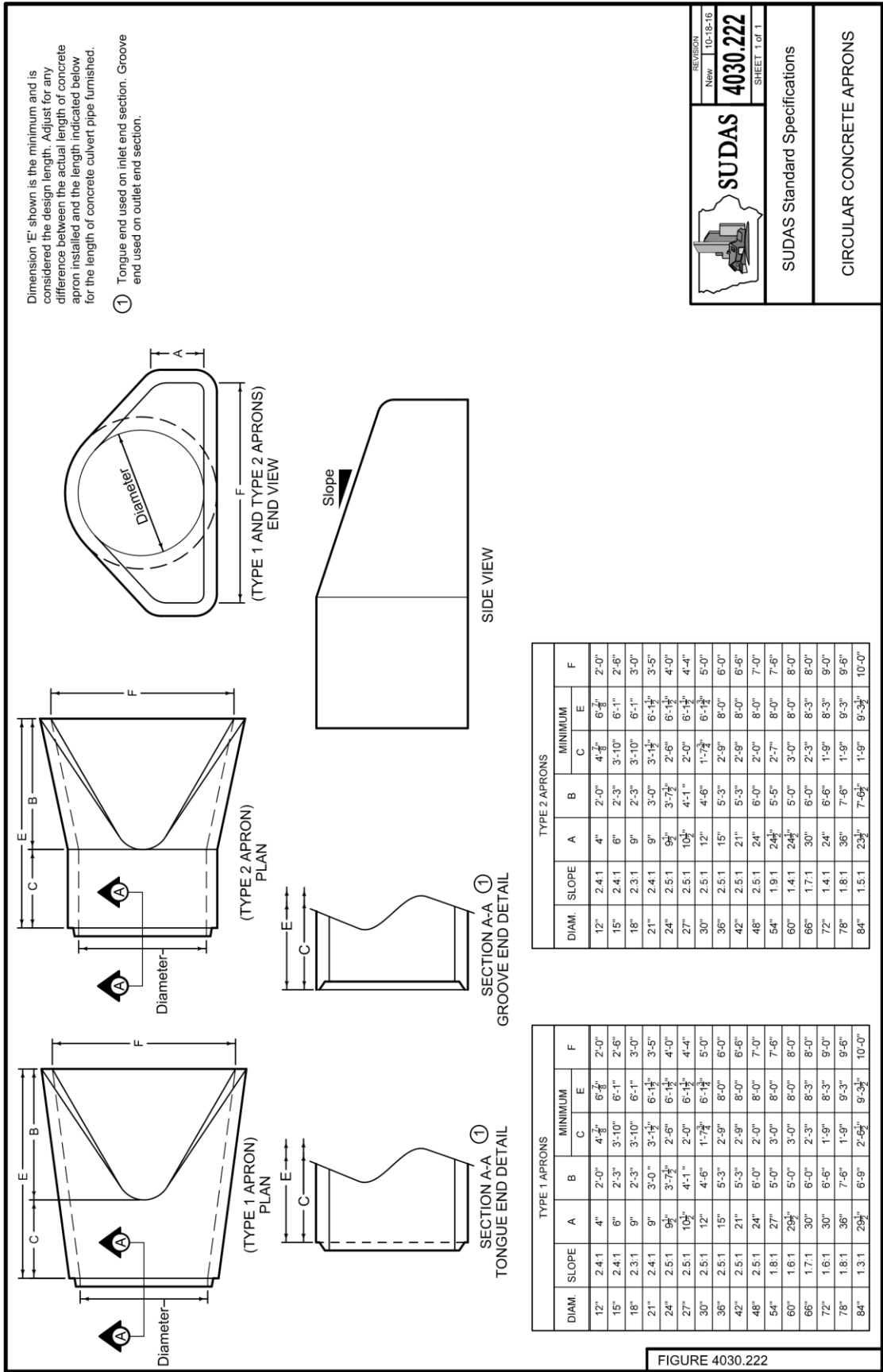
- A. Install pipe aprons where specified in the contract documents. Use the same installation methods as used on the pipe to which the apron is being attached. Dewater area as necessary to prevent installing the apron in water or on saturated soil or bedding. Do not allow water to rise around the apron prior to backfilling the area.
- B. Install apron footings where specified. Construct per Section 6010 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 culvert pipe with a manufacturer's approved bolt, weld, or clamp to fasten directly to the culvert.
- E. Install apron guard where specified. Construct according to Figure 4030.224 or 4030.225. Repair any damage to the galvanized coating that occurs due to storage, handling, or installation.

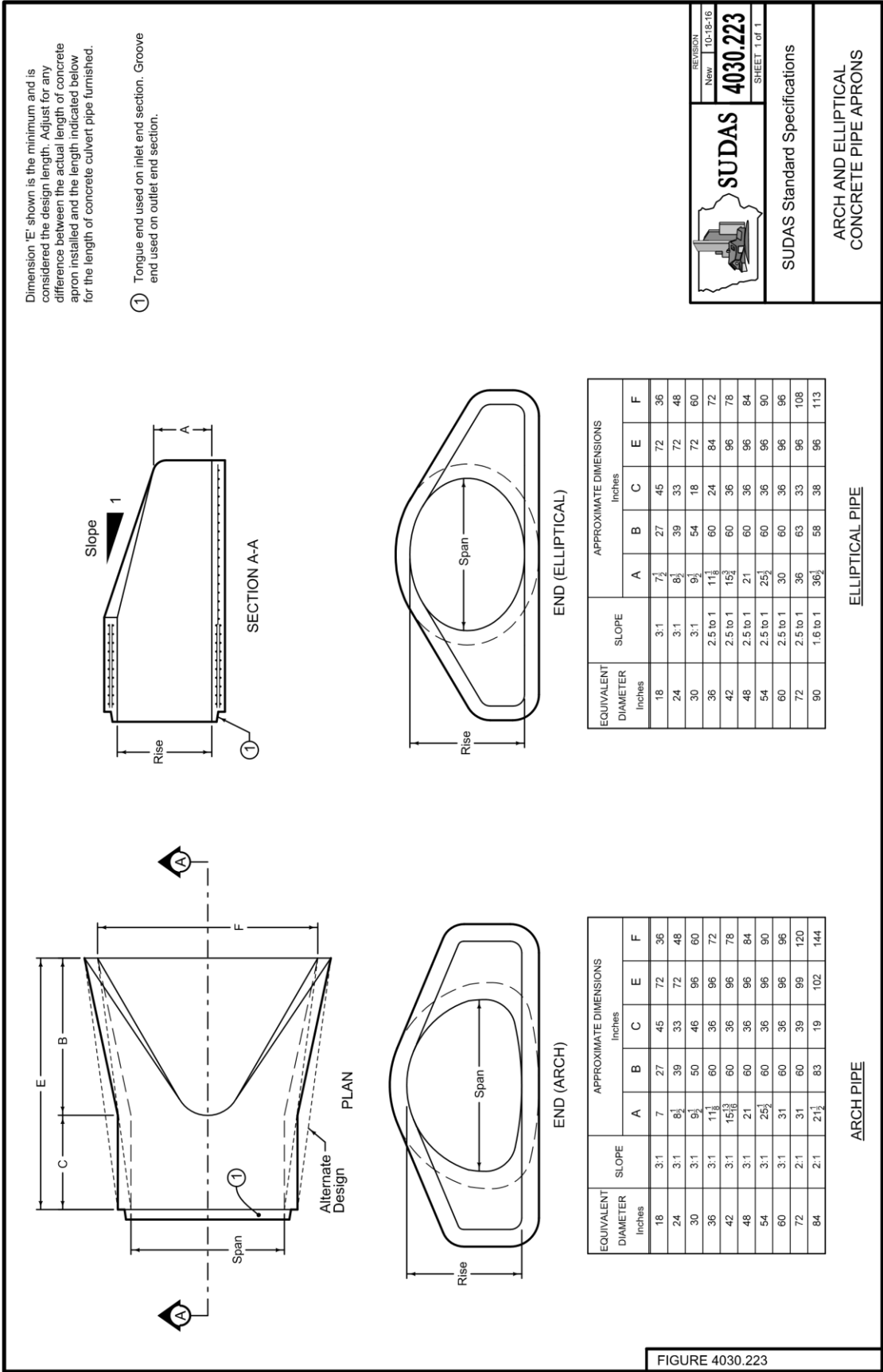
3.03 CLEANING, INSPECTION, AND TESTING

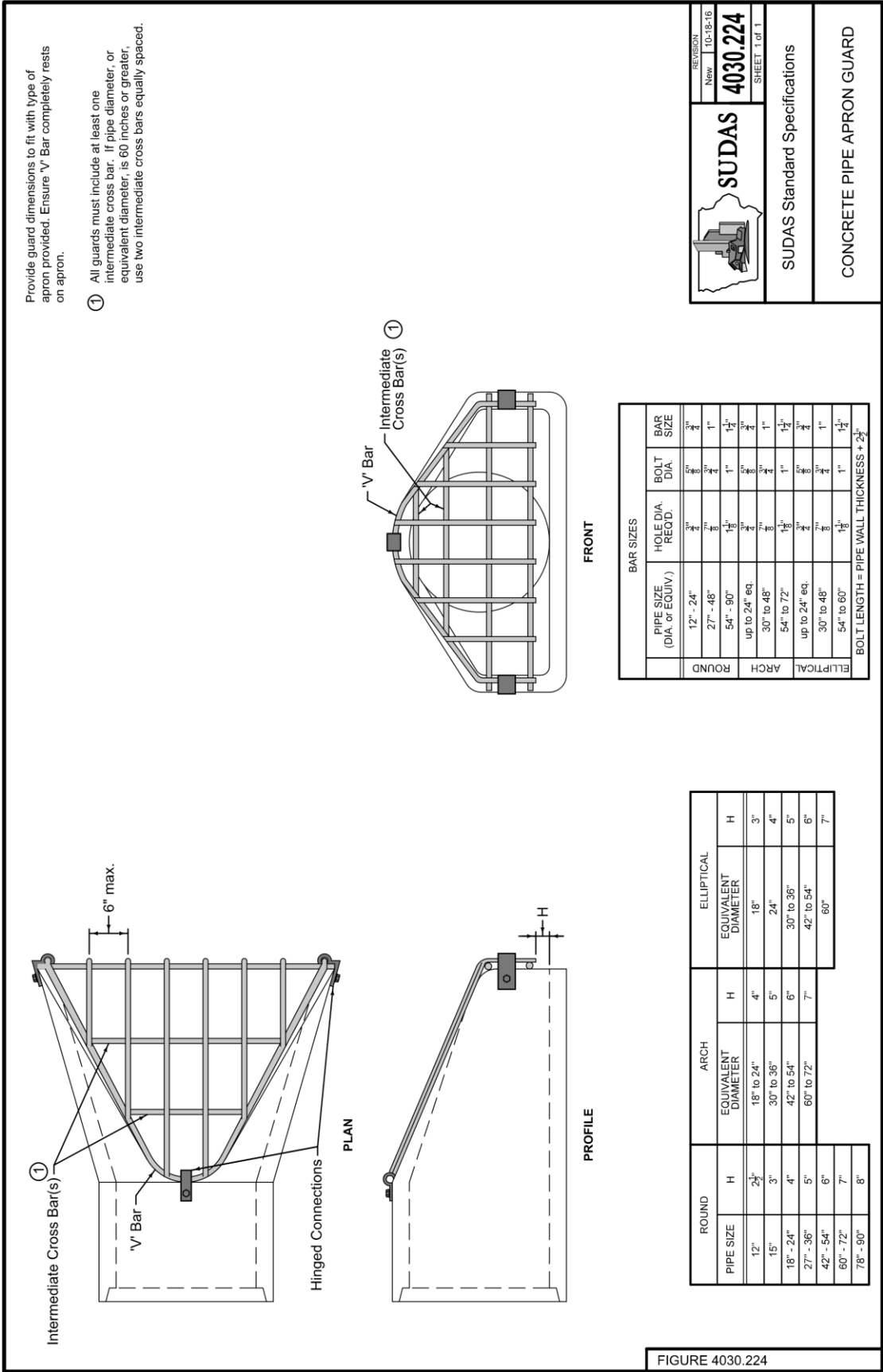
Clean, inspect, and test culverts per Section 4060.

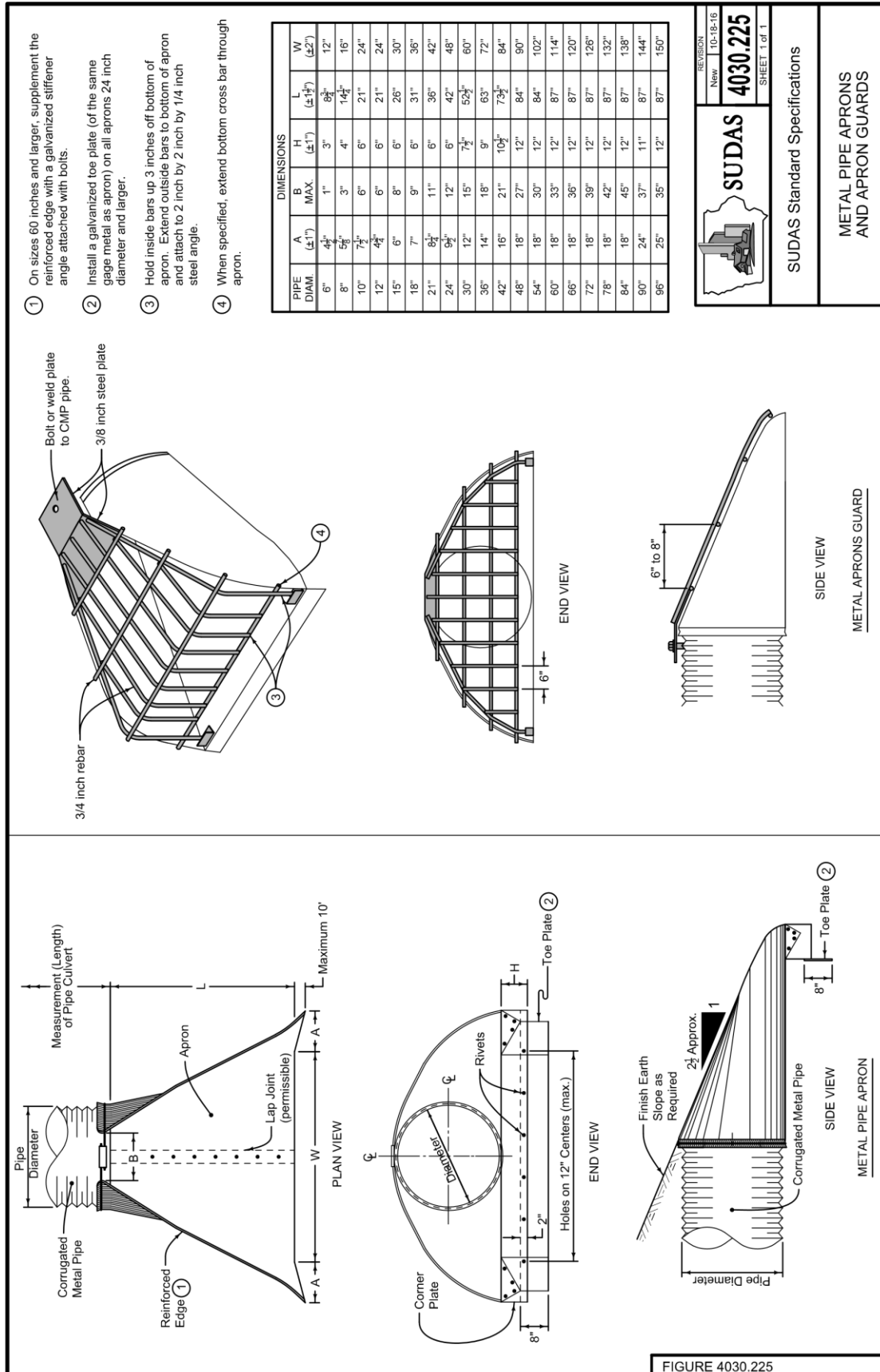
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SECTION 4040 - SUBDRAINS AND FOOTING DRAIN COLLECTORS

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 Division 1 - General Provisions and Covenants.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT

A. Subdrains:

1. **Measurement:** Each type and size of pipe installed will be measured in linear feet from end of pipe to end of pipe along the centerline of pipe, exclusive of outlets. Lengths of elbows and tees will be included in length of pipe measured.
2. **Payment:** Payment will be made at the unit price of each type and size of pipe.
3. **Includes:** Unit price includes, but is not limited to, trench excavation, furnishing and placing bedding and backfill material, engineering fabric (when specified), connectors, and elbows and tees.

B. Footing Drain Collectors:

1. **Measurement:** Each type and size of pipe will be measured in linear feet along centerline of pipe from end of pipe to end of pipe.
 2. **Payment:** Payment will be made at the unit price for each type and size of pipe.
 3. **Includes:** Unit price includes, but is not limited to, trench excavation, pipe, wyes, tap, fittings, and furnishing and placing bedding and backfill material.
- C. Subdrain or Footing Drain Cleanouts:**
1. **Measurement:** Each type and size of subdrain or footing drain cleanout will be counted.
 2. **Payment:** Payment for each cleanout will be made at the unit price for each type and size of subdrain or footing drain cleanout.
- D. Subdrain or Footing Drain Outlets and Connections:**
1. **Measurement:** Each type and size of outlet or connection to a structure will be counted.
 2. **Payment:** Payment for each outlet or connection to a structure will be made at the unit price for each type and size installed.
 3. **Includes:** Unit price includes, but is not limited to, pipe, non-shrink grout, coupling bands, and rodent guards for pipes 6 inches or smaller.
- E. Storm Sewer Service Stub:** The storm sewer service stub is the portion of the storm sewer service from the footing drain collector or storm sewer to a point 10 feet outside of the right of-way or as specified in the contract documents.
1. **Measurement:** Each type and size of pipe will be measured in linear feet along centerline of pipe from the centerline of storm sewer or footing drain collector to 10 feet outside of the right-of-way.
 2. **Payment:** Payment will be made at the unit price per linear foot for each type and size of storm sewer service stub.
 3. **Includes:** Unit price includes, but is not limited to, trench excavation, furnishing bedding material, placing bedding and backfill material, tap, fittings, and plugs.

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 4020, 2.01.**2.02 TYPE 1 SUBDRAINS (LONGITUDINAL SUBDRAIN)****A. Polyvinyl Chloride Pipe and Fittings (Solid Wall PVC):**

1. Comply with Section 4040, 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 4040, 2.01, B.
2. Slot subdrain pipe according to ASTM F 949.

C. High Density Polyethylene Pipe and Fittings (HDPE):

1. Comply with Section 4040, 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 4040, 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 4040, 2.01.
 2. Pipe to be double-walled.
- C. **PVC:** Comply with Section 4040, 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 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 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 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 4020, 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 6010 for structural concrete for base and invert shaping.
4. **Castings:** Use a light duty (HS-20 loading) cast iron casting complying with Section 6010, 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 4040, 2.01.

PART 3 - EXECUTION**3.01 SUBDRAINS**

- A. Install Type 1 or Type 2 subdrain where specified in the contract documents. Comply with 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 Figure 4040.232.
- C. Provide outlets where specified in the contract documents.
1. Comply with 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

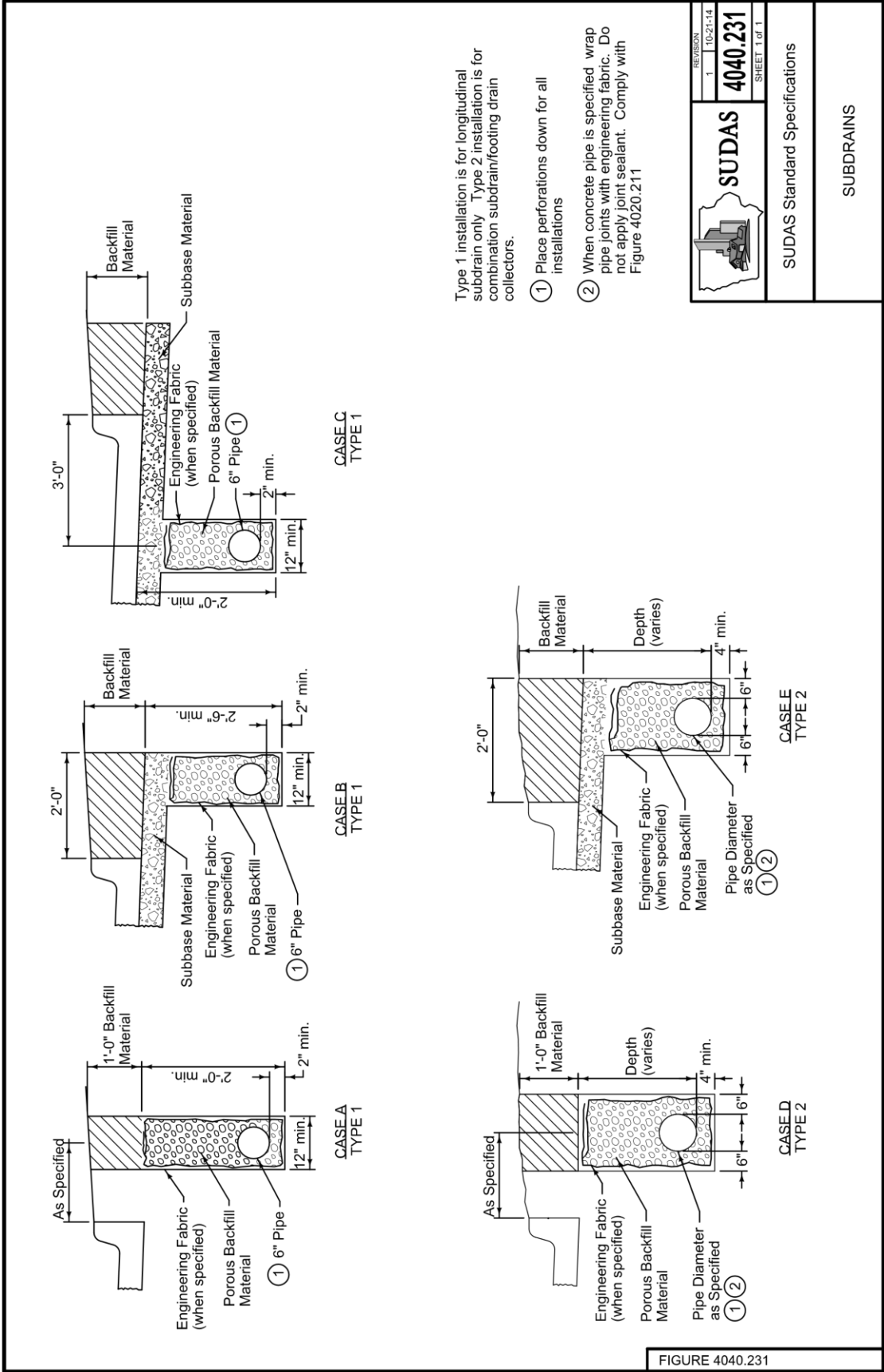
- A. Install footing drain collectors according to Section 3010.
- B. If specified, install engineering fabric.

- 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 6010.

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



Type 1 installation is for longitudinal subdrain only. Type 2 installation is for combination subdrain/footing drain collectors.

- 1 Place perforations down for all installations
- 2 When concrete pipe is specified, wrap pipe joints with engineering fabric. Do not apply joint sealant. Comply with Figure 4020.211

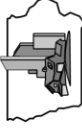
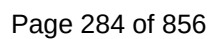
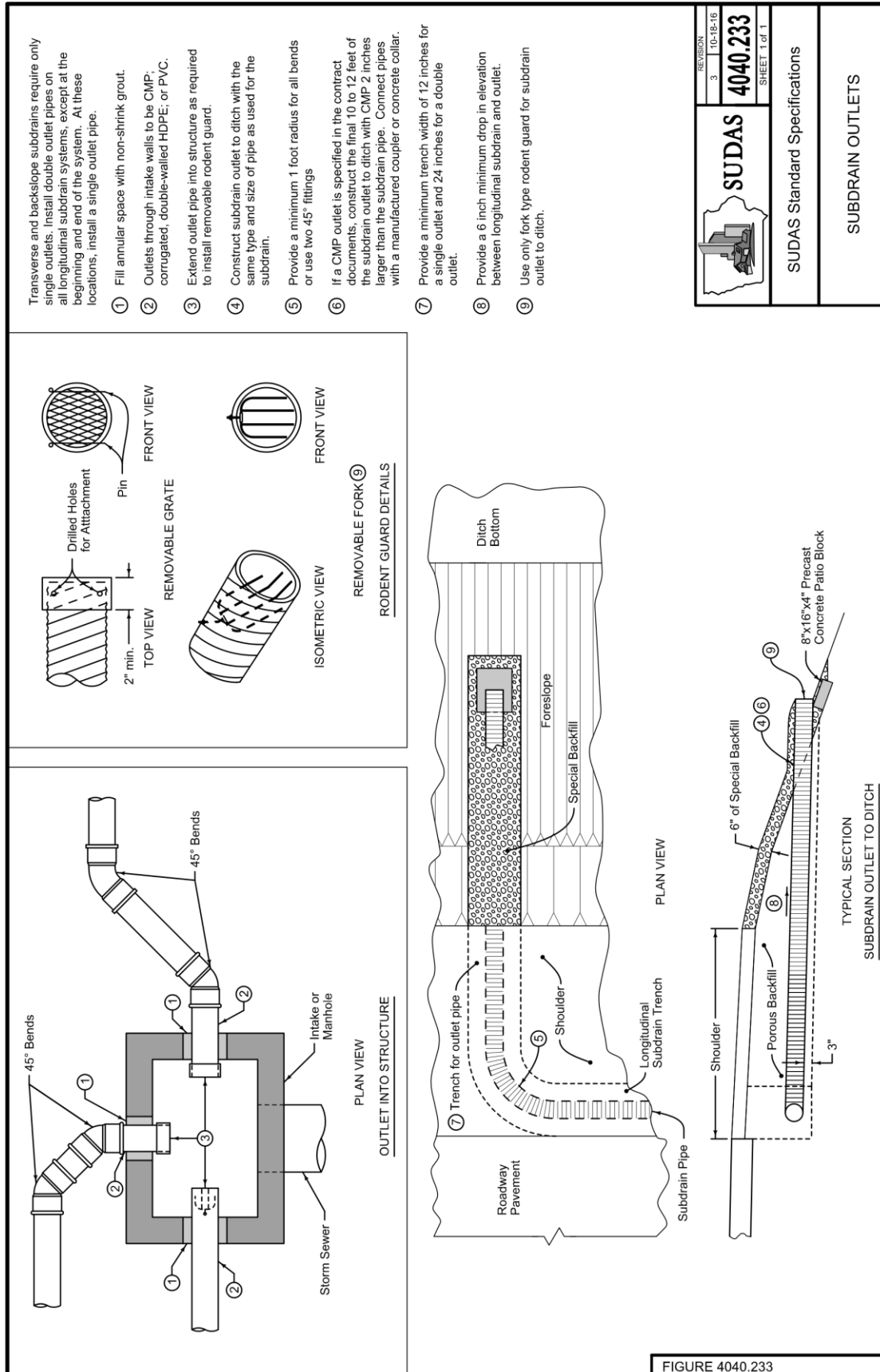
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SUDAS Standard Specifications			
SUBDRAINS			

FIGURE 4040.231





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SECTION 4050 - PIPE REHABILITATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Sliplining Pipe
- B. Cured-in-place Pipe Lining
- C. Deformed/Reformed Pipe Lining
- D. Folded/Formed Pipe Lining
- E. Spot Repairs by Pipe Replacement

1.02 DESCRIPTION OF WORK

- A. Pipe Lining:
 - 1. Resin impregnated, cured-in-place.
 - 2. Deformed/reformed polyethylene.
 - 3. Folded/formed polyvinyl chloride.
 - 4. Sliplining.
- B. Pipe spot repairs.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants, as well as the following:
Provide, as a minimum, the following information for evaluation.

A. Product Information:

- 1. Product name.
- 2. Year product first available in the United States.
- 3. Total footage or number of line segments installed in the United States.
- 4. Results of all available product testing, including but not limited to leakage, physical properties, pipe stiffness, chemical resistance, strain-corrosion, external loading, flow characteristics, infiltration/inflow reductions, structural capacity, and external hydrostatic loading capacity.
- 5. Samples of before and after product.
- 6. Design method.
- 7. Typical lining thickness for pipe sizes included in the project.

B. Manufacturer Information:

1. Manufacturer name.
2. Years of experience manufacturing the product.
3. Country of manufacture of all product components.
4. Quality control procedures for product manufacture, including inspection requirements, testing procedures, and allowable tolerance levels.
5. Related ASTM standards, or other nationally recognized standards for product manufacturing.

C. Installer Information:

1. Installer name.
2. Completed project list for last five years including for each project and year completed, client name/address/contact person/phone number, footages installed by pipe diameter, and number of lateral reinstatements.
3. Detailed installation procedures, including estimated times for each task, lateral reinstatement methods, number of required excavations, and other items unique to each product.
4. Video of installation process, if available.
5. Evidence of properly trained personnel.
6. Related ASTM standards or any nationally recognized standards for product installation.
7. Available equipment list.
8. Detailed procedures for repairing the product in the event of future damage or failure and for tapping future service connections, including and required specialized equipment or training.
9. Videos of two rehabilitated sewer sections showing before and after conditions.
10. Additional information may be required. The submittal of prequalification information in no way implies that the product, manufacturer, or installer will be deemed to be qualified. The Contracting Authority, in its sole discretion, will determine whether a product, manufacturer, or installer does or does not qualify as an approved equal.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

- A. Prior to start of work, notify all affected parties 24 hours in advance as to the length of time their service will be blocked.

- B. Notify the Jurisdictions water works to use meter and pay for water, if required.
- C. Unless otherwise specified, the Owner will provide water for installation of cured-in-place pipe from a nearby hydrant through a separate valve mounted on the hydrant.
- D. Public Relations Program: Establish a Public Information and Notification Program for contacting each home or business connected to the affected sanitary sewer, informing them of the work to be done and when the sewer will be off-line. The following specific steps are part of the Public Information and Notification Program.
 - 1. Provide written notice to be delivered to each affected home or business describing work, schedule, how the work affects them, and a local telephone number of the Contractor they can call to discuss the project or their problems.
 - 2. Personally contact each home or business on the day lateral verifications using closed circuit video inspection are to be performed. The homeowner or business will be asked to run water down their drain to verify each lateral. If the homeowner is unavailable, attempt other arrangements (cleanouts) to drain water through the lateral to verify each connection.
 - 3. Provide written notice and personally contact the home or business the day prior to beginning inversion of the section of sewer to which they are connected.
 - 4. Personally contact all homes or businesses that cannot be reconnected within the time stated in the written notice.
 - 5. Furnish and service portable toilets for use by the home or business occupants if so required by any affected served business or homeowner.

1.08 MEASUREMENT AND PAYMENT

A. Pipe Lining:

- 1. **Measurement:** Each type and size of pipe lining will be measured in linear feet along the centerline of the pipe lining from center of manhole to center of manhole.
- 2. **Payment:** Payment will be made at the unit price per linear foot for each type and size of pipe lining.
- 3. **Includes:** Unit price includes removal of internal obstructions, pipe cleaning, inspection, and all costs associated with the public information and notification program.

B. Building Sanitary Sewer Service Reconnection:

- 1. **Measurement:** Each active existing building sanitary sewer service reconnected to the pipe lining, including the services reconnected by excavating and reconnecting services or by trenchless reconnection methods, will be counted.

2. **Payment:** Payment will be made at the unit price for each reconnection.
 3. **Includes:** Unit price includes, but is not limited to, removal of internal obstructions, pipe cleaning, and all costs associated with the public information and notification program.
- C. **Spot Repairs by Pipe Replacement:** Both of the following methods will be used for measurement and payment of spot repairs by pipe replacement.
1. **Spot repairs by Count:**
 - a. **Measurement:** Each spot repair location will be counted.
 - b. **Payment:** Payment will be made at the unit price for each spot repair.
 - c. **Includes:** Unit price includes, but is not limited to, uncovering and removing existing pipe, placing backfill material for replacement pipe, and restoring the surface.

And;

2. **Spot Repairs by Linear Foot:**
 - a. **Measurement:** Each spot repair will be measured in linear feet along the centerline of the replacement pipe.
 - b. **Payment:** Payment will be made at the unit price per linear foot of spot repair.
 - c. **Includes:** Unit price includes, but is not limited to, furnishing and installing replacement pipe and connections.

PART 2 - PRODUCTS

2.01 POLYETHYLENE AND POLYOLEFIN MANUFACTURED PIPE FOR SLIPLINING

A. Pipe:

1. Comply with ASTM D 3035, minimum pipe stiffness of 46 psi.
2. Polyethylene complying with ASTM D 1248, Type III, Class C, Category 5, Grade P 34 or ASTM D 3350 Cell Classification PE 335434C.
3. Maximum outside diameter as specified in the contract documents.

B. Joints:

1. Joined into continuous length on job site.
2. Fuse butt joints according to the pipe manufacturer's recommendations with approved equipment and complying with ASTM D 2657.

2.02 POLYVINYL CHLORIDE PIPE (PVC) MANUFACTURED PIPE 12 INCH TO 36 INCH FOR SLIPLINING

A. Pipe:

1. Comply with ASTM F 949, minimum pipe stiffness, 46 psi.
 2. PVC plastic complying with ASTM D 1784, Cell Classification 12454.
- B. **Joints:** Gasketed joints complying with ASTM F 477 and ASTM D 3212.

2.03 POLYVINYL CHLORIDE PIPE (PVC) MANUFACTURED PIPE 21 INCH TO 48 INCH FOR SLIPLINING

- A. **Pipe:**
1. Comply with ASTM F 1803, minimum pipe stiffness, 46 psi.
 2. PVC plastic complying with ASTM D 1784, Cell Classification 12364.
- B. **Joints:** Gasketed joints complying with ASTM F 477 and ASTM D 3212.

2.04 CENTRIFUGALLY CAST FIBERGLASS REINFORCED POLYMER MORTAR PIPE (CCFRPM) 18 INCH TO 48 INCH FOR SLIPLINING

- A. **Pipe:** Comply with ASTM D 3262.
- B. **Joints:** Gasketed joints complying with ASTM D 4161.

2.05 RESIN-IMPREGNATED TUBE FOR CURED-IN-PLACE PIPE (CIPP) LINING

- A. **Pipe Lining:**
1. Comply with ASTM F 1216.
 2. Use one or more layers of flexible needled felt or equivalent non-woven material.
 3. Stretch material to fit irregular pipe and negotiate bends.
 4. Outside layer plastic coated with a translucent flexible material. No delamination of plastic coating.
 5. Fabricated to a size that when installed tightly fits length without joints.
 6. Designed as per Equation X-1, ASTM F 1216.
- B. **Resin and Catalyst:**
1. Unsaturated, styrene-based, thermoset resin and catalyst system or an epoxy resin and hardener that is compatible with the inversion process.
 2. Cures in the presence of water with temperature greater than 150°F and less than 180°F.
 3. Initial structural properties complying with ASTM F 1216. Also comply with the following table.

Table 4050.01: CIPP Lining Properties

CIPP Properties	ASTM Test Method	Minimum Value
Flexural Strength	D 790	4,500 psi
Flexural Modulus of Elasticity	D 790	250,000 psi

C. CIPP Lining Dimensions:

1. Use nominal internal diameter and length such that CIPP forms to internal circumference and length of original pipe.
2. Field verify diameter and length.
3. Use one continuous length without joints.

2.06 DEFORMED/REFORMED HIGH DENSITY POLYETHYLENE PIPE LINING (DRP-HDPE)**A. Pipe Lining:**

1. Manufactured in deformed shape from HDPE pipe compound complying with ASTM D 1248, Class C, Category 5 and Grade P 34.
2. Comply with long term hydrostatic strength rating of 1600 psi or more according to ASTM D 2837.
3. Environmental stress crack resistance (ESCR) less than 2,000 hours in 100% solution, Igepal CO-630 at 100° C before failure according to ASTM D 1693, Condition C.
4. Comply with the following table for minimum DRP lining structural standards.

Table 4050.02: DRP-HDPE Lining Properties

FIPP Properties	ASTM Test Method	Minimum Value
Flexural Strength	D 790	3,300 psi
Flexural Modulus of Elasticity	D 790	136,000 psi
Tensile Strength	D 638	3,200 psi

B. DRP Lining Dimensions:

1. Nominal internal diameter and length of existing pipe as specified in the contract documents.
2. Field verify diameter and length.
3. Outside diameter fabricated to fit tightly.
4. Use one continuous length without joints between manholes.
5. Minimum SDR wall thickness as specified in the contract documents.

2.07 FOLDED/FORMED POLYVINYL CHLORIDE PIPE LINING (FFP-PVC)**A. Pipe Lining:**

1. Manufacture in deformed shape complying with ASTM D 1784, Cell Classification 12454 B. Compounds with different cell classifications because one or more properties are superior to those specified are acceptable.
2. Performance requirements complying with ASTM D 3034.
3. Comply with the following table for FFP lining structural properties.

Table 4050.03: FFP-PVC Lining Properties

FIPP Properties	ASTM Test Method	Minimum Value
Tensile Modulus of Elasticity	D 638	350,000 psi
Tensile Strength	D 638	6,000 psi

B. FFP Lining Dimensions:

1. Nominal internal diameter and length of existing pipe as specified in the contract documents.
2. Field verify diameter and length prior to manufacturing.
3. Use one continuous length without joints between manholes.
4. Outside diameter fabricated to fit tightly.
5. Minimum SDR wall thickness as specified in the contract documents and complying with ASTM F 1216.

2.08 PIPE REPAIR COUPLINGS FOR SPOT REPAIRS BY PIPE REPLACEMENT

A. Style: Full circle, fully lined, bolted.

B. Length: 12 inches, minimum.

C. Materials and Manufacturer:

1. Shells, armors, side bars, lugs, Turner lifting bars, bolts and nuts; complying with ASTM A 240, Type 304 stainless steel.
2. MIG welds, fully passivated.
3. Rubber gasket complying with ASTM D 2000, AA415 with full coverage and a grid pattern.
4. Stainless steel armor bonded to gasket to bridge lug area.

D. Nuts and Bolts: ½ inch or ⅝ inch, Teflon coated threads.

2.09 SEWER MAIN PIPE (FOR SPOT REPAIRS)

A. Comply with Section 4010.

B. Use materials for pipe replacement as specified in the contract documents or approved by the Engineer.

PART 3 - EXECUTION**3.01 EXAMINATION****A. Cleaning:**

1. Clean and remove soil, grit, debris, and obstructions according to Section 4060 prior to video inspection and/or insertion of pipe lining.
2. Do not flush debris to downstream sections.
3. Deposit removed material at an approved site.

B. Video Inspection:

1. Furnish the Jurisdiction with a recording of sewers: 1) before the lining process and while the flow is being bypassed; and 2) after the lining process and service reconnections have been completed.
2. Provide an on-screen numerical display of the camera location, indexed from the starting manhole, in feet.

C. Service and Obstruction Location:

1. Coordinate and cooperate with the Engineer for service and obstruction location.
2. Locate the active sewer services by one of following:
 - a. Use video inspection to observe service locations, breaks, obstructions, and structural failures.
 - b. Insert a sounding device through the service, noting its location on the ground surface.
 - c. Dye testing.

3.02 BYPASSING SEWAGE

- A. Submit a bypassing plan to the Engineer for review.
- B. Plug the line at a point upstream of pipe to be rehabilitated if bypassing is required.
- C. Pump flow to a downstream point or adjacent system as directed by the Engineer.
 1. Provide pump and bypass lines of adequate capacity to handle all flows.
 2. Provide adequate reserve pumps on-site for emergency use and for storm flows.

3.03 OBSTRUCTIONS

- A. Remove all obstructions.
- B. If an obstruction is encountered that cannot be removed by equipment operating within the pipe, excavate and remove the obstruction upon approval of the Engineer.

- C. Place backfill, compact, and restore the surface according to the contract documents.

3.04 TEMPORARY SEWER SERVICE

If full normal sewer service is not re-established within the times stated, provide temporary facilities or hotel accommodations for affected residents and businesses.

3.05 SLIPLINING

A. Excavation:

1. For sliplining insertions, excavate at or near one structure and work from the existing manhole at the other end of the section to be pulled.
2. Insertion Pit:
 - a. For sliplining with segmented pipe (one pipe section at a time), construct the insertion pit as required to accommodate the length of individual pipe sections.
 - b. For sliplining with pipe that is to be welded together above ground and pulled into the sewer, dig a pit length 12 times the inside pipe diameter and slope the pit end back to the ground surface at a rate of 2.5 (horizontal) to 1.0 (vertical).

B. Test Head:

1. Pull the pulling head with one short section of sliplining pipe through the sewer before inserting the pipe to test for taps or obstructions protruding too far into the sewer.
2. Attach cables to both ends of the test head to allow for removal if an obstruction is encountered.

- C. **Installation:** Push segmented pipe into the host pipe according to the manufacturer's recommendations, or pull in a continuously welded pipe according to ASTM F 585.

D. Service Reconnection:

1. Allow the sliplining pipe to recover according to the manufacturer's recommendations.
2. Do not leave the sanitary service unconnected for more than 24 hours.
3. Complete reconnections involving excavation of service lines according to the local plumbing codes.
4. Reconnect excavated service connections according to the local plumbing code, except that the annular space between the host pipe and the sliplining pipe is to be filled with grout.

E. Grouting:

1. Before trimming the ends of the pipe and sealing, allow for the pipe to recover its original length according to the manufacturer's recommendations.

Recovery time is at least equal to the time required to pull the pipe into place.

2. Fill the space between the sliplining pipe and the host pipe with CLSM complying with Section 3010, 2.05 or other material approved by the Engineer. Pump filler in from the lower end of the sliplining pipe.

3.06 RESIN IMPREGNATED CIPP LINING

- A. Install according to the manufacturer's recommendations for this lining process and ASTM F 1216 unless otherwise specified.
- B. Use a resin impregnated tube, hydraulically inverted in place with an approved lubricant, and cured-in-place according to ASTM F 1216, Section 7.
- C. Make the tube continuous between manholes. The tube may span several manhole reaches as allowed by the equipment, properties of the CIPP, and the size and condition of the sewer.
- D. Ensure the tube is free of uncured spots, lifts (spots cured away from the sewer), and delaminations. Remove and replace deficient sections.
- E. Service Reconnections:
 1. Do not leave sanitary service unconnected for more than 24 hours.
 2. Complete reconnections involving excavation of service lines according to the local plumbing code.

3.07 DRP-HDPE OR FFP-PVC LINING INSTALLATION

Install according to the manufacturer's recommendations for particular lining material and process, unless otherwise specified.

A. Lining Installation:

1. Designate location where insertion is to begin, subject to the Engineer's approval.
2. Transport lining to the site in one continuous length on spools compatible with the manufacturer's designated process.
3. Heat lining material at the job site as necessary for insertion. Pull lining into the sewer with appropriate pulling heads, cables, and heat distribution equipment.
4. Ensure lining is continuous between manholes as allowed by the tensile properties of lining and the size and condition of the sewer.
5. Connect fully inserted lining to the heat source distribution equipment.
6. Round and expand by uniformly distributed heat, steam, and pressure and by mechanical devices.
7. After lining has been expanded to a tight fit, cool gradually under pressure until the process is complete.

8. Provide a continuous pipe lining, without joints, over the entire length of pipe.
9. Ensure the lining is free of all material defects, pits, pinholes, cracks, crazing, folds, or unrounded sections.
10. Repair all defects at no additional cost to the Jurisdiction.

B. Service Reconnections:

1. Do not leave sanitary service unconnected for more than 24 hours.
2. Complete reconnections involving excavation of service lines according to the local plumbing code.

3.08 SPOT REPAIRS BY PIPE REPLACEMENT

- A. Excavate trench according to Section 3010.
- B. Remove existing pipe to the extent required and disconnect affected sewer services.
- C. Install replacement pipe of the same nominal size as the existing pipe.
 1. Use the materials as specified in the contract documents that comply with Section 4010.
 2. Place bedding material according to Section 3010.
- D. Install pipe repair coupling.
 1. Cut pipes to length required allowing no more than a 1/2 inch gap between butted pipe ends at coupling location. Cut pipes perpendicular to centerline.
 2. Clean the outside surface of the existing and replacement pipes as required to provide a positive seal with the pipe repair coupling.
- E. Wrap coupling around pipes, centered on butt joint, and tighten bolts according to manufacturer's recommendations.
- F. Reconnect sewer services.
- G. Place backfill in trench according to Section 3010.

3.09 CLEANUP AND CLOSEOUT

- A. Verify that the services are reconnected and fully operable, with at least 90% of original capacity.
- B. Submit initial and final video tapes, CDs, or DVDs to the Engineer.
- C. Remove all equipment and debris.

END OF SECTION

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SECTION 4060 - 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 Division 1 - General Provisions and Covenants.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING

Comply with Division 1 - General Provisions and Covenants, 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.

1.08 MEASUREMENT AND PAYMENT

Cleaning, inspecting, and testing sanitary sewers, storm sewers, pipe culverts, and rehabilitated pipes (including video inspection) are incidental to other project costs and will not be paid for separately.

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 VISUAL INSPECTION

- A. Check each section of sanitary sewer, storm sewer, or pipe culvert by lamping.
- B. Light should be visible through section of pipe lamped.
- C. Visually inspect each run of pipe.
- D. Repair or replace defective pipe or joints, or remove and relay pipe not meeting alignment tolerances, as directed by the Engineer.

3.03 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 4010 for sanitary sewers and Section 4020 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.

3.04 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 6030.

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 $0.472 \times d$, 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:

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.

3.05 DEFLECTION TESTING

- A. Perform deflection tests on all flexible sanitary sewer mains, excluding ductile iron pipe. Also perform deflection tests on all HDPE 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.

3.06 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

- I. 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

- J. Examine exposed pipe and fittings during testing. Repair all visible leaks.
- K. 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

DIVISION 5 - WATER MAINS AND APPURTENANCES

DIVISION 5 IS NOT UTILIZED.

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DIVISION 6 - STRUCTURES FOR SANITARY AND STORM SEWER

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SECTION 6010 - STRUCTURES FOR SANITARY AND STORM SEWERS

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 Division 1 - 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 Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants, 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 Division 1 - General Provisions and Covenants.

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.

1.08 MEASUREMENT AND PAYMENT

A. Manhole:

1. **Measurement:** Each type and size of manhole will be counted.
2. **Payment:** Payment will be at the unit price for each type and size of manhole.
3. **Includes:** Unit price includes, but is not limited to, excavation, furnishing bedding material, placing bedding and backfill material, compaction, base, structural concrete, reinforcing steel, precast units (if used), concrete fillets, pipe connections, infiltration barriers (sanitary sewer manholes only), castings, and adjustment rings.

B. Intake:

1. **Measurement:** Each type and size of intake will be counted.
2. **Payment:** Payment will be at the unit price for each type and size of intake.
3. **Includes:** Unit price includes, but is not limited to, excavation, furnishing bedding material, placing bedding and backfill material, compaction, base, structural concrete, reinforcing steel, precast units (if used), concrete fillets, pipe connections, castings, and adjustment rings.

C. Drop Connection:

1. **Measurement:** Each drop connection will be counted.
2. **Payment:** Payment will be at the unit price for each drop connection.
3. **Includes:** Unit price includes, but is not limited to, the connection to the manhole and all pipe, fittings, concrete encasement, and bedding and backfill material.

D. Casting Extension Rings:

1. **Measurement:** Each casting extension ring will be counted.
2. **Payment:** Payment will be at the unit price for each casting extension ring.

E. Manhole or Intake Adjustment, Minor:

1. **Measurement:** Each existing manhole or intake adjusted to finished grade by addition or removal of adjustment rings or adjustment of adjustable casting will be counted.
2. **Payment:** Payment will be made at the unit price for each minor manhole or intake adjustment.
3. **Includes:** Unit price includes, but is not limited to, removing existing casting and existing adjustment rings, furnishing and installing adjustment rings, furnishing and installing new casting, and installing new infiltration barrier (sanitary sewer manholes only).

F. Manhole or Intake Adjustment, Major:

1. **Measurement:** Each existing manhole or intake adjusted to grade by addition or removal of riser, cone or flat top sections, or the exchange of existing riser sections with sections having different vertical dimensions will be counted.
2. **Payment:** Payment will be at the unit price for each major adjustment.
3. **Includes:** Unit price includes, but is not limited to, removal of existing casting, adjustment rings, top sections, and risers; excavation; concrete and reinforcing steel or precast sections; furnishing and installing new casting; installing new infiltration barrier (sanitary sewer manholes only); placing backfill material; and compaction.

G. Connection to Existing Manhole or Intake:

1. **Measurement:** Each connection made to an existing manhole or intake will be counted.
2. **Payment:** Payment will be made at the unit price for each sewer connection.
3. **Includes:** Unit price includes, but is not limited to, coring or cutting into the existing manhole or intake, pipe connections, grout, and waterstop (when required).

H. Remove Manhole or Intake:

1. **Measurement:** Each manhole or intake removed will be counted.
2. **Payment:** Payment will be made at the unit price for each manhole or intake.
3. **Includes:** Unit price includes, but is not limited to, removal of casting, concrete, and reinforcement; plugging pipes; filling remaining structure with flowable mortar; and placing compacted fill over structure to finished grade.

PART 2 -PRODUCTS**2.01 MANHOLE AND INTAKE TYPES****Table 6010.01: Manhole and Intake Types**

	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

2.02 PRECAST

Comply with ASTM C 478.

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 6010, 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 6010, 2.02 and 2.03.

2.09 MANHOLE OR INTAKE ADJUSTMENT RINGS (Grade Rings)

Use one of the following materials for grade adjustments of manhole or intake frame and cover assemblies:

- A. **Reinforced Concrete Adjustment Rings:** Comply with ASTM C 478. Provide rings free from cracks, voids, and other defects.

B. High Density Polyethylene Adjustment Rings: Comply with ASTM D 1248 for recycled plastic.

1. 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

2. Do not use polyethylene grade adjustment rings when they are exposed to HMA pavement or heat shrink infiltration barriers.
3. When used in a single configuration, provide tapered adjustment ring with thickness that varies from 1/2 inch to 3 inches.
4. Install adjustment rings on clean, flat surfaces according to the manufacturer's recommendations with the proper butyl rubber sealant/adhesive.

C. Expanded Polypropylene Adjustment Rings: Comply with ASTM D 4819 for expanded polypropylene when tested according to ASTM D 2375.

1. Use adhesive meeting ASTM C 920, Type S, Grade N5, Class 25.
2. Provide finish rings with grooves on the lower surface and flat upper surface.
3. Do not use when heat shrinkable infiltration barrier is used.
4. 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. **Load Capacity:** Standard duty unless otherwise shown on the casting figures.
- D. **Standard Duty:** Casting certified for 40,000 pound proof-load according to AASHTO M 306.
- E. **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.

F. 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 ²	Yes	No	Yes ¹
	6010.601	SW-601, B	3	Adjustable ³	No	No	Yes ¹
	6010.601	SW-601, C	2	Fixed ²	Yes	Yes	Yes ¹
	6010.601	SW-601, D	3	Adjustable ³	No	Yes	Yes ¹
Storm Sewer	6010.602	SW-602, E ⁴	2	Fixed ²	Yes	No	No
	6010.602	SW-602, F ⁴	3	Adjustable ³	No	No	No
	6010.602	SW-602, G ⁴	2	Fixed	No	No	No

¹ Machine bearing surfaces required.

² Typically used with non-paved or flexible surfaces, including HMA, seal coat, gravel, and brick

³ Typically used with PCC surfaces, including castings in concrete boxouts.

⁴ Storm sewer casting may include environmental symbols and/or messages such as "DUMP NO WASTE, DRAINS TO RIVER."

2. Intakes:

- a. Comply with 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.
- 2) 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 4010, 2.01 (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 6010, 2.03.
- B. **Precast Base Section:**
 1. For sanitary sewers, provide a precast concrete fillet, unless otherwise allowed by the Engineer. Comply with Section 6010, 3.01.
 2. For storm sewers, provide a cast-in-place concrete fillet with concrete complying with the requirements of Section 6010, 2.03.

2.13 STEPS

- A. Provide steps in all circular, precast manholes unless otherwise specified in the contract documents.
- B. Comply with ASTM C 478.
- C. Manufacture using polypropylene encased steel.
- D. Uniformly space steps at 12 to 16 inches.
- E. Align with vertical side of eccentric top section.
- F. 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 Figure 6010.305. May be substituted for pipe diameters less than 48 inches.

2.15 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 EXCAVATION AND BACKFILL MATERIAL

Comply with Section 3010 for bedding and backfill materials.

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS FOR INSTALLATION OF MANHOLES AND INTAKES

- A. **Excavation:** Excavate according to Section 3010.
- B. Subgrade Preparation:
 - 1. **Cut Sections** (Undisturbed Soil): Prepare subgrade to accurate elevation required to place structure base or subbase.
 - 2. **Fill Sections:** Compact to 95% of maximum Standard Proctor Density and hand grade to accurate elevation required to place structure base or subbase, or install stabilization material as directed by the Engineer.
 - 3. **Unstable Soil:** Install stabilization material as directed by the Engineer.
- C. Subbase:
 - 1. **Cast-in-place Structures:** No subbase material is required.
 - 2. **Precast Structures:** If precast structure is provided, 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.
 - 1. **Cast-in-place:** Comply with Section 6010, 3.02.
 - 2. **Precast:** Comply with Section 6010, 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 3010.
 - 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 6010, 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 6010, 3.05.
 3. **Precast Sanitary Sewer Manholes:** Connect to structure with flexible, watertight gasket according to Section 6010, 2.08. Keep void between pipe and manhole section free of debris and concrete.
 4. **Sanitary Sewer Manholes on Existing Pipe:** Install waterstop according to Section 6010, 2.08.
- F. **Joint Sealant:**
 1. **Sanitary Sewer Manholes:**
 - a. Install rubber O-ring or profile gasket (precast structures) or.
 - 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:** Install the type of casting specified in the contract documents and adjust to proper grade. Where a manhole or intake is to be in a paved area, adjust the casting to match the slope of the finished surface. When specified in the contract documents, attach a casting frame to the structure with four anchor bolts.
- 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 6010, 3.02 or Iowa DOT Materials I.M.445.

B. Cast-in-place Base:

1. Comply with Section 6010, 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 3010.

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 nonshrink grout or construct a concrete collar around the pipe according to Section 6010, 3.05, B.

3.06 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.

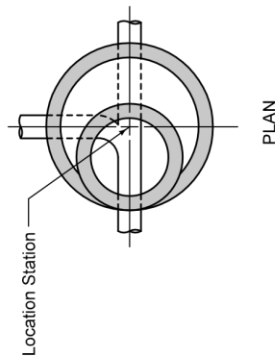
3. If specified in the contract documents, fill the line to be abandoned with flowable mortar or CLSM (comply with Section 3010) by gravity flow or pumping.
- C. Fill remaining structure using flowable mortar.
- D. Place compacted backfill over remaining structure as required for embankment or compacted backfill.

3.07 CLEANING, INSPECTION, AND TESTING

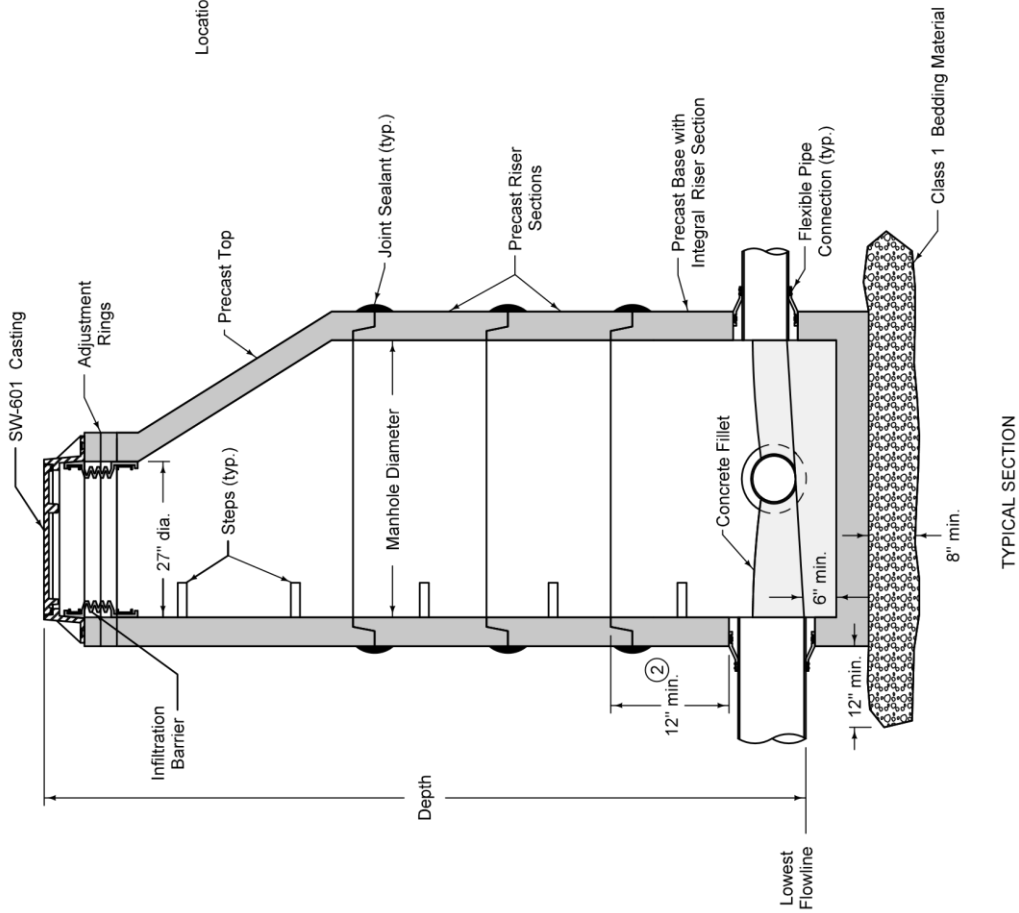
Clean, inspect, and test structures according to Section 6030.

END OF SECTION

- ① For additional configurations, maintain a minimum of 12 inches of concrete between vertical edges of pipe openings.
- ② 12 inch minimum riser height above all pipe openings.



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

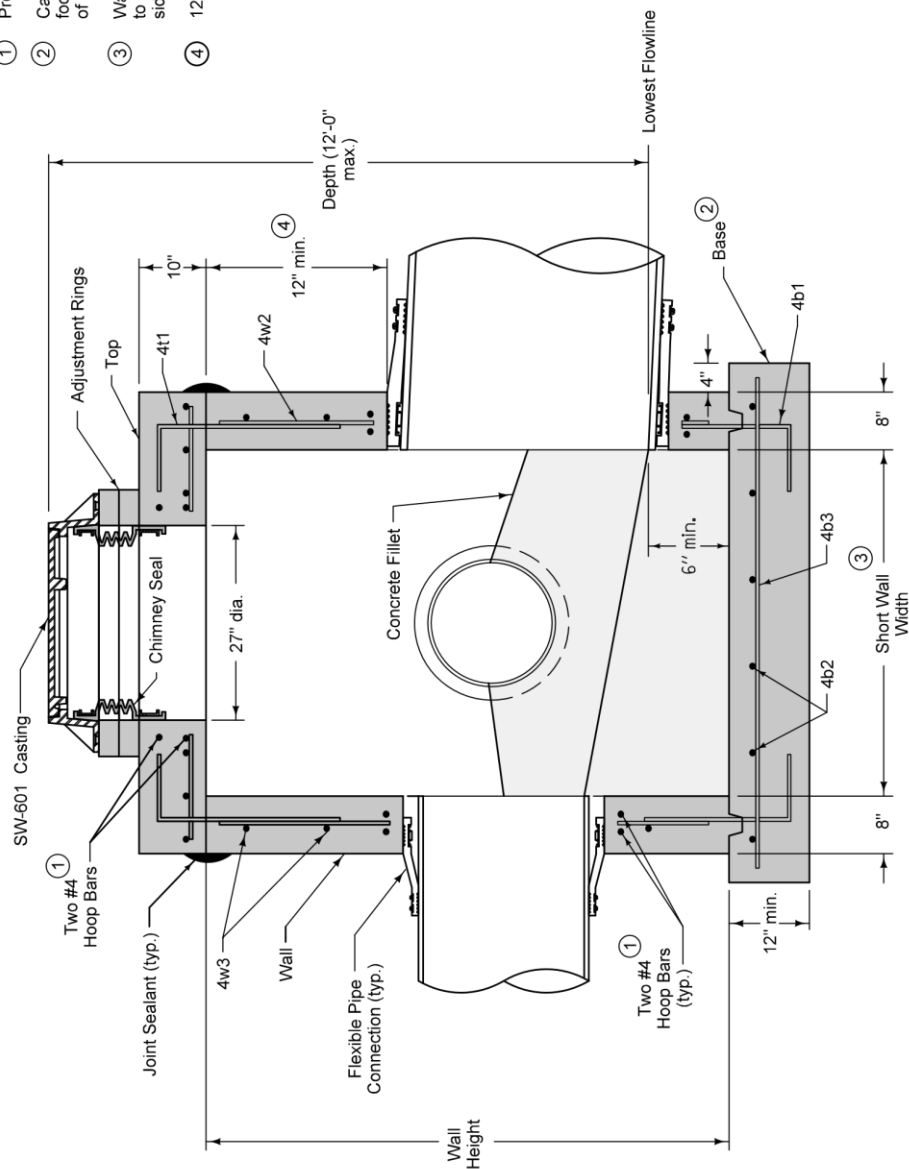


SUDAS	IOWA DOT	REVISION
		2 04-17-18
FIGURE 6010.301	STANDARD ROAD PLAN	SW-301
REVISIONS: Changed "Invert" to "Concrete Fillet".		SHEET 1 of 1
Paul D. Wiegand SUDAS DIRECTOR		Brian Smith DESIGN NETWORK ENGINEER
CIRCULAR SANITARY SEWER MANHOLE		

FIGURE 6010.301 | SHEET 1 OF 1

Adjacent walls may have different widths based upon pipe configuration, but structure must be rectangular.

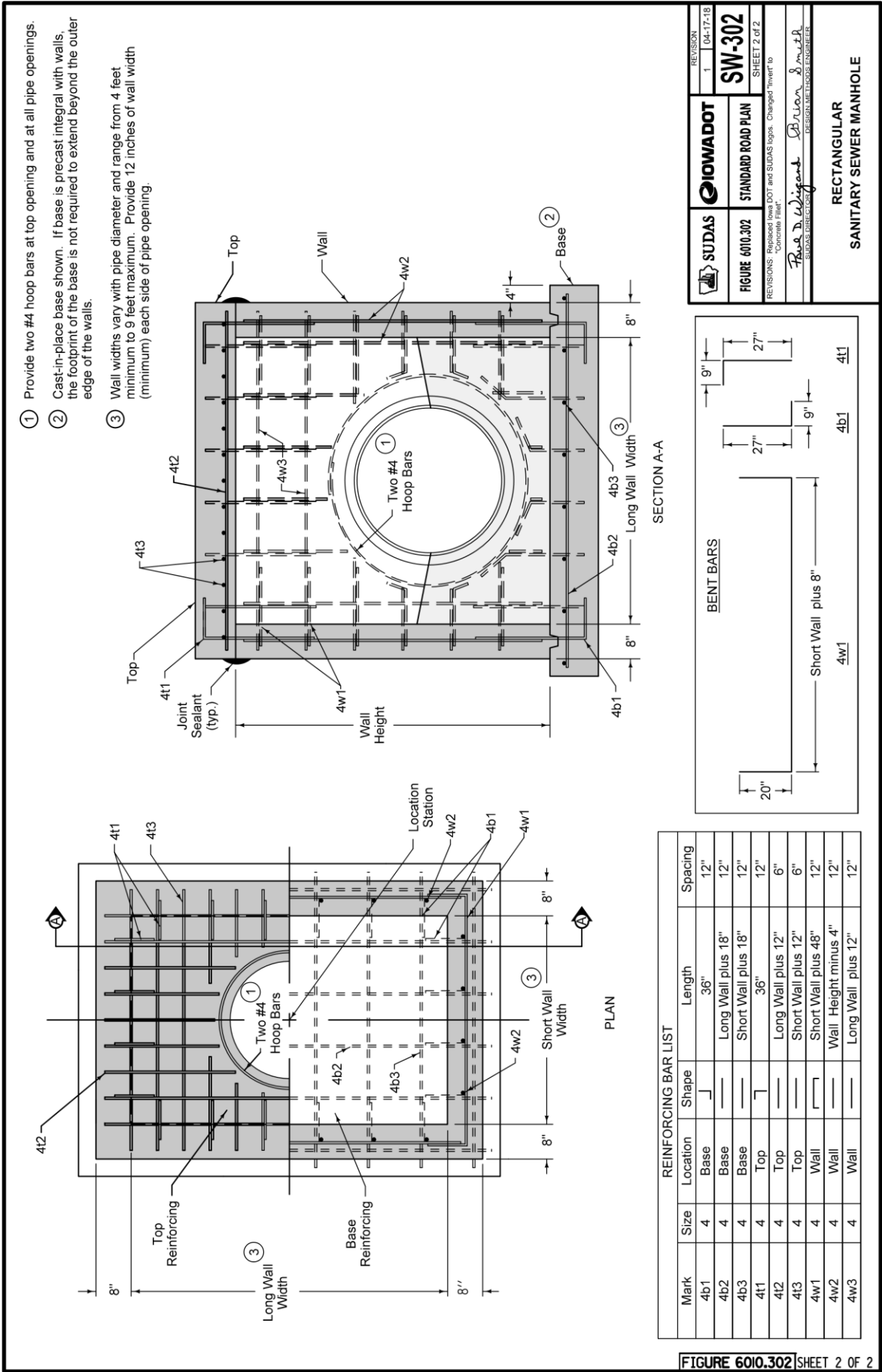
- ① Provide two #4 hoop bars at top opening and at all pipe openings.
- ② Cast-in-place base shown. If base is precast integral with walls, the footprint of the base is not required to extend beyond the outer edge of the walls.
- ③ Wall widths vary with pipe diameter and range from 4 feet minimum to 9 feet maximum. Provide 12 inches of wall width (minimum) each side of pipe opening.
- ④ 12 inch minimum wall height above all pipe openings.



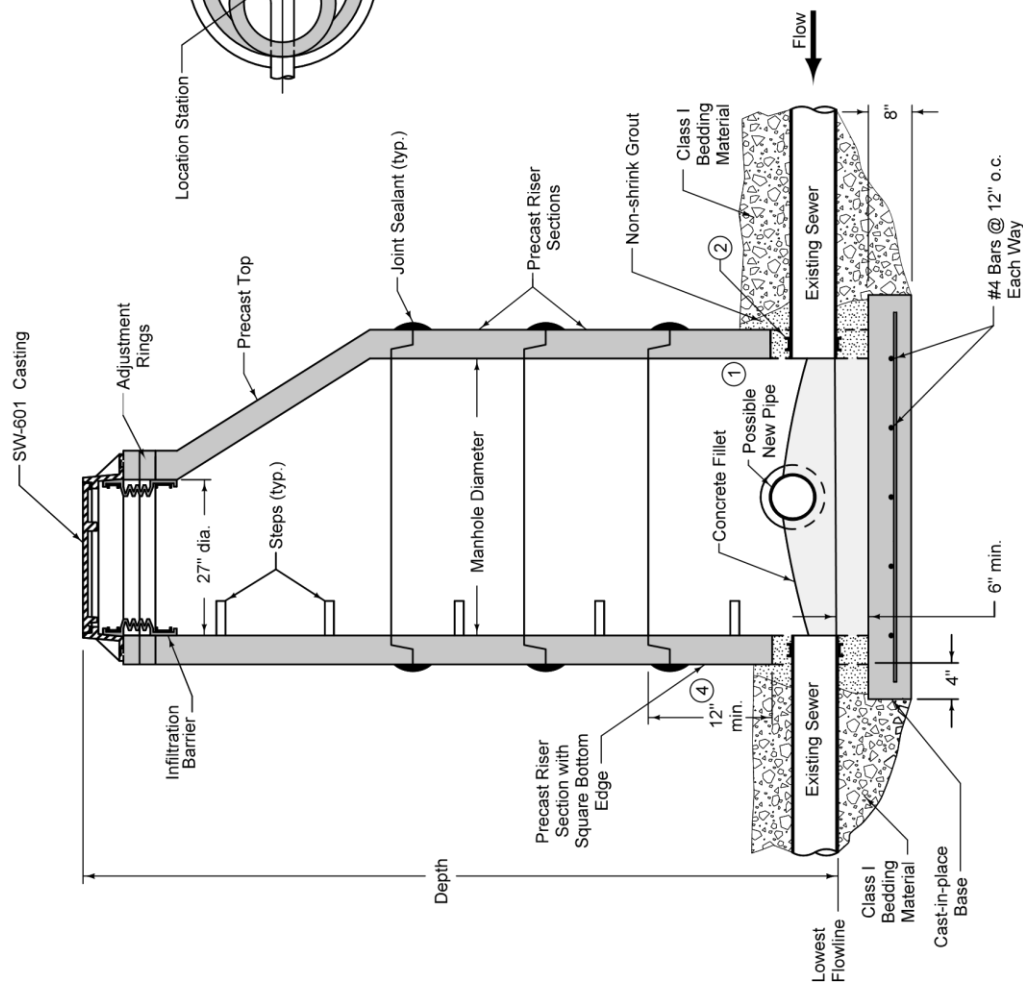
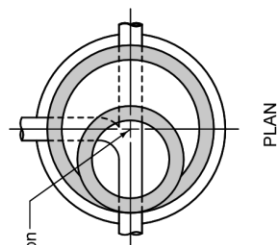
TYPICAL SECTION

	IOWA DOT	REVISION	1	04-17-18
		FIGURE 6010.302	STANDARD ROAD PLAN	SW-302
		SHEET 1 of 2		
		REVISIONS: Replaced Iowa DOT and SUDAS logos. Changed "Invert" to "Concrete Fillet".		
		Paul D. Wiegand DESIGN ENGINEER		
		RECTANGULAR SANITARY SEWER MANHOLE		

FIGURE 6010.302 SHEET 1 OF 2



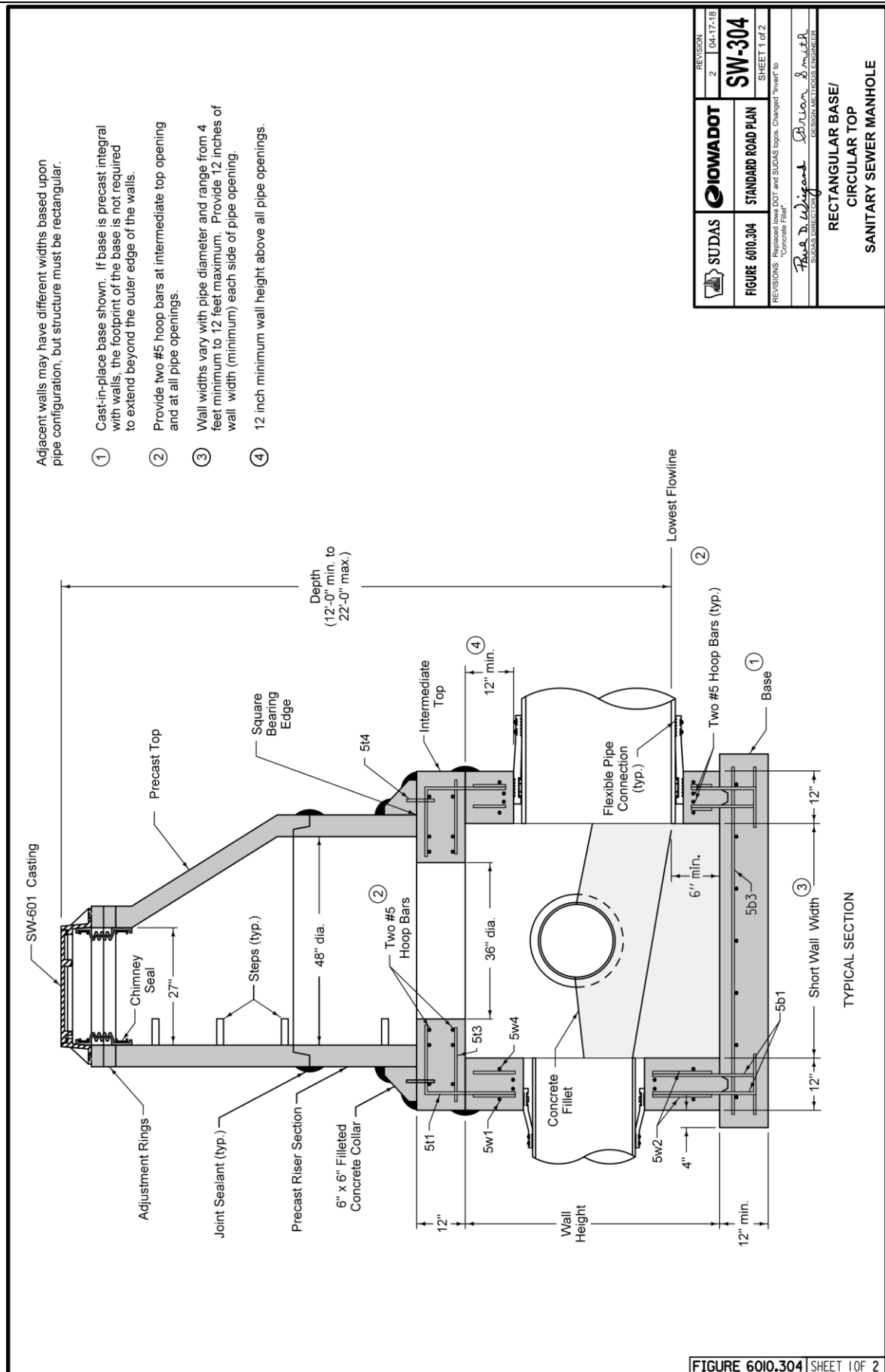
- ① For new pipe connections, provide cored opening with flexible pipe connector.
- ② For existing pipe connections, provide an arched opening with a diameter up to 6 inches larger than outside diameter of pipe. Install waterstop around existing pipe. Fill void between pipe and opening with non-shrink grout.
- ③ For additional configurations, maintain a minimum of 12 inches of concrete between vertical edges of pipe openings.
- ④ 12 inch minimum riser height above all pipe openings.

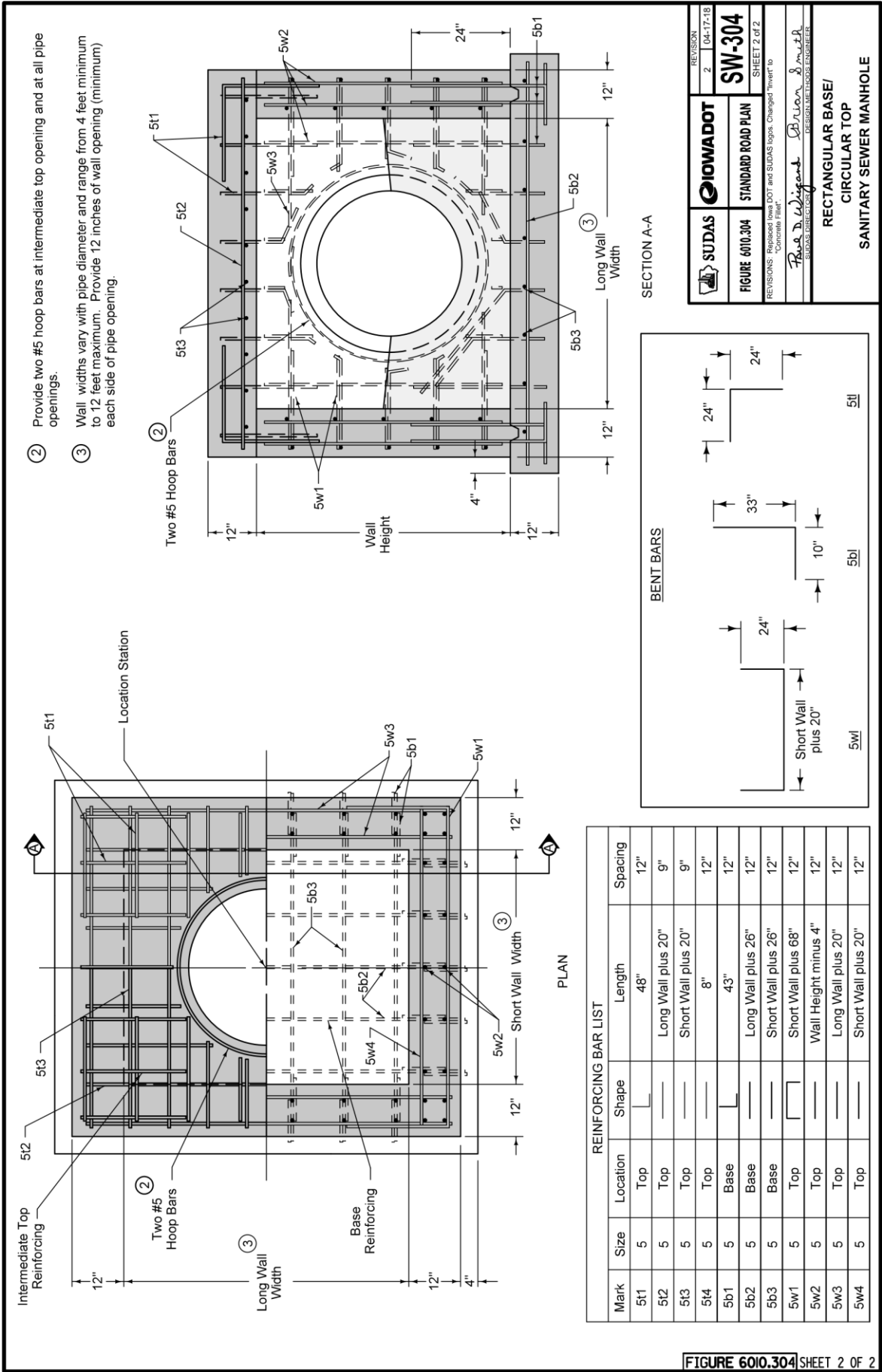


Manhole Diameter (inches)	Maximum Pipe Diameter (inches) for 2 Pipes	
	At 180° Separation	At 90° Separation
48	24	18
60	36	24
72	42	30
84	48	36
96	60	42

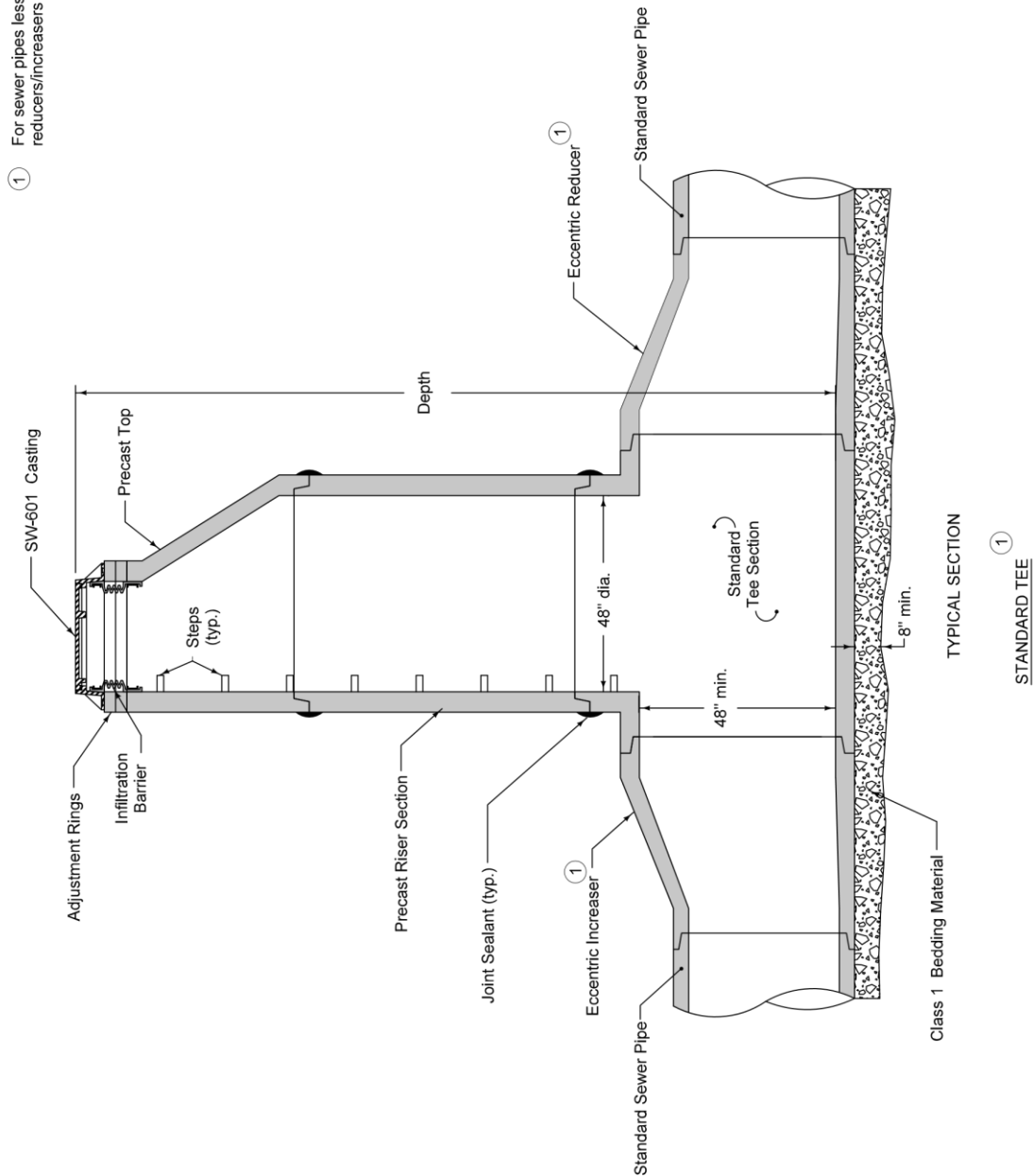
 SUDAS	 IOWADOT	REVISION	2	04-17-18
		SW-303		
FIGURE 6010.303				
STANDARD ROAD PLAN				
SHEET 1 of 1				
REVISIONS: Changed "Insert" to "Concrete Fillet".				
Paul D. Wiegand Brian Smith DESIGN ENGINEER				
SANITARY SEWER MANHOLE OVER EXISTING SEWER				

FIGURE 6010.303 | SHEET 1 OF 1



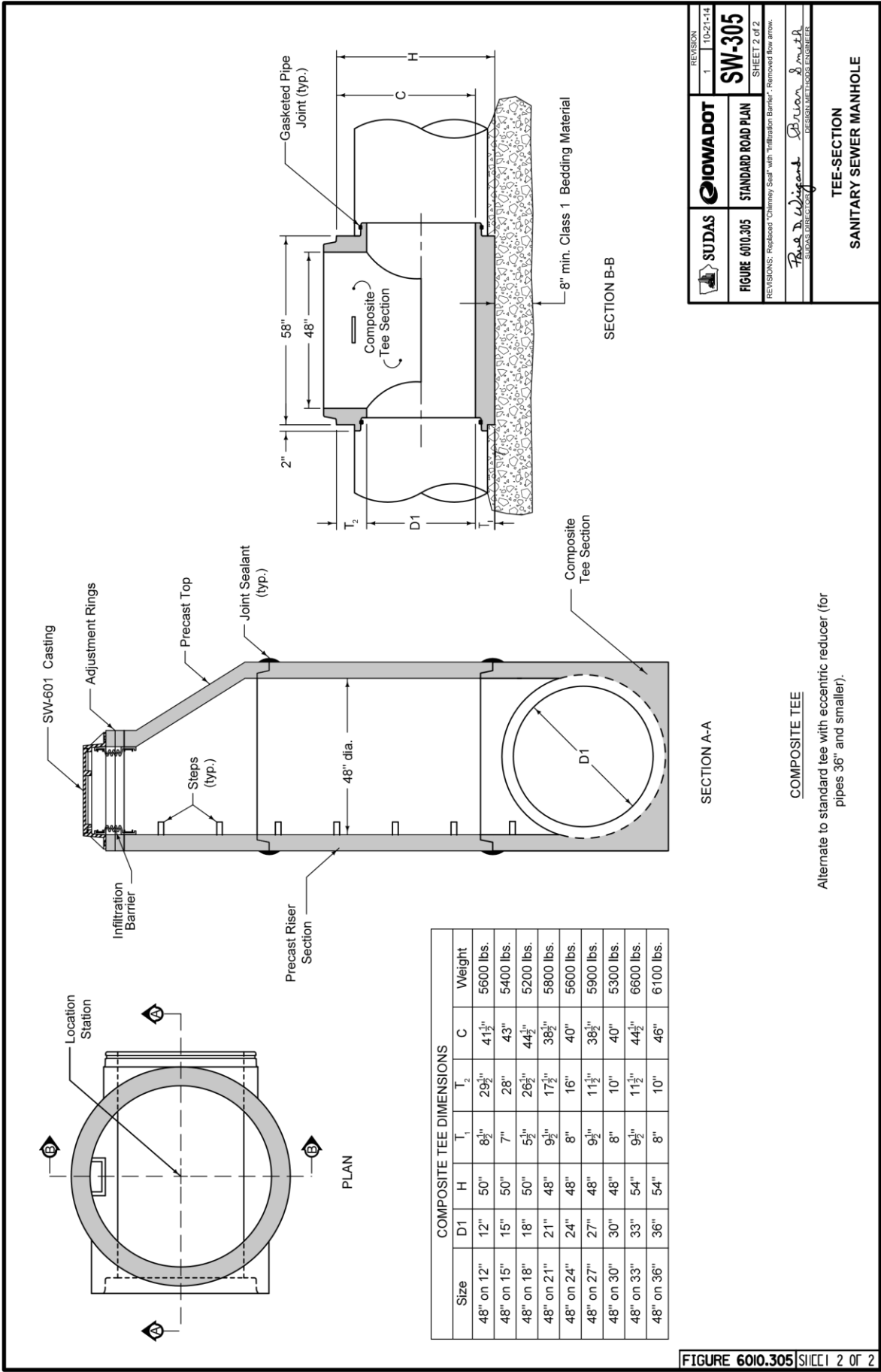


① For sewer pipes less than 48 inches in diameter, install eccentric reducers/increasers with a standard tee or utilize a composite tee.



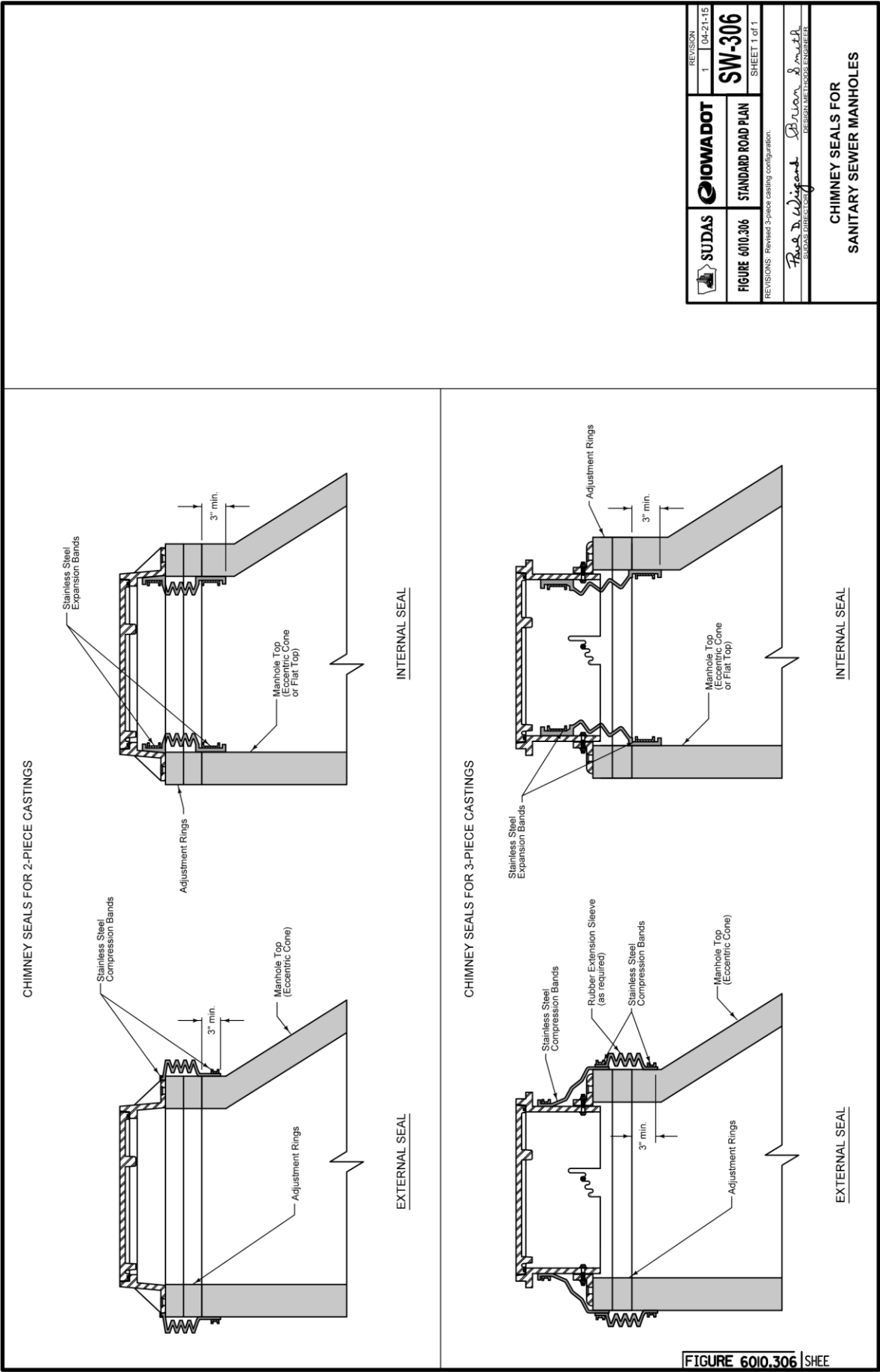
		REVISION 1 10-21-14
FIGURE 6010.305	STANDARD ROAD PLAN	SW-305
REVISIONS: Replaced "Culinary Seal" with "Infiltration Barrier". Removed flow arrow.		SHEET 1 of 2
Paul D. Wiegand, Brian Smith		DESIGNER
SUDAS PROJECT NO.		DESIGNER'S PROJECT NO.
TEE-SECTION		SANITARY SEWER MANHOLE

FIGURE 6010.305 SHEET 1 OF 2



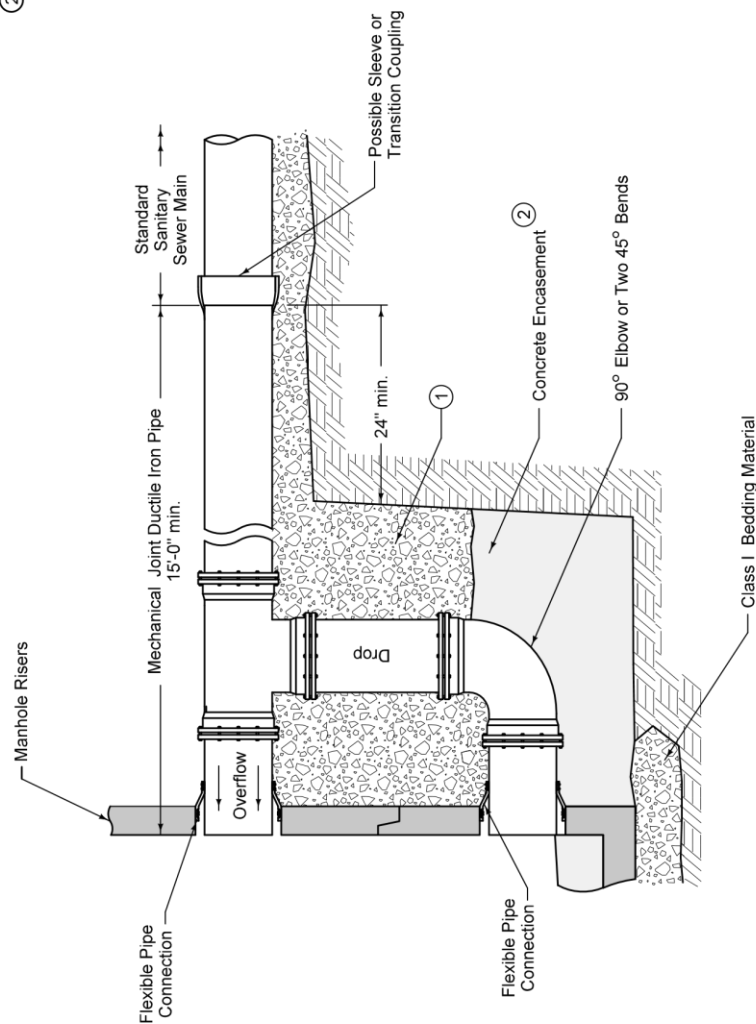
		REVISION	1	10-21-14
		FIGURE 6010.305	STANDARD ROAD PLAN	SHEET 2 of 2
REVISIONS: Replaced "Culinary Seal" with "Infiltration Barrier". Removed flow arrow.				
Paul D. Wiegand, Brian Smith SUDAS PROJECT ENGINEER				
TEE-SECTION SANITARY SEWER MANHOLE				

COMPOSITE TEE
Alternate to standard tee with eccentric reducer (for
pipes 36" and smaller).



Construct drop and overflow from ductile iron pipe of same diameter specified for sewer main. Provide mechanical joints for all ductile iron pipe and fittings.

- ① Place Class 1 bedding material, CLSM, flowable mortar, or concrete from top of elbow to bottom of sewer main.
- ② Encase elbow in concrete. 12 inches minimum on all sides.

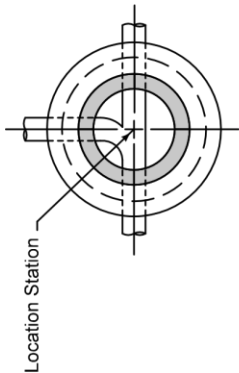


	SUDAS	IOWA DOT	REVISION	
			1	04-17-18
FIGURE 6010.307		SW-307		
STANDARD ROAD PLAN		SHEET 1 of 1		
REVISIONS: Replaced Iowa DOT and SUDAS logos.				
Paul D. Wiegand		Brian Smith		
SUDAS DIRECTOR		DESIGN & TECHNICAL SERVICES		
DROP CONNECTION FOR SANITARY SEWER MANHOLE				

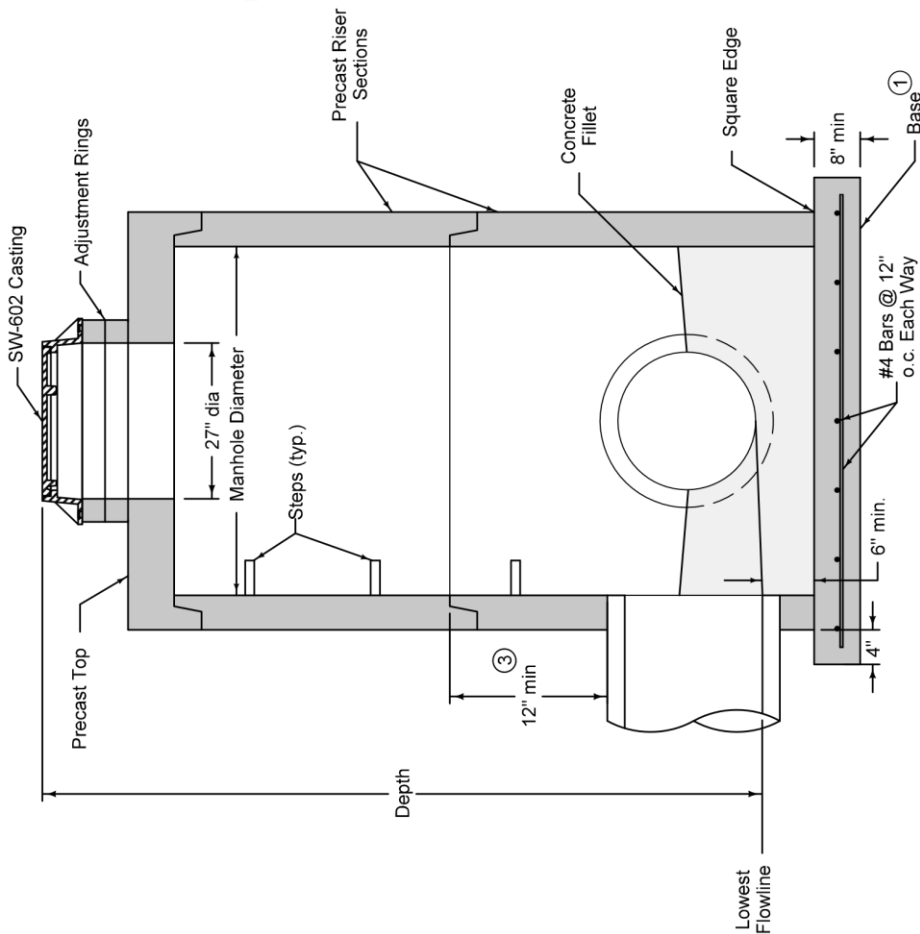
FIGURE 6010.307 SHEET

- 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 ^② (inches) for 2 Pipes	
	At 180° Separation	At 90° Separation
48	24	18
60	36	24
72	42	30
84	48	36
96	60	42



PLAN



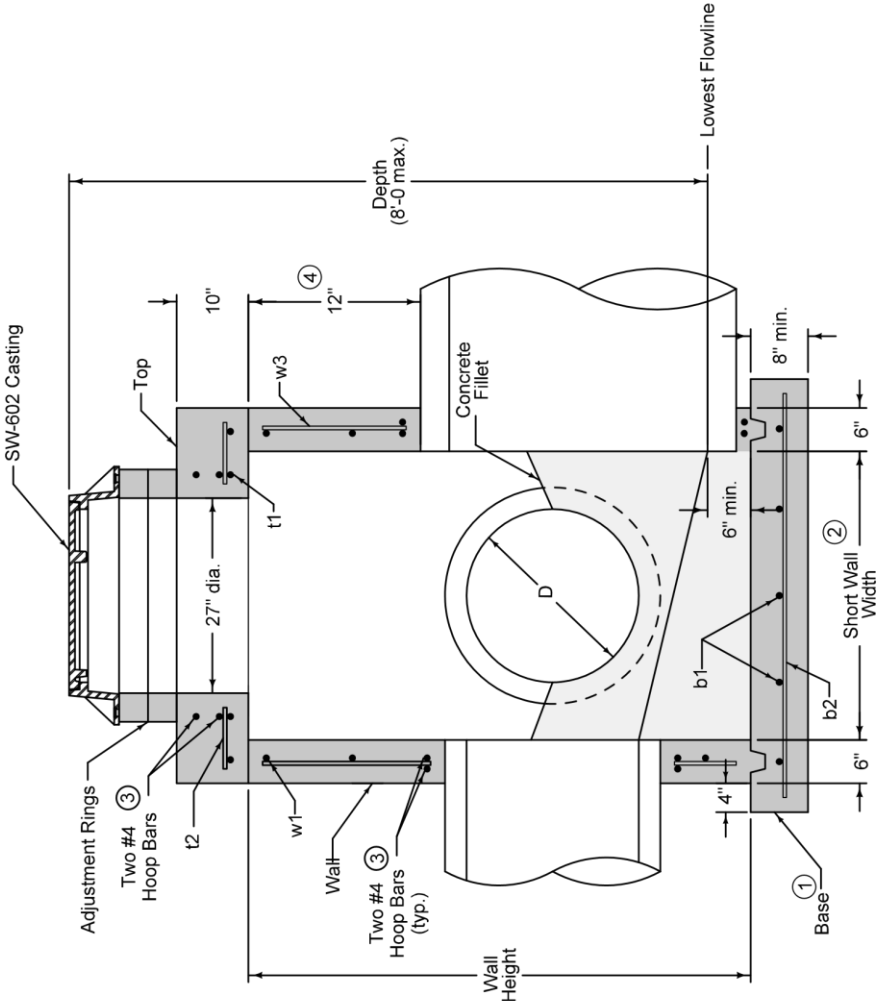
TYPICAL SECTION

 SUDAS	 IOWA DOT	REVISION 1 04-17-18
	FIGURE 6010.401	STANDARD ROAD PLAN
REVISIONS: Check for correct callout to Concrete Filler, Updated Inflow and SUDAS and DOT logos.		SHEET 1 of 1
Prepared by: <i>Brian Smith</i> DESIGN ENGINEER		
CIRCULAR STORM SEWER MANHOLE		

FIGURE 6010.401 SHEET

Adjacent walls may have different widths based upon pipe configuration, but structure must be rectangular.

- ① 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.
- ② Wall widths vary with pipe diameter and range from 40 inches minimum to 77 inches maximum. Provide 6 inches of wall width (minimum) each side of pipe opening.
- ③ Provide two #4 hoop bars at top opening and at all pipe openings.
- ④ 12 inch minimum wall height above all pipes.



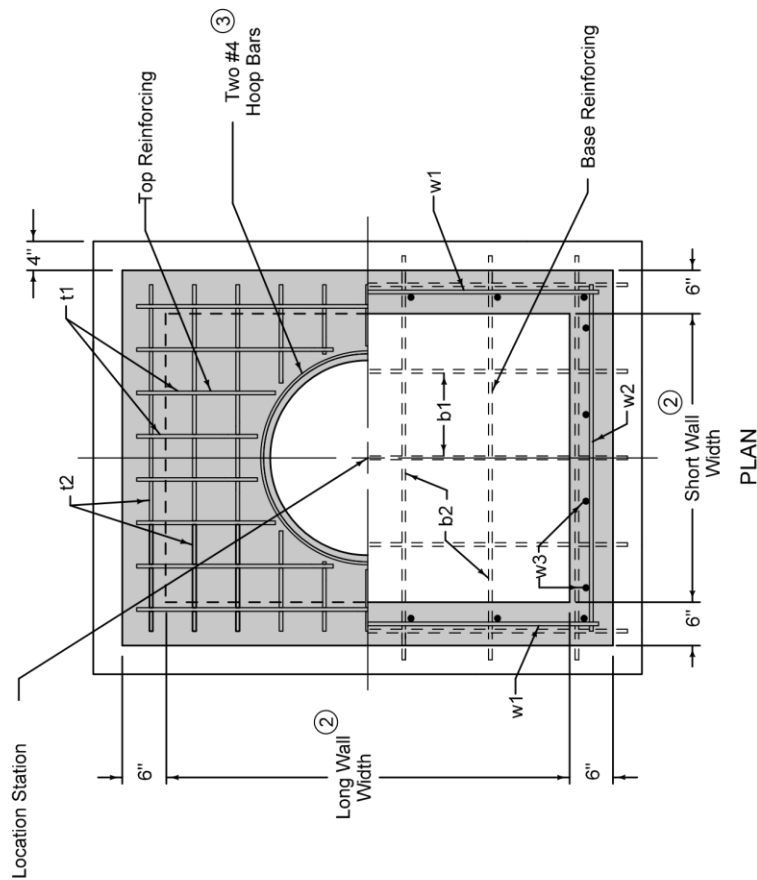
TYPICAL SECTION

 SUDAS	IOWA DOT	REVISION
		1 04-17-18
FIGURE 6010.402	STANDARD ROAD PLAN	SW-402
		SHEET 1 of 2
REVISIONS: Changed "short wall" callout to "Concrete Fillet". Updated line work and Dot and Surface Logo.		
Paul D. Dugand Brian Smith		
SUDAS DIRECTOR DESIGNER		
RECTANGULAR STORM SEWER MANHOLE		

FIGURE 6010.402

F

- ② Wall widths vary with pipe diameter and range from 40" minimum to 77" maximum. Provide 6" of wall width (minimum) each side of pipe opening.
- ③ Provide two #4 hoop bars at top opening and at all pipe openings.

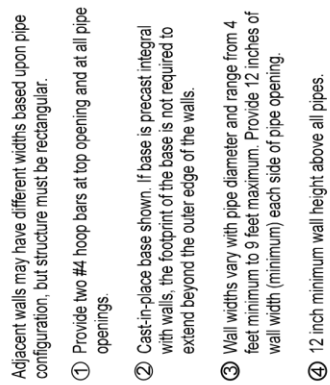


REINFORCING BAR LIST				
Mark	Size	Location	Shape	Length
t1	See Table	Top	—	Long Wall plus 8"
t2	See Table	Top	—	Short Wall plus 8"
b1	See Table	Base	—	Long Wall plus 14"
b2	See Table	Base	—	Short Wall plus 14"
w1	See Table	Walls	—	Long Wall plus 8"
w2	See Table	Walls	—	Short Wall plus 8"
w3	See Table	Walls	—	Wall Height minus 4"

Diameter of Largest Pipe, D	Minimum Bar Size
48" or 54"	6
33" to 42"	5
30" or smaller	4

	SUDAS	FIGURE 6010.402	IOWA DOT	REVISION	1	04-17-18
				SW-402		
STANDARD ROAD PLAN			SHEET 2 of 2			
REVISIONS: Changed "Invert" callout to "Concrete Pier". Updated line work and Dot and Soudas Logo.						
<i>David Dugan and Brian Smith</i>						
SUDAS DESIGNER						
DESIGN BY IOWA DOT ENGINEER						
RECTANGULAR STORM SEWER MANHOLE						

FIGURE 6010.402 SHEET

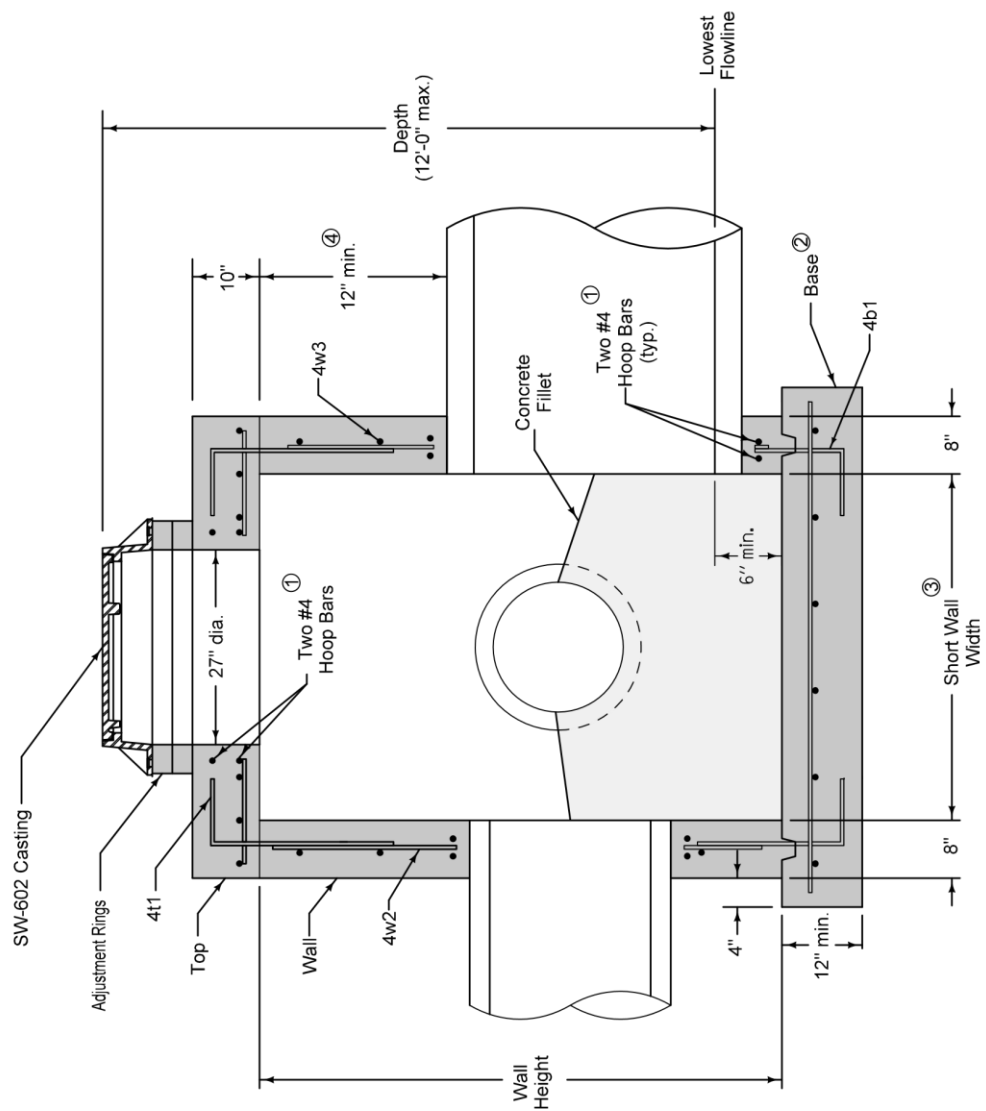


- ① Provide two #4 hoop bars at top opening and at all pipe openings.
- ② Cast-in-place base shown. If base is precast integral with walls, the footprint of the base is not required to extend beyond the outer edge of the walls.
- ③ Wall widths vary with pipe diameter and range from 4 feet minimum to 9 feet maximum. Provide 12 inches of wall width (minimum) each side of pipe opening.
- ④ 12 inch minimum wall height above all pipes.

- ② 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.

- ③ Wall widths vary with pipe diameter and range from 4 feet minimum to 9 feet maximum. Provide 12 inches of wall width (minimum) each side of pipe opening.

- ④ 12 inch minimum wall height above all pipes.



Adjustment Rings

(12'-0" max.)

①
Two #4
-Hoop Bars

Lowest
Flowline

②

-4b1

•

•

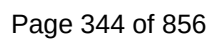
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0

TYPICAL SECTION

FIGURE 6010.403

	SUDAS	IOWA DOT	REVISION
			1 104-718
FIGURE 4010-403		SHEET 1 of 2	
REVISIONS: <i>Concrete gutter</i> to "Concrete Finish" Updated line work and DOT and SUDAS logo			
<i>Paul D. Wiegand</i> SUDAS PROJECT ARCHITECT		DESIGN BY IADORS ENGINEERS	



- Adjacent walls may have different widths based upon pipe configuration, but structure must be rectangular.
- ① 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.
 - ② Provide two #5 hoop bars at intermediate top opening and at all pipe openings.
 - ③ Wall widths vary with pipe diameter and range from 4 feet minimum to 12 feet maximum. Provide 12 inches of wall width (minimum) each side of pipe opening.
 - ④ 12 inch minimum wall height above all pipes.

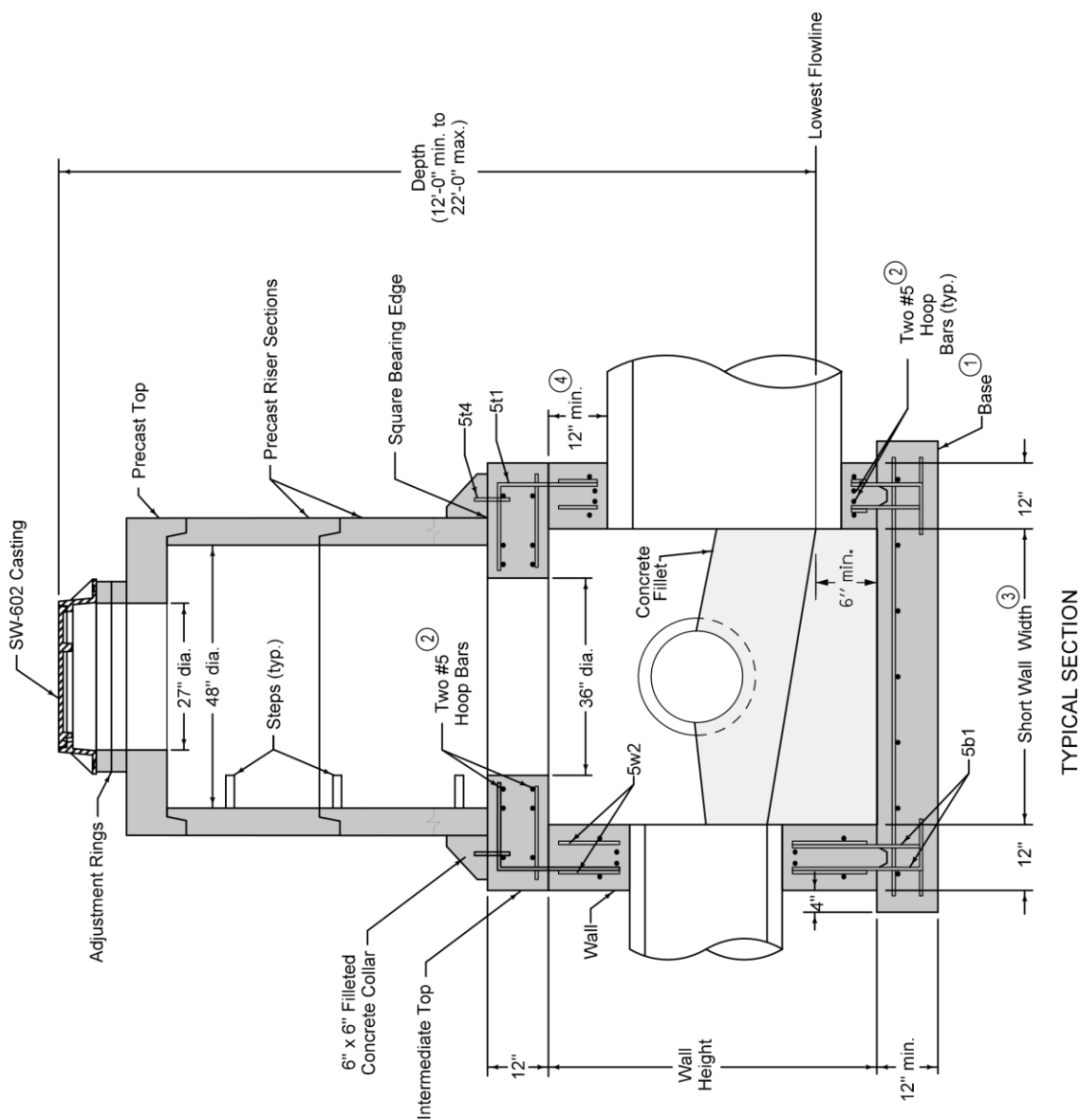
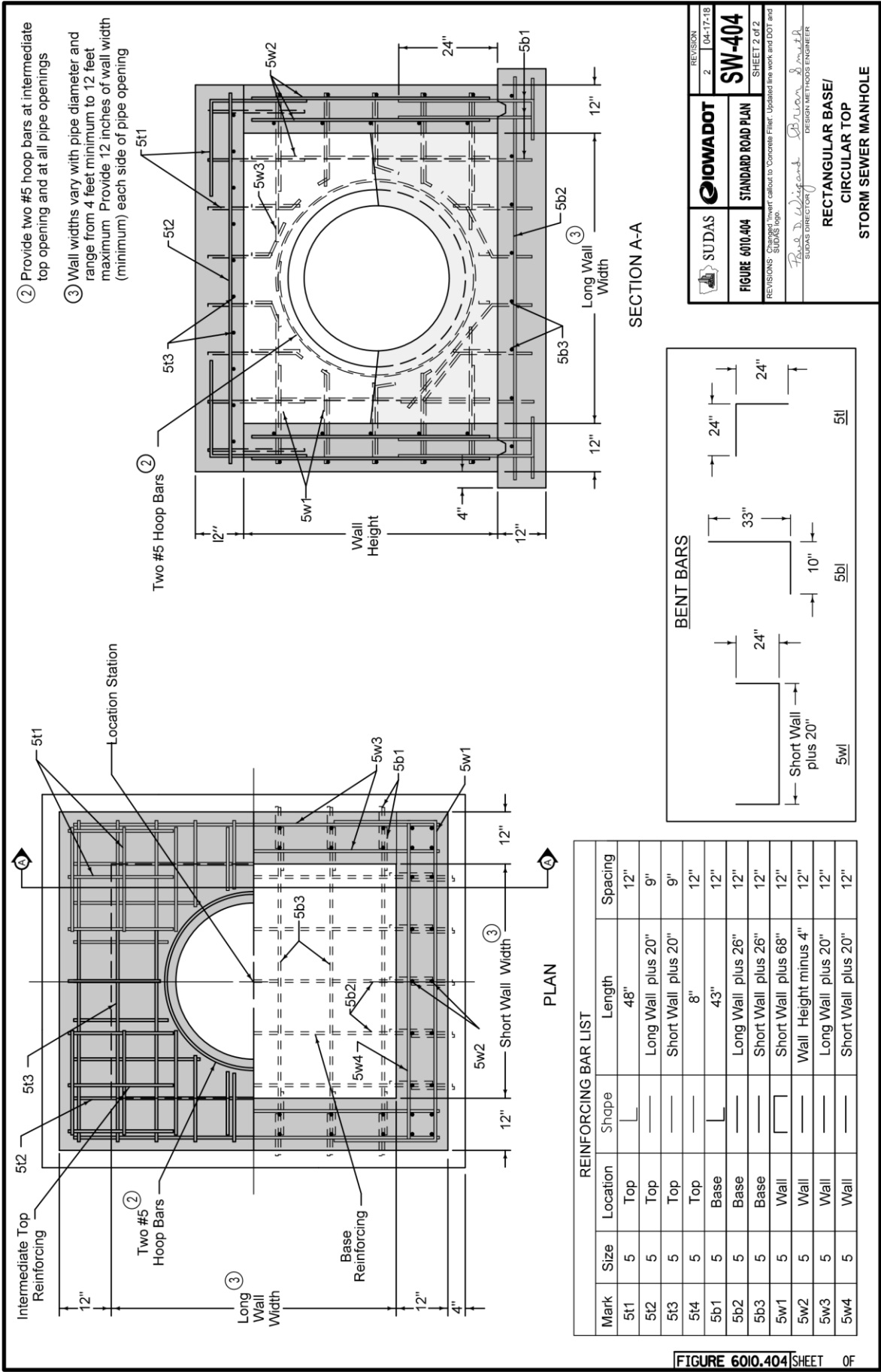
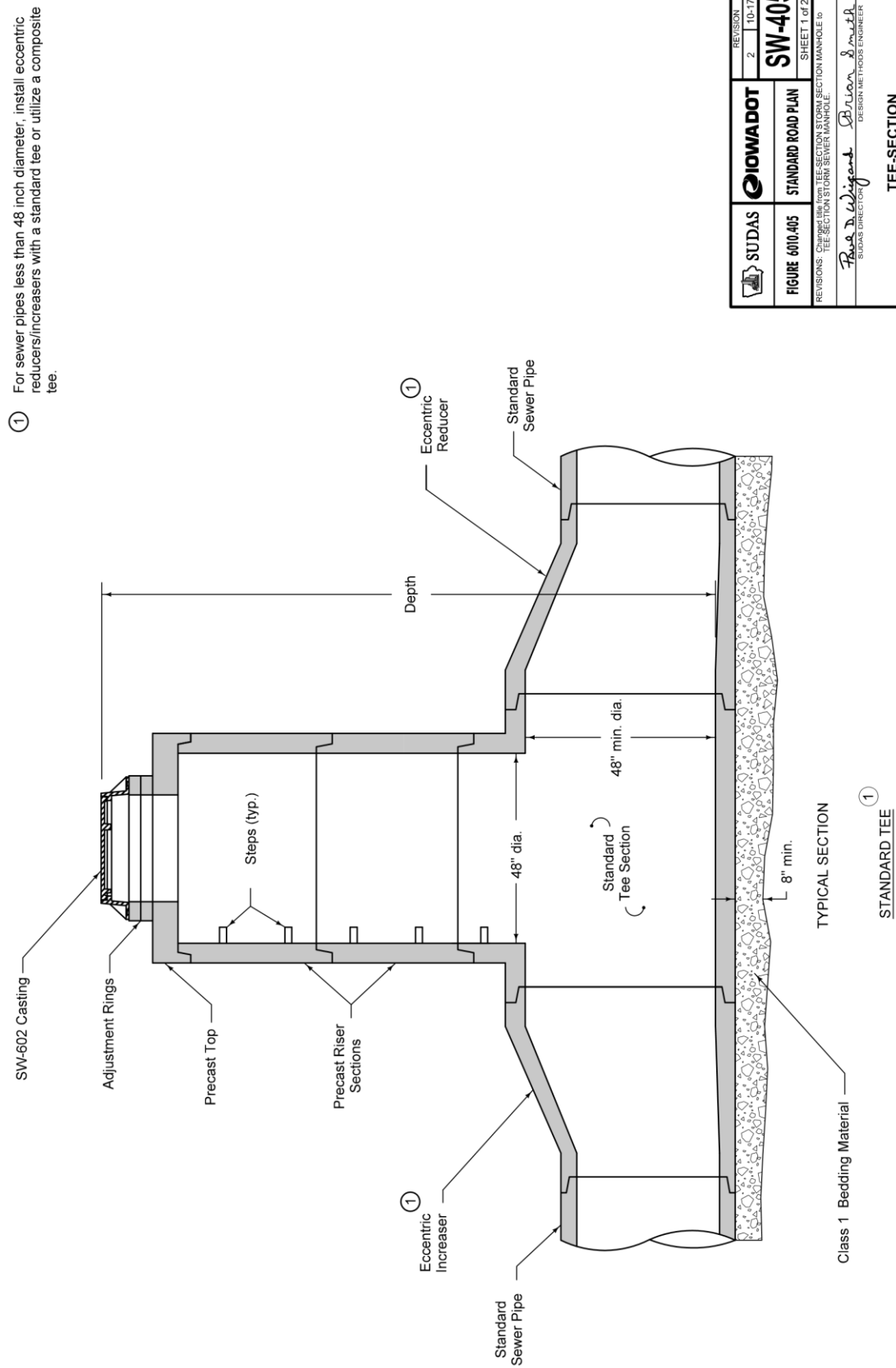


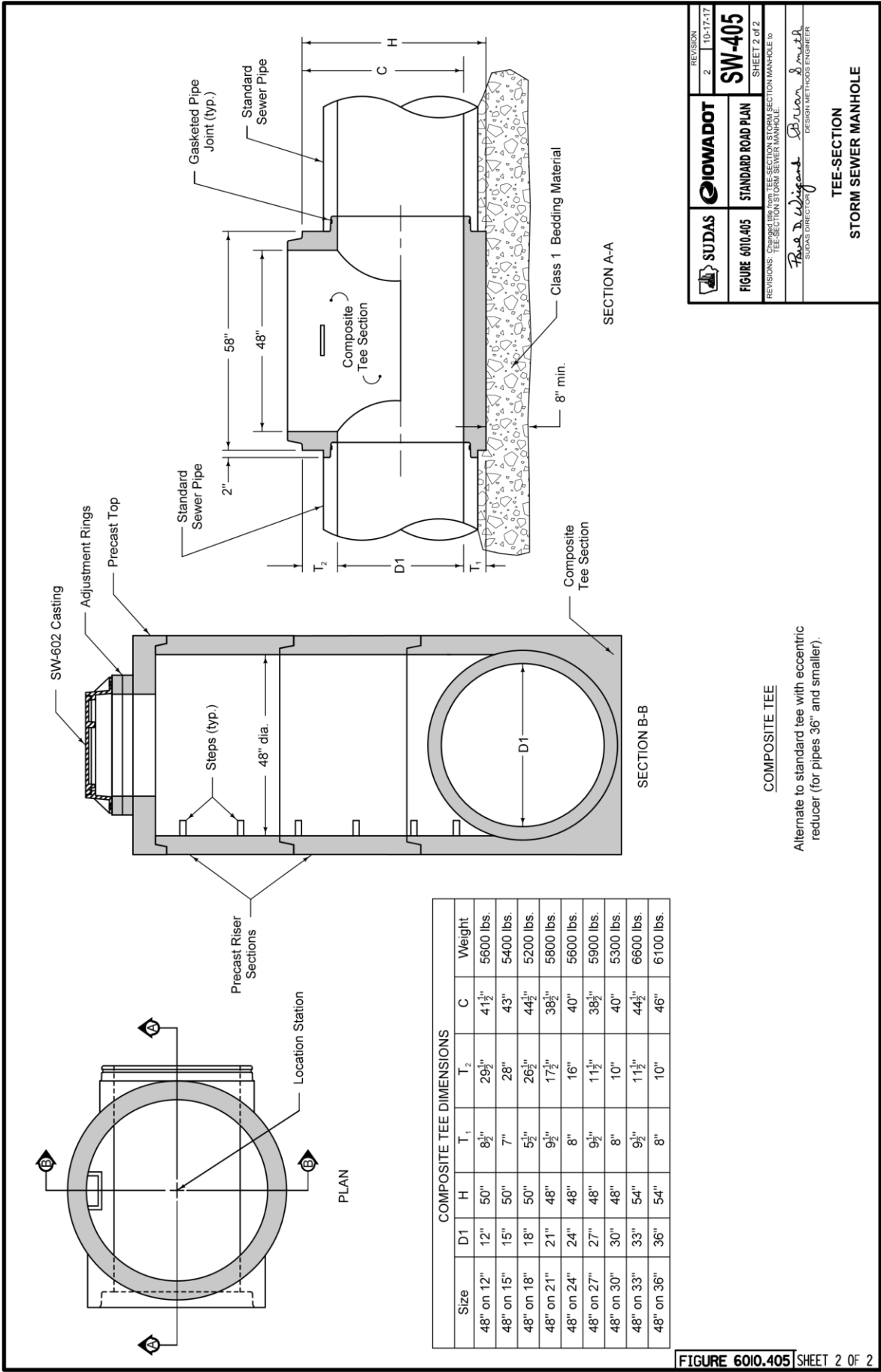
FIGURE 6010.404

SUDAS	IOWA DOT	REVISION	04-17-18
		2	
FIGURE 6010.404	STANDARD ROAD PLAN	SW-404	
REVISIONS: Change sheet callout to Concrete Fillet. Updated line work and DOT and SUDAS logos.		SHEET 1 of 2	
Paul D. Wiegand		Brian Smith	
SUDAS DIRECTOR		DESIGN METHODS ENGINEER	
RECTANGULAR BASE/		CIRCULAR TOP	
STORM SEWER MANHOLE			



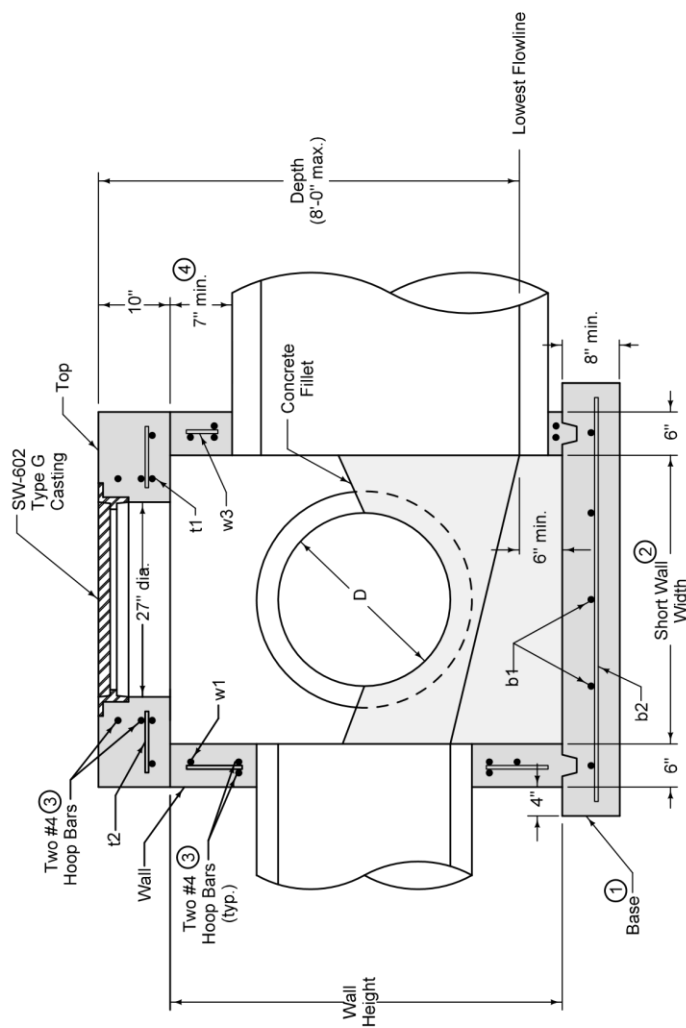


	SUDAS	FIGURE 400U.405	STANDARD ROAD PLAN	IOWADOT	REVISION	10-17-17
					2	
FIGURE 400U.405				SW-405	SHEET 1 of 2	
REVISIONS: <i>Original</i> SEE THE SECTION KEYWAY SECTION MANHOLE TO THE SECTION STORM SEWER MANHOLE						
TEE-SECTION STORM SEWER MANHOLE				DESIGNER: <i>David A. Smith</i> SUDAS DIRECTOR		



Adjacent walls may have different widths based upon pipe configuration, but structure must be rectangular.

- ① 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.
- ② Wall widths vary with pipe diameter and range from 40 inches minimum to 77 inches maximum. Provide 6 inches of wall width (minimum) each side of pipe opening.
- ③ Provide two #4 hoop bars at top opening and at all pipe openings.
- ④ 7 inch minimum wall height above all pipes.

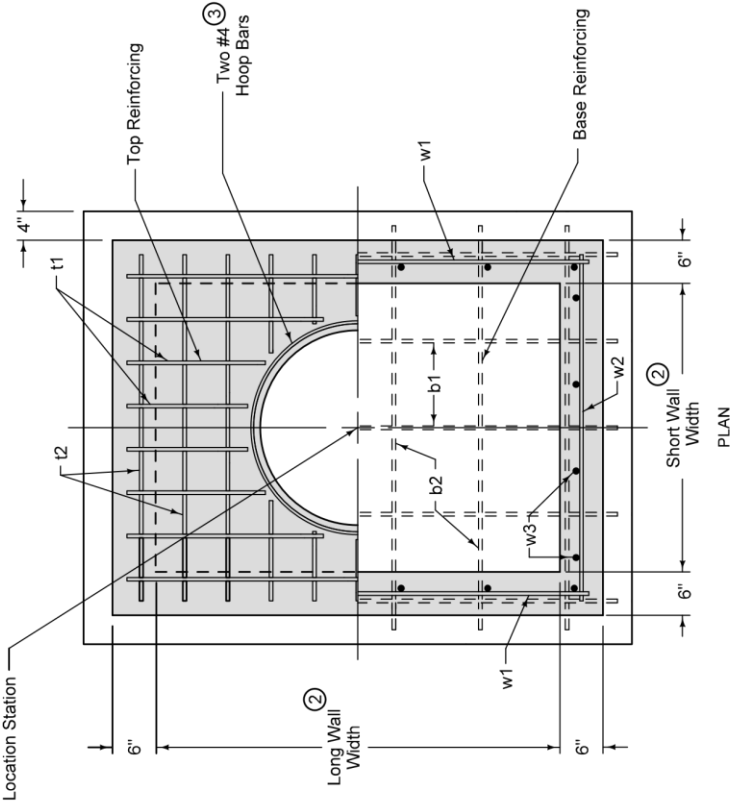


TYPICAL SECTION

FIGURE 6010.406 SHEET 1

	SUDAS		REVISION	
			1	04-17-18
FIGURE 6010.406	STANDARD ROAD PLAN	SW-406	SHEET 1 of 2	
			REVISIONS: Changed "invert" callout to "Concrete Fillet."	
			Paul D. Wiegand Brian Smith SUDAS DIRECTOR DESIGN METHODS ENGINEER	
			SHALLOW RECTANGULAR STORM SEWER MANHOLE	

- ② Wall widths vary with pipe diameter and range from 40 inches minimum to 77 inches maximum. Provide 6 inches of wall width (minimum) each side of pipe opening.
- ③ Provide two #4 hoop bars at top opening and at all pipe openings.

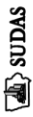


REINFORCING BAR LIST

Mark	Size	Location	Shape	Length	Spacing
t1	See Table	Top	—	Long Wall plus 8"	6"
t2	See Table	Top	—	Short Wall plus 8"	6"
b1	See Table	Base	—	Long Wall plus 14"	12"
b2	See Table	Base	—	Short Wall plus 14"	12"
w1	See Table	Walls	—	Long Wall plus 8"	12"
w2	See Table	Walls	—	Short Wall plus 8"	12"
w3	See Table	Walls	—	Wall Height minus 4"	12"

*Place a minimum of one w1 bar above each pipe opening

Diameter of Largest Pipe, D	Minimum Bar Size
48" or 54"	6
33" to 42"	5
30" or smaller	4

SUDAS

IOWA DOT

REVISION
1 04-17-18

FIGURE 6010.406

STANDARD ROAD PLAN

SW-406

REVISIONS: Changed "invert callout to Concrete Floor."

Russ D. Wiegand
SUDAS DIRECTOR
DESIGN METHODS ENGINEER

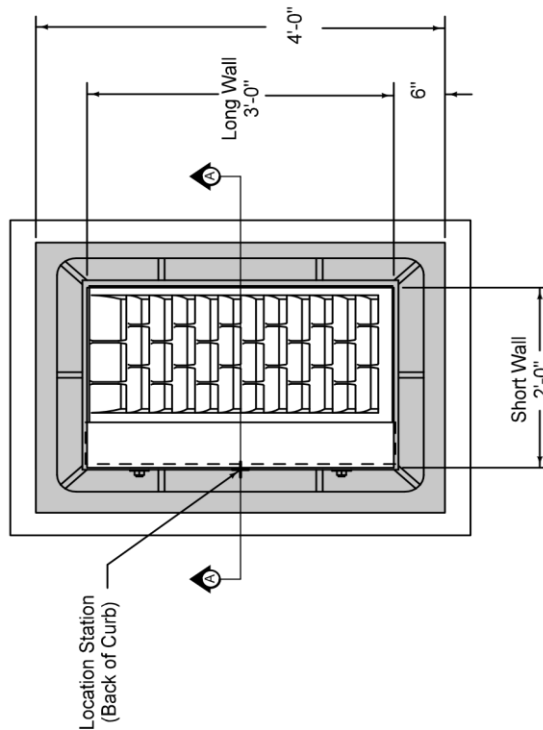
SHALLOW RECTANGULAR
STORM SEWER MANHOLE

SHEET 2 of 2

FIGURE 6010.406 SHEET 2 OF 2

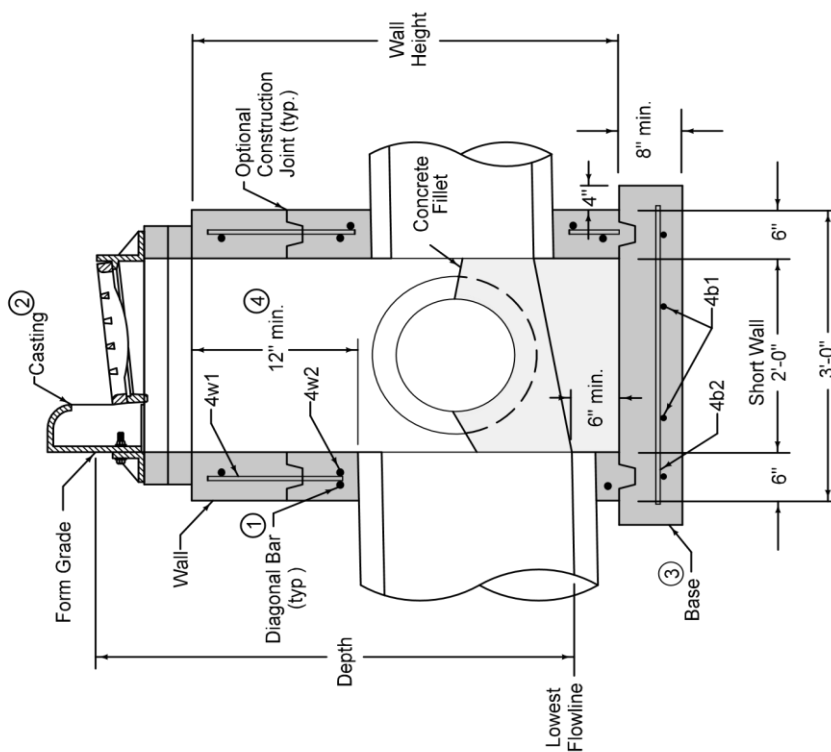
Refer to SW 514 for boxout details

- 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

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



SECTION A-A

REINFORCING BAR LIST				
Mark	Size	Location	Shape	Length
4w1	4	Walls	—	Wall Height minus 4"
4w2	4	Long Walls	—	3'-8"
4w3	4	Short Walls	—	2'-8"
4b1	4	Base	—	4'-2"
4b2	4	Base	—	3'-2"
		Count	Spacing	
		14	12"	
		Varies	12"	
		Varies	12"	
		4	10"	
		5	10"	

FIGURE 6010.50 | SHEET 1 OF 1

FIGURE 6010.501

STANDARD ROAD PLAN

SW-501

SHEET 1 of 1

REVISIONS: Changed Invert callout to 'Concrete Fillet'. Updated DOT and SUDAS logos.

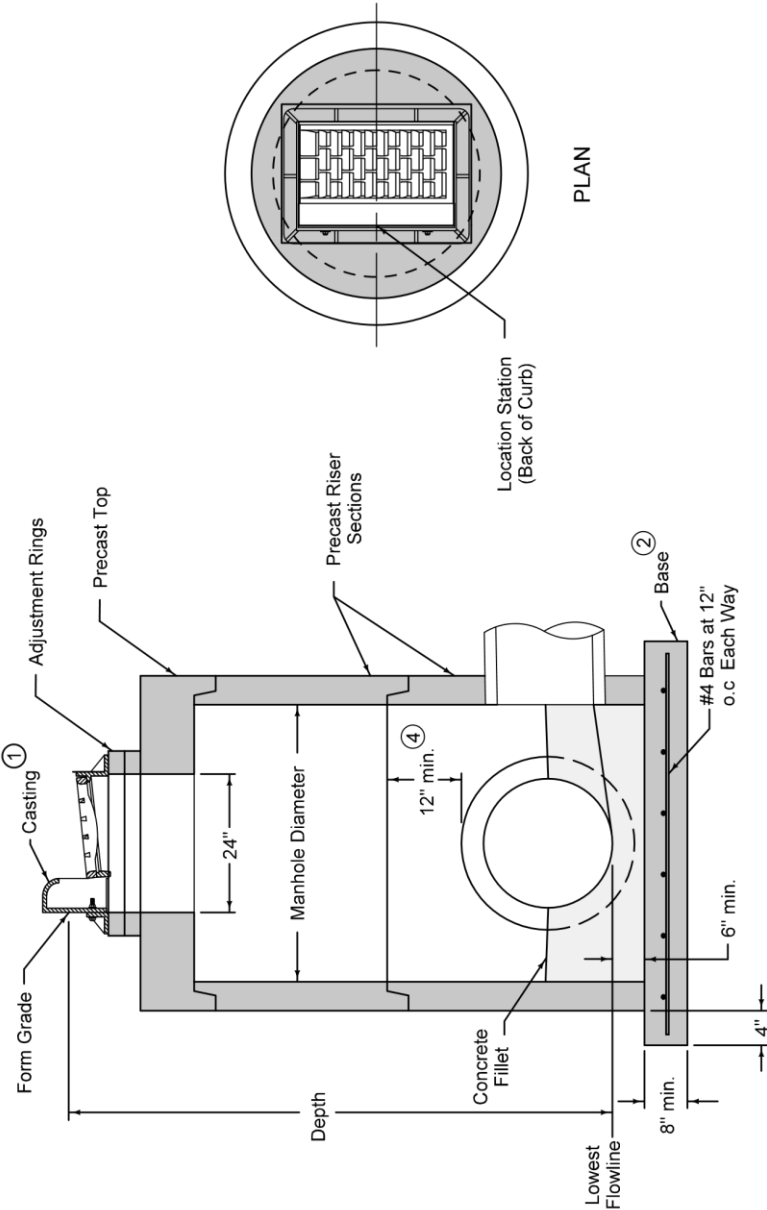
Reed Wiggins
SUDAS DIRECTOR
DESIGN METHOD ENGINEER

SINGLE GRATE INTAKE

Refer to SW 514 for boxout details

- ① SW-503 Type R unless Type Q is specified in the contract documents
- ② Cast-in-place base shown. Base may be square. If base is precast integral with walls, the footprint of the base is not required to extend beyond the outer edge of the walls
- ③ For additional configurations, maintain a minimum of 12 inches of concrete between vertical edges of pipe openings.
- ④ 12 inch minimum riser height above all pipes.

Manhole Diameter (inches)	Maximum Pipe Diameter ③ (inches) for 2 Pipes	
	at 180° Separation	at 90° Separation
48	24	18
60	36	24
72	42	30
84	48	36
96	60	42



		REVISION 2 04-17-18
	FIGURE 6010.502	STANDARD ROAD PLAN
SW-502		SHEET 1 of 1
REVISIONS: Change in callout to Concrete Fillet. Updated linework and Iowa DOT and SUDAS logos.		
Paul D. Dugand Brian Smith SUDAS PROJECT ENGINEER		
CIRCULAR SINGLE GRATE INTAKE		

FIGURE 6010.502 SHEET 1 OF 1

Refer to SW-514 for boxout details.

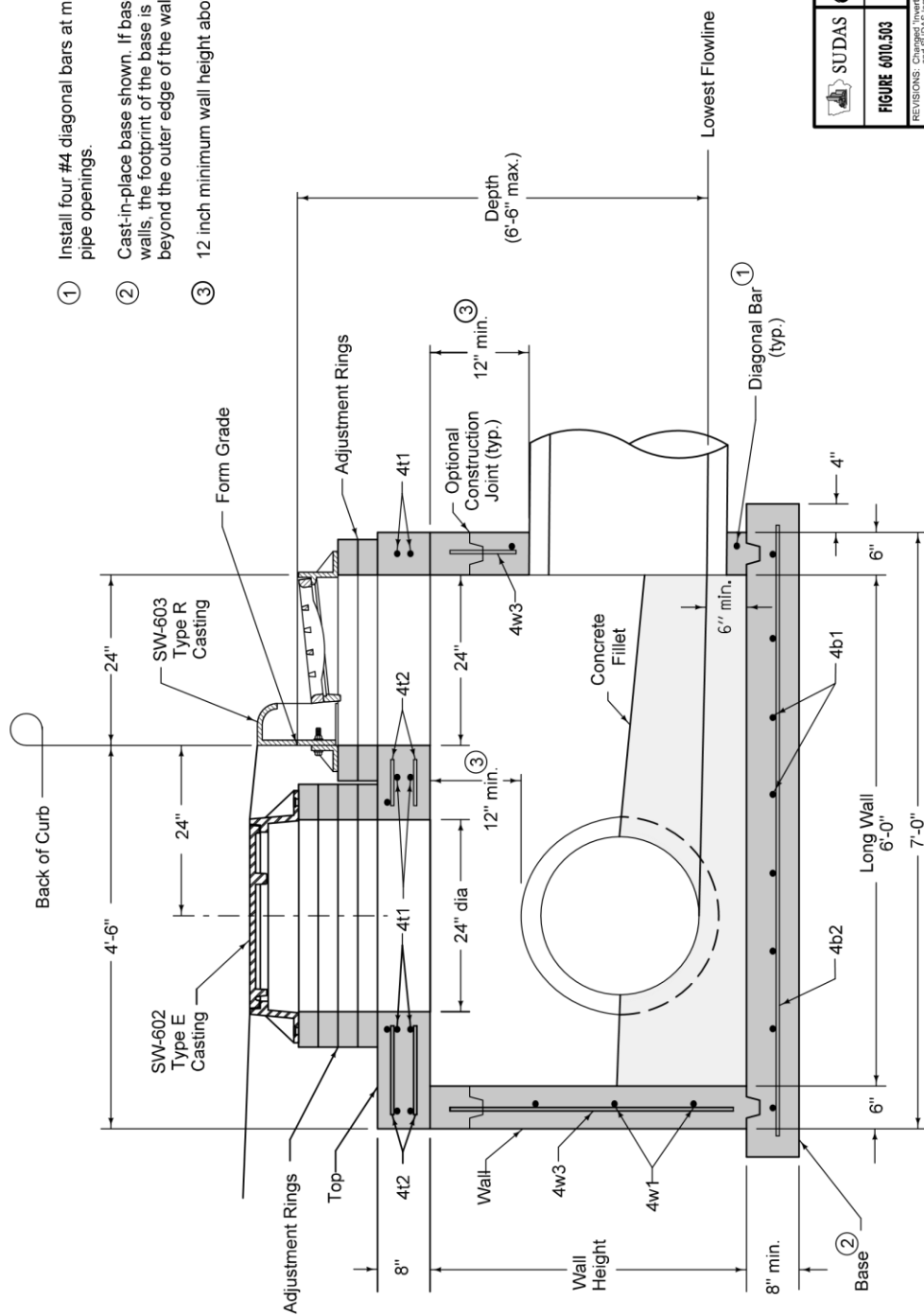
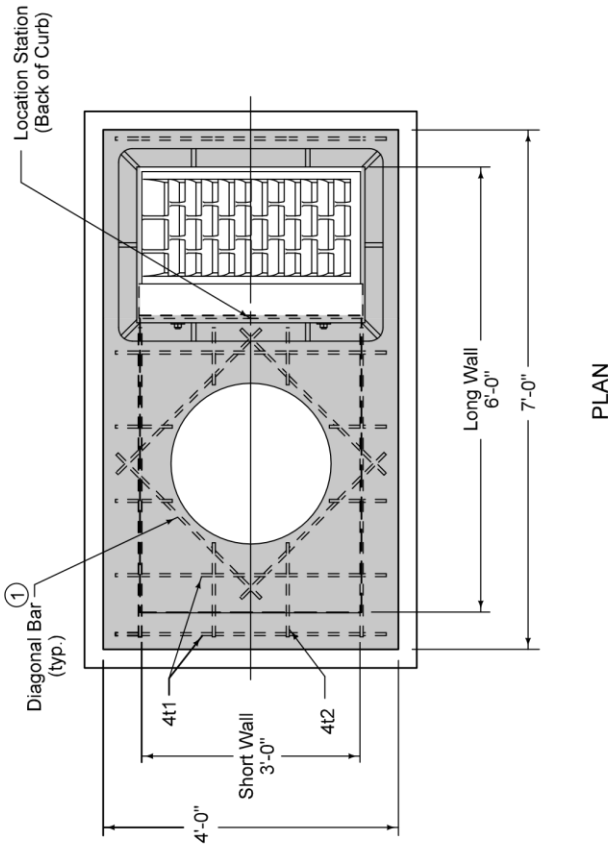


FIGURE 6010.503

 SUDAS		REVISION	
		2	04-17-18
FIGURE 6010.503		SW-503	
STANDARD ROAD PLAN		SHEET 1 of 2	
REVISIONS: Change 1: Callout to Concrete Fillet. Updated Break and Low DOT and SUDAS logo.			
David D. Dugand		Brian Smith	
SUDAS DIRECTOR		DESIGNER	
SINGLE GRATE INTAKE WITH MANHOLE			

- ① Install four #4 diagonal bars at manhole opening and at all pipe openings.



REINFORCING BAR LIST					
Mark	Size	Location	Shape	Count	Length Spacing
4t1	4	Top	—	12	3'-8" 12"
4t2	4	Top	—	8	4'-2" 12"
4b1	4	Base	—	7	4'-2" 13"
4b2	4	Base	—	5	7'-2" 10"
4w1	4	Short Walls	—	Varies	3'-8" 12"
4w2	4	Long Walls	—	Varies	6'-8" 12"
4w3	4	Walls	—	18	Wall Height minus 4" 13"

MAXIMUM PIPE DIAMETERS		
Pipe Location	Precast Structure	Cast-in-place Structure
Short Wall	24"	30"
Long Wall	30"	36"

		REVISION 2 04-17-18
FIGURE 6010.503	STANDARD ROAD PLAN	SW-503
REVISIONS: Changed to callout to Concrete Pier. Updated Inroad and Iowa DOT SUDAS logo.		SHEET 2 of 2
Paul D. Dugand Brian Smith SUDAS DIRECTOR IOWA DOT DESIGNER		
SINGLE GRATE INTAKE WITH MANHOLE		

FIGURE 6010.503 SHEET

Refer to SW-514 for boxout details.

- ① Install four #4 diagonal bars at manhole opening and at all pipe openings.
- ② 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.
- ③ 12 inch minimum wall height above all pipes.
- ④ Slope of 1.5% or as specified in the contract documents.

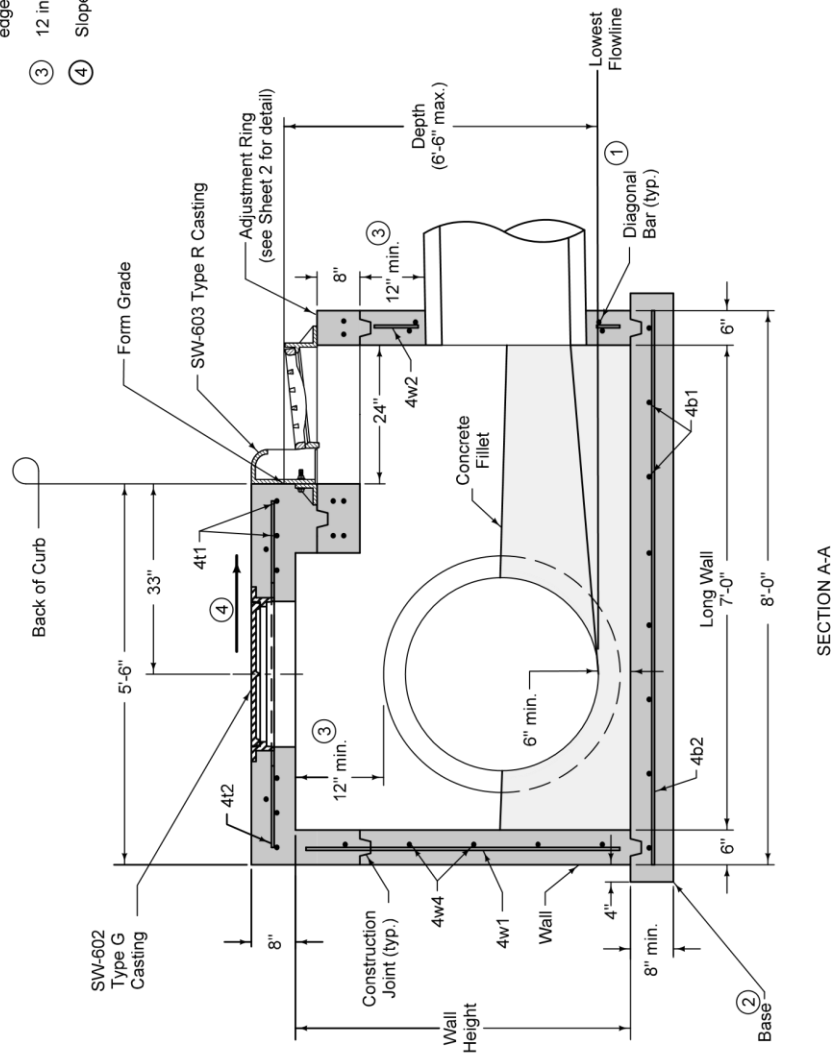
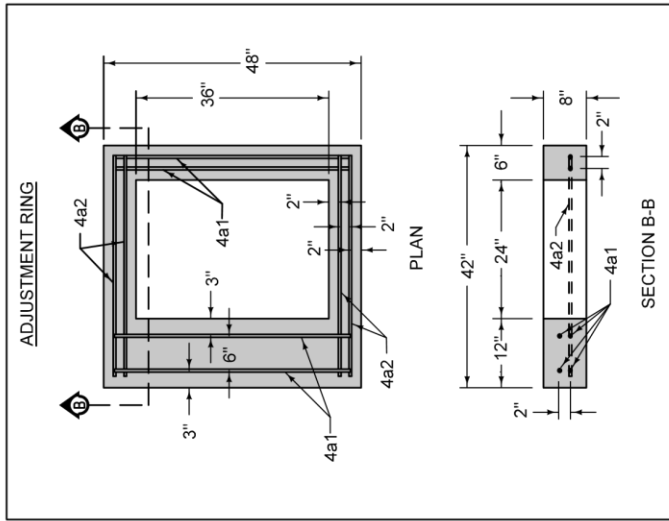
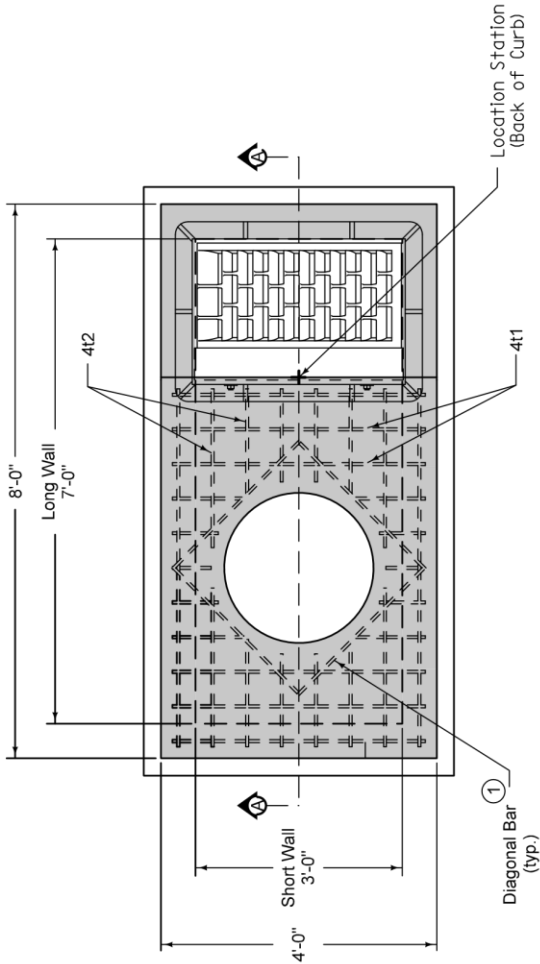


FIGURE 6010.504

 SUDAS	IOWA DOT	REVISION	3	04-17-18
		SW-504		
FIGURE 6010.504	STANDARD ROAD PLAN	SHEET 1 of 2		
REVISIONS: Changed "invert" callout to "Concrete Fillet."				
Paul D. Wigand Brian Smith SUDAS PROJECT ENGINEER DESIGNER/INTEGRITY ENGINEER				
SINGLE GRATE INTAKE WITH FLUSH-TOP MANHOLE				

- ① Install four #4 diagonal bars at manhole opening and at all pipe openings.

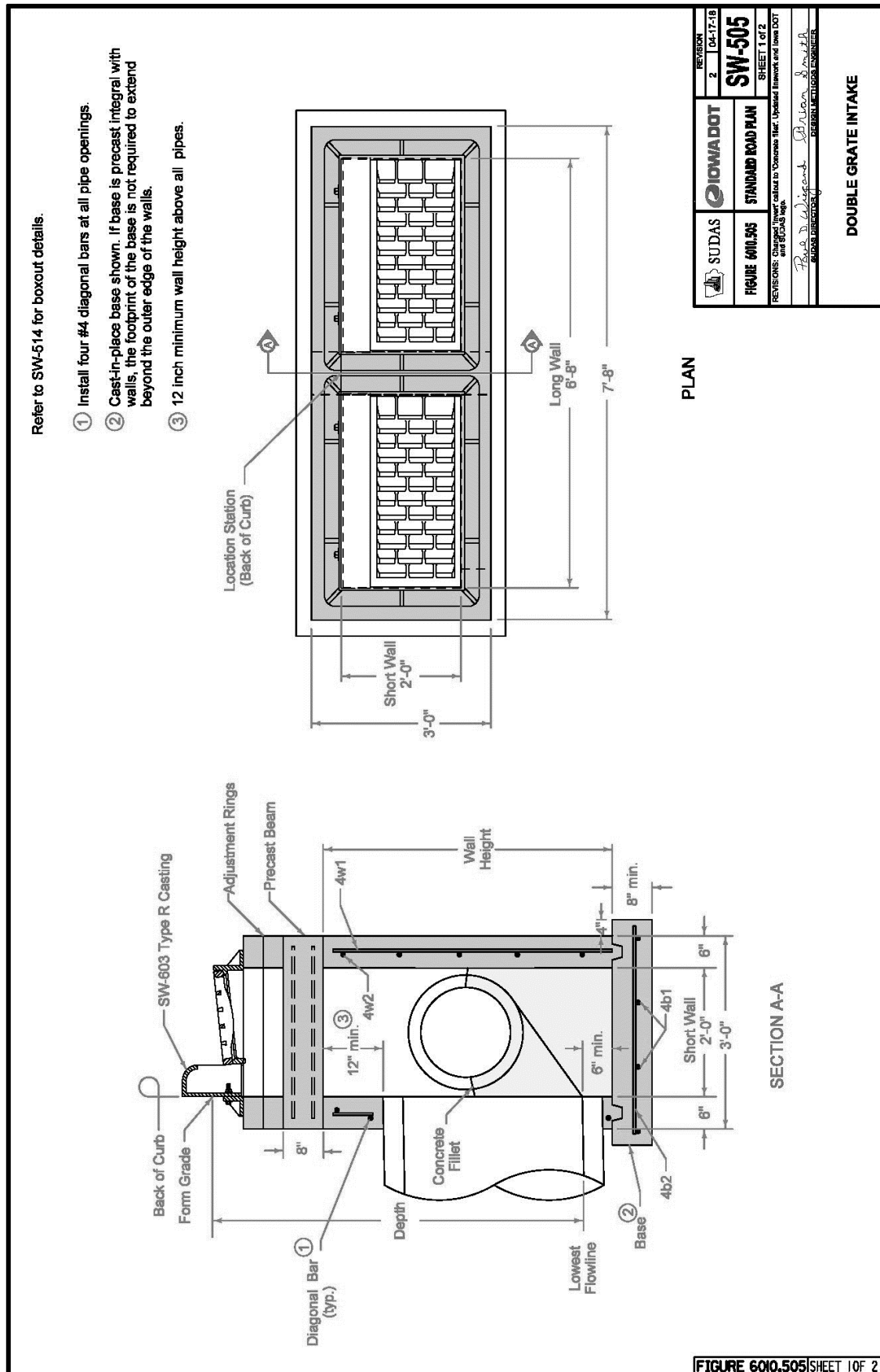


REINFORCING BAR LIST						
Mark	Size	Location	Shape	Count	Length	Spacing
4t1	4	Top	—	1 1	3'-8"	6"
4t2	4	Top	—	8	5'-2"	6"
4b1	4	Base	—	8	4'-2"	13"
4b2	4	Base	—	5	8'-2"	10"
4a1	4	Adj. Ring	—	6	3'-8"	See Adj. Ring Plan
4a2	4	Adj. Ring	—	4	3'-2"	See Adj. Ring Plan
4w1	4	Walls	—	13	Wall Height minus 4"	12"
4w2	4	Walls	—	1 1	Wall Height minus 16"	12"
4w3	4	Long Walls	—	Varies	7'-8"	12"
4w4	4	Short Walls	—	Varies	3'-3"	12"

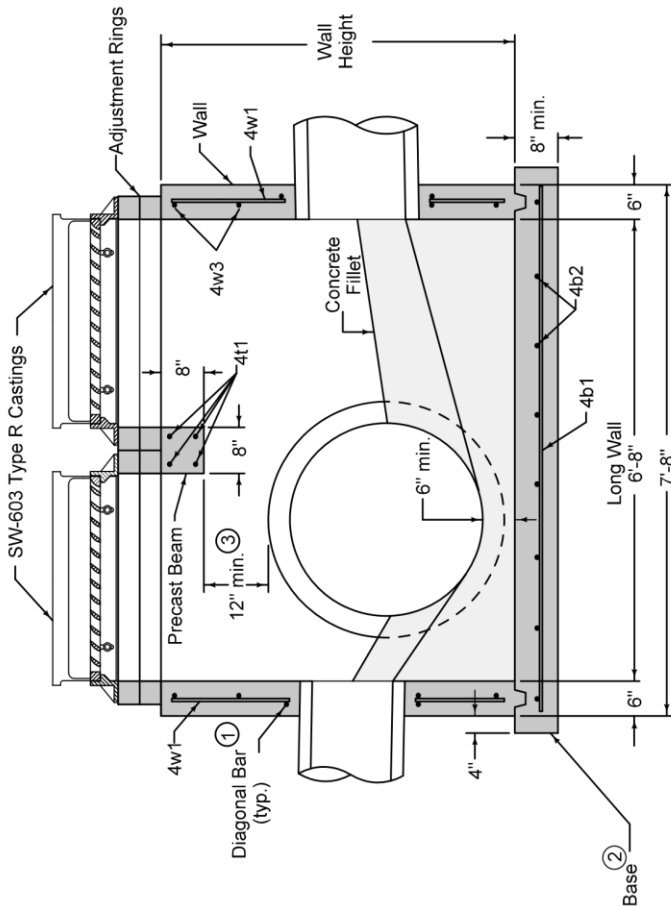
FIGURE 6010.504 SHEET

		REVISION 3 04-17-18
FIGURE 6010.504	STANDARD ROAD PLAN	SW-504
REVISIONS: Changed Invert callout to 'Concrete Floor.'		SHEET 2 of 2
Paul D. Wiegand SUDAS PROJECT ENGINEER		Brian Smith DESIGNER
SINGLE GRATE INTAKE WITH FLUSH-TOP MANHOLE		

MAXIMUM PIPE DIAMETERS		
Pipe Location	Precast Structure	Cast-in-place Structure
Short Wall	18"	24"
Long Wall	30"	36"



- ① Install four #4 diagonal bars at all pipe openings
- ② 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
- ③ 12 inch minimum wall height above all pipes.



TYPICAL SECTION

REINFORCING BAR LIST					
Mark	Size	Location	Shape	Count	Length
4t1	4	Beam	—	4	2'-8"
4b1	4	Base	—	4	7'-10"
4b2	4	Base	—	8	3'-2"
4w1	4	Walls	—	20	Wall Height minus 4"
4w2	4	Long Walls	—	Varies	7'-4"
4w3	4	Short Walls	—	Varies	2'-8"
					Spacing
					4"
					10"
					12"
					12"
					12"

MAXIMUM PIPE DIAMETERS		
Pipe Location	Precast Structure	Cast-in-place Structure
Short Wall	15"	18"
Long Wall	60"	66"

SUDAS

IOWA DOT

FIGURE 6010.505

STANDARD ROAD PLAN

REVISION

2

04-17-18

SW-505

SHEET 2 of 2

REVISIONS: Changed to callout to Concrete fillet. Updated format and Iowa DOT SUDAS PROJECT LOG

Paul D. Wigand

DESIGNER

DOUBLE GRATE INTAKE

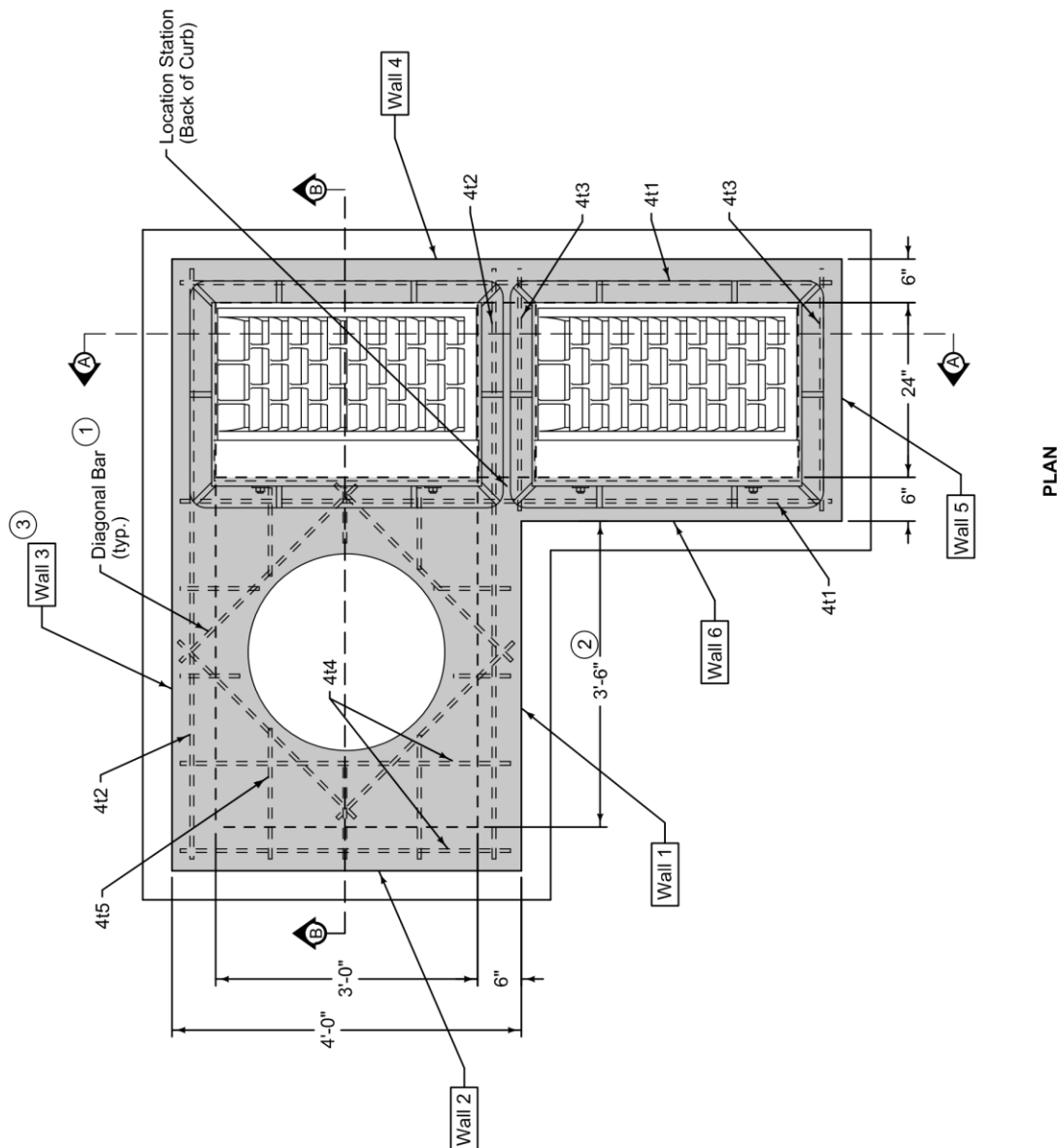
FIGURE 6010.505 SHEET

Maximum pipe diameters are set based on maximum structure depth of 6 feet-6 inches and the objective of placement of the centerline of the pipe on the centerline of the manhole opening for maintenance purposes.

Refer to SW-514 for boxout details.

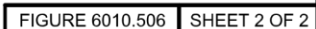
- ① Install four #4 diagonal bars at manhole opening and at all pipe openings.
- ② If Wall 1 is widened to 4 feet, the maximum pipe diameter can be increased to 36 inches.
- ③ If Wall 1 is widened to 4 feet, the maximum pipe diameter in Wall 3 can be increased to 42 inches.

MAXIMUM PIPE DIAMETERS	
Wall	Max. Dia.
1	30" ②
2	24"
3	36" ③
4	42"



		REVISION
		3 04-17-18
FIGURE 6010.506	STANDARD ROAD PLAN	SW-506
REVISIONS: Changed "Invert Callout to Concrete Floor"		SHEET 1 of 2
Randy D. Dugan, DESIGNER		Brian Smith, CHECKED
DOUBLE GRATE INTAKE WITH MANHOLE		

FIGURE 6010.506 SHEET 1 OF 2



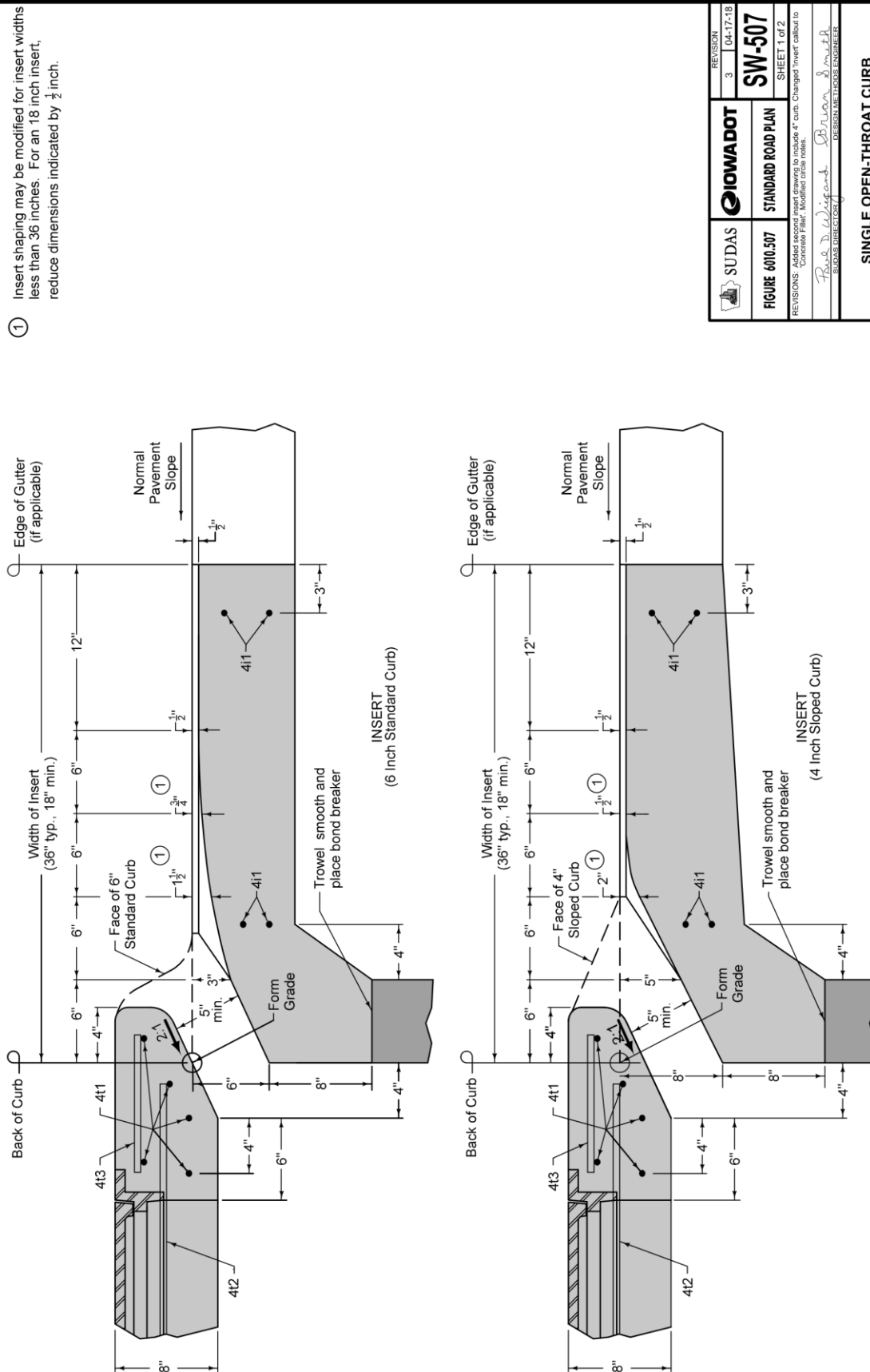


FIGURE 6010.507 SHEET 1 OF 2

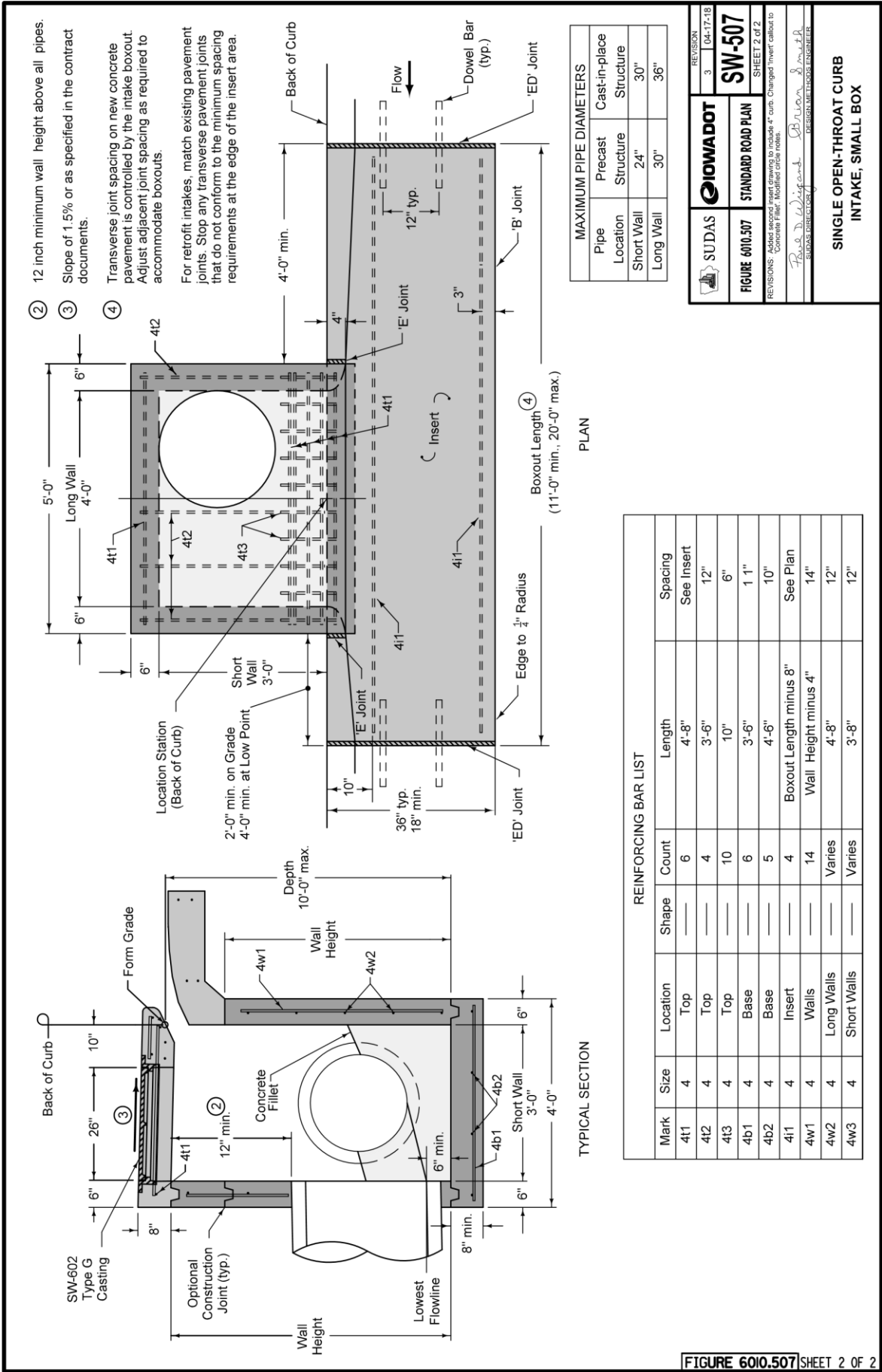


FIGURE 6010.507 SHEET 2 OF 2

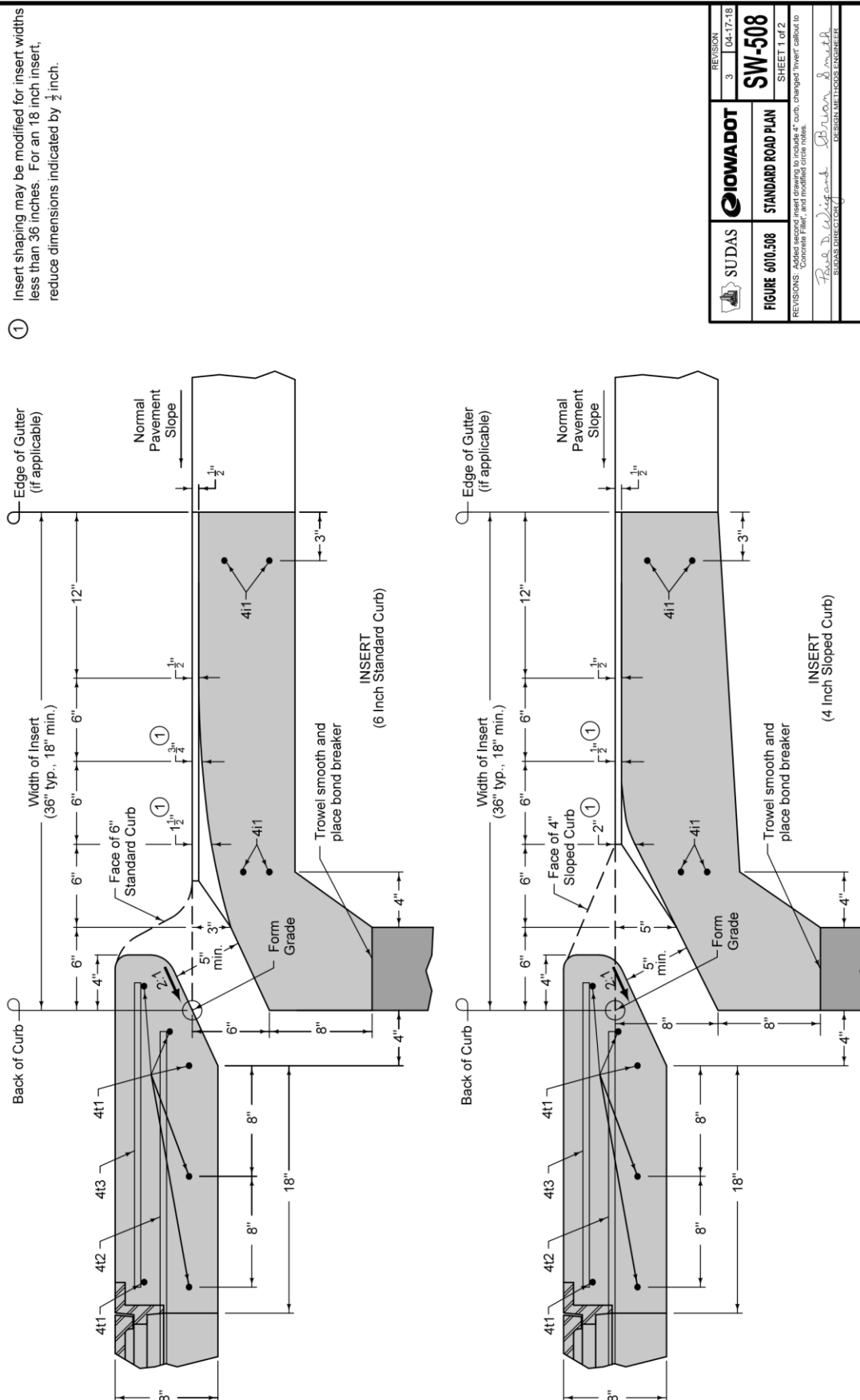
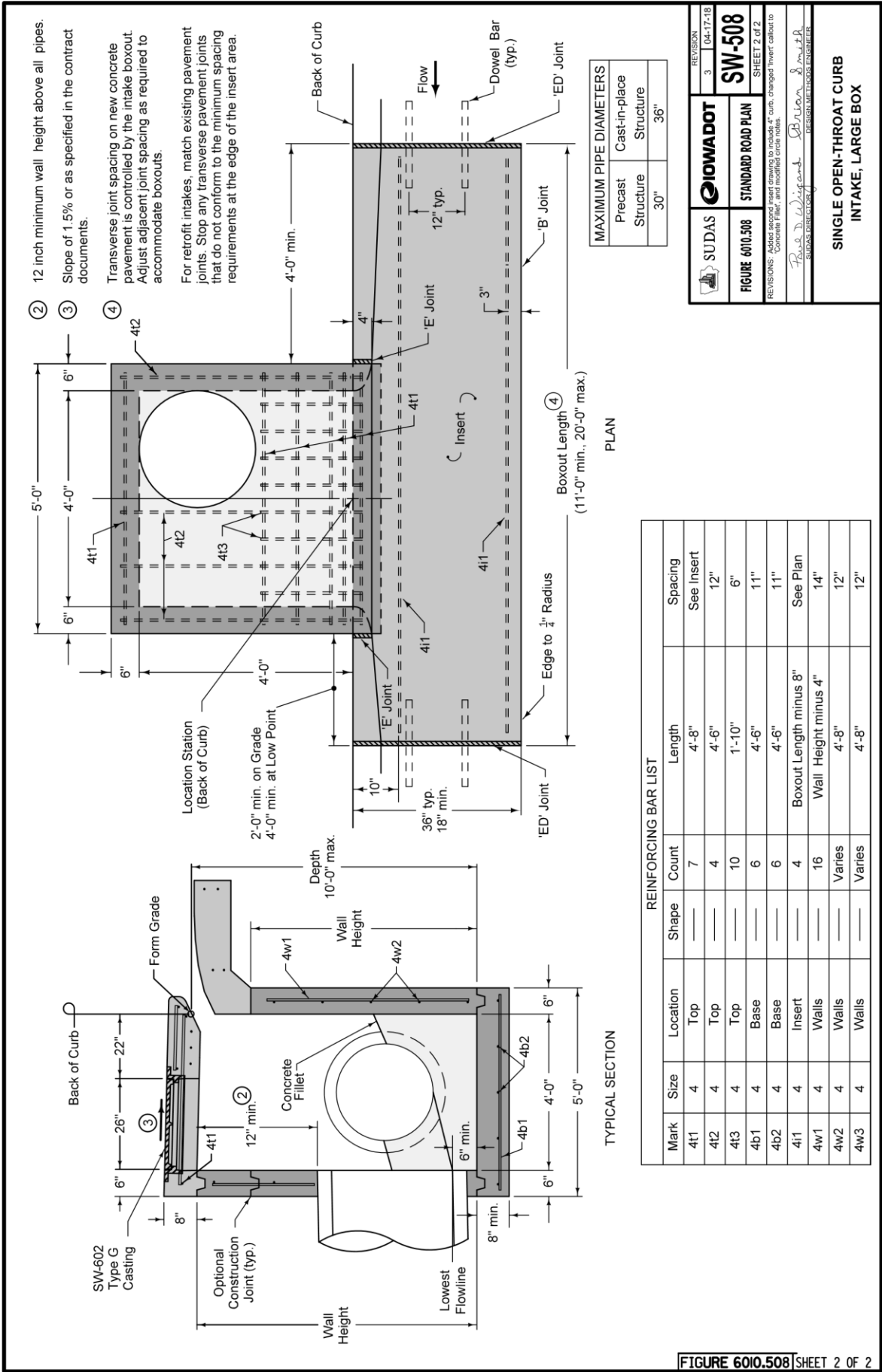
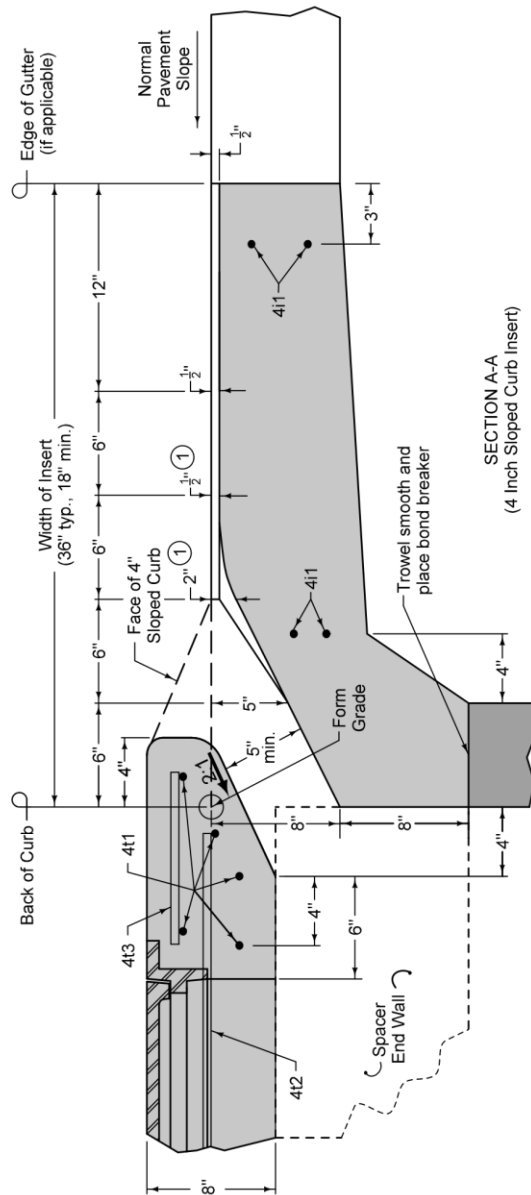
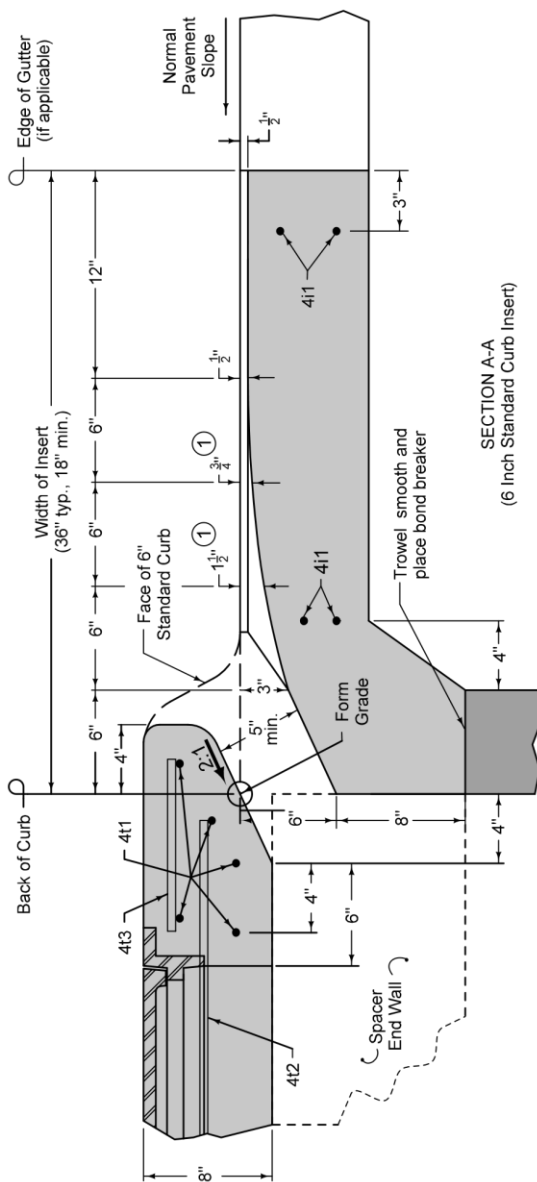


FIGURE 6010.508 SHEET 1 OF 2



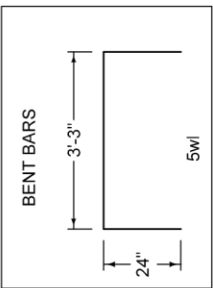
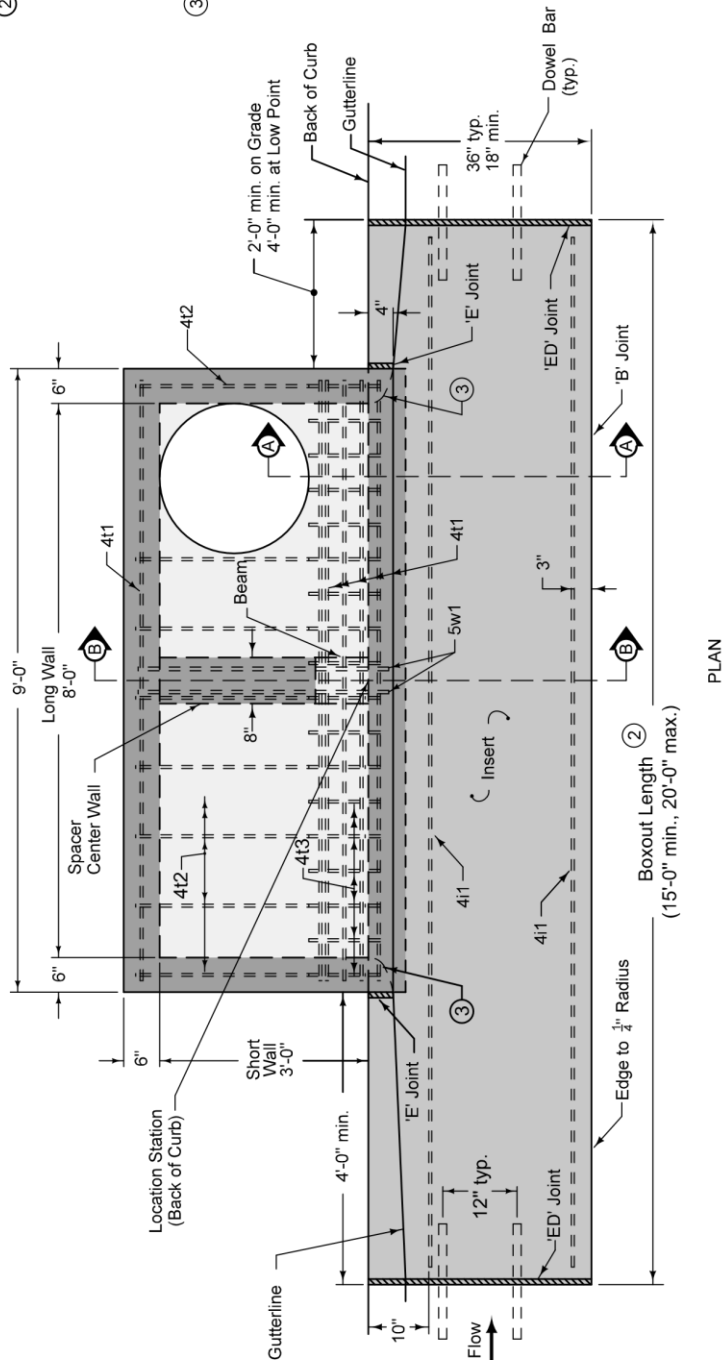
- ① Insert shaping may be modified for insert widths less than 36 inches. For an 18 inch insert, reduce dimensions indicated by $\frac{1}{4}$ inch.



	SUDAS		REVISION	
			5	04-17-18
FIGURE 6010.509			SW-509	
STANDARD ROAD PLAN			SHEET 1 of 3	
REVISIONS: Added second throat drawing to include 4" curb. Changed invert callout to Concrete Floor, Modified circle notes.				
David Dugand Brian Smith SUDAS DIRECTOR DESIGNER/INSPECTOR				
DOUBLE OPEN-THROAT CURB INTAKE, SMALL BOX				

FIGURE 6010.509 SHEET 1

- ② Transverse joint spacing on new concrete pavement is controlled by the intake boxout. Adjust adjacent joint spacing as required to accommodate boxouts.
- For retrofit intakes, match existing pavement joints that do not conform to the minimum spacing requirements at the edge of the insert area.
- ③ Rounded shaping at inlet.



REINFORCING BAR LIST				
Mark	Size	Location	Shape	Count
4b1	4	Base	—	9
4b2	4	Base	—	5
4t1	4	Insert	—	4
4t2	4	Top	—	6
4t3	4	Top	—	8
4w1	4	Top	—	18
4w2	4	Walls	—	22
4w3	4	Long Walls	—	Varies
5w1	5	Short Walls	—	Varies
		Beam	—	2

Length	Spacing
3'-6"	12"
8'-6"	10"
Boxout Length minus 8"	See Insert
8'-6"	See Plan
3'-6"	12"
10"	6"
Wall Height minus 4"	13"
4'-8"	12"
3'-8"	12"
7'-3"	4"

SUDAS

IOWA DOT

FIGURE 6010.509

STANDARD ROAD PLAN

REVISIONS: Added access point opening to include 4" curb. Changed invert callout to Concrete Floor. Modified circle notes.

SW-509

SHEET 2 of 3

DESIGNED BY: *Brian Smith*

DOUBLE OPEN-THROAT CURB
INTAKE, SMALL BOX

FIGURE 6010.509 SHEET 2 OF 3

- (4) 12 inch minimum wall height above all pipes.
 (5) Slope of 1.5% or as specified in the contract documents.

MAXIMUM PIPE DIAMETERS			
Pipe Location	Precast Structure	Cast-in-place Structure	
Short Wall	24"	30"	
Long Wall	60"	66"	

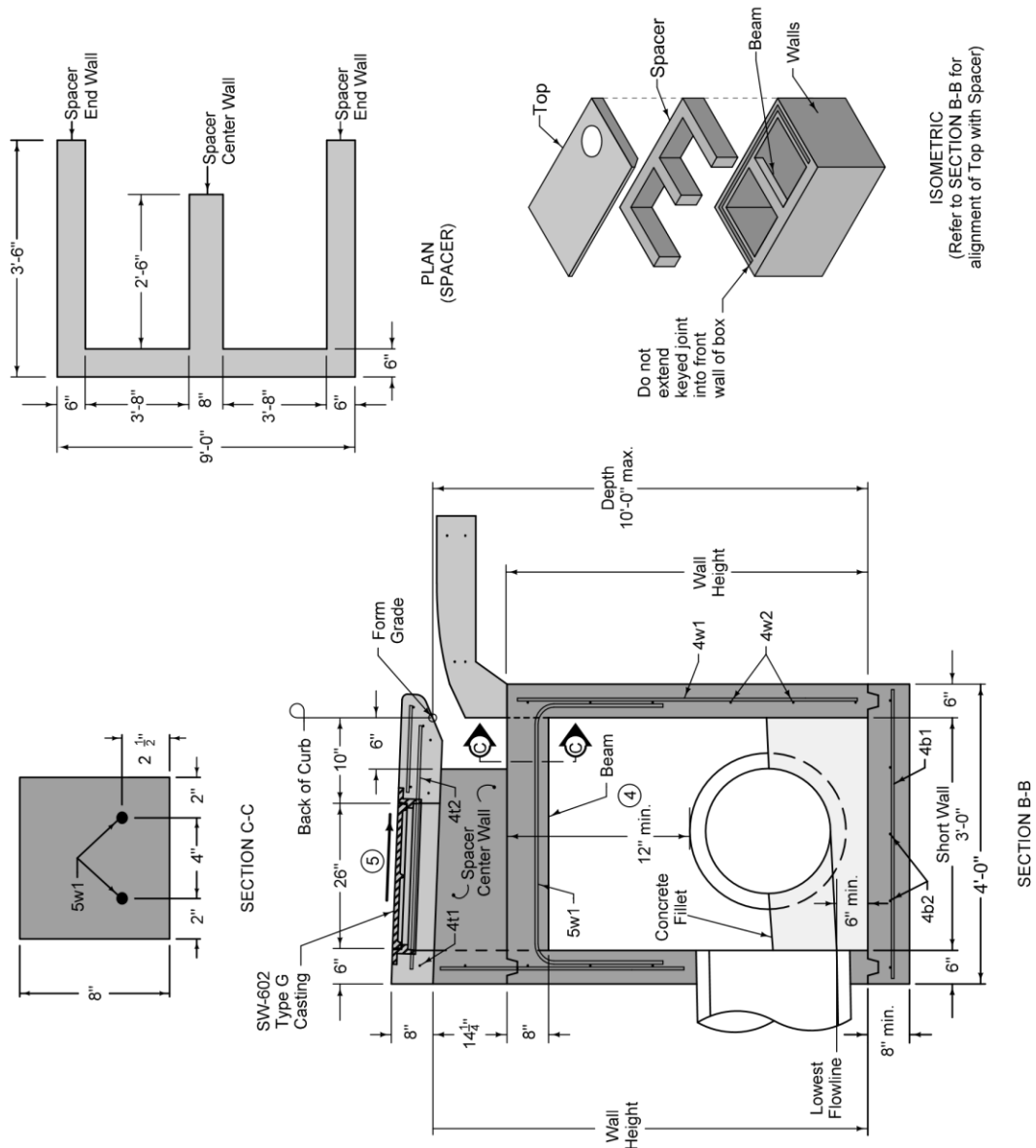


FIGURE 6010.509 SHEET 3

- ① Insert shaping may be modified for insert widths less than 36 inches. For an 18 inch insert, reduce dimensions indicated by $\frac{1}{4}$ inch.

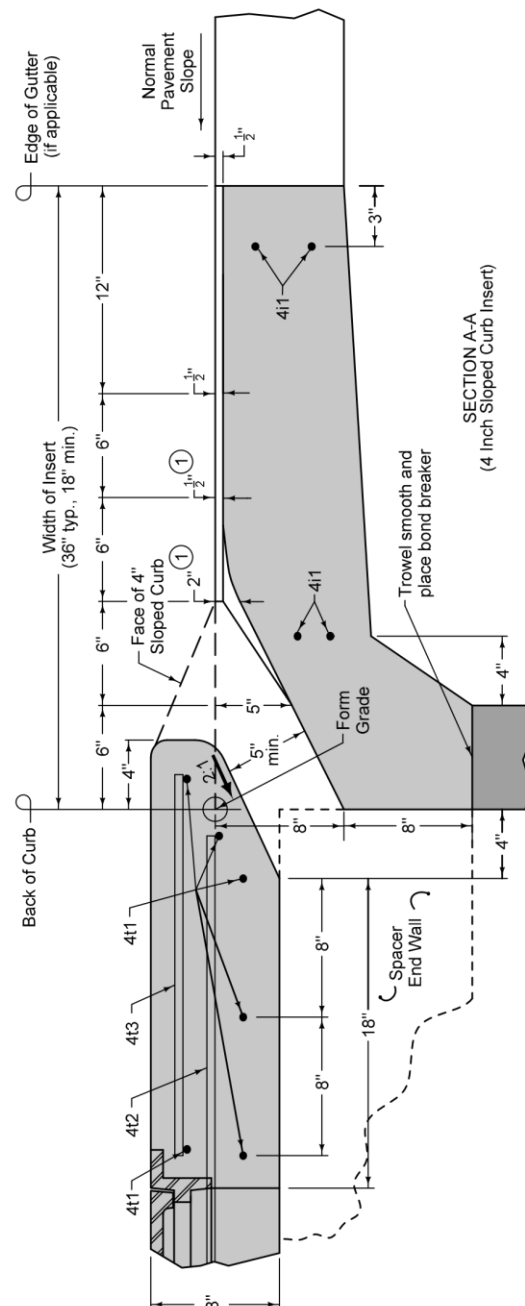
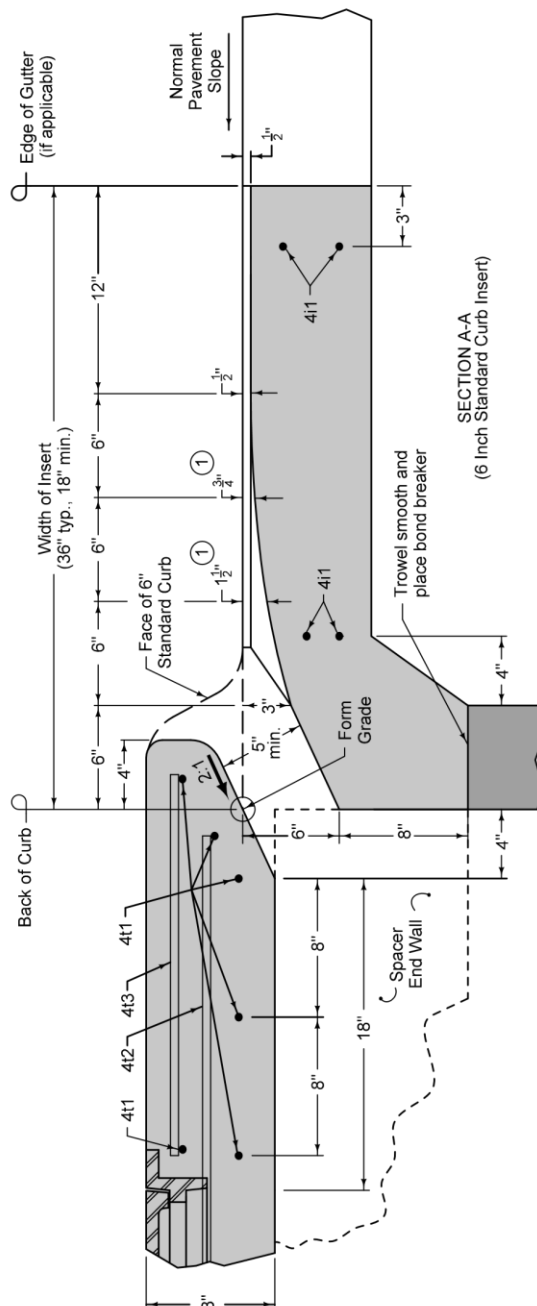
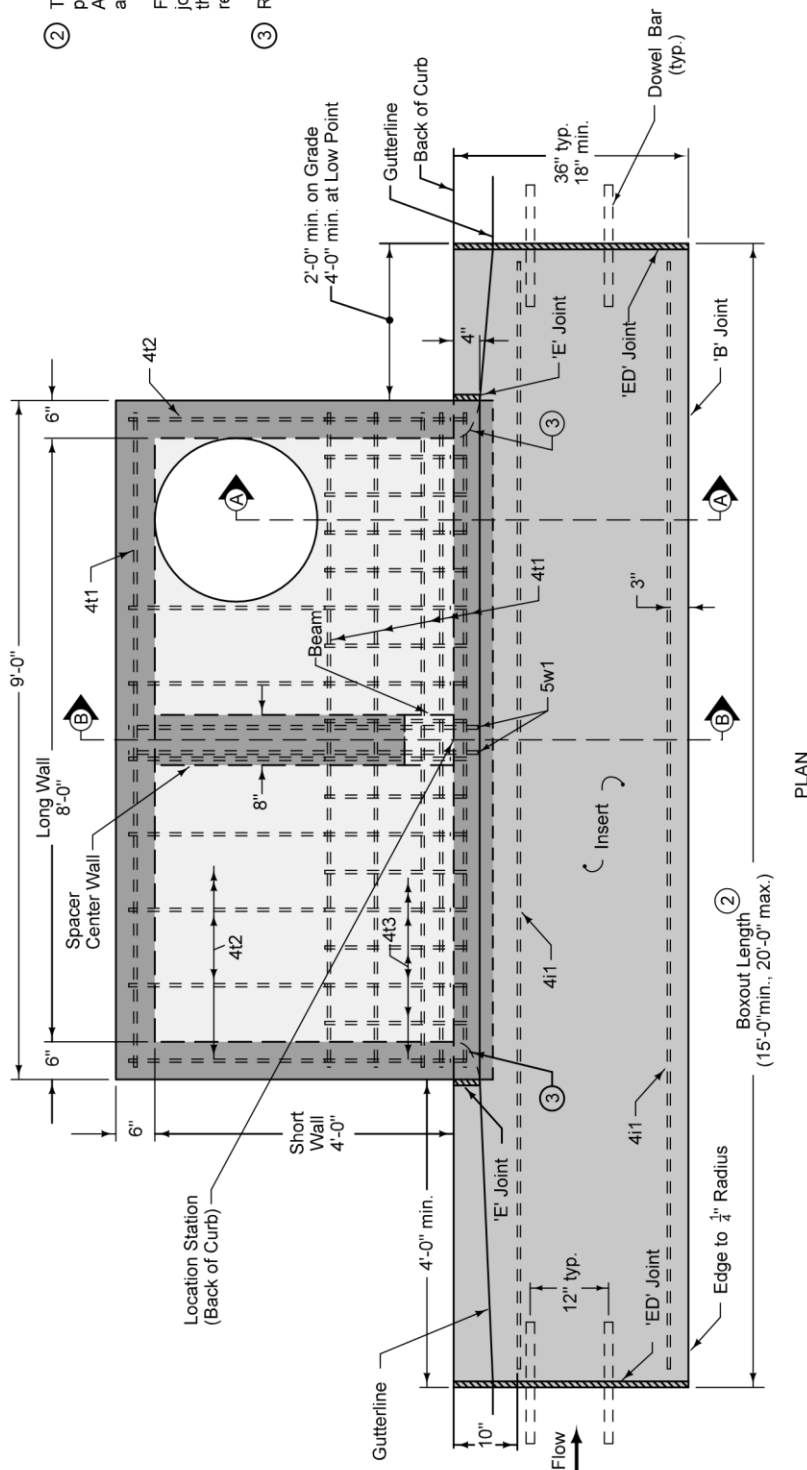


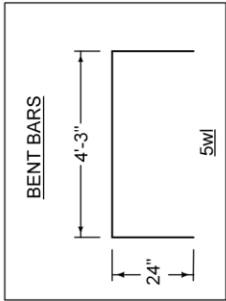
FIGURE 6010.510 SHEET 1

	SUDAS		REVISION	5	04-17-18
			FIGURE 6010.510	STANDARD ROAD PLAN	SW-510
			SHEET 1 of 3		
			REVISIONS: Added second insert drawing to include 4" curb. Changed Invert callout to Concrete Floor. Modified circle notes.		
			<i>Paul D. Deigand</i> DESIGNER <i>Brian Smith</i> CHECKED DOUBLE OPEN-THROAT CURB INTAKE, LARGE BOX		

- ② Transverse joint spacing on new concrete pavement is controlled by the intake boxout. Adjust adjacent joint spacing as required to accommodate boxouts.
- For retrofit intakes, match existing pavement joints that do not conform to the minimum spacing requirements at the edge of the insert area.
- ③ Rounded shaping at inlet.



REINFORCING BAR LIST					
Mark	Size	Location	Shape	Count	Spacing
4b1	4	Base	—	9	12"
4b2	4	Base	—	6	11"
4i1	4	Insert	—	4	Boxout Length minus 8"
4t1	4	Top	—	7	See Plan
4t2	4	Top	—	8	12"
4t3	4	Top	—	18	6"
4w1	4	Walls	—	24	Wall Height minus 4"
4w2	4	Long Walls	—	Varies	4'-8"
4w3	4	Short Walls	—	Varies	8'-8"
5w1	5	Beam	—	2	8'-3"



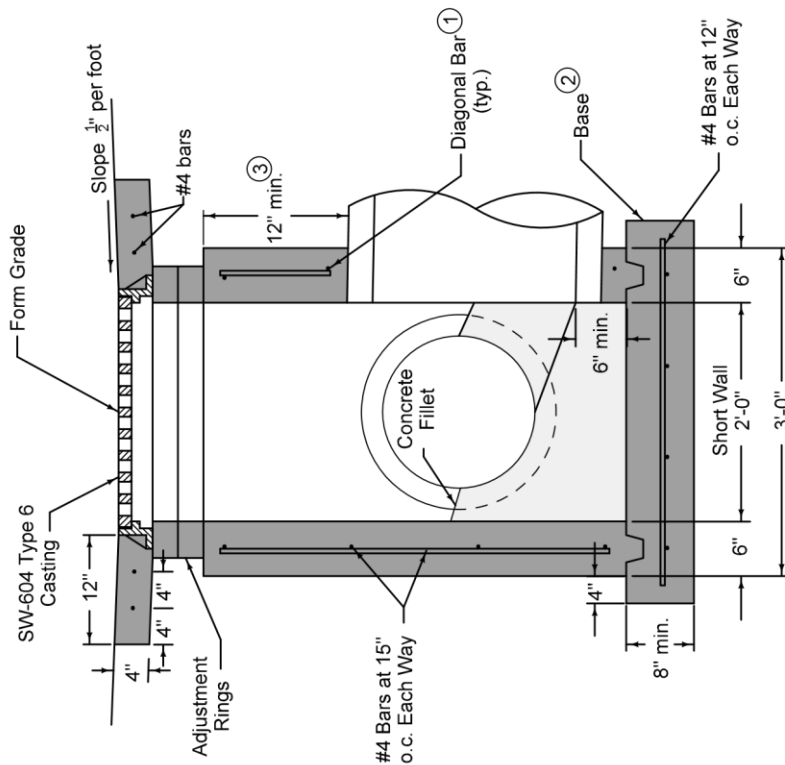
SUDAS	IOWADOT	REVISION
		5 04-17-18
FIGURE 6010.510	STANDARD ROAD PLAN	SW-510
SHEET 2 of 3		
REVISIONS: Added second insert drawing to include 4" curb. Changed 'invert' callout to 'Concrete Floor'. Modified circle notes.		
Rae D. Wiegand, Design Engineer		
SUDAS DIRECTOR		

DOUBLE OPEN-THROAT CURB
INTAKE, LARGE BOX

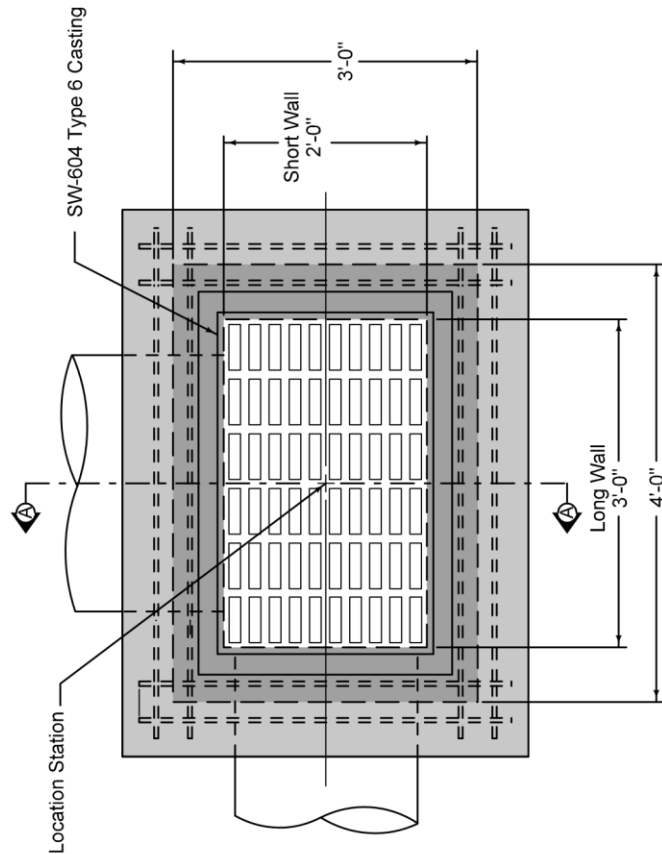
FIGURE 6010.510 SHEET 3

	SUDAS	FIGURE 6010.510	STANDARD ROAD PLAN	SW-510	REVISION
					5 04-17-18
REVISIONS: Added vertical curve drawing to include 4' curb. Changed "throat" cabinet to "curbstone" final. Modified final notes.					SHEET 3 of 3
<i>Paul D. Weigand</i> SUDAS DIRECTOR					<i>Debra Smith</i> DESIGN METHOD ENGINEER
DOUBLE OPEN-THROAT CURB INTAKE, LARGE BOX					

- ① Install four #4 diagonal bars at all pipe openings.
- ② 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.
- ③ 12 inch minimum wall height above all pipes.



SECTION A-A



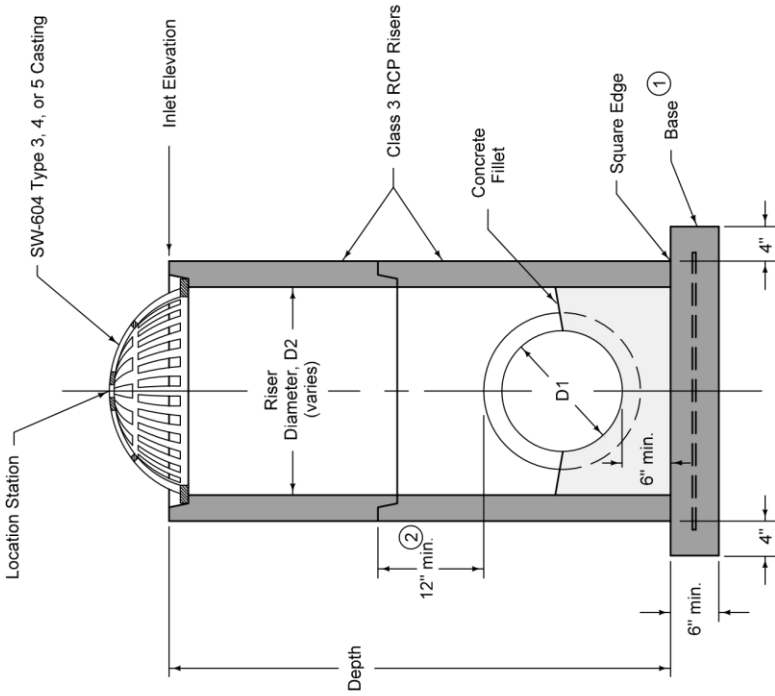
PLAN

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

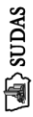
SUDAS	IOWA DOT	REVISION	1	04-17-18
		FIGURE 6010.511	STANDARD ROAD PLAN	SW-511
REVISIONS: Changed 'lower' callout to 'Concrete Fillet' Updated line work and lower DOT and SUDAS logos			SHEET 1 of 1	
Base Duwigand Brian Smith			DESIGN METHOD ENGINEER	
SUDAS DIRECTOR				
RECTANGULAR AREA INTAKE				

- ① Precast (shown) or cast-in-place base:
- Precast: 6 inch thick concrete with #6 welded wire mesh on 4 inch centers (WWF 4" x 4"). Center mesh vertically within base.
 - Cast-in-place: 8 inch thick non-reinforced concrete.
- ② 12 inch minimum riser height above all pipes.

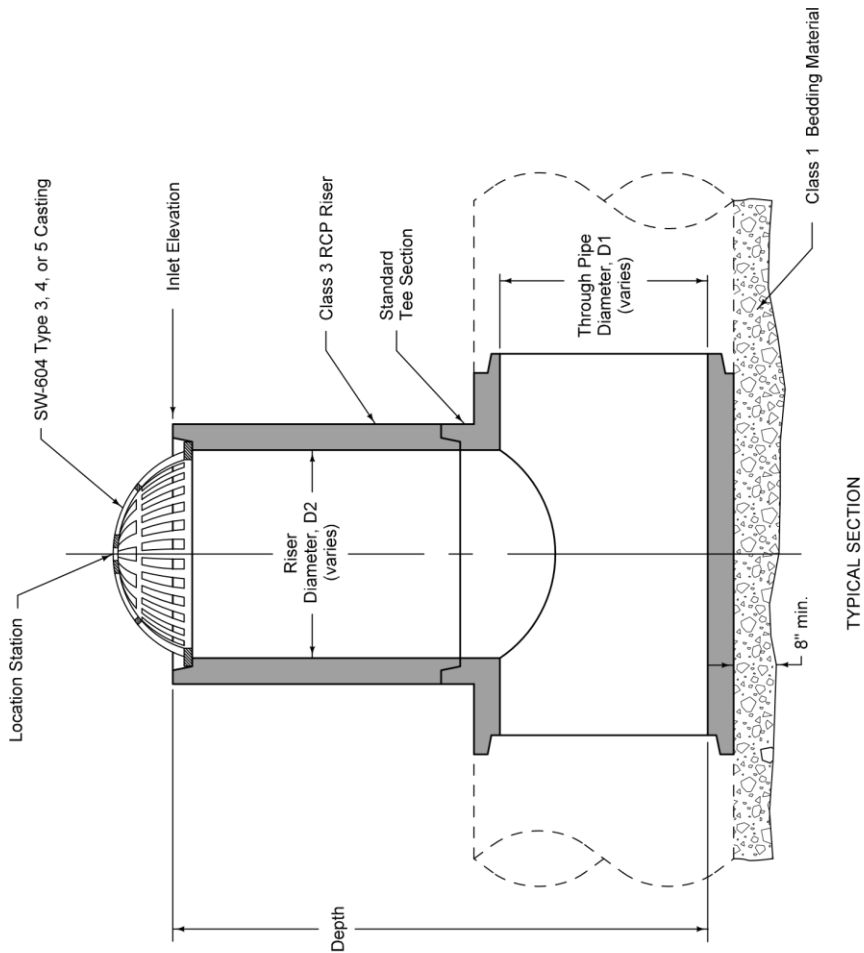
INTAKE SIZE - CASE 1	
Outlet Pipe Diameter, D1	Minimum Riser Diameter, D2
12"	18"
15"	24"
18"	24"
21"	30"
24"	30"
27"	36"



TYPICAL SECTION
CASE 1

 SUDAS		REVISION 3 04-17-18
	FIGURE 6010.512	STANDARD ROAD PLAN
FIGURE 6010.512		SHEET 1 of 2
REVISIONS: Changed "invert" callout to "Concrete Fillet".		
<i>Russ D. Wiegand</i> DESIGNER <i>Brian Smith</i> CHECKED <i>SW-604</i> DESIGNER		
CIRCULAR AREA INTAKE		

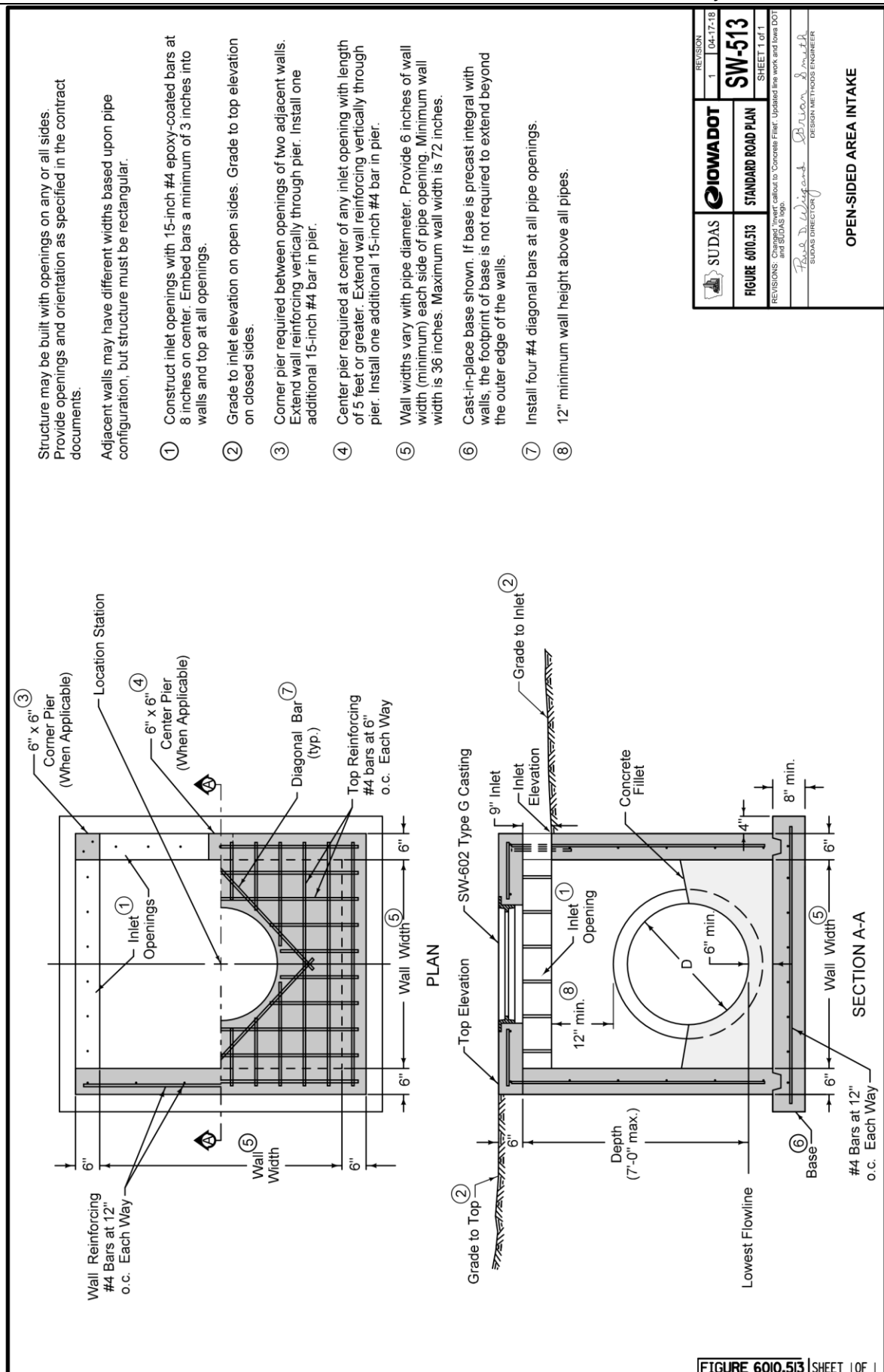
③ Minimum riser diameter is 18 inches.

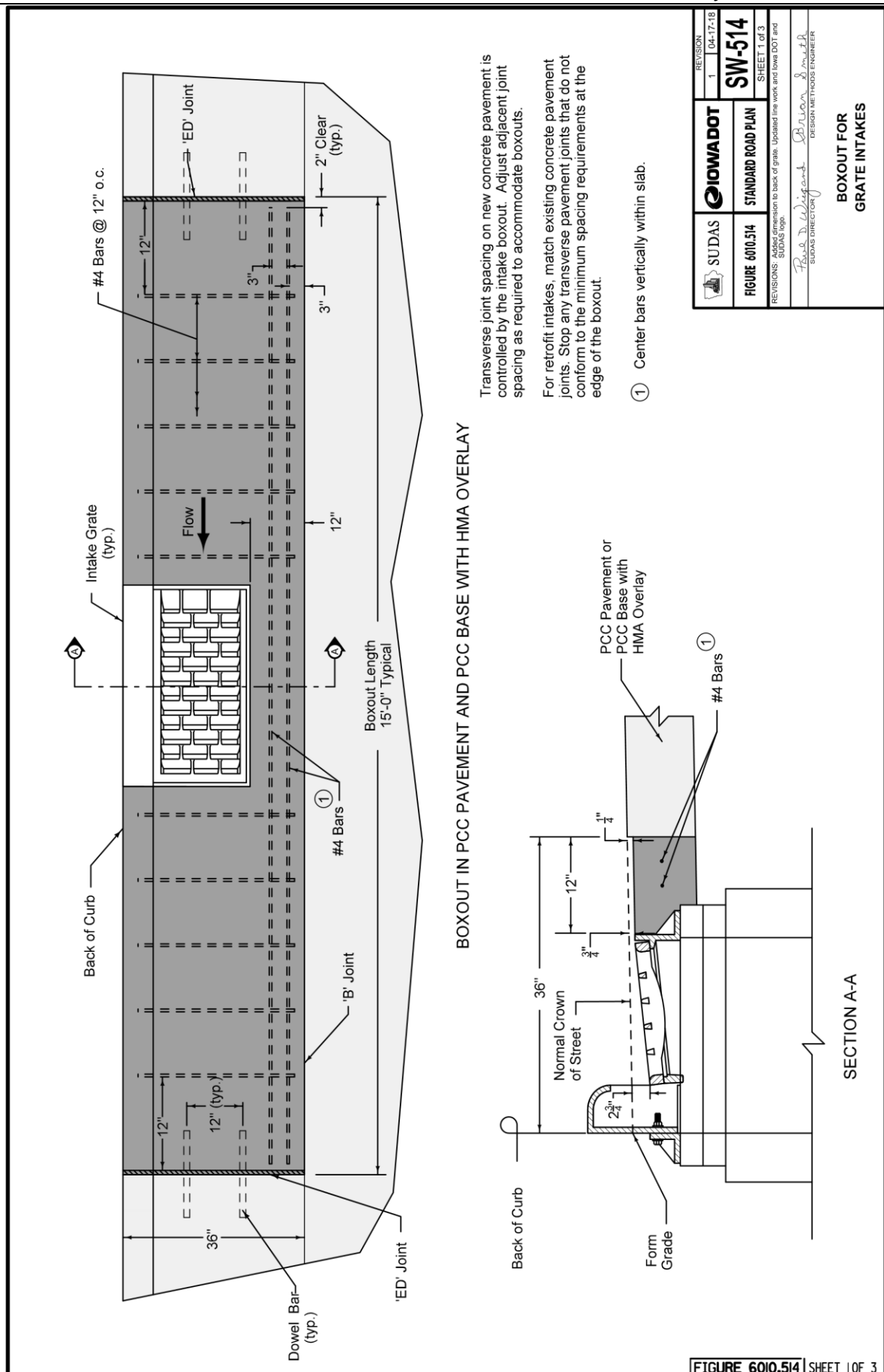


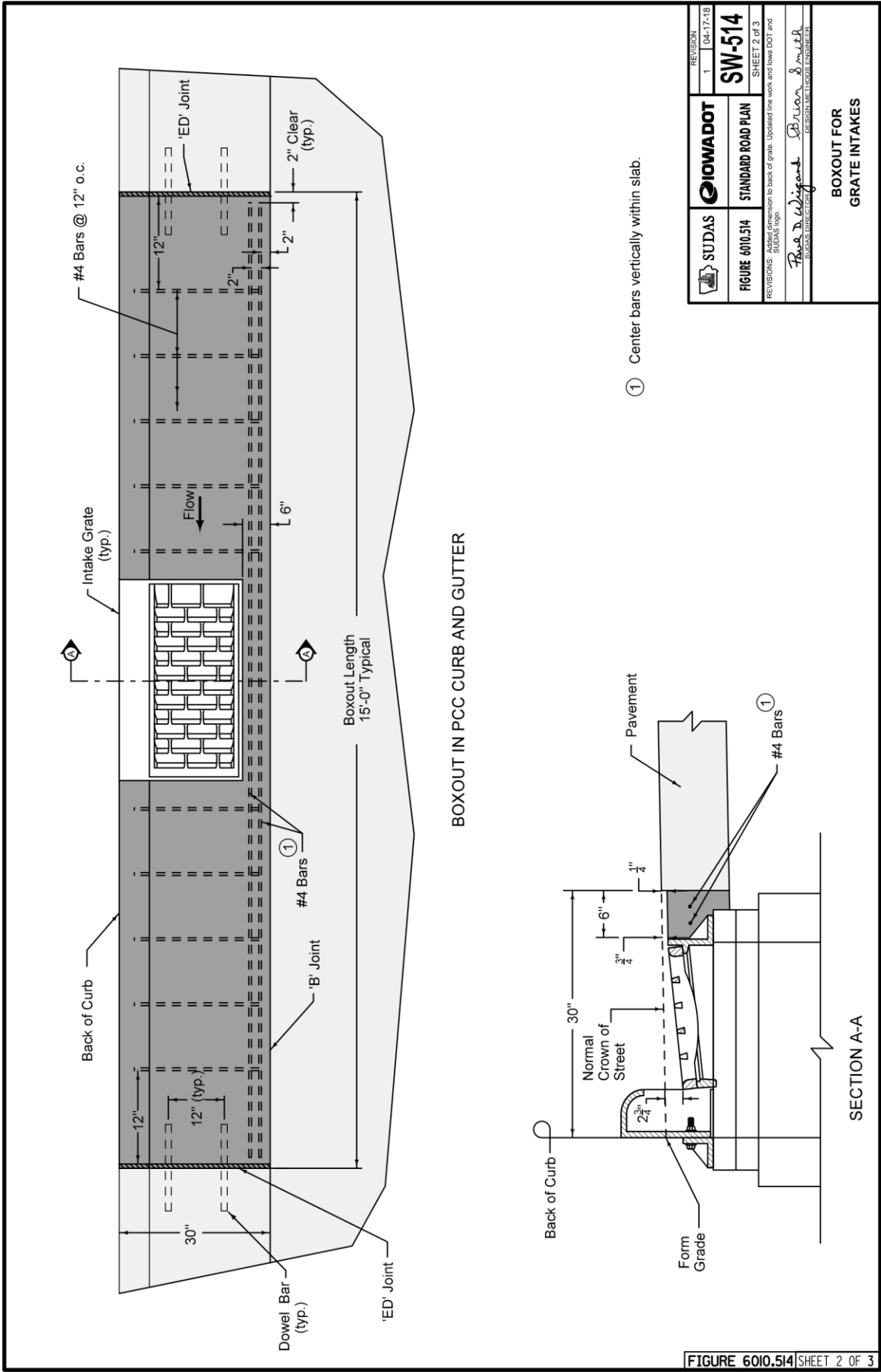
INTAKE SIZE - CASE 2	
Through Pipe Diameter, D1	Maximum Riser Diameter, D2
18"	18"
21"	18"
24"	24"
27"	24"
30"	30"
36" or more	36"

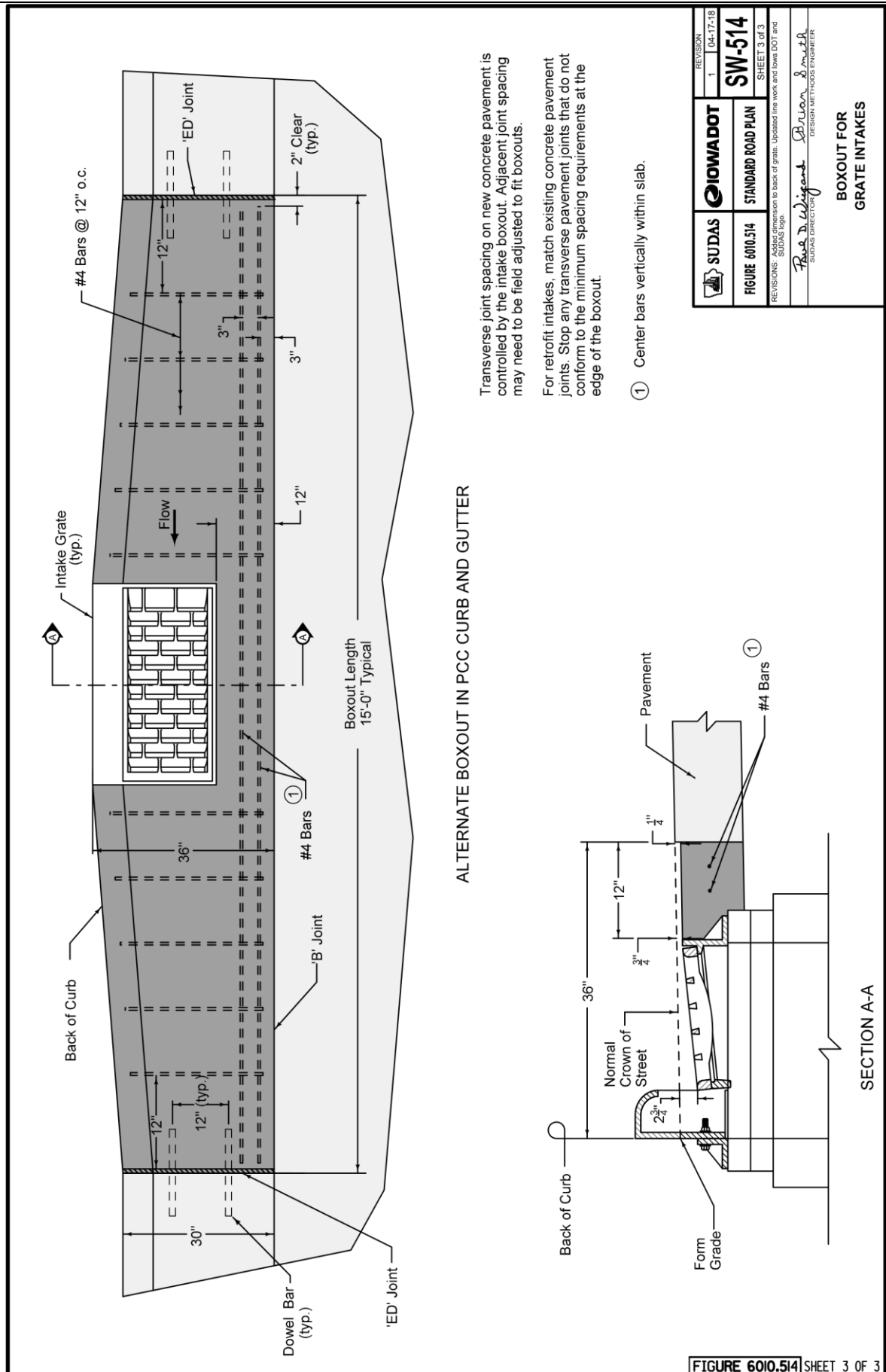
	FIGURE 6010.512	STANDARD ROAD PLAN	IOWADOT	REVISION	3	04-17-18
				SW-512		
REVISIONS: Changed "invert" callout to "Concrete Floor."				SHEET 2 of 2		
 PAUL D. WIGAND SUDAS DIRECTOR				 BRIAN SMITH DESIGN METHODS ENGINEER		
CIRCULAR AREA INTAKE						

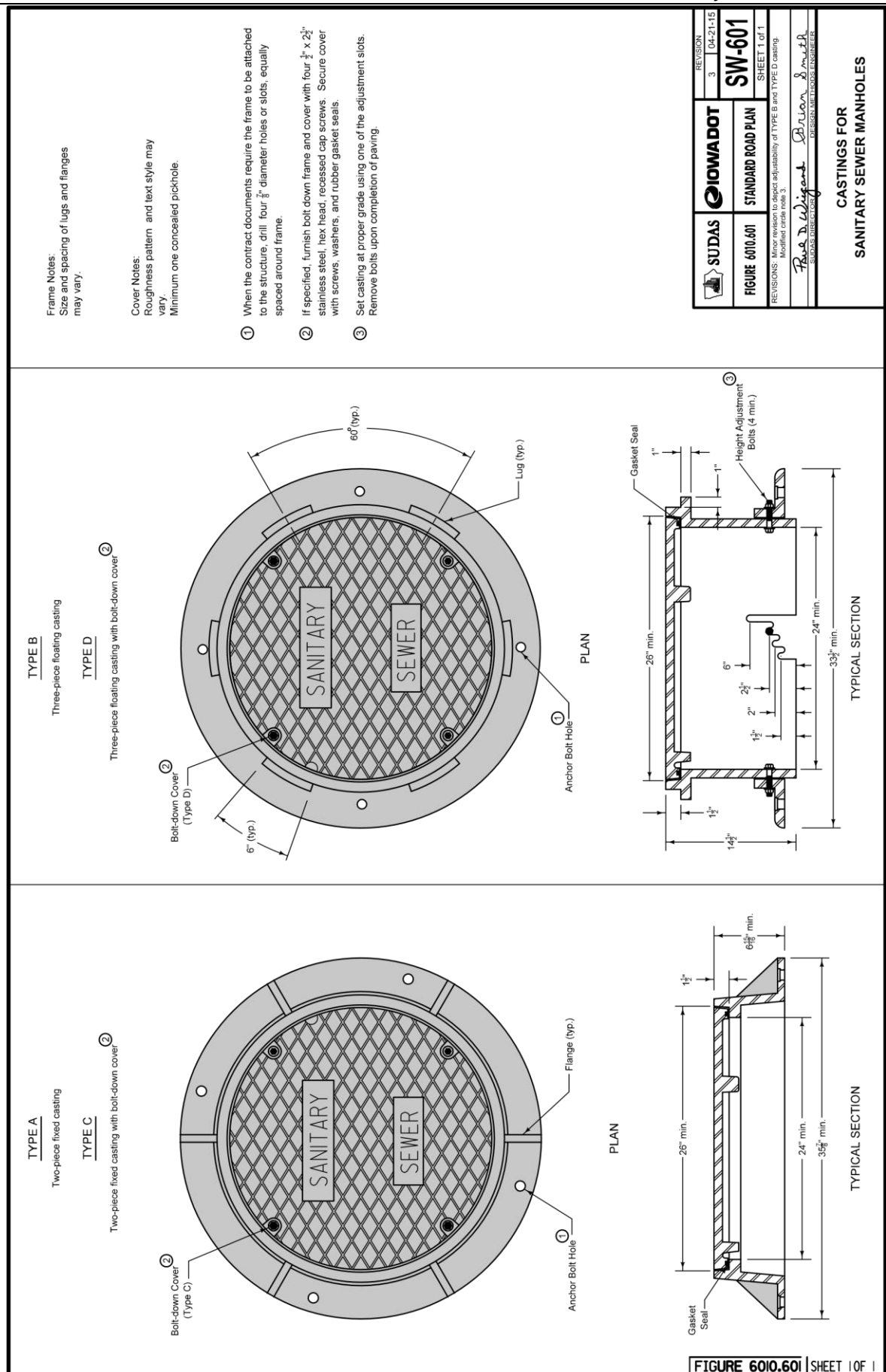
FIGURE 6010.512 SHEET 2 OF 2



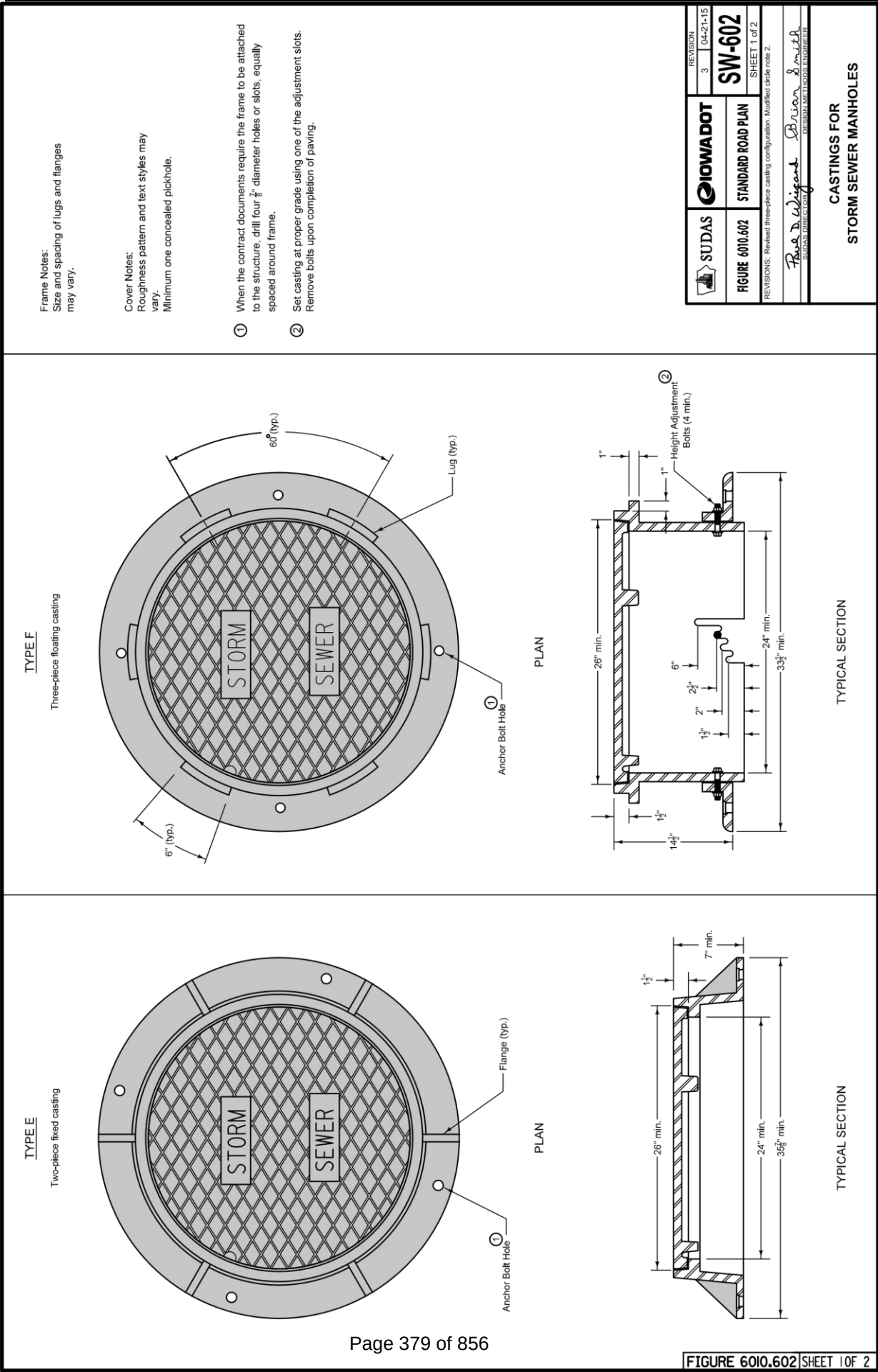


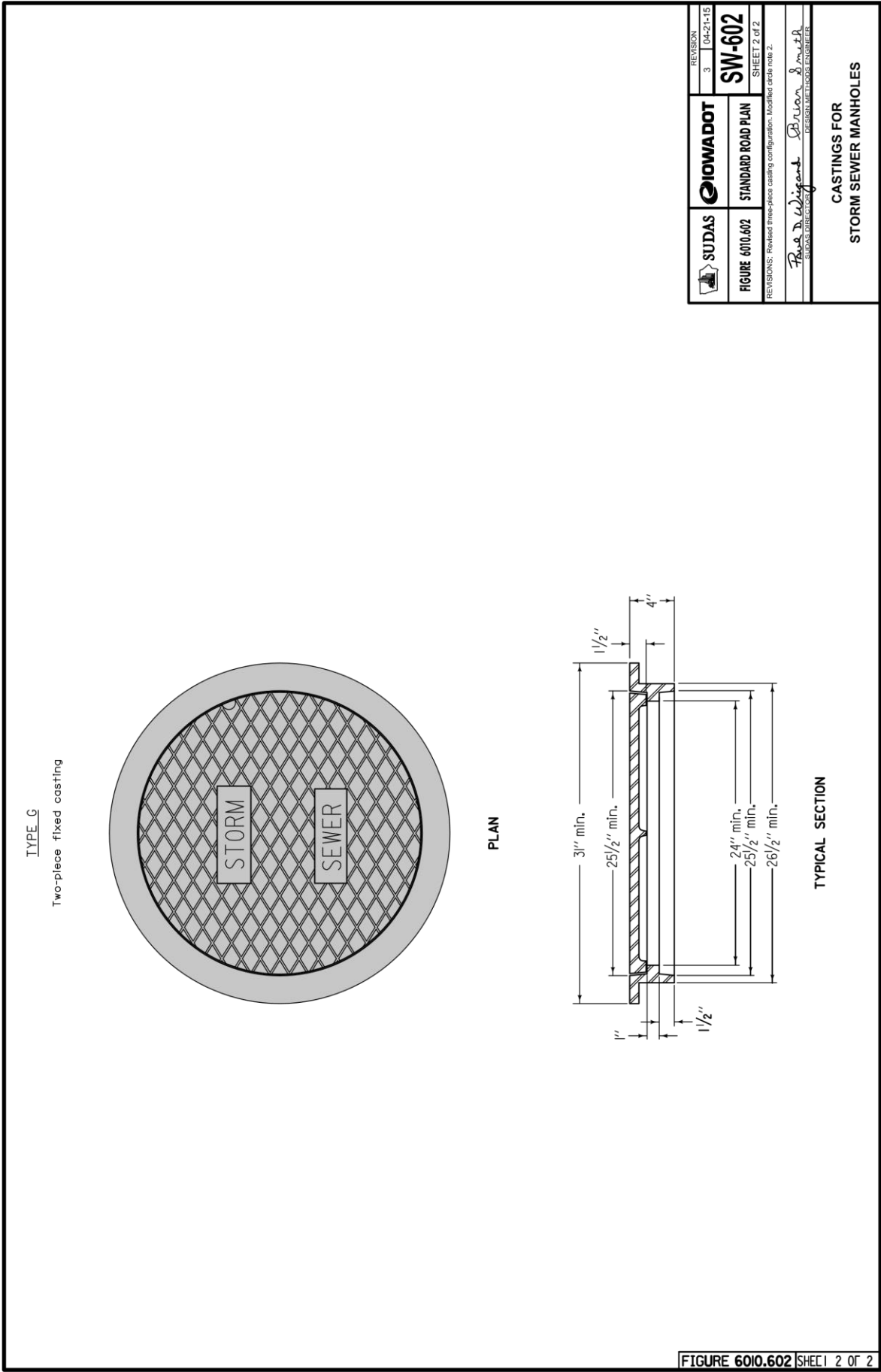


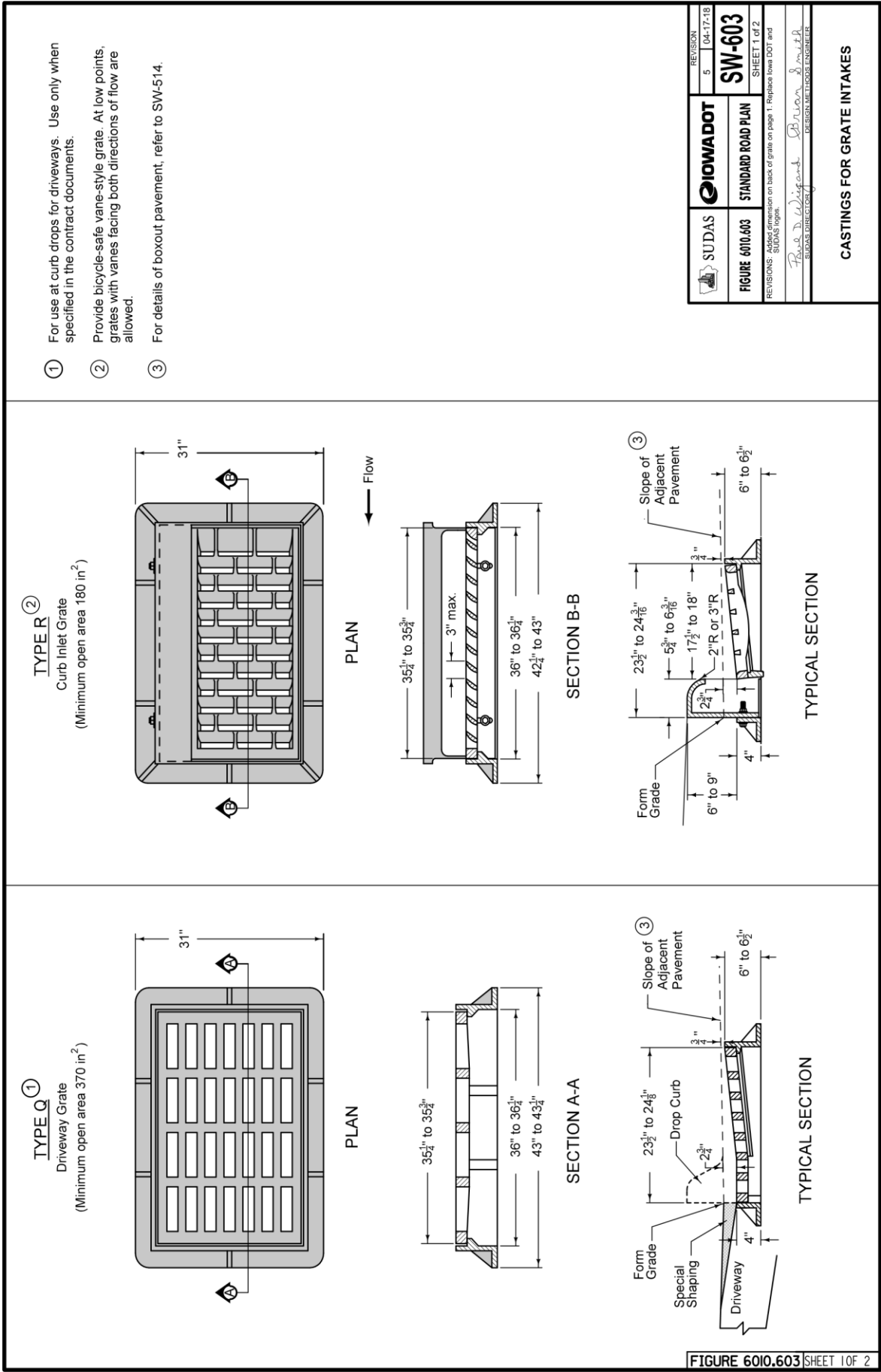




SUDAS	IOWADOT	REVISION 3 04-21-15
FIGURE 6010.601	STANDARD ROAD PLAN	SW-601
REVISIONS: Minor changes to sheet adjustability of TYPE B and TYPE D casting. Modified circle note 3.		
<i>Paul D. Wiegand</i> DESIGNER Brien Smith DESIGNER		
CASTINGS FOR SANITARY SEWER MANHOLES		





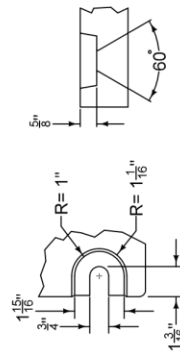
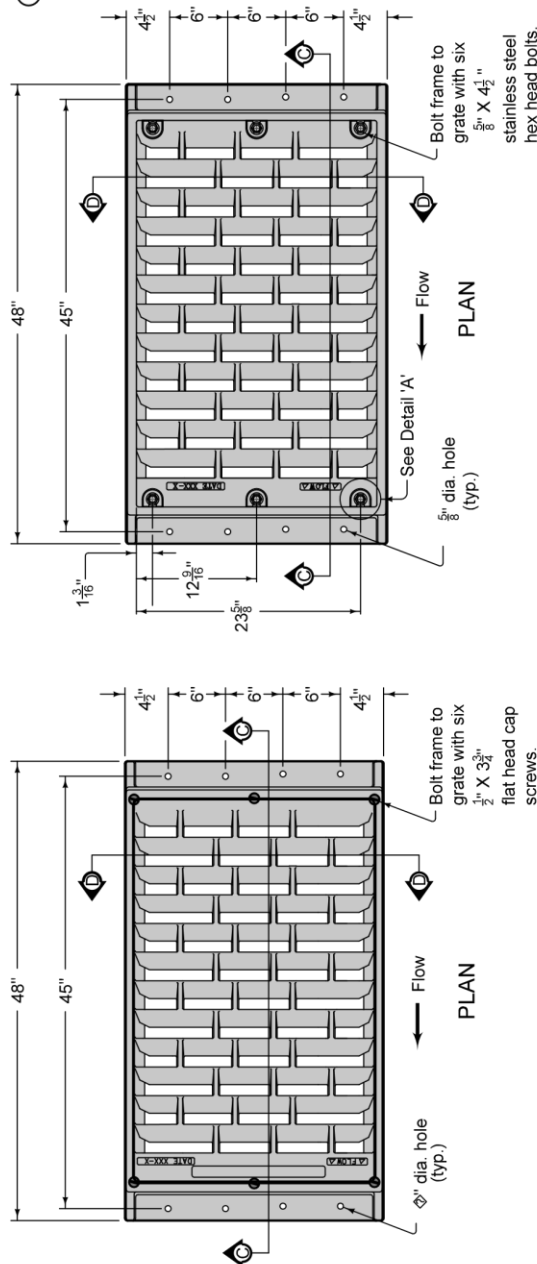


TYPE S ② ④
Barrier Intake Grate
(Minimum open area 300 in²)

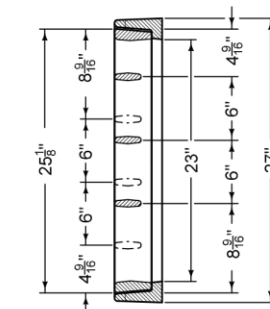
② Provide bicycle-safe vane-style grate. At low points, grates with vanes facing both directions of flow are allowed. The Contractor has the choice of which Type S Grate to use.

④ Use ductile iron frame castings meeting the requirements of ASTM A 536.

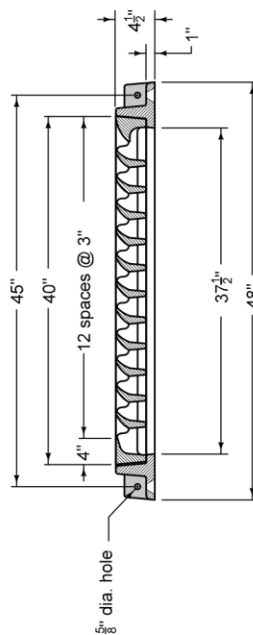
Frame minimum weight = 220 lbs.
Grate minimum weight = 340 lbs.



DETAIL 'A'
Bolt Slot Detail



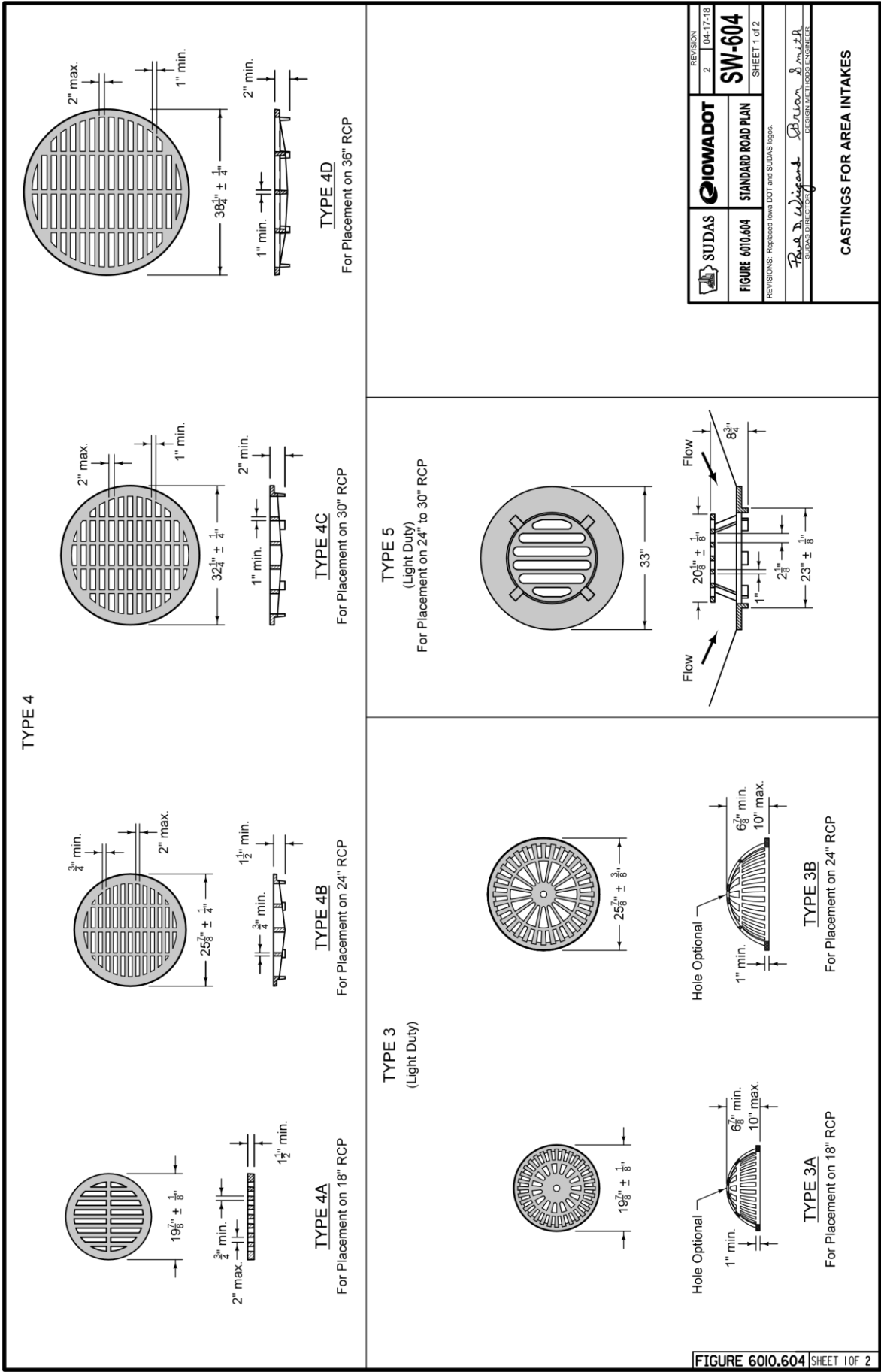
SECTION D-D



SECTION C-C

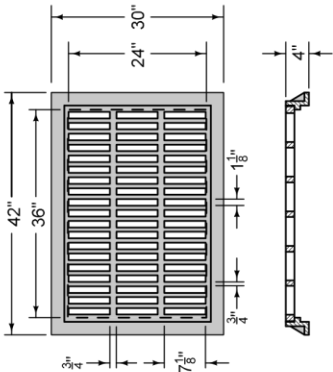
FIGURE 6010.603 SHEET 2 OF 2

 SUDAS	IOWA DOT	REVISION	
		5	04-17-18
FIGURE 6010.603	STANDARD ROAD PLAN	SW-603	
		SHEET 2 of 2	
REVISIONS: Add detail dimension on back of grate on page 1. Replace lower DOT and SUDAS logo.			
Randy D. Dugand Brian Smith			
SUDAS DIRECTOR DESIGNER/ENGINEER			
CASTINGS FOR GRATE INTAKES			

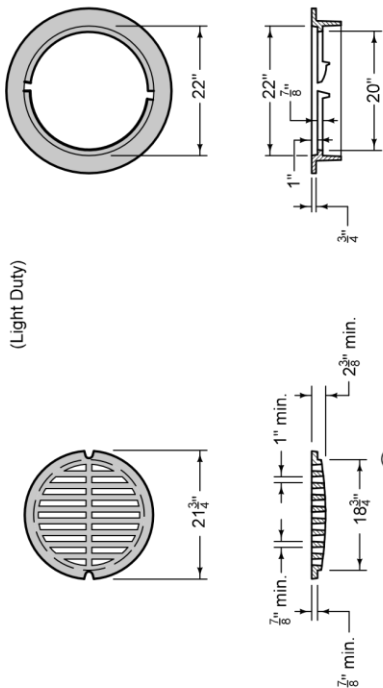


① Cast grate without locking lugs so it may be used in an inverted position.

TYPE 6



TYPE 9
(Light Duty)



GRATE

Minimum Weight = 85 lbs.

FRAME

Minimum Weight = 75 lbs.

FIGURE 6010.604 SHEET 2 OF 2

 SUDAS	 IOWA DOT	REVISION 2 04-17-18
FIGURE 6010.604	STANDARD ROAD PLAN	SW-604
REVISIONS: Replaced Iowa DOT and SUDAS logos.		SHEET 2 of 2
<i>Russ D. Wiegand</i> SUDAS DIRECTOR		<i>Brian Smith</i> DESIGN & LOGO ENGINEER
CASTINGS FOR AREA INTAKES		

SECTION 6020 - REHABILITATION OF EXISTING MANHOLES

PART 1 - GENERAL

1.01 SECTION INCLUDES

Rehabilitation of existing manholes.

1.02 DESCRIPTION OF WORK

Rehabilitate existing manholes to waterproof and to prevent inflow and infiltration, to prevent corrosion, or to reestablish the structural integrity of the manhole. Includes construction of structural liners, protective liners, and infiltration barriers.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants, as well as the following:

- A. Concrete mix design, if required by the Engineer.
- B. Catalog cuts of all mortar mixes, sealants, and liners.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT

A. Infiltration Barriers:

1. Rubber Chimney Seal:

- a. **Measurement:** Each rubber chimney seal installed on an existing manhole will be counted.
- b. **Payment:** Payment will be made at the unit price for each chimney seal.
- c. **Includes:** Unit price includes, but is not limited to, all necessary compression or expansion bands and extension sleeves as necessary to complete chimney seal.

2. Molded Shield:

- a. **Measurement:** Each molded shield installed on an existing manhole will be counted.
- b. **Payment:** Payment will be made at the unit price for each molded shield.

- a) **Includes:** Unit price includes, but is not limited to, sealant.
- 3. Urethane Chimney Seal:
 - a. **Measurement:** Each urethane chimney seal installed on an existing manhole will be counted.
 - b. **Payment:** Payment will be at the unit price for each urethane chimney seal.
- B. **In-Situ Manhole Replacement, Cast-in-place Concrete:**
 - 1. **Measurement:** The vertical dimension of in-situ manhole replacement will be measured in feet from the lowest flowline to the top of the rim.
 - 2. **Payment:** Payment will be at the unit price per vertical foot.
 - 3. **Includes:** Unit price includes, but is not limited to, handling of sewer flows as required to properly complete the installation, invert overlay as recommended by the manufacturer, replacement of existing casting with a new casting, and **testing the manhole upon completion.**
- C. **In-Situ Manhole Replacement, Cast-in-place Concrete with Plastic Liner:**
 - 1. **Measurement:** The vertical dimension of in-situ manhole replacement with plastic liner will be measured in feet from the lowest flowline to the top of the rim.
 - 2. **Payment:** Payment will be at the unit price per vertical foot.
 - 3. **Includes:** Unit price includes, but is not limited to, handling of sewer flows as required to properly complete the installation, invert overlay as recommended by the manufacturer, replacement of existing casting with a new casting, sealing at the frame and cover, sealing pipe penetrations as recommended by the manufacturer, and testing the manhole upon completion.
- D. **Manhole Lining with Centrifugally Cast Cementitious Mortar Liner with Epoxy Seal**
 - 1. **Measurement:** The vertical dimension of manhole lining will be measured for depth in feet from the bottom of the lining to the top of the lining for each liner thickness specified.
 - 2. **Payment:** Payment will be at the unit price per vertical foot for each liner thickness.
 - 3. **Includes:** Unit price includes, but is not limited to, the handling of sewer flows during lining operations as required to properly complete the installation, and replacement of the existing casting with a new casting.

PART 2 - PRODUCTS

2.01 INFILTRATION BARRIER

- A. **Rubber Chimney Seal:** Comply with Section 6010, 2.11 for external and internal rubber chimney seals.

- B. **Molded Shield:** Comply with Section 6010, 2.11 for molded shields.
- C. **Heat Shrink Sleeve:** Comply with Section 6010, 2.11 for heat shrink sleeves.
- D. **Urethane Chimney Seal:** Comply with the following table for the physical properties.

Table 6020.01: Physical Properties

Property	ASTM Test Method	Acceptable Value
Elongation	D 412	800%, minimum
Tensile Strength	D 412	1150 psi, minimum
Adhesive Strength	D 903	175 lb/in, minimum
Pressure Resistance	C 1244	2 minutes

2.02 IN-SITU MANHOLE REPLACEMENT, CAST-IN-PLACE CONCRETE

- A. **Forming System:** Provide an internal forming system capable of forming a new and structurally independent manhole wall within the existing manhole, with the specified thickness and conforming to the general shape of the existing manhole.
- B. **Concrete:** Type I/II Portland cement with 5/8 inch minus coarse aggregate with fiber reinforcement and water reducer, 4,000 psi minimum 28 day compressive strength or as approved by the Engineer.
- C. **Plastic Liner:** When specified, provide a PVC or PE plastic liner resistant to degradation by sulfuric acid. Use a liner capable of being attached to the exterior of the forming system during erection of the forms. Use a plastic liner with a ribbed or studded exterior surface suitable for anchoring to the newly formed interior wall.
- D. **Casting:** Provide new casting. Comply with Section 6010, 2.10.

2.03 CENTRIFUGALLY CAST CEMENTITIOUS MORTAR LINER WITH EPOXY SEAL

- A. **Cementitious Lining:**
 1. Use a high-strength, high-build, corrosion-resistant mortar, based on Portland cement fortified with micro silica. Mixed mortar is to have a paste-like consistency that may be sprayed, cast, pumped, or gravity-flowed into any area 1/2 inch and larger.

2. Comply with the following table for physical properties.

Table 6020.02: Physical Properties

Property	Value
Unit Weight	125 pcf
Set Time at 70° F ASTM C 403 Initial Set / Final Set	240 minutes / 440 minutes
Modulus of Elasticity ASTM C 469 24 hours / 28 days	180,000 psi / 1,150,000 psi
Flexural Strength ASTM C 293 24 hours / 28 days	650 psi / 800 psi
Compressive Strength ASTM C 109 24 hours / 28 days	3,000 psi / 10,000 psi
Tensile Strength ASTM C 307	600 psi
Shear Bond ASTM C 882	>1,000 psi
Shrinkage ASTM C 157	None
Chloride Permeability ASTM C 1202	<550 Coulombs

3. Use a lining containing a liquid admixture for the prevention of micro-biologically induced corrosion.

B. Corrosion-Resistant Epoxy Lining:

1. Use a two-component 100% solids epoxy formulated for use in sewer systems.
2. Comply with the following table for physical properties.

Table 6020.03: Physical Properties

Property	Value
Dry Time	4-6 hours at 75° F
Compressive Strength ASTM D 695	16,800 psi
Flexural Strength ASTM D 790	13,900 psi
Tensile Strength ASTM D 638	12,400 psi
Hardness ASTM D 2240	68-72 Shore D
Heat Distortion ASTM D 648	220°F
Ultimate Elongation ASTM D 638	4.5 %
Adhesive Shear ASTM C 882	1,000 psi

- C. **Casting:** Provide new casting. Comply with Section 6010, 2.10.

PART 3 - EXECUTION**3.01 INFILTRATION BARRIER**

- A. **Rubber Chimney Seal:** Comply with Section 6010, 3.01.

- B. **Molded Shield:** Comply with Section 6010, 3.01.
- C. **Urethane Chimney Seal:** Use only when specified in the contract documents.
 - 1. Prepare the surface according to the manufacturer's recommendations, including sandblasting, pressure washing, sealing leaks or gaps, and drying the surface.
 - 2. Apply primer, prepare product, and brush-apply the seal to a minimum thickness of 175 mils, covering 2 inches above the bottom of the frame and the entire adjustment ring area to 3 inches below the bottom adjustment ring.

3.02 IN-SITU MANHOLE REPLACEMENT, CAST-IN-PLACE CONCRETE

- A. **Preparation:** Prepare according to the forming system manufacturer's recommendations, including the following:
 - 1. Clean the existing surface to remove loose material and debris.
 - 2. Remove existing steps that might interfere with the erection of the forms.
 - 3. Control infiltration that may affect placement of concrete.
- B. **Installation:** Install and test according to the forming system manufacturer's recommendations, including the following:
 - 1. Place pipe extensions through the structure to maintain flow during installation.
 - 2. Erect forms inside the manhole. Secure the assembled internal forms to prevent shifting and to provide sufficient stiffness and strength to prevent collapse.
 - 3. Install a plastic liner when specified.
 - 4. Seal the forms at the bottom of the manhole to ensure the concrete does not enter the sewer.
 - 5. Carefully place concrete between the forms and the existing manhole walls. Place concrete from the bottom up to prevent segregation of concrete.
 - 6. Consolidate concrete as required to fill all pockets, seams, and cracks within the existing manhole wall.
 - 7. Remove the forms when the concrete has cured sufficiently.
 - 8. Weld and test joints if a plastic liner is installed.
 - 9. Apply a sealing strip around the circumference of the invert top where it meets the vertical wall and around all pipe penetrations to form a waterstop.
 - 10. Overlay the invert top with concrete or high-strength mortar. Vary thickness from 3 inches at the wall to 1/2 inch at the edge of the channel.
 - 11. Apply an epoxy lining to the invert top. Apply clean sand to the epoxy to create a non-slip surface.

12. Seal the plastic liner to the manhole casting and existing pipe stubs as recommended by the manufacturer.

13. Install new casting.

3.03 CENTRIFUGALLY CAST CEMENTITIOUS MORTAR LINER WITH EPOXY SEAL

A. **Surface Preparation:** Prepare according to the manufacturer's recommendations, including the following:

1. Wash the interior with a high-pressure washer.
2. Plug active leaks with the appropriate sealing material.

B. **Mortar Application:** Apply according to the manufacturer's recommendations, including the following:

1. Apply with a rotating centrifugal casting applicator, beginning at the bottom of the manhole.
2. Retrieve the applicator head at the manufacturer's recommended speed to achieve the desired thickness.
3. Apply to the full required thickness utilizing multiple passes as necessary. Minimize the time between passes so subsequent passes are cast against fresh mortar.
4. Verify thickness with a wet gauge at several locations to ensure proper depth.
5. Hand-apply high-strength mortar to the invert surface. Vary thickness from 3 inches at the wall to 1/2 inch at the edge of the channel.

C. **Epoxy Seal Application:** Seal according to the manufacturer's recommendations, including the following:

1. Apply with a rotating centrifugal casting applicator or airless sprayer onto the fresh mortar liner.
2. If the epoxy seal is applied more than 24 hours after application of the mortar liner, or if the mortar liner is contaminated, clean the liner and then apply the epoxy.

D. **Finishing:** Install a new casting.

3.04 CLEANING, INSPECTION, AND TESTING

Comply with Section 6030 for in-situ manhole replacement and centrifugally cast mortar lined rehabilitation.

END OF SECTION

SECTION 6030 - 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 Division 1 - General Provisions and Covenants.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants, 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 6010 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. K
 - 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 4060.
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 4060, 3.04. After 1 hour, measure the drop in water level.
8. Test failure is indicated by water loss greater than the maximum allowable calculated exfiltration.

3.05 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

DIVISION 7 - STREETS AND RELATED WORK

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SECTION 7010 -PORTLAND CEMENT CONCRETE PAVEMENT

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 Division 1 - General Provisions and Covenants, 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.
- B. Submit mixes or mix designs approved by the Iowa Department of Transportation or an independent testing laboratory.
- C. Maturity curves for paving mixes and maturity reading results.
- D. Submit all testing and certifications according to Section 7010, 3.07.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, HANDLING, AND SALVAGING

Comply with Division 1 - General Provisions and Covenants, 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 Division 1 - General Provisions and Covenants, 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

1.08 MEASUREMENT AND PAYMENT

A. PCC Pavement:

1. **Measurement:** Measurement will be in square yards for each different thickness of PCC pavement. The area of manholes, intakes, or other fixtures in the pavement will not be deducted from the measured pavement area.
2. **Payment:** Payment will be at the unit price per square yard for each thickness of PCC pavement.
3. **Includes:** Unit price includes, but is not limited to, final trimming of subgrade or subbase, integral curb, bars and reinforcement, joints and sealing, surface curing and pavement protection, safety fencing, concrete for rigid headers, boxouts for fixtures, pavement smoothness testing, and quality control for stringless paving.

B. Air Content Deficiency:

1. **Measurement:** Measurement will be in square yards for each different thickness of PCC pavement subject to a unit price reduction for air content deficiency according to Section 7010, 3.07.
2. **Payment:** Payment will be at the reduced unit price according to Table 7010.03 for each thickness of PCC pavement. If there is an air content deficiency on a privately contracted roadway project, the Jurisdiction ultimately accepting ownership of the roadway will receive the penalty payment prior to acceptance of the work.

C. Pavement Smoothness Deficiency:

1. **Measurement:** Measurement will be in square yards for each different thickness of PCC pavement subject to a unit price reduction for pavement smoothness according to Section 7010, 3.07.
2. **Payment:** Payment will be at the reduced unit price according to Table 7010.04 for each thickness of PCC pavement. If there is a pavement smoothness deficiency on a privately contracted roadway project, the Jurisdiction ultimately accepting ownership of the roadway will receive the penalty payment prior to acceptance of the work.

D. PCC Pavement Thickness Deficiency:

1. **Measurement:** Measurement will be in square yards for each different thickness of PCC pavement that has deficient pavement thickness as determined in Table 7010.05.
2. **Payment:** Payment will be at the percentage of the unit price indicated in Table 7010.05 for each different thickness of PCC pavement. If there is a pavement thickness deficiency on a privately contracted roadway project, the Jurisdiction ultimately accepting ownership of the roadway will receive the penalty payment prior to acceptance of the work.

E. Curb and Gutter:

1. **Measurement:** Measurement will be in linear feet measured along the face of the curb for each different width and thickness of curb and gutter.
2. **Payment:** Payment will be at the unit price per linear feet of curb and gutter.
3. **Includes:** Unit price includes, but is not limited to, final subgrade/subbase preparation, bars and reinforcement, joints and sealing, surface curing and pavement protection, and boxouts for fixtures.

F. Beam Curb:

1. **Measurement:** Measurement will be in linear feet measured along the face of the curb.
2. **Payment:** Payment will be at the unit price per linear feet of beam curb.
3. **Includes:** Unit price includes, but is not limited to, final subgrade/subbase preparation, bars and reinforcement, joints and sealing, surface curing and pavement protection, and boxouts for fixtures.

G. Concrete Median:

1. **Measurement:** Measurement will be in square yards of concrete median. When the curb is integral with the pavement, the width will be measured from back of curb to back of curb.
2. **Payment:** Payment will be at the unit price per square yard of concrete median.
3. **Includes:** Unit price includes, but is not limited to, final subgrade/subbase preparation, bars and reinforcement, joints and sealing, surface curing and pavement protection, and boxouts for fixtures.

H. PCC Railroad Crossing Approach:

1. **Measurement:** Measurement will be in square yards of railroad crossing approach.
2. **Payment:** Payment will be at the unit price per square yard of railroad crossing approach.
3. **Includes:** Unit price includes, but is not limited to, excavation for modified subbase and subdrain, furnishing and installing subdrain, furnishing and installing subdrain outlet or connection to storm sewer, furnishing and installing porous backfill material, furnishing and installing fiber board barrier, furnishing and placing modified subbase material, furnishing and installing reinforcing steel and tie bars, furnishing and placing concrete, furnishing, placing, and compacting HMA.

I. PCC Pavement Samples and Testing:

1. **Measurement:** Lump sum item; no measurement will be made.
2. **Payment:** Payment will be at the lump sum price for PCC pavement samples and testing.

3. **Includes:** Lump sum price includes, but is not limited to, certified plant inspection, pavement thickness cores, profilograph pavement smoothness measurement (when required by the contract documents), and maturity testing.
- J. **Granular Surfacing:** Comply with Section 7030 for granular surfacing material placed at intersecting roads, driveways, and turnouts.
- K. **PCC Pavement Widening:**
 1. **Measurement:** Measurement will be in square yards for each different thickness of PCC pavement widening. The area of manholes, intakes, or other fixtures in the pavement will not be deducted from the measured pavement widening area.
 2. **Payment:** Payment will be at the unit price per square yard for each thickness of PCC pavement widening.
 3. **Includes:** Unit price includes, but is not limited to, final subgrade/subbase preparation, integral curb, bars and reinforcement, joints and sealing, surface curing and pavement protection, safety fencing, concrete for rigid headers, boxouts for fixtures, and pavement smoothness.
- L. **Pavement Removal:** Comply with Section 7040.
- M. **Fixture Adjustment:** Comply with Section 6010 for adjustment of manholes and intakes and Section 5020 for adjustment of water valves and fire hydrants.

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, 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:

Iowa DOT Article 4109.02, Gradation No. 1 in the Aggregate Gradation Table.

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

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
1/2"	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 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 tie bars and dowel bars. Meet the tie bar requirements for bar mats. All 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.
 - a. Resilient filler
 - b. Flexible foam expansion joint filler
 - c. Tire buffings expansion joint filler
 - d. 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.
3. 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.
4. 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 7010, 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 7010, 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 7010, 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 7010.
 - 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 7010, 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:
 - 1) The following day, or
 - 2) 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 an approximate slope of 15 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 7040, 3.02.

B. **Final Subgrade/Subbase Preparation:**

1. **General:**

- a. Meet the requirements of Section 2010 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 2010, 3.06.
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 6010, 3.04 for manhole adjustments and Section 5020, 3.04 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 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.
- c. 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 $T/2 \pm 1/2$ 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.
 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 7010 and Figure 7010.903. Construct HMA section according to the full depth patch requirements of Section 7040.
- 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. **Straight Edging:**
 - 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.

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 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 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 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 7010, 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 Figure 7010.102)

- A. Complete the construction of curb and gutter separate from pavement in the same manner as for pavement in Section 7010, 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 34°F and rising. At the time of placement, concrete must have a temperature of at least 40°F.
 - 2) Stop mixing and placing when the air temperature is 38°F or less and falling or if the temperature stops rising and does not reach 38°F.
- 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.

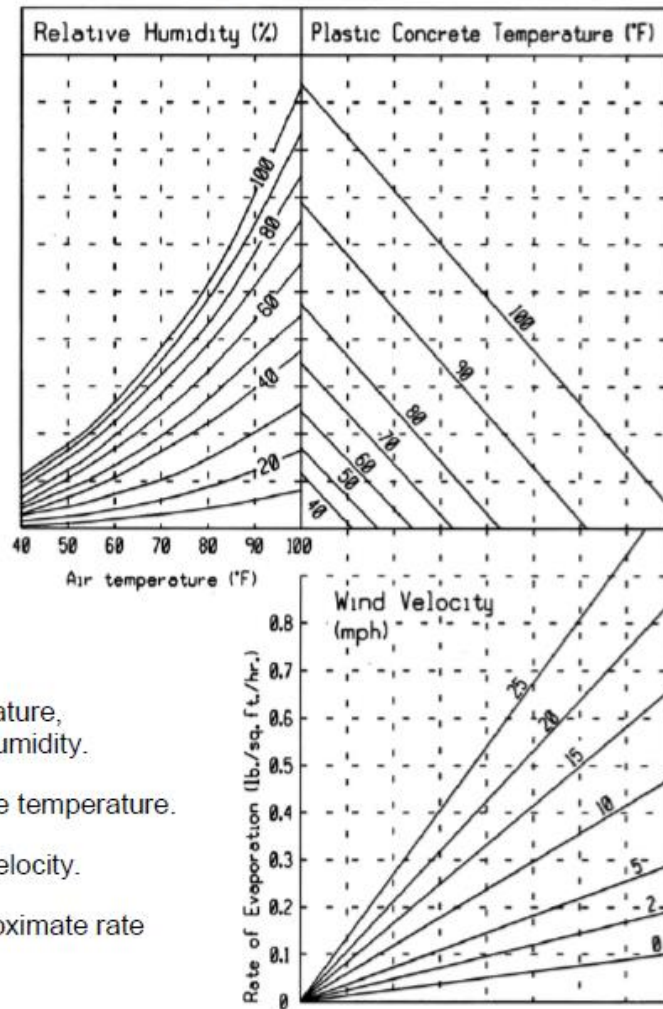
¹Keep protection in place until one of the following conditions is met:

- 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.
 - 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.

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

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	

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
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	Contractor
	Smoothness	SUDAS 7010, 3.07	Field Test – Profilograph	Project length	
	Thickness	SUDAS 7010, 3.07	Field Test	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:

3. Air content of the concrete will be evaluated according to Iowa DOT Materials I.M. 318 and 327.
4. 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 $\frac{1}{4}$ 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 $\frac{1}{8}$ 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"

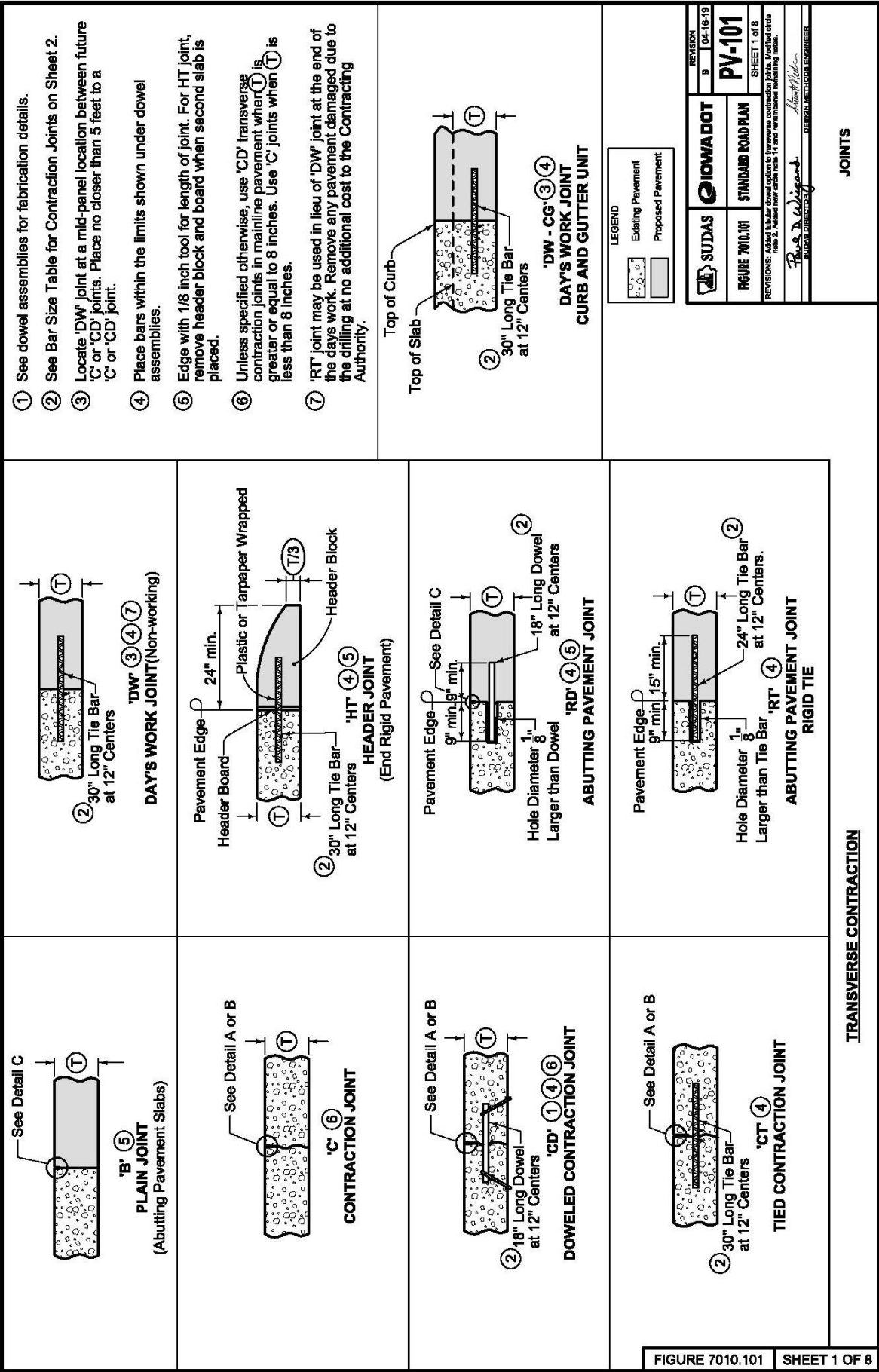
Thickness Index Range	Percent Payment
More than 0 to -0.15	100
-0.16 to -0.25	95
-0.26 to -0.50	85
-0.51 or less	As determined by the Engineer

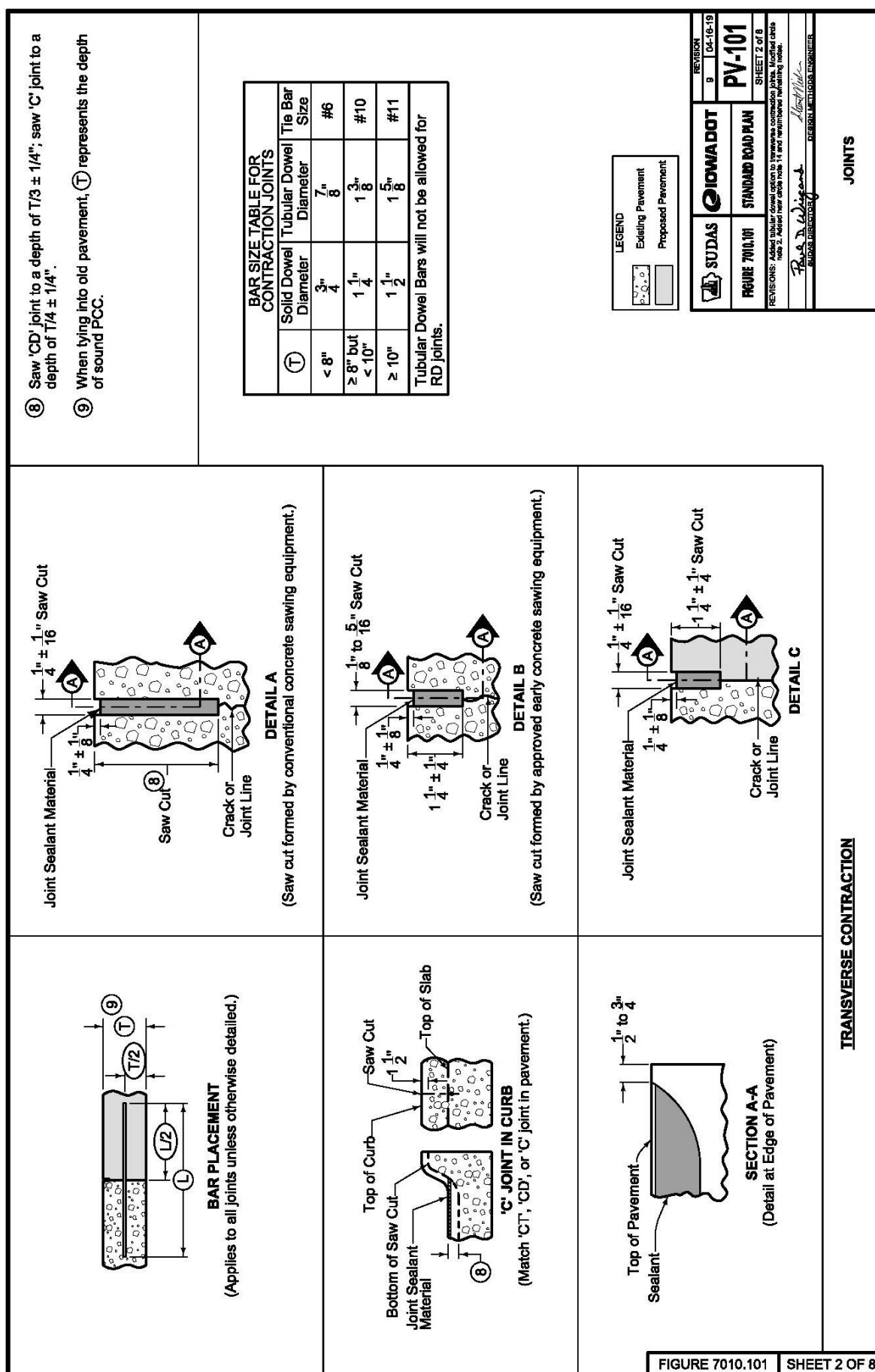
Table 7010.06: Pay Factor for PCC Pavement for Design Thickness 9" or Greater

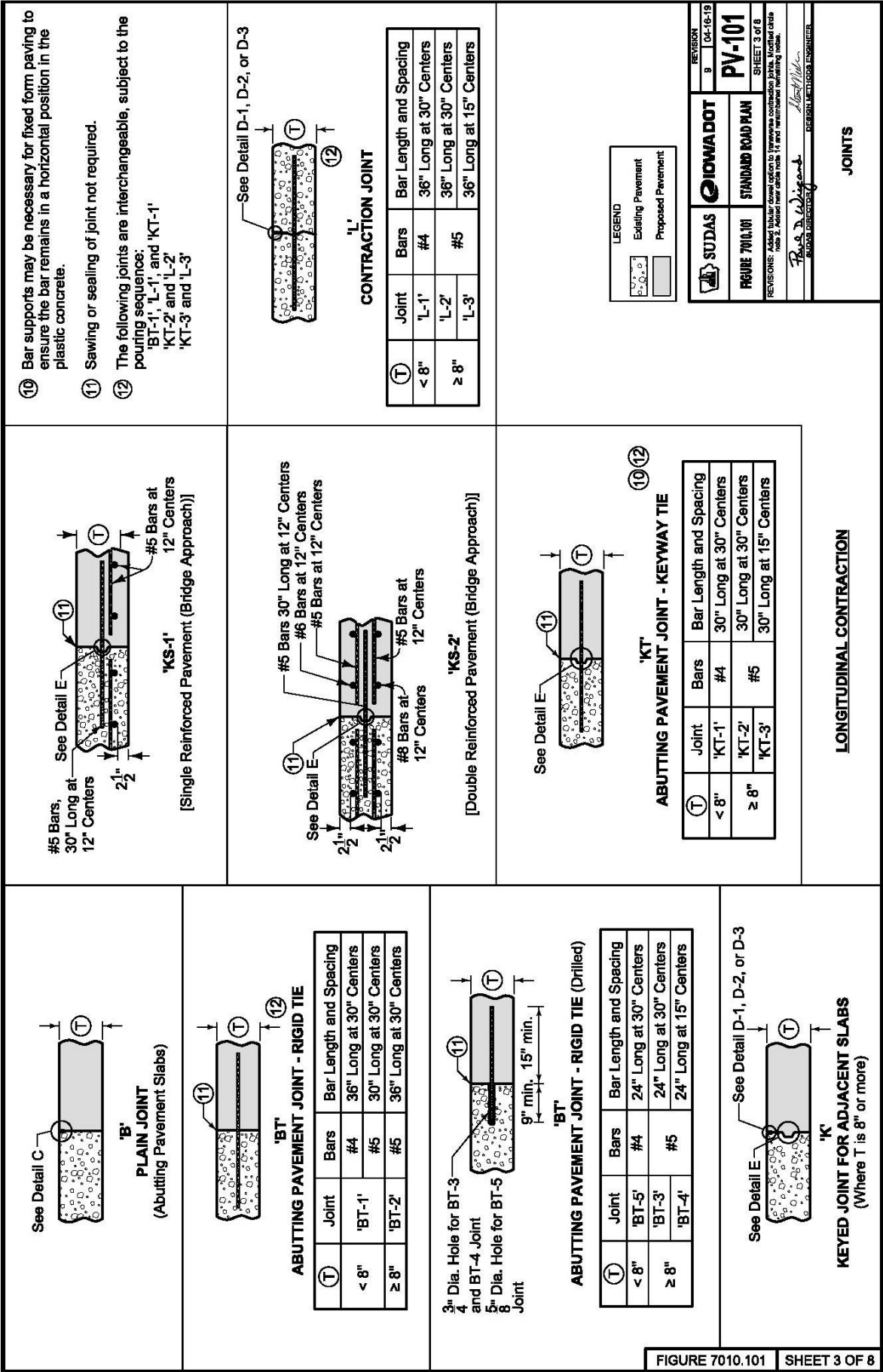
Thickness Index Range	Percent Payment
More than 0.00 to -0.15	100
-0.16 to -0.20	99
-0.21 to -0.25	98
-0.26 to -0.30	97
-0.31 to -0.35	96
-0.36 to -0.40	95
-0.41 to -0.45	94
-0.46 to -0.50	93
-0.51 to -0.55	92
-0.56 to -0.60	91
-0.61 to -0.65	90
-0.66 to -0.70	89
-0.71 to -0.75	88
-0.76 to -0.80	87
-0.81 to -0.85	86
-0.86 to -0.90	85
-0.91 or less	As determined by the Engineer

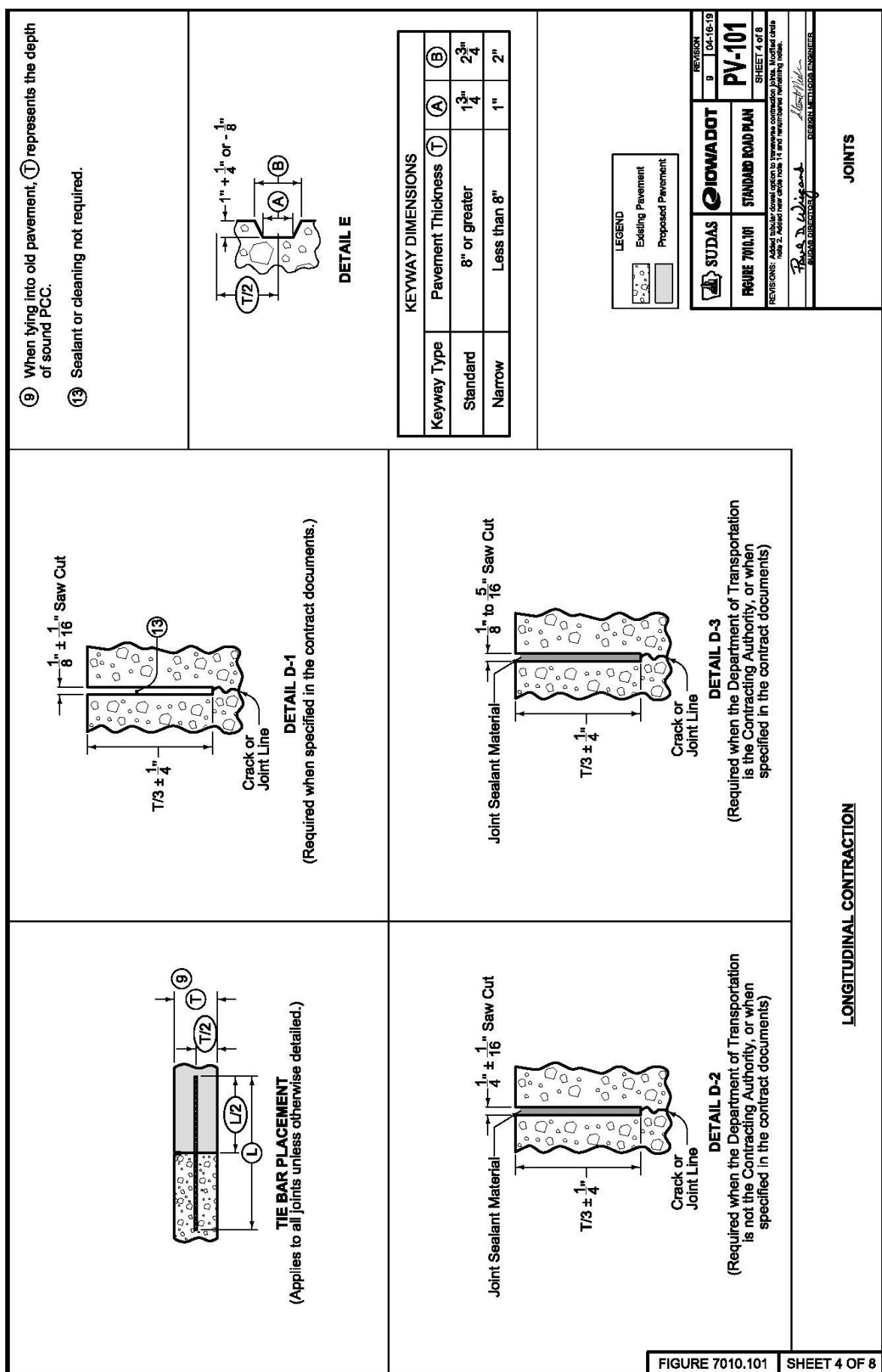
- E. **Defects or Deficiencies:** Remove and replace or repair pavement containing excessive cracks, fractures, spalls, or other defects at no additional cost to the Contracting Authority. The method of replacement or repair will be determined by the Engineer.

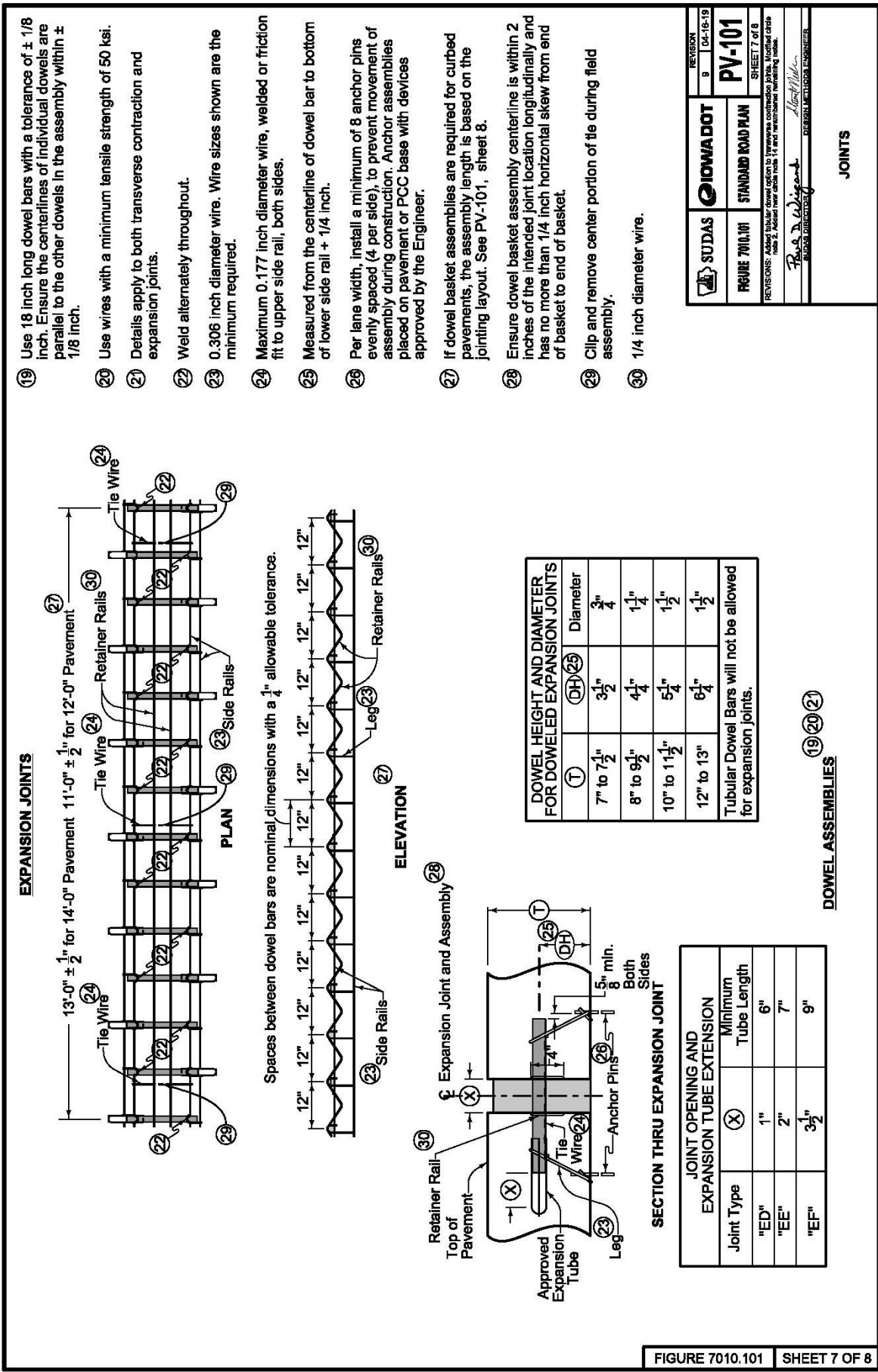
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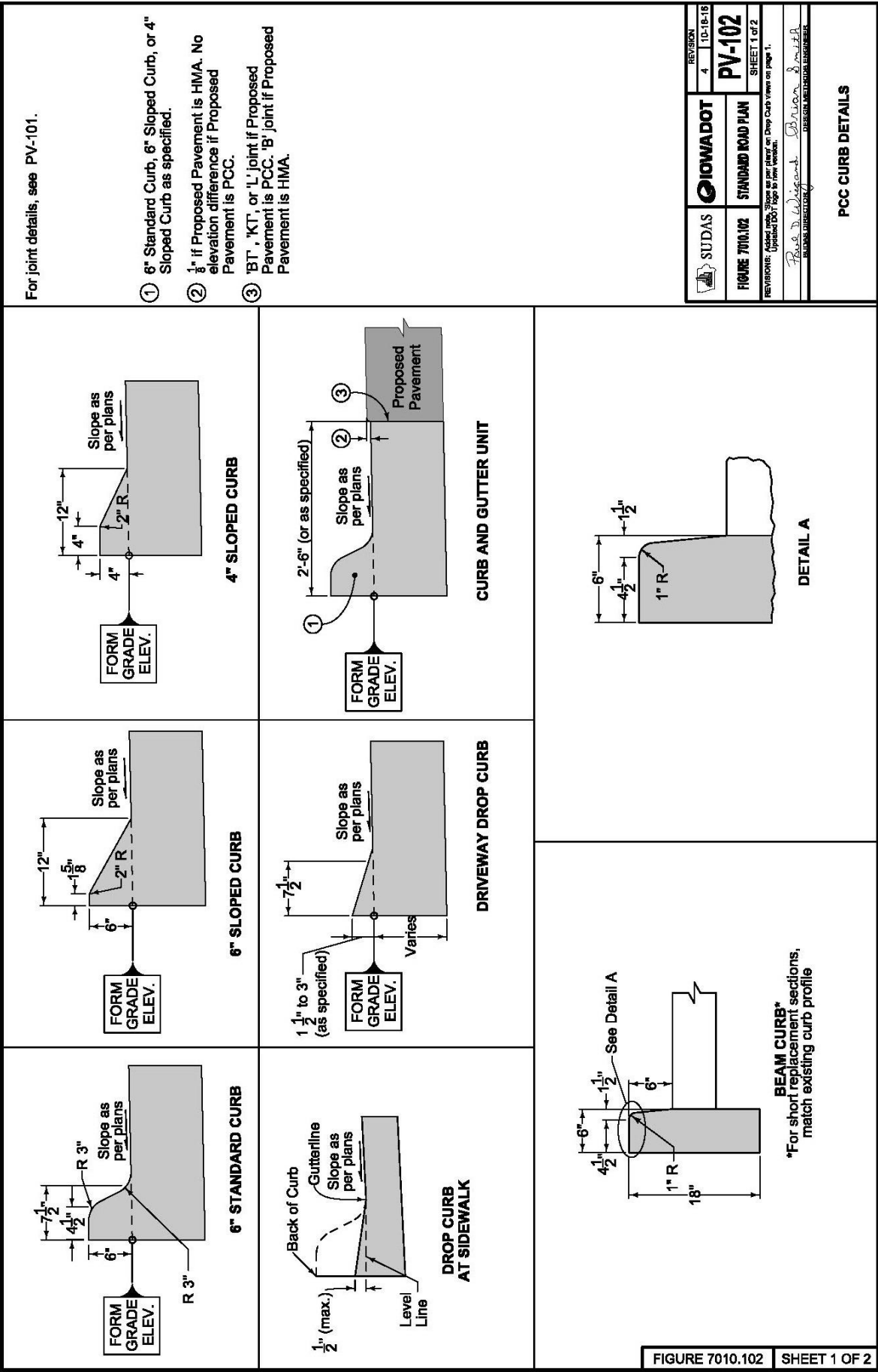


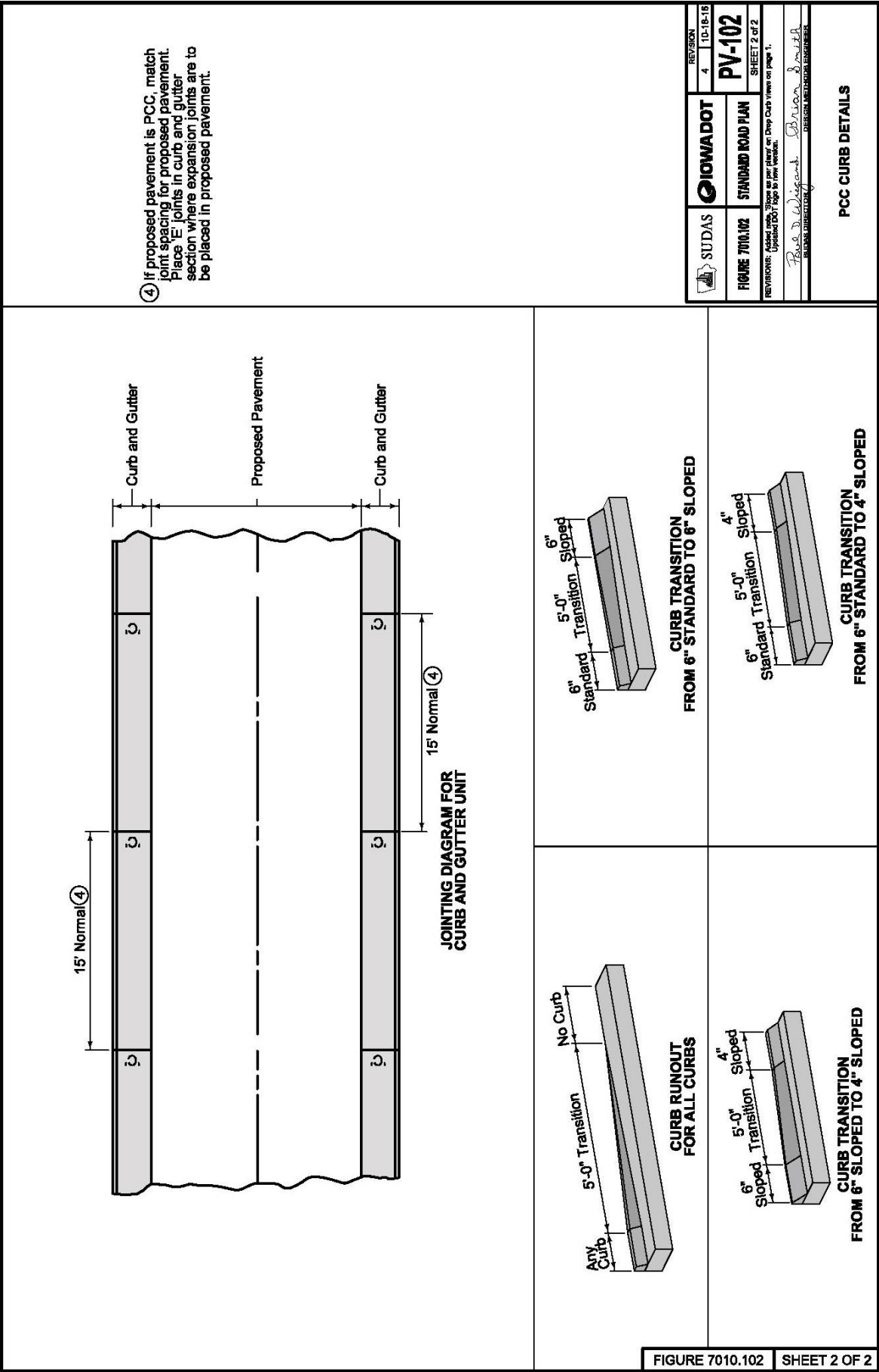












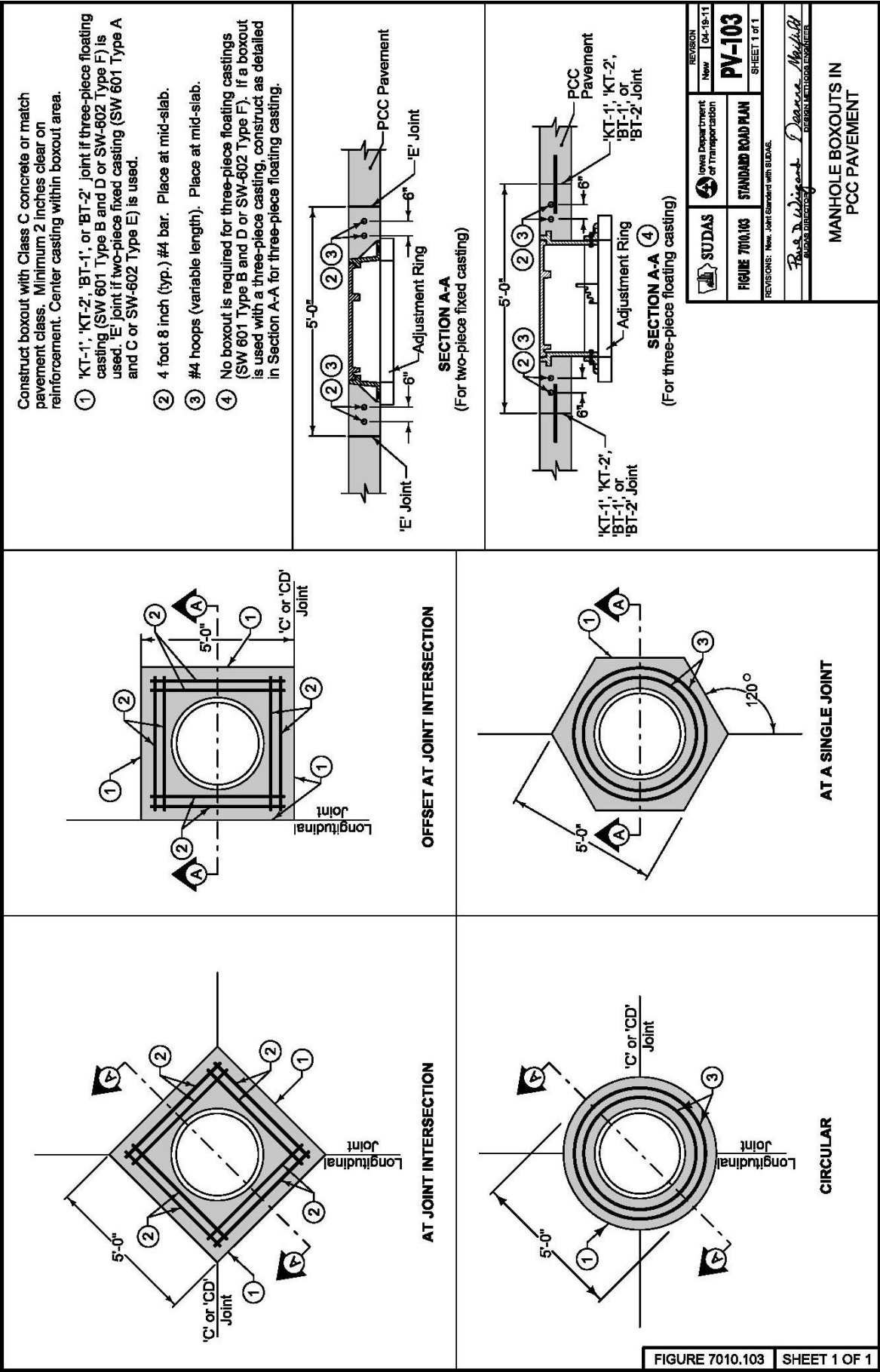
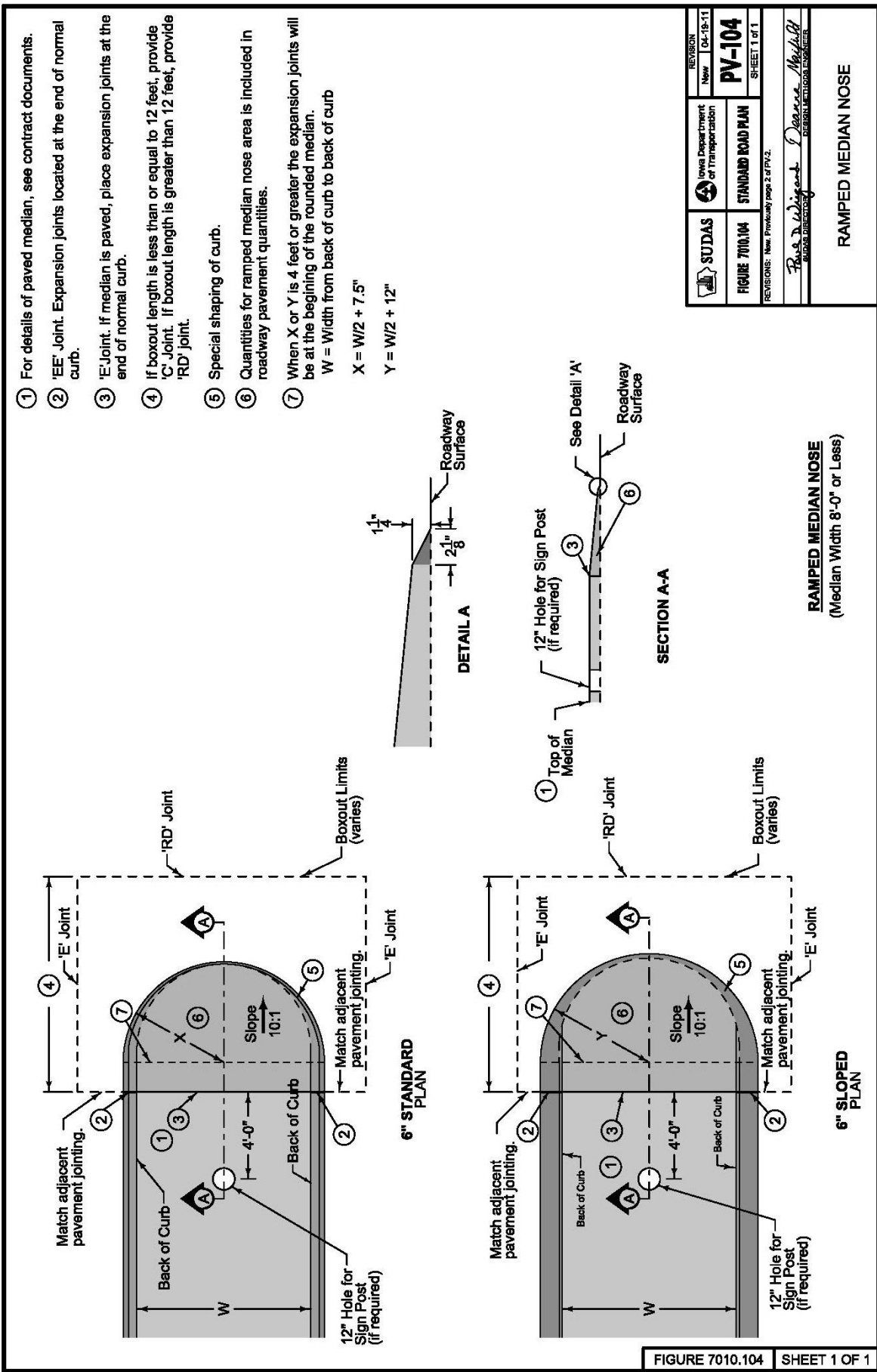


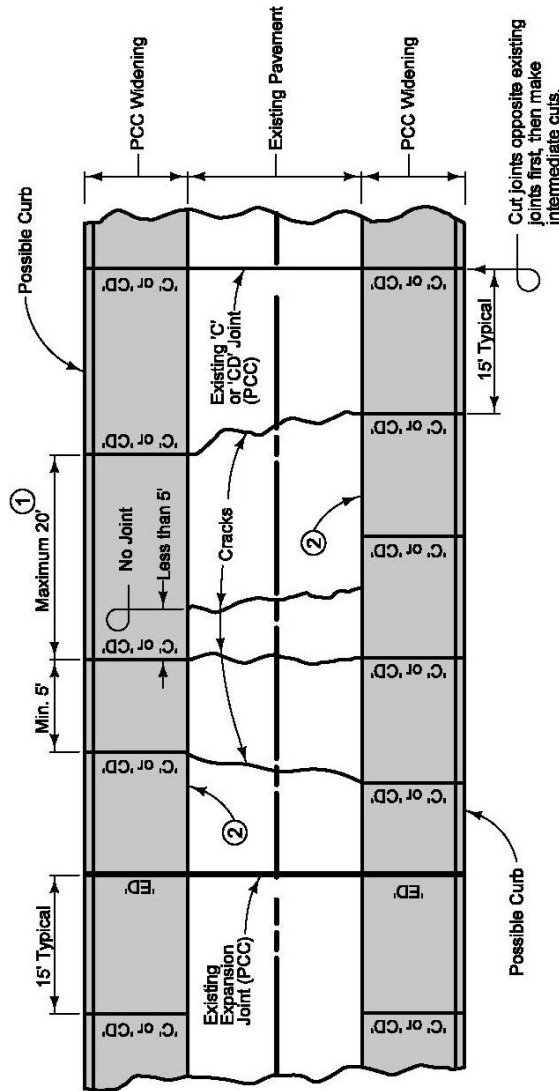
FIGURE 7010.103 SHEET 1 OF 1

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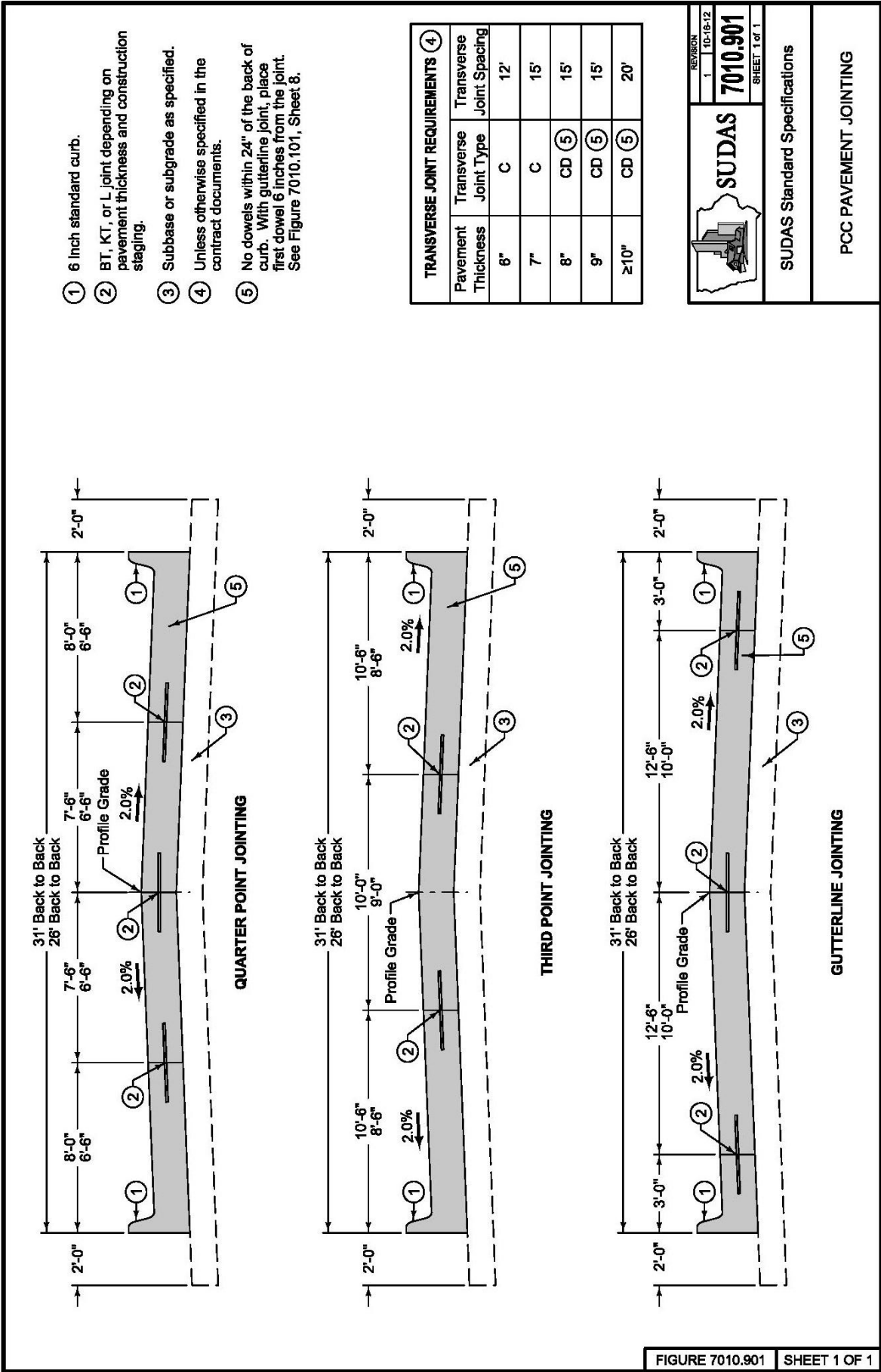
For joint details, see PV-101.
For curb details, see PV-102.

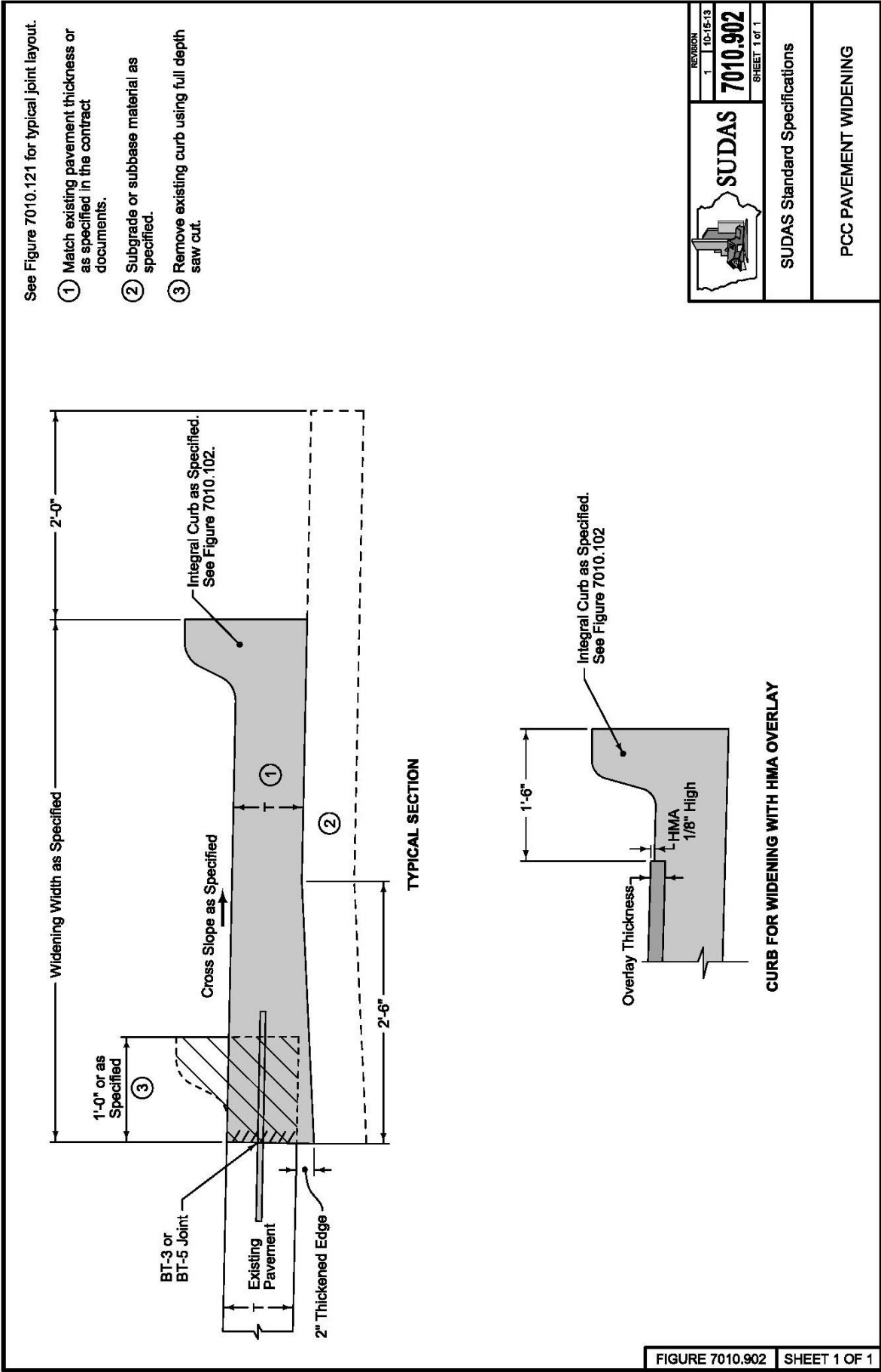
- ① If more than 20 feet, add extra joint at midpoint.
- ② 'BT' Joint

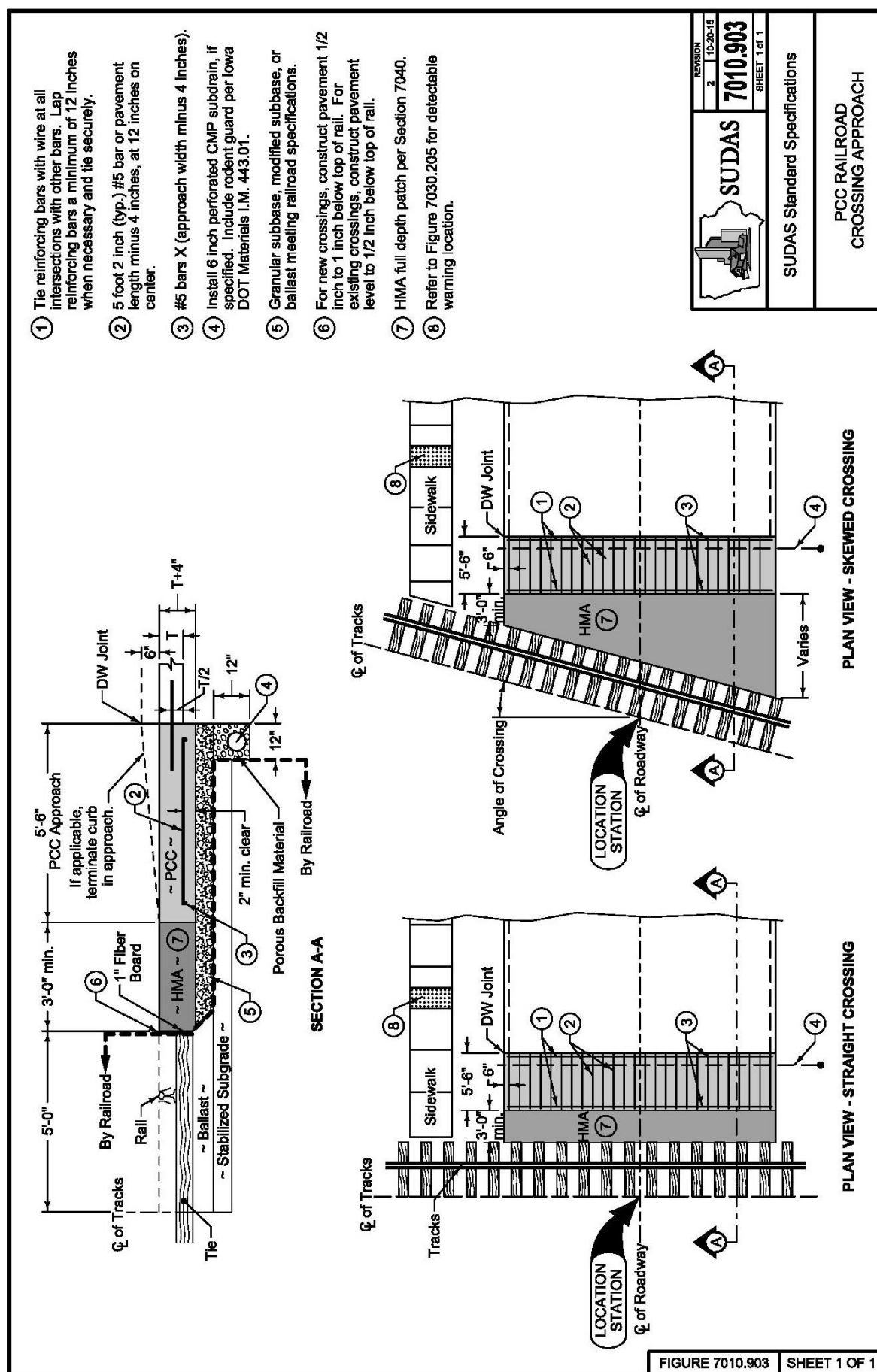


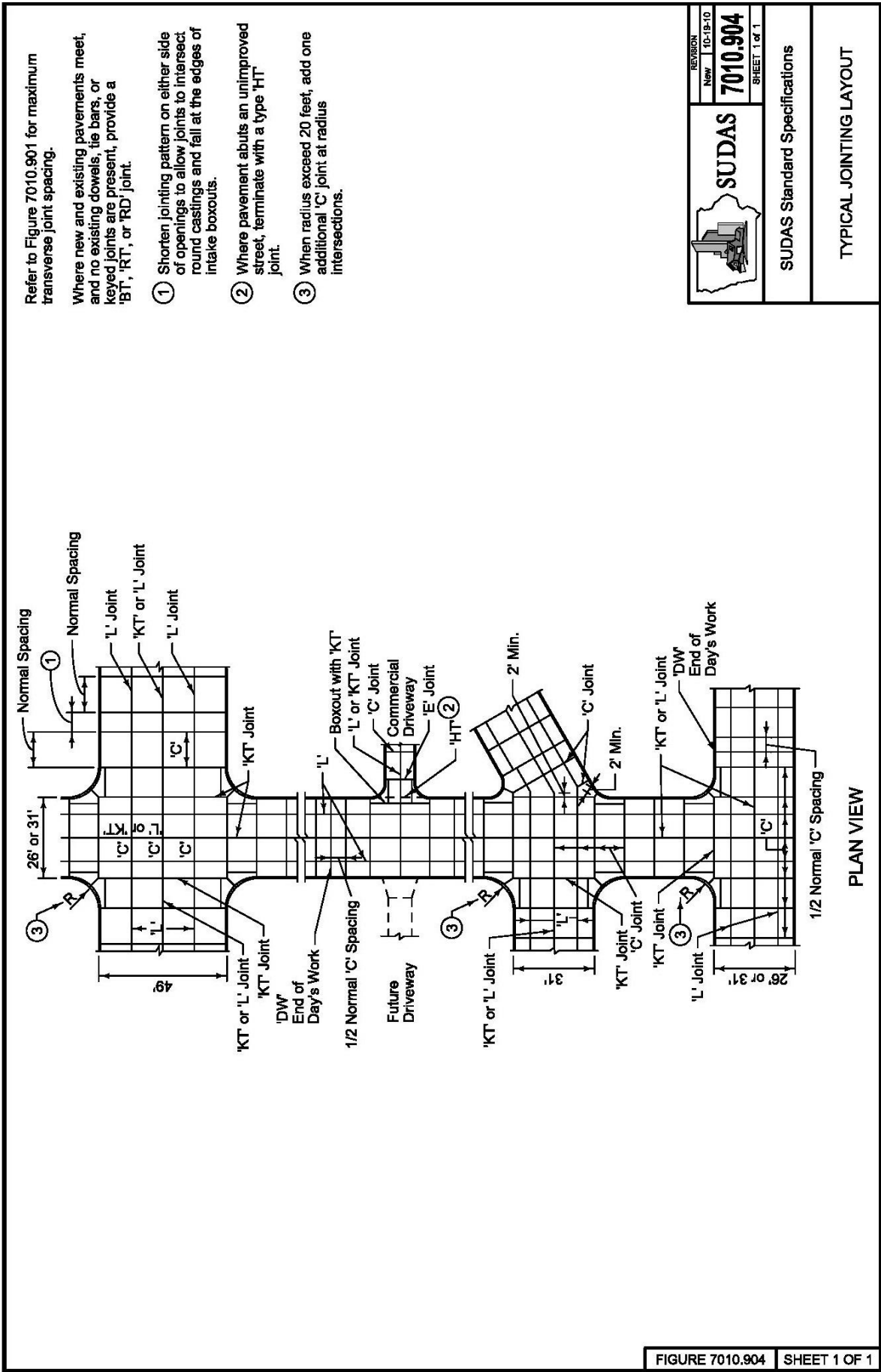
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			PV-121		
SHEET 1 OF 1					
FIGURE 7010.121					
STANDARD ROAD PLAN					
REVISIONS: Add detail note 2 and replaced the DOT logo in the title block with the Iowa DOT logo.					
Paul D. Wiegand, Brian Smith					
SUDAS DIRECTOR IOWA DOT					
DESIGN METHOD ENGINEER					
JOINTING PCC PAVEMENT WIDENING					

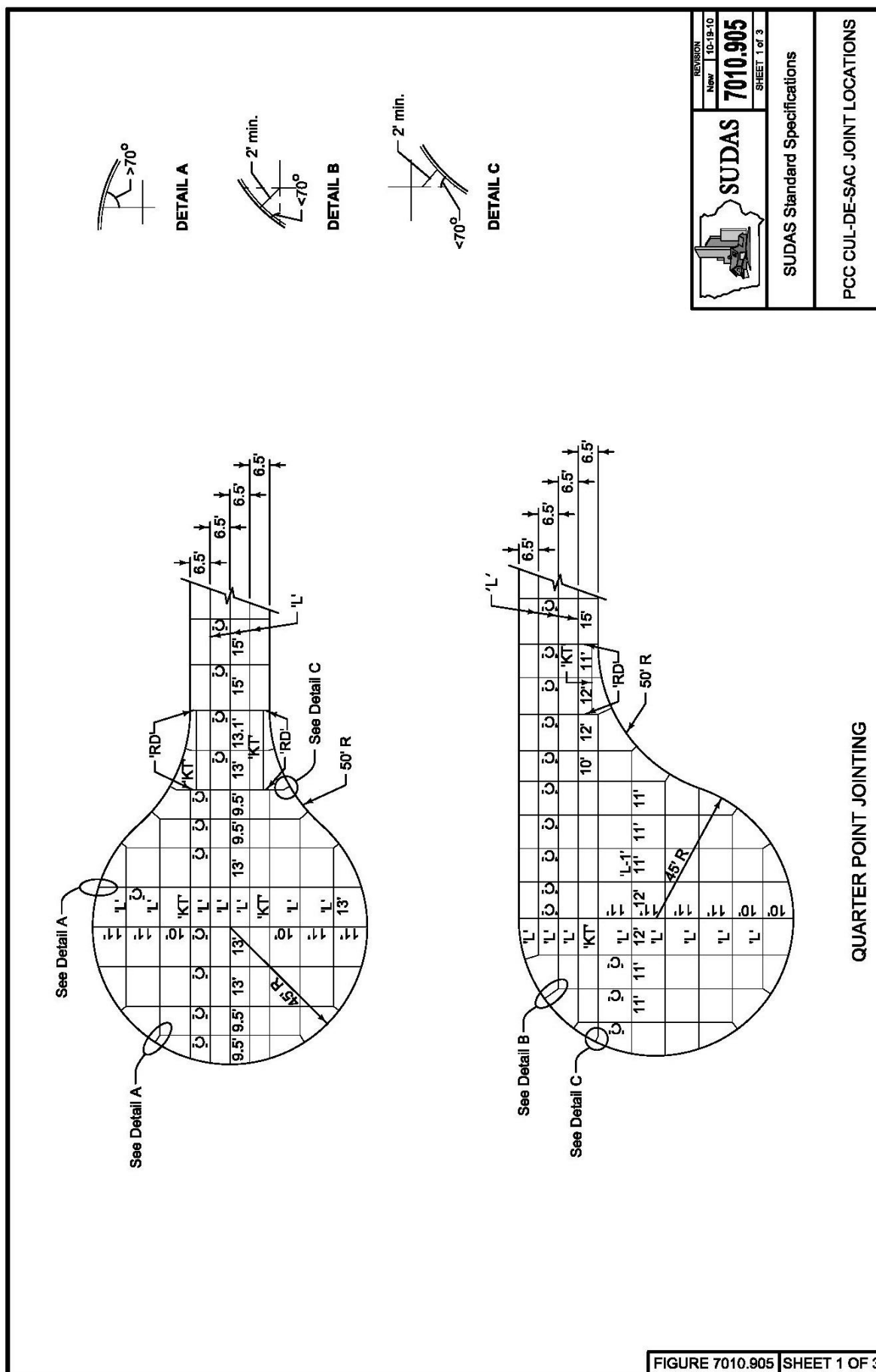
FIGURE 7010.121 SHEET 1 OF 1

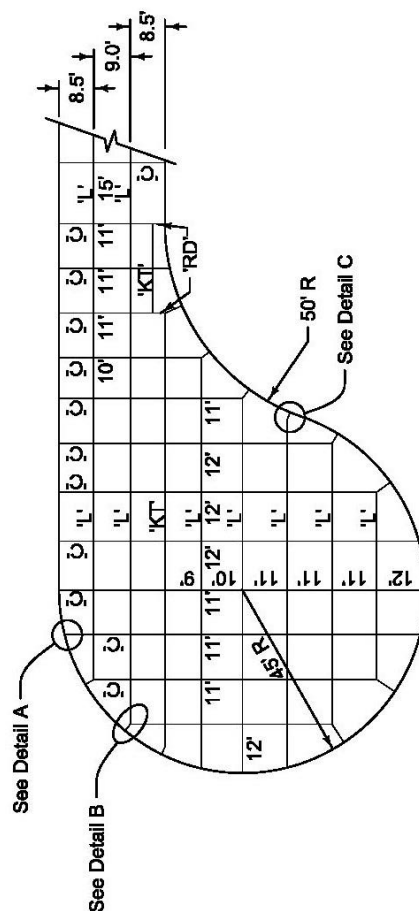
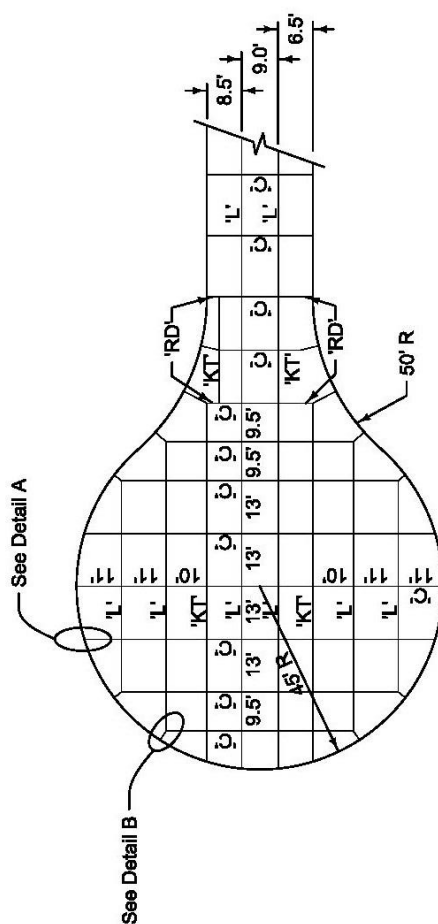












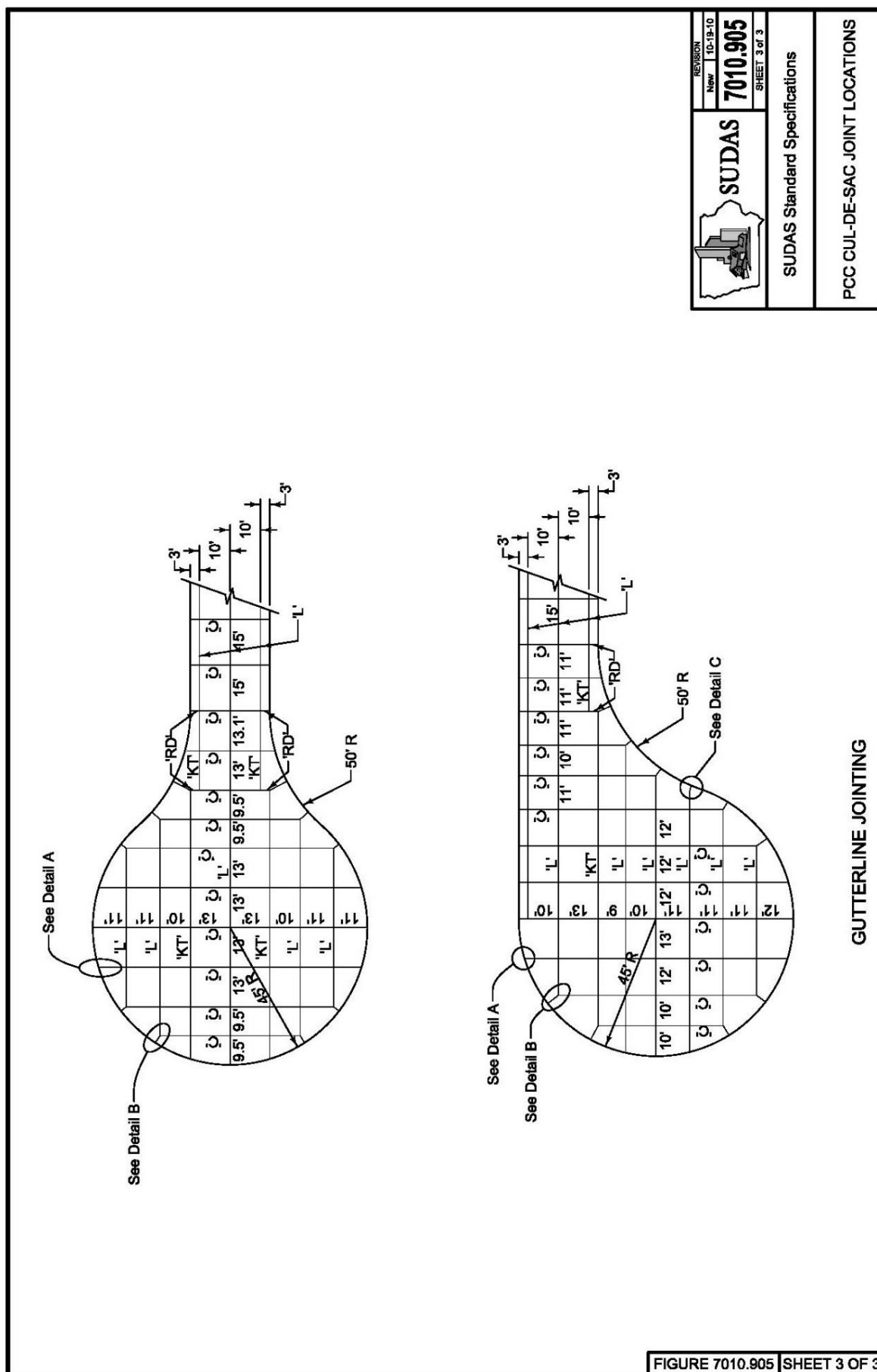
THIRD POINT JOINTING

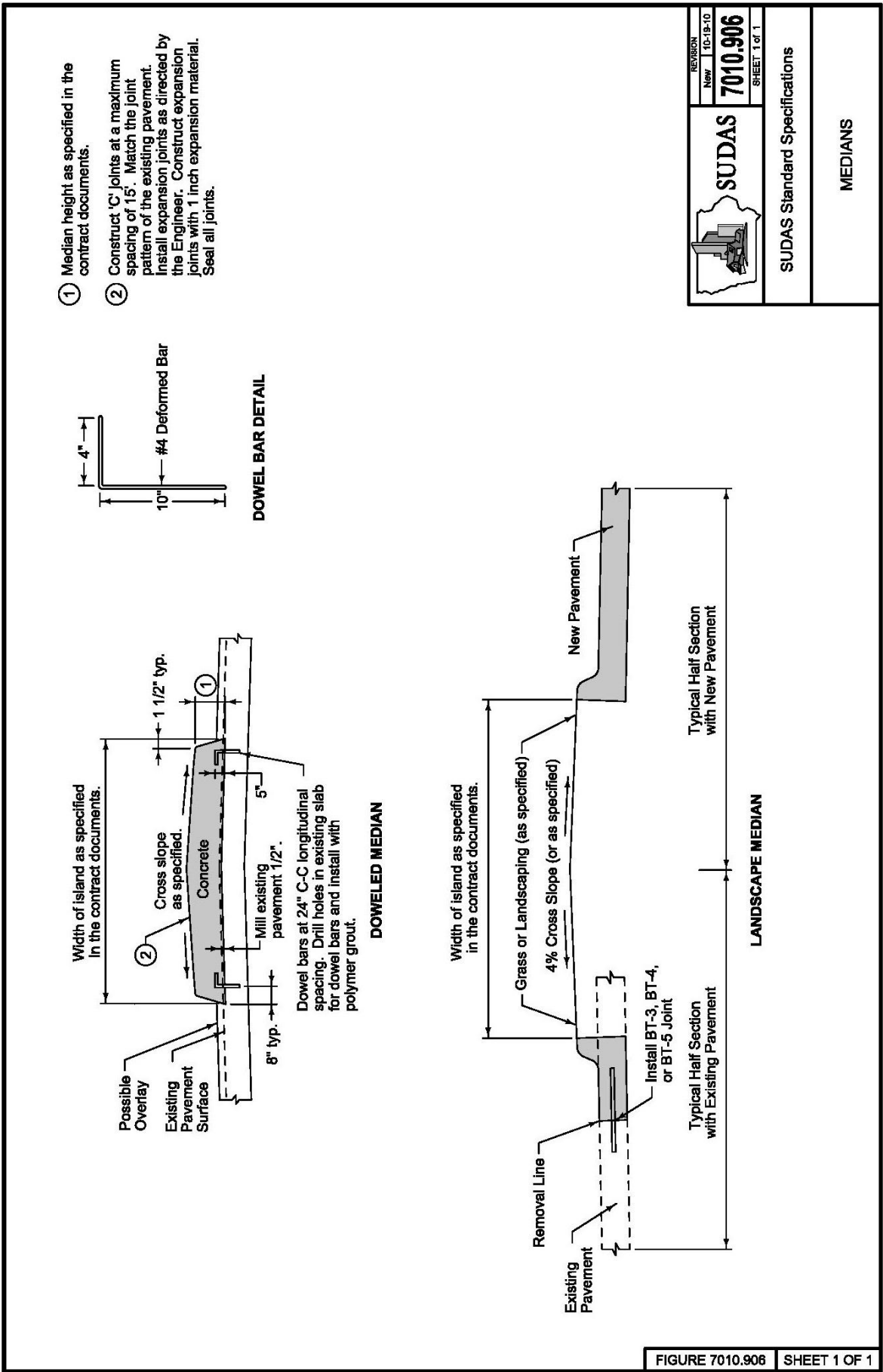
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	7010.905
	SHEET 2 of 3

SUDAS Standard Specifications

PCC CUL-DE-SAC JOINT LOCATIONS

FIGURE 7010.905 SHEET 2 OF 3





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SECTION 7011 - PORTLAND CEMENT CONCRETE OVERLAYS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Bonded Concrete Overlays Over Concrete
- B. Bonded Concrete Overlays Over Asphalt
- C. Unbonded Concrete Overlays Over Concrete (with separation layer)
- D. Unbonded Concrete Overlays Over Asphalt

1.02 DESCRIPTION OF WORK

Includes the requirements for the construction of PCC overlays.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants and Section 7010, 1.03.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants

1.05 DELIVERY, STORAGE, HANDLING, AND SALVAGING

Comply with Division 1 - General Provisions and Covenants and Section 7010, 1.05.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants and Section 7010, 1.06.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT

A. PCC Overlays:

1. PCC Overlay, Furnish Only:

- a. **Measurement:** Measurement will be in cubic yards of PCC furnished and incorporated into the PCC overlay, including widening sections, partial depth patches (as part of pre-overlay repairs), and irregular sections.
- b. **Payment:** Payment will be at the unit price per cubic yard of PCC furnished and incorporated into the PCC overlay.
- c. **Includes:** Unit price includes, but is not limited to, furnishing the concrete mixture and delivery to the project site.

2. PCC Overlay, Place Only:

- a. **Measurement:** Measurement will be in square yards of PCC overlay placed, including widening sections, partial depth patches, and irregular

sections. The area of manholes, intakes, or other fixtures in the overlay will not be deducted from the measured overlay area. Area is based on the longitudinal surface and nominal width of existing pavement.

- b. **Payment:** Payment will be at the unit price per square yard of PCC overlay placed.
 - c. **Includes:** Unit price includes, but is not limited to, integral curb, bars and reinforcement, joints and sealing, finishing and texturing, surface curing and pavement protection, safety fencing, concrete for rigid headers, boxouts for fixtures, and pavement smoothness testing.
3. **Surface Preparation for Bonded PCC Overlay:**
- a. **Measurement:** Measurement will be in square yards of pavement surface prepared for bonded PCC overlay based on the area shown in the contract documents. Area is based on the longitudinal surface and nominal width of existing pavement.
 - b. **Payment:** Payment will be at the unit price per square yard of pavement surface prepared for bonded PCC overlay.
 - c. **Includes:** Unit price includes, but is not limited to, sandblasting, shot blasting, scarification, and surface cleaning.
4. **Surface Preparation for Unbonded PCC Overlay:**
- a. **Measurement:** Measurement will be in square yards of pavement scarified for unbonded PCC overlay based on the area shown in the contract documents. Area is based on the longitudinal surface and nominal width of existing pavement.
 - b. **Payment:** Payment will be at the unit price per square yard of pavement scarified for unbonded PCC overlay.
 - c. **Includes:** Unit price includes, but is not limited to, surface preparation required by the contract documents, including scarification and surface cleaning.
5. **HMA Separation Layer for Unbonded PCC Overlay:**
- a. **Measurement:** Measurement will be in square yards of HMA separation layer for unbonded PCC overlay. Area is based on the longitudinal surface and nominal width of existing pavement.
 - b. **Payment:** Payment will be at the unit price per square yard of HMA separation layer for unbonded PCC overlay.
 - c. **Includes:** Unit price includes, but is not limited to, cleaning surface and furnishing and placing HMA mix, including asphalt binder.
6. **Geotextile Fabric Separation Layer for Unbonded PCC Overlay:**
- a. **Measurement:** Measurement will be in square yards of geotextile fabric separation layer for unbonded PCC overlay. Area is based on the longitudinal surface and nominal width of existing pavement.

- b. **Payment:** Payment will be at the unit price per square yard of geotextile fabric separation layer for unbonded PCC overlay.
 - c. **Includes:** Unit price includes, but is not limited to, cleaning surface and furnishing, placing, and securing the geotextile fabric separation layer.
- B. **Pavement Removal:** Comply with Section 7040, 1.08, H.
- C. **Air Content Deficiency:** Comply with Section 7010, 1.08, B.
- D. **Pavement Smoothness Deficiency:** Comply with Section 7010, 1.08, C.
- E. **PCC Pavement Thickness Deficiency:** Comply with Section 7010, 1.08, D.
- F. **Curb and Gutter:** Comply with Section 7010, 1.08, E.
- G. **Fixture Adjustment:** Comply with Section 6010 for adjustment of manholes and intakes and Section 5020 for adjustment of water valves and fire hydrants.
- H. **PCC Pavement Samples and Testing:** Comply with Section 7010 SUDAS

PART 2 -PRODUCTS

2.01 MATERIALS

- A. **Cement:** Comply with Section 7010, 2.01, A.
- B. **Supplementary Cementitious Materials (SCM):** Comply with Section 7010, 2.01, B.
- C. **Fine Aggregate for Concrete:** Comply with Section 7010, 2.01, C.
- D. **Coarse Aggregate for Concrete:**
 - 1. Crushed stone particles with Class 2 durability complying with Iowa DOT Section 4115 and Materials I.M. 409.
 - 2. Comply with Iowa DOT Section 4115 and Article 4109.02, Gradation No. 3 and 5 in the Aggregate Gradation Table.
 - 3. Bonded PCC Overlays:
 - a. Use the maximum nominal coarse aggregate size that is no greater than one-third of the overlay thickness.
 - b. Provide aggregates that will produce a concrete mixture having a coefficient of thermal expansion (CTE) equal to or less than the CTE of the existing concrete pavement.
 - 4. The Engineer may authorize a change in gradation, subject to materials available locally at the time of construction.
- E. **Fiber Reinforcement:**
 - 1. Provide macro-synthetic fibers complying with ASTM C 1116, Type III Section 4.1.3.

2. Incorporate at a dosage rate according to the manufacturer's recommendations (typically pounds per cubic yard to 7.5 pounds per cubic yard).

F. **Water Requirements:** Comply with Section 7010, 2.01, E.

G. **Admixtures:** Comply with Section 7010, 2.01, F.

H. **Tie Bars, Dowel Bars, and Expansion Tubes:** Comply with Section 7010, 2.01, G and H.

I. **Joint Fillers and Sealers:** Comply with Section 7010, 2.01, L.

J. **Liquid Curing Compound:**

1. **White Pigmented Compounds.** Comply with Iowa DOT Section 4105.
2. **Poly Alpha-methylstyrene:** Comply with ASTM C 309, Type 2, Class B with 100% of the resin consisting of poly alpha-methylstyrene (PAMS) meeting the requirements of Table 7011.01.

Table 7011.01: PAMS Curing Compound

Properties	Range
Total solids, % by weight of compound	> 42
% reflectance in 72 hr (ASTM E 1347)	> 65
Loss of water, kg/m ² in 24 hr (ASTM C 156)	< 0.15
Loss of water, kg/m ² in 72 hr (ASTM C 156)	< 0.40
V.O.C. Content, g/L	< 350

K. **HMA Separation Layer for Unbonded Overlay over Concrete:**

1. **Asphalt Binder:** PG 58-28S.
2. **Mixture:** Standard Traffic (ST) 3/8 inch HMA mix.
 - a. Target air voids is 3%.
 - b. No maximum film thickness restriction.
 - c. No minimum filler/bitumen ratio restriction.
3. **Aggregate:**
 - a. Type B.
 - b. No percent crushed particle requirement.
 - c. Gradation cannot fall below the restricted zone.

L. **Geotextile Fabric Separation Layer for Unbonded Overlay over Concrete:**

1. **Material Properties:** Based on the contract document's specified mass per unit area, provide a geotextile fabric meeting the requirements of Table 7011.02.

2. Fabric Weight and Thickness:

- a. For unbonded overlays less than or equal to 4 inches thick, provide a geotextile separation layer with a weight of 13.3 oz/yd² and a thickness of 130 mils.
- b. For unbonded overlays greater than or equal to 4.5 inches thick, provide a geotextile separation layer with a weight of 14.7 oz/yd² and a thickness of 170 mils.

Table 7011.02: Geotextile Separation Layer

Property	Requirements	Test Procedures
Geotextile Type	Nonwoven, needle-punched, no thermal treatment to include calendaring*	EN 13249, Annex F (Certification)
Color	Uniform/nominally same color fibers	(Visual Inspection)
Weight (mass per unit area) ¹³	$\geq 13.3 \text{ oz/yd}^2$ $\geq 14.7 \text{ oz/yd}^2$ $\leq 16.2 \text{ oz/yd}^2$	ISO 9864 (ASTM D 5261)
Thickness under load (pressure)	[a] 0.29 psi: $\geq 0.12 \text{ in.}$ [b] 2.9 psi: $\geq 0.10 \text{ in.}$ [c] 29 psi: $\geq 0.04 \text{ in.}$	ISO 9863-1 (ASTM D 5199)
Wide-width tensile strength	$\geq 685 \text{ lb/ft.}$	ISO 10319 (ASTM D 4595)
Wide-width maximum elongation	$\leq 130 \text{ percent}$	ISO 10319 (ASTM D 4595)
Water permeability in normal direction under load (pressure)	$\geq 3.3 \times 10^{-4} \text{ ft/s at } 2.9 \text{ psi}$	DIN 60500-4 (modified ASTM D5493)
In-lane water permeability (transmissivity) under load (pressure)	[a] $\geq 1.6 \times 10^{-3} \text{ ft/s at } 2.9 \text{ psi}$ [b] $\geq 6.6 \times 10^{-3} \text{ ft/s at } 2.9 \text{ psi}$	ISO 12958 (ASTM D 6574) or ISO 12958 (modified ASTM D 4716)
Weather resistance	Retained strength $\geq 60 \text{ percent}$ (70% average)	EN 12224 (ASTM D 4355 @ 500 hr exposure for grey, white, or black material only)
Alkali resistance	$\geq 96 \text{ percent}$ polypropylene/polyethylene	EN 13249, Annex B (Certification)

* Calendaring is a process that passes the geotextile through one or more heated rollers during the manufacturing process. The surface of the geotextile is modified during this process. Calendaring may reduce the absorption properties of the geotextile on the calendered side.

M. 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.

2.02 CONCRETE MIXES**A. Mix Design:** Comply with Section 7010, 2.01 and 2.02, except as modified below:

1. Provide C-3WR or C-4WR for bonded overlays.

2. Comply with Iowa DOT Class C mix meeting the requirements of Iowa DOT Materials I.M. 529.
3. 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:** Comply with Section 7010, 2.02, B.

C. **Fly Ash and Ground Granulated Blast Furnace Slag (GGBFS) as Supplementary Cementitious Materials:** Comply with Section 7010, 2.02, C.

PART 3 - EXECUTION

3.01 EQUIPMENT

Comply with Section 7010, 3.01.

3.02 CONSTRUCTION

Construct overlays in the same manner as PCC pavement (Section 7010, 3.02), except as modified herein.

A. **Pre and Post Construction:** Comply with the contract documents.

B. **Overlay Transition Areas:** Refer to the contract documents for details of overlay transitions at project limits, bridges, intersections, and other locations.

C. **Temperature Limitations:**

1. **Air Temperature:** Do not place overlay concrete when air or existing pavement surface is below 40°F.
2. **Surface Temperature:** Do not place overlay on pavement when the surface temperature exceeds 120°F. If the surface is above 110°F:
 - a. Apply water to the pavement surface ahead of the paving operation. Ensure no standing water remains on the pavement at the time the overlay is placed.
 - b. If a fabric separation layer is used, wet the fabric but do not saturate.
 - c. Do not apply water to the surface if the temperature is below 100°F.

D. **Bonded Overlay Surface Preparation:**

1. **Over PCC:**

- a. Remove all dirt, oil, and other foreign materials, as well as any laitance or loose material from the surface against which new concrete is to be placed, including all pavement markings and raised pavement markings.
- b. If the existing pavement is milled, shot blast or waterblast the milled surface.
- c. Complete patching with concrete patches after milling, as shown in the contract documents.

- d. Sweep the prepared surface and blow clean with dry, oil free compressed air directly ahead of the paving operation to remove loose dirt or debris. Keep air blasting operations as close to overlay operations as possible to prevent any resettlement of debris onto the previously cleaned area. If material is subsequently tracked onto the surface, the surface must be re-cleaned.
- 2. Over HMA:**
- a. If required, mill the existing surface to the depth and cross-slope shown in the contract documents. If stripped or loose asphalt is encountered, remove to provide sound structural layer for bonding. Minimum thickness of sound asphalt required for bonding is 3 inches.
 - b. Complete patching with concrete patching after milling, as shown in the contract documents. Adjust panel location as necessary so no single overlay panel is located over both asphalt pavement and a concrete patch.
 - c. Sweep the prepared surface and blow clean with dry, oil free compressed air directly ahead of the paving operation to remove loose dirt or debris. Keep air blasting operations as close to overlay operations as possible to prevent any resettlement of debris onto the previously cleaned area. If material is subsequently tracked onto the surface, the surface must be re-cleaned.
- E. Unbonded Overlay Surface Preparation:** Clean the existing pavement surface immediately prior to paving to remove dirt or debris.
- 1. Over PCC with HMA Separation Layer:**
- a. Do not scarify the existing PCC surface if an HMA separation layer will be constructed.
 - b. Use Class II compaction except use only static steel wheeled rollers complying with Iowa DOT Articles 2303.03 and 2303.04.
- 2. Over PCC with Geotextile Fabric Separation Layer:**
- a. Limit ridges on milled surfaces to 1/4 inch maximum height.
 - b. Roll fabric onto pavement and pull fabric tight without wrinkles.
 - c. Do not place more fabric than can be paved over within one day.
 - d. Overlap adjacent rolls by 8 inches $\pm$ 2 inches. No more than three layers should overlap.
 - e. Fasten fabric to existing pavement with pneumatic driven nails every 6 feet or less or secure the geotextile with 3M HoldFast 70 Cylinder Spray Adhesive or approved equal. Apply adhesive to all edges of the fabric and as needed to prevent shifting or folding of the fabric during concrete placement.

3. Over HMA:

- a. Mill high spots in the existing asphalt surface as specified in the contract documents.
- b. Remove all loose asphalt material after milling.

F. Existing Pavement Loading:

1. Do not allow concrete delivery trucks to travel over existing pavement unless approved by the Engineer. If approved, limit cleaning and water misting of the existing pavement to just ahead of the paving machine.
2. Do not allow loads in excess of the legal axle load on the existing pavement.
3. Partially loaded trucks may be required to prevent damage to the existing pavement. If asphalt thickness after milling is 3 inches or less, reduce loaded truck hauling over the existing pavement.

G. Paving Suspended:

1. Suspend the paving operation where stability of the underlying pavement section has been lost.
2. Do not place concrete on an underlying pavement that has become unstable.

H. Bar and Reinforcement Placement:

1. **Tie Bars:** When the contract documents require tie bars for widening units greater in thickness than the overlay:
 - a. Provide No. 4 tie bars.
 - b. For overlay thickness 4.5 inches or less, secure tie bars to surface of existing pavement.
 - c. For overlay thickness 5 inches or greater, place tie bars at mid-point of overlay thickness.
2. **Dowel Bars:**
 - a. At least 7 days prior to the beginning of concrete paving, submit a written Quality Control Plan that provides a method for keeping the dowel basket assemblies anchored to the subgrade, the existing pavement, or bond breaker layer and into the underlying pavement. Ensure the Quality Control Plan includes the following:
 - 1) Proposed type and number of fasteners
 - 2) Proposed installation equipment
 - 3) Dowel basket assembly anchoring plan (i.e. anchor all basket assemblies prior to concrete placement, one lane at a time, anchor all basket assemblies during the concrete placement operation, etc.)
 - 4) Action plan if misaligned baskets are identified during concrete pavement placement

- b. Paving operations may be suspended by the Engineer if basket anchoring fails to comply with the Quality Control Plan.

I. Surface Curing:

- 1. For bonded concrete overlays, apply curing compound at twice the standard rate recommended by the manufacturer.
- 2. For unbonded concrete overlays 6 inches or thinner, apply curing compound at twice the standard rate recommended by the manufacturer.
- 3. If PAMS curing compound is specified per Section 7011, 2.01, J, apply at the rate recommended by the manufacturer.

J. Saw Joints:

- 1. **General:** Submit a plan for the Engineer's approval, which includes the following items.
 - a. Method(s) for assuring adequate saw cut depth in areas of variable concrete overlay thickness.
 - b. Anticipated production rate of concrete overlay placement.
 - c. Estimated number of saws necessary to prevent random cracking.
 - d. Appropriate corrective actions should random cracking occur.
- 2. **Bonded Overlay Over Existing Concrete Pavement:** Submit a plan for the Engineer's approval, which includes the following items.
 - a. Marking of all existing joint locations to ensure that joints in the overlay will be placed directly over all existing joints in the underlying concrete pavement.
 - b. **Transverse Joints:**
 - 1) Saw transverse contraction joints directly over the existing concrete joint the full depth of the overlay plus 1/2 inch (including accommodating variable thickness of the bonded concrete overlay).
 - 2) Ensure that the width of the sawed transverse joints in the bonded concrete overlay exceeds the width of the crack opening in the underlying joints.
 - c. **Longitudinal Joints:** Saw directly over existing joints full depth.
- 3. **Bonded Overlay Over Existing Asphalt or Composite Pavement:**
 - a. **Transverse Joint:** Saw to a depth of 1/3 of the overlay thickness or no less than 1.25 inches with an early entry saw.
 - b. **Longitudinal Joints:** Saw to a depth of 1/3 of the overlay thickness.
 - c. **Expansion Joints:** Match expansion joints in the bonded overlay to those in the existing concrete pavement.

4. Unbonded Overlays Over Concrete, Composite, or Asphalt Pavement:

- a. **Transverse Joints:** Saw to a depth of 1/3 of the overlay thickness or no less than 1.25 inches with an early entry saw.
- b. **Longitudinal Joints:** Saw to a depth of 1/3 of the overlay thickness.
- c. **Expansion Joints:** Match expansion joints in the bonded overlay to those in the existing concrete pavement.

3.03 CURB AND GUTTER CONSTRUCTION

Comply with Section 7010, 3.03.

3.04 PAVEMENT PROTECTION

Comply with Section 7010, 3.04.

3.05 USE OF PAVEMENT

Comply with Section 7010, 3.05.

3.06 TRANSPORTATION RESTRICTIONS

Comply with Section 7010, 3.06.

3.07 QUALITY CONTROL

Comply with Section 7010, 3.07.

END OF SECTION

SECTION 7020 - HOT MIX ASPHALT PAVEMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Hot Mix Asphalt (HMA) Pavement
- B. Base Widening

1.02 DESCRIPTION OF WORK

- A. Includes the requirements for the construction of HMA surface, intermediate, and base courses placed upon a prepared subgrade, subbase, base, or pavement and HMA base widening.
- B. Comply with Iowa DOT Section 2303 for construction of HMA pavement and base widening, except as modified herein.
 - 1. Provide Quality Management - Asphalt (QM-A) for bid items with HMA quantities exceeding 1,000 tons. Provide quality control for bid items with HMA quantities of 1,000 tons or less according to Section 7020, 3.06.
 - 2. Refer to Table 7020.01 for gyratory mixture design criteria. Note - this table was copied from the SUDAS Design Manual, Section 5D-1.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants, as well as the following:

- A. Prepare and submit the job mix formula to the Engineer for approval prior to HMA production.
- B. Provide quality control test results.
- C. Submit all pavement smoothness testing and certifications according to Section 7020, 3.05.
- D. Upon request, provide material certifications to the Engineer.
- E. Submit HMA certifications for all bid items with HMA quantities of 1,000 tons or less, according to Section 7020, 3.06.
- F. Weight receipts should include mix size and type and/or correlate to the bid item.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants, as well as the following:

Table 7020.01: Mixture Design Criteria

(derived from Iowa DOT Materials I.M. 510)

Mix	Layer Designation	Gyratory Density		Film Thickness	Aggregate ²			
		N _{des}	Design % G _{mm} (target)		Quality Type	Crush (min)	FAA (min)	Sand Equivalent (min)
LT	0.3 M S	50	96.0	8.0 - 15.0	A ¹	60 ¹	---	40
	0.3 M I							
	0.3 M B		97.0		A ¹	45		
ST	1M S	50	96.0	8.0 - 15.0	A	75 ¹	40	40
	1M I							
	1M B		97.0		60 ¹	60 ¹	---	
HT	10M S	75	96.0	8.0 - 15.0	A	75	43	45
	10M I							
	10M B		96.5		A1	60		
For mix design levels exceeding 10M ESALs, see Iowa DOT Materials I.M. 510.								

¹ Requirements differing from Iowa DOT Materials I.M. 510; for base mixes, aggregate quality improved from B to A and percent crushed aggregate increased by 15%.

² Flat & Elongated 10% maximum at a 5:1 ratio

1.05 DELIVERY, STORAGE, HANDLING, AND SALVAGING

Comply with Division 1 - General Provisions and Covenants, as well as the following:

- A. **Aggregate Storage:** Prevent contamination and intermingling per Iowa DOT Section 2303.
- B. **Salvaged or Reclaimed Materials:** Classification of RAP will be as determined by the Iowa DOT. If RAP stockpile classification has not been determined by the Iowa DOT, the Contractor is responsible for obtaining the classification from an outside testing firm using the same tests as the Iowa DOT.
- C. **Disposal:** Dispose of excess HMA according to applicable local, state, and federal regulations in a manner that does not cause damage or harm to adjacent properties or public facilities.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants, 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.

1.08 MEASUREMENT AND PAYMENT

A. HMA Pavement by Ton:

- 1. **Measurement:** Measurement will be in tons of HMA pavement.
- 2. **Payment:** Payment will be at the unit price per ton of HMA pavement.

3. **Includes:** Unit price includes, but is not limited to, asphalt mix with asphalt binder, tack coats between layers, construction zone protection, and quality control.

B. HMA Pavement by Square Yards:

1. **Measurement:** Measurement will be in square yards for each different thickness of HMA pavement. The area of manholes, intakes, or other fixtures in the pavement will not be deducted from the measured pavement area.
2. **Payment:** Payment will be at the unit price per square yard for each thickness of HMA pavement.
3. **Includes:** Unit price includes, but is not limited to, asphalt mix with asphalt binder, tack coats between layers, construction zone protection, and quality control.

C. HMA Base Widening by Ton:

1. **Measurement:** Measurement will be in tons of HMA base widening.
2. **Payment:** Payment will be at the unit price per ton of HMA base widening.
3. **Includes:** Unit price includes, but is not limited to, asphalt mix with asphalt binder, tack coat between layers, construction zone protection, and quality control.

D. HMA Base Widening by Square Yard:

1. **Measurement:** Measurement will be in square yards for each different thickness of HMA base widening. The area of manholes, intakes, or other fixtures in the pavement will not be deducted from the measured base widening area.
2. **Payment:** Payment will be at the unit price per square yard for each thickness of HMA base widening.
3. **Includes:** Unit price includes, but is not limited to, asphalt mix with asphalt binder, tack coat between layers, construction zone protection, and quality control.

E. HMA Railroad Crossing Approach:

1. **Measurement:** Measurement will be in square yards of railroad crossing approach.
2. **Payment:** Payment will be at the unit price per square yard of railroad crossing approach.
3. **Includes:** Unit price includes but is not limited to excavation for modified subbase and subdrain, furnishing and installing subdrain, furnishing and installing subdrain outlet, furnishing and installing porous backfill material, furnishing and installing fiber board barrier, furnishing and placing modified subbase material, furnishing and applying tack coat, furnishing, placing, and compacting HMA.

F. Density Deficiency:

1. **Measurement:** Measurement will be in square yards for each different density of HMA pavement subject to a unit price reduction for density deficiency according to Section 7020, 3.04.
2. **Payment:** Payment will be at the reduced unit price according to Table 7020.02 for each density of HMA pavement. If there is a density deficiency on a privately contracted roadway project, the Jurisdiction ultimately accepting ownership of the roadway will receive the penalty payment prior to acceptance of the work.

G. HMA Pavement Thickness Deficiency:

1. **Measurement:** Measurement will be in square yards for each different thickness of HMA pavement that has deficient pavement thickness as determined in Section 7020, 3.04.
2. **Payment:** Payment will be at the percentage of the unit price indicated in Table 7020.03 for each different thickness of HMA pavement. If there is a pavement thickness deficiency on a privately contracted roadway project, the Jurisdiction ultimately accepting ownership of the roadway will receive the penalty payment prior to acceptance of the work.

H. HMA Pavement Smoothness Deficiency:

1. **Measurement:** Measurement will be in square yards for each different segment of HMA pavement subject to a unit price reduction for pavement smoothness according to Section 7020, 3.05.
2. **Payment:** Payment will be at the reduced unit price according to Table 7020.04 for each segment of HMA pavement. If there is a pavement smoothness deficiency on a privately contracted roadway project, the Jurisdiction ultimately accepting ownership of the roadway will receive the penalty payment prior to acceptance of the work.

I. HMA Pavement Samples and Testing:

1. **Measurement:** Lump sum item; no measurement will be made.
2. **Payment:** Payment will be at the lump sum price for HMA pavement samples and testing.
3. **Includes:** Lump sum price includes, but is not limited to, certified plant inspection, pavement thickness cores, density analysis, profilograph pavement smoothness measurement (when required by the contract documents), and air void testing.

J. Fixture Adjustment: Comply with Section 6010 for adjustment of manholes and intakes and Section 5020 for adjustment of water valves and fire hydrants.**K. Pavement Removal:** Comply with Section 7040.**L. Subgrade and Subbase:** For excavation and construction of subgrade and subbase, comply with Section 2010.

PART 2 - PRODUCTS

2.01 HMA MATERIALS

Comply with Iowa DOT Section 2303, with the following exception:

Follow the procedure outlined in Iowa DOT Materials I.M. 510 for HMA mixture designs, except replace Table 1 in Appendix A, HMA Mixture Design Criteria with the SUDAS HMA Mixture Design Criteria (Table 7020.01) (Tables 2 through 4 in Appendix A still apply).

2.02 WARM MIX ASPHALT MATERIALS

If use of warm mix asphalt (WMA) is approved by the Jurisdiction, comply with Iowa DOT Section 2303.

2.03 RECYCLED ASPHALT MATERIALS

- A. **Recycled Asphalt Pavement:** If use of recycled asphalt pavement (RAP) is approved by the Jurisdiction, comply with Iowa DOT Section 2303.
- B. **Recycled Asphalt Shingles:** If use of recycled asphalt shingles (RAS) is approved by the Jurisdiction, comply with Iowa DOT Section 2303.

2.04 SUBGRADE AND SUBBASE

Comply with Section 2010.

PART 3 - EXECUTION

3.01 HMA PAVEMENT

Construct according to Iowa DOT Section 2303 and the following:

- A. **Preparation of Pavement Foundation:** Construct subgrade and subbase according to Section 2010.
- B. **Compaction:** Compact to a minimum of 94% of laboratory density. Do not exceed 8% average air void level for roadway density specimens.
- C. **Tack Coats:** Apply tack coats according to Iowa DOT Section 2303. In addition, if the emulsion is diluted, the dilution must be done by the manufacturer and certified. Provide the Engineer with the new application rate required to achieve the specified undiluted application rate.
- D. **Fillets and Runouts:** Rake out coarse aggregate prior to shaping and compaction of fillets and runouts.
- E. **HMA Railroad Crossing Approach:** Construct according to Section 7020 and Figure 7020.902.
- F. **Fixtures in the Pavement Surface:**
 - 1. Adjust manhole frames and other fixtures within area to be paved to conform to finished surface. Comply with Section 6010, 3.04 for manhole adjustments and Section 5020, 3.04 for water fixture adjustments.

2. Clean outside of fixture to depth of pavement before asphalt placement.
3. Construct boxouts where allowed for later adjustment of fixtures. See Figure 7020.201 for the size and shape of the boxout.

G. **Samples and Testing:** Take samples from the compacted material and test according to Section 7020, 3.04. Randomly locate samples in the pavement area. Notify the Jurisdiction the day prior to coring and testing to give the Jurisdiction the opportunity to witness coring and testing.

3.02 BASE WIDENING

A. **Equipment:** Use equipment complying with Iowa DOT Section 2213.

B. **Conditions:**

1. **Resurfacing over Concrete Base Widening:** When the existing pavement is HMA material over concrete pavement, saw or mill the old asphalt to the full depth of the proposed resurfacing or to depth of sound material producing a reasonable vertical line at the edge of the underlying concrete.
2. **HMA Base Widening:** Apply a tack coat to the vertical edge of the old pavement at a rate of 0.10 to 0.15 gallon per square yard according to Section 7020, 3.01. No waiting period will be required before placing the widening.

C. **Preparation of Subgrade:**

1. Cut the width of the trench for the widening at least 6 inches greater than the base width of the widening according to the contract documents. If widening roadways with open ditches, provide ditches or drains from the widening trench at frequent intervals to allow subgrade drainage to side ditches.
2. Construct subgrade and subbase according to Section 2010.
3. Bring the subgrade to an elevation and cross-section such that, after being compacted to a minimum of 95% of maximum Standard Proctor Density, the surface will be at the required elevation.
4. Remove material, other than sand, that will not readily compact. Replace with material that will readily compact and roll that portion of the subgrade again. Use an appropriate roller complying with Iowa DOT Article 2001.05.
5. While constructing the subgrade, maintain the soil in a condition sufficiently moist to facilitate compaction.
6. Check the finished subgrade with a template supported on the surface of the adjacent pavement. Clean the edge of the old pavement.

D. **Construction:**

1. Place the HMA mixture in the number of lifts required to produce the required thickness.
2. Do not allow the compacted thickness of the top lift to exceed 2 1/2 inches. The maximum compacted thickness of lower lifts may exceed 3 inches if the

- thicker lifts demonstrate satisfactory compaction. Maximum lift thickness shall be 4 1/2 inches.
3. Do not place HMA on the surface of the existing pavement, and immediately remove any spilled base material.
 4. Ensure that, after compaction, the constructed width conforms to the required width.
 5. Promptly and thoroughly compact each lift. Comply with Section 7020, 3.01.
 6. Place succeeding lifts of HMA material as soon as the previous lift has been compacted.
 7. Obtain the lab density for that day's HMA paving from an Iowa DOT-approved testing lab and based on the job mix formula design criteria.
 8. Take density samples from the compacted material and test according to Section 7020, 3.04. Randomly locate samples in the area 6 inches from the base being widened to 6 inches from the outside edge of a given pass of the placing equipment. Notify the Jurisdiction the day prior to coring and testing to give the Jurisdiction the opportunity to witness coring and testing.
 9. When the contract for base widening does not include resurfacing, construct the final surface of widening flush with, or no more than 1/8 inch below, the surface of the old pavement.
 10. Do not open the widening to traffic until it has cooled sufficiently to support the traffic without displacement or movement.

3.03 PROTECTION FROM TRAFFIC

A. General:

1. Protect the new pavement and its appurtenances damages caused by traffic, additional cost to the Contracting Authority. This includes the erection and maintenance of warning signs, lights, fence, and barricades; flaggers to direct traffic; and pavement bridges or crossovers as appropriate.
2. 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.

B. End of Day's Run:

1. 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.
2. Install construction zone protection upon completion of paving operations. Leave protection in place and maintained until the pavement has cooled sufficiently to withstand traffic without damage.
3. Intermediate construction zone protection may be required for the purpose of opening the pavement for access to a side road, side street, or entrances.

- C. 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.

3.04 DEFECTS OR DEFICIENCIES

A. Repairs Required:

1. Remove and replace or repair pavement containing excessive cracks, deformities, deficiencies, or other defects at no additional cost to the Contracting Authority. The method of replacement or repair will be determined by the Engineer. Extended warranty may be approved by the Engineer.
2. Areas to be replaced will be determined by the Engineer. Complete all repairs according to Section 7040.

B. Density Deficiencies:

1. The Engineer will obtain and test 7 samples for each lot according to Iowa DOT Materials I.M. 204 Appendix F. The quality index for density of each lot will be determined by the following formula:

$$\text{Density (Q.I.)} = \frac{(\text{Average } G_{mb})_{\text{Field Lot}} - ((\% \text{ Density})_{\text{Specified}} \times (\text{Average } G_{mb})_{\text{Lab Lot}})}{(\text{Standard Deviation } G_{mb})_{\text{Field Lot}}}$$

where G_{mb} = bulk Specific Gravity of the mixture

2. Payment will be adjusted according to the density requirements of Table 7020.02 for the quality index for density determined for the lot:

Table 7020.02: Pay Factor for HMA Pavement Density

Density Index 7 Samples ¹	Percent Payment
greater than 0.72	100
0.40 to 0.72	95
0.00 to 0.39	85
less than 0.00	75 Maximum

¹ Or 6 samples and 1 outlier. Only one outlier will be allowed.

No incentive payment for pavement density will be made.

C. Thickness Deficiencies:

1. The Engineer will measure the cores according to Iowa DOT Materials I.M. 337. All areas of uniform and similar thickness and width for the project will be divided into lots.
2. The thickness of the completed course will be measured to the nearest 1/8 inch, exclusive of seal coat. All areas of uniform and similar thickness and width for the project will be divided into lots. The frequency specified for taking density samples from the surface lift will be used when measuring for completed thickness. However, samples that may not be tested for density because they are less than 70% of the intended thickness will be used for thickness, and in these particular instances, the additional samples of

sufficient thickness that are used for density tests will not be measured for thickness. Thickness samples will be taken full depth of the completed course and after measurement; remove the density samples for the top layer from the core. If any of the measurements for a lot is less than the designated thickness, the quality index for thickness of that lot will be determined by the following formula:

$$\text{Thickness (Q.I.)} = \frac{\text{Avg. Thickness} - (\text{Design Thickness} - 0.50)}{\text{Max Thickness} - \text{Minimum Thickness}}$$

3. Payment will be further adjusted by the appropriate percentage according to the quality index for thickness determined for that lot and the following table:

Table 7020.03: Pay Factor for HMA Pavement Thickness

Thickness Index 7 Samples	Percent Payment (Previously Adjusted for Density)
greater than 0.34	100
0.14 to 0.34	95
0.00 to 0.13	85
less than 0.00	less than 0.00 75 Maximum

No incentive payment for pavement density will be made.

3.05 PAVEMENT SMOOTHNESS

- A. Straightedge: The Engineer will check HMA 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.
- B. Profilograph:
 1. If specified in the contract documents, comply with Iowa DOT Section 2316 to measure pavement smoothness with a profilograph. Ensure the evaluation is certified according to Iowa DOT Materials I.M. 341. Position the center wheel of the profilometer 6 feet from the centerline or the lane line.
 2. Evaluate according to the smoothness requirements of Table 7020.04 and make surface corrections and/or price reductions. Surface corrections will be completed with no additional cost to the Contracting Authority. No incentive for pavement smoothness will be made.

Table 7020.04: Price Reduction for Pavement Smoothness

Initial Profile Index (inch/mile/segment)	New Pavements (\$/segment)	Resurfaced Pavements (\$/segment)
12.1 - 22.0	Unit price	Unit price
22.1 - 30.0	\$500	\$250
30.1 and over ¹	Grind only	Grind only

¹ For segments with an initial index of 30.1 and over, grind the surface to a finish index of 22.0 or better. In lieu of accepting a price reduction and grinding the surface to a final index of 22.0 or better, the Contractor may elect to replace part or the entire segment.

3.06 QUALITY CONTROL

- A. Provide Quality Management - Asphalt (QM-A) for bid items with HMA quantities exceeding 1,000 tons. On locally let projects, all testing normally conducted by the Iowa DOT may be performed by the Jurisdiction or an independent testing laboratory hired by the Jurisdiction.
 1. General: Follow the procedures and meet the criteria established in Iowa DOT Article 2303.03, B; Section 2521; and Materials I.M. 510 and 511. Percent within Limits (PWL) stipulations in these documents is not required.
 2. Mix Design - Job Mix Formula (JMF):
 - a. The Contractor is responsible for the JMF for each mixture.
 - b. Submit a completed JMF for approval to the materials lab designated by the Contracting Authority. Submit supporting documentation demonstrating the design process was followed and how the recommended JMF was determined. Include an economic evaluation when required according to Iowa DOT Section 2303. Include trial and final proposed aggregate proportions and corresponding gyratory data. In addition, submit sufficient loose mixture and individual material samples for approval of the design if requested by the Engineer.
 - c. The person preparing the JMF must be Iowa DOT certified in bituminous mix design.
 - d. If the JMF is not satisfactory, submit another JMF for review. An approved JMF will be required prior to beginning plant production.
 3. Plant Production:
 - a. General:
 - 1) Perform sampling and testing to provide the quality control of the mixture during plant production. Certified Plant Inspection according to Iowa DOT Section 2521 is required.
 - 2) Ensure personnel performing production quality control testing is Iowa DOT certified for the duties performed.
 - 3) Provide easy and safe access to the location in the plant where samples are taken.

- 4) A "significant mix change" is defined as a single occurrence of an aggregate interchange of greater than 5%, a single occurrence of an asphalt content change greater than 0.2%, or any deletion or introduction of a new material into the mix.

b. Sampling and Testing:

- 1) Sample and test asphalt binder to verify the quality of the binder grade. Take asphalt binder samples at random times as directed and witnessed by the Engineer according to Iowa DOT Materials I.M. 204.
- 2) Use cold feed or ignition oven gradation for aggregate gradation control to assure materials are being proportioned according to the specifications. Take aggregate samples at random times as directed and witnessed by the Engineer according to Iowa DOT Materials I.M. 204. The Engineer will secure the samples according to Iowa DOT Materials I.M. 205, Appendix A.
- 3) Sample the hot HMA mixture at random locations as directed and witnessed by the Engineer according to Iowa DOT Materials I.M. 322. Secure the samples according to Iowa DOT Materials I.M. 205, Appendix A.
- 4) Assist the Engineer with material sampling for verification testing. When the Engineer provides notification that a sample is to be taken, obtain sample within 15 minutes.
- 5) Each day's production of a mix design will be considered a lot.
 - a) When the anticipated quantity for the day is 2,000 tons or more, divide that day's production into four sublots, with the first subplot being the first 500 tons produced. The Engineer will divide the remaining anticipated quantity for the day into three equally sized sublots.
 - b) When the anticipated quantity for the day is less than 2,000 tons, use the first 500 tons produced for the first daily subplot. The Engineer will establish 750 ton daily sublots for mix production exceeding the first 500 tons.
- 6) No more than four paired hot HMA mixture samples will be required for acceptance of a lot.
- 7) Do not take paired samples from the first 100 tons of mix produced each day or the first 100 tons of mix following a significant mix change. When paving operations are staged so each day of placement is less than 100 tons for the entire production of a bid item, establish a sampling plan with the Engineer that includes a minimum of one sample per 2,500 tons.
- 8) Test the quality control sample of each production paired sample as follows:

- a) Prepare and compact two gyratory specimens according to Iowa DOT Materials I.M. 325G.
 - b) Determine the density for each specimen according to Iowa DOT Materials I.M. 321. Average the results to determine sample density.
 - c) Use the field quality control laboratory compaction for field density control.
 - d) The laboratory density for field control will be the bulk specific gravity of compacted mixture (G_{mb}) at N_{design} . Bulk specific gravity at N_{design} will be determined by compacting specimens to N_{max} and back calculating the bulk specific gravity at N_{design} . Determine the Theoretical Maximum Specific Gravity of the uncompacted mixture according to Iowa DOT Materials I.M. 350 or other test methods recognized by AASHTO or ASTM.
 - e) Determine laboratory air voids for each sample according to Iowa DOT Materials I.M. 501.
- 9) When liquid anti-strip additives are used, satisfy one of the following methods to regulate the quantity of additive:
- a) Present certification that the equipment used to measure and blend the liquid anti-strip additive:
 - i. Meets the anti-strip supplier's recommended practice,
 - ii. Is directly tied to the asphalt binder supply system, and
 - iii. Has been calibrated to the equipment manufacturer's guidelines.
 - b) Test the binder to measure the quantity of liquid anti-strip additive in the binder for every 5,000 tons of HMA production. Obtain the Engineer's approval for the supplier's test method prior to use of the test.
 - c) Run the test method in Iowa DOT Materials I.M. 319 during production. If unable to certify or test for the presence and quality, run the test method in Iowa DOT Materials I.M. 319 each 10,000 tons of production to measure the effectiveness of the additive. Ensure test results satisfy the minimum requirements of Iowa DOT Article 2303.02, E.
- c. Production Control:
- 1) After the JMF is established, the combined aggregate furnished for the project, the quantity of asphalt binder, and the laboratory air voids should consistently comply with the JMF, as target values. Control them within the production tolerance given in Table 7020.05.

Table 7020.05 Production Tolerances

Measured Characteristic	Target Value (%)	Specifications Tolerance (%) ¹
Cold feed gradation No. 4 (4.75 mm) and larger sieves	by JMF	± 7.0
Cold feed gradation No. 8 (2.36 mm)	by JMF	± 5.0
Cold feed gradation No. 30 (600 µm)	by JMF	± 4.0
Cold feed gradation No. 200 (75 µm)	by JMF	± 2.0 ²
Daily asphalt binder content	by JMF	± 0.3
Field laboratory air voids - absolute deviation from target	0.0 ³	<1.0 ⁴

¹ Based on single test unless otherwise specified.

² Maintain the filler/bitumen ratio of the plant produced mixture between 0.6 and 1.4.

³ Unless otherwise specified.

⁴ Based on the moving average of four test values.

- 2) Control plant production so that the plant produced HMA mixture will meet mixture design criteria (within the test tolerances given in Table 7020.05) for Air Voids at N-design gyrations of the gyratory compactor. Monitor the slope of the gyratory compaction curve of plant produced material. Slope variations in excess of ±0.40 of the mixture design gyratory compaction curve slope may indicate potential problems with uniformity of the mixture.
- 3) The gyratory mix design gradation control points for the size mixture designated in the project plans will not apply to plant production control.
- 4) Strive for the target value of the percent air void and asphalt binder by adjusting gradation and asphalt binder content.
- 5) Produce a uniform composition mixture complying with the JMF.
- 6) Adjustments to the JMF target gradation and asphalt binder content values may be made.
 - a) Determine from quality control testing that adjustments are necessary to achieve the specified properties.
 - b) Consult with the Engineer regarding adjustments to the JMF.
 - c) The Contractor's adjustment recommendations prevail, provided all specifications and established mix criteria are being met for plant production.
- 7) Measure estimated film thickness and voids in the mineral aggregate (VMA) for specifications compliance every day of HMA production.
- 8) Prepare quality control charts according to Iowa DOT Materials I.M. 511. Keep the charts current and available showing both individual sample results and moving average values. Base moving average values on four consecutive sample results. Moving averages may restart only in the event of a mandatory plant shutdown for failure to maintain the

average within the production tolerance. Include the target value and specifications tolerances on control charts.

- 9) Calculate laboratory voids for individual samples according to Iowa DOT Materials I.M. 501. Use the individual density and individual maximum specific gravity determined for each sample. To determine the moving average of laboratory voids, use the average of the last four individual sample laboratory voids.

- 10) Monitor the test results and make mix adjustments, when appropriate, to keep the mixture near the target values. Notify the Engineer whenever the process approaches a specification tolerance limit. Cease operations when the moving average point for laboratory air voids is outside the specification tolerance limit. Assume responsibility to cease operations, including not incorporating material which has not been placed. Do not start the process again until notifying the Engineer of the corrective action proposed.

B. Provide quality control for bid items with HMA quantities of 1,000 tons or less as follows:

1. Mix Design: Prepare the job mix formula. Prior to HMA production, obtain the Engineer's approval for the job mix formula. Comply with Iowa DOT Article 2303.02 and Iowa DOT Materials I.M. 510. Submit for approval.
2. Plant Production: Use a current calibration of the HMA production plant for the job mix formula no more than 12 months old. Maintain an asphalt binder log to track when the binder was delivered. Identify the job mix formula on the HMA delivery ticket. Use certified asphalt binder and approved aggregate sources meeting the job mix formula. Monitor the quality control test results and make adjustments to keep the mixture near the target job mix formula values.
3. Construction: Take density measurements of the compacted mixture. Use the field quality control laboratory compaction for field density control as specified in Section 7020, 3.04. The Engineer may accept the density of the compacted layer based on cores or density gauge. The Engineer may waive density measurement provided the compaction has been thorough and effective. Take density measurements of the compacted mixture no later than the next working day following placement and compaction. For small quantities, a lot is the entire quantity of each HMA mixture bid item. The quality index for density will not apply to small quantities.
4. Sampling and Testing: Material sampling and testing is for production quality control only. Acceptance of mixture is based on Contractor certification. Perform a minimum of one aggregate cold-feed and one loose HMA test per lot. Sampling and testing of loose HMA is only required for mechanically placed mixture. All sampling and testing procedures will follow the Iowa DOT Specifications and Materials I.M.s using certified technicians and qualified testing equipment. The Engineer may approve alternative sampling

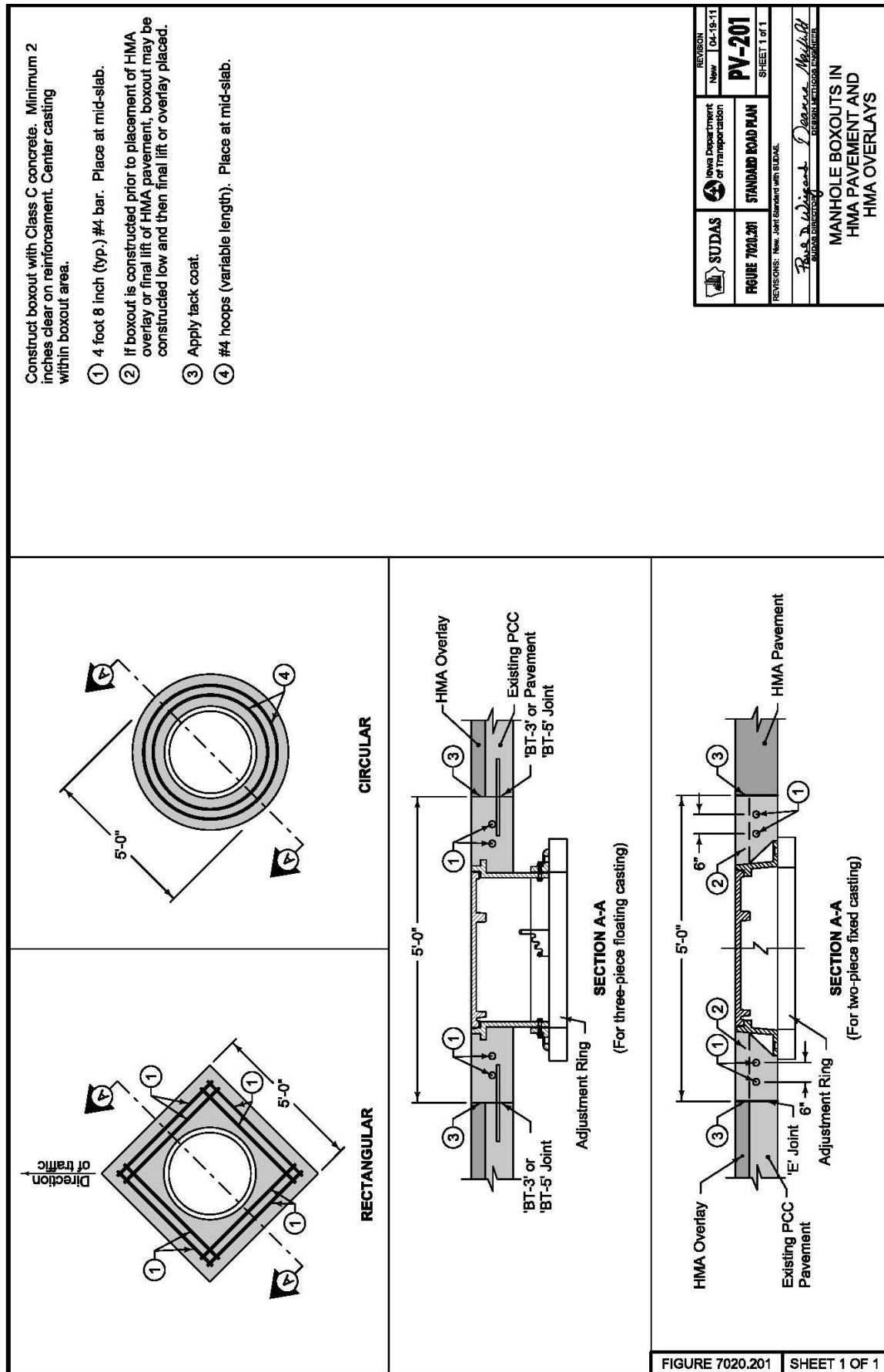
procedures, or may approve sampling of uncompacted mix and gradation if Contractor can provide plant reports for other recent projects(s) demonstrating the job mix formula has been produced according to the specifications. Take the sample between the first 100 to 200 tons of production. No split samples for agency correlation testing are required. Asphalt binder will be accepted based on the asphalt supplier's shipment certification. No binder sampling or testing is required. No material sampling or testing is required for daily HMA production of less than 100 tons on any project.

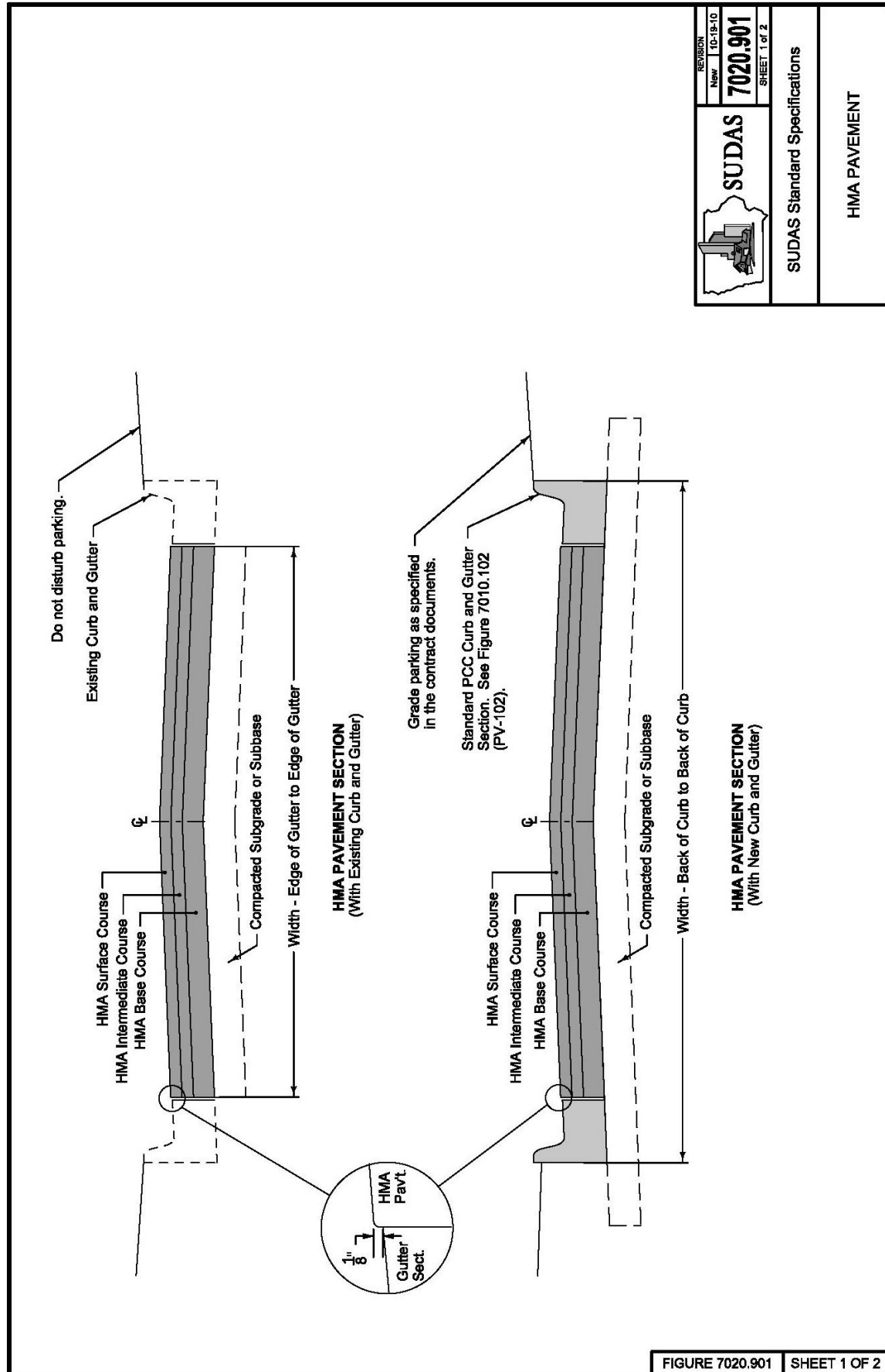
5. Certification: Provide a certification for the production of any mixture in which the requirements in this section for small quantities or are applied. Place the test results and certification statement on the Iowa DOT Daily Plant Report. The Daily Plant Report for certified HMA may be submitted at the end of the project for all certified HMA quantities, or submitted at intervals for portions of the certified quantity. Use the following certification statement:

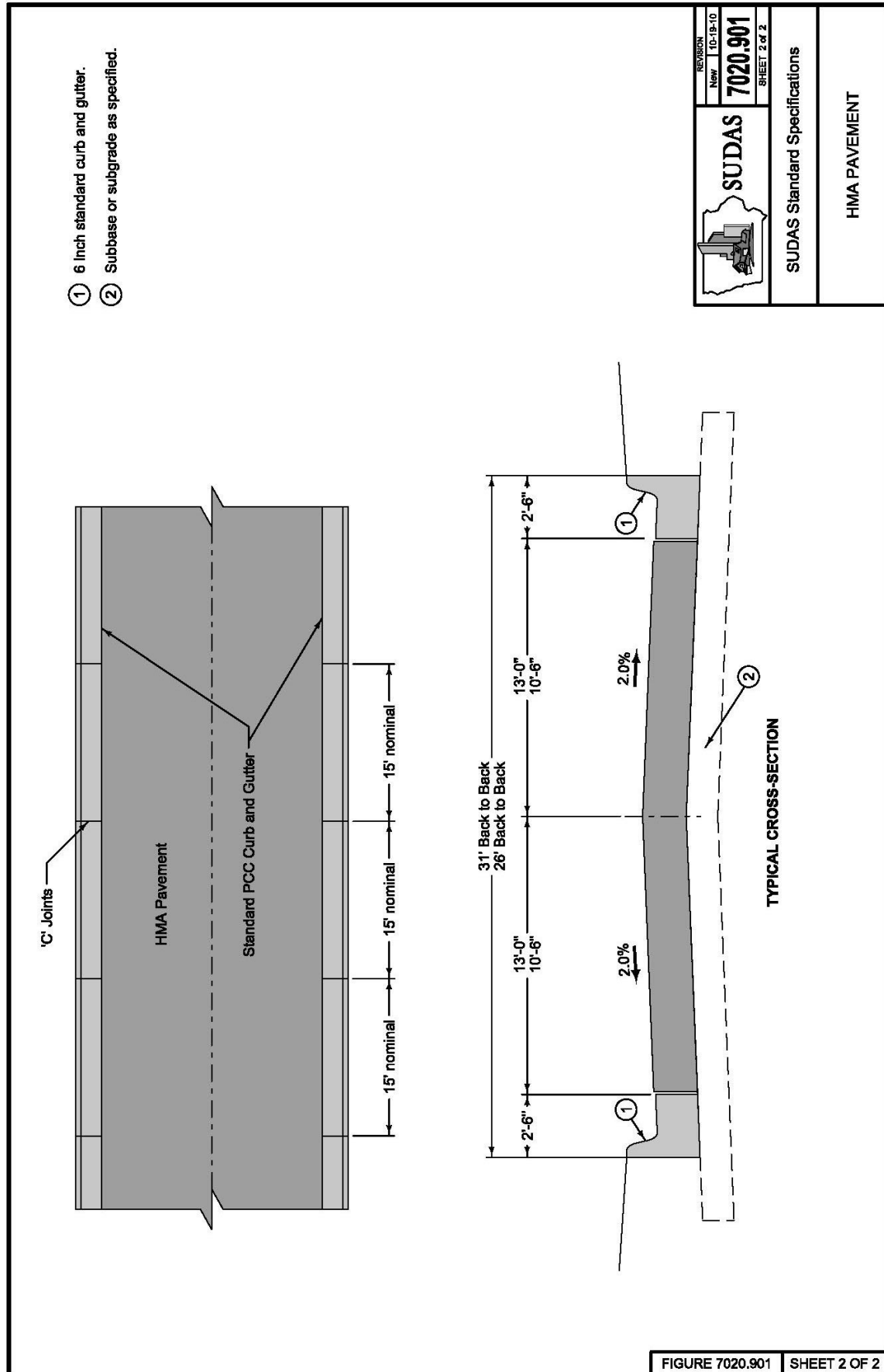
“The certified HMA was produced in compliance with the provisions of Section 7020, of the SUDAS Standard Specifications. The certified HMA was produced with certified asphalt binder and approved aggregates as specified in the approved mix design.”

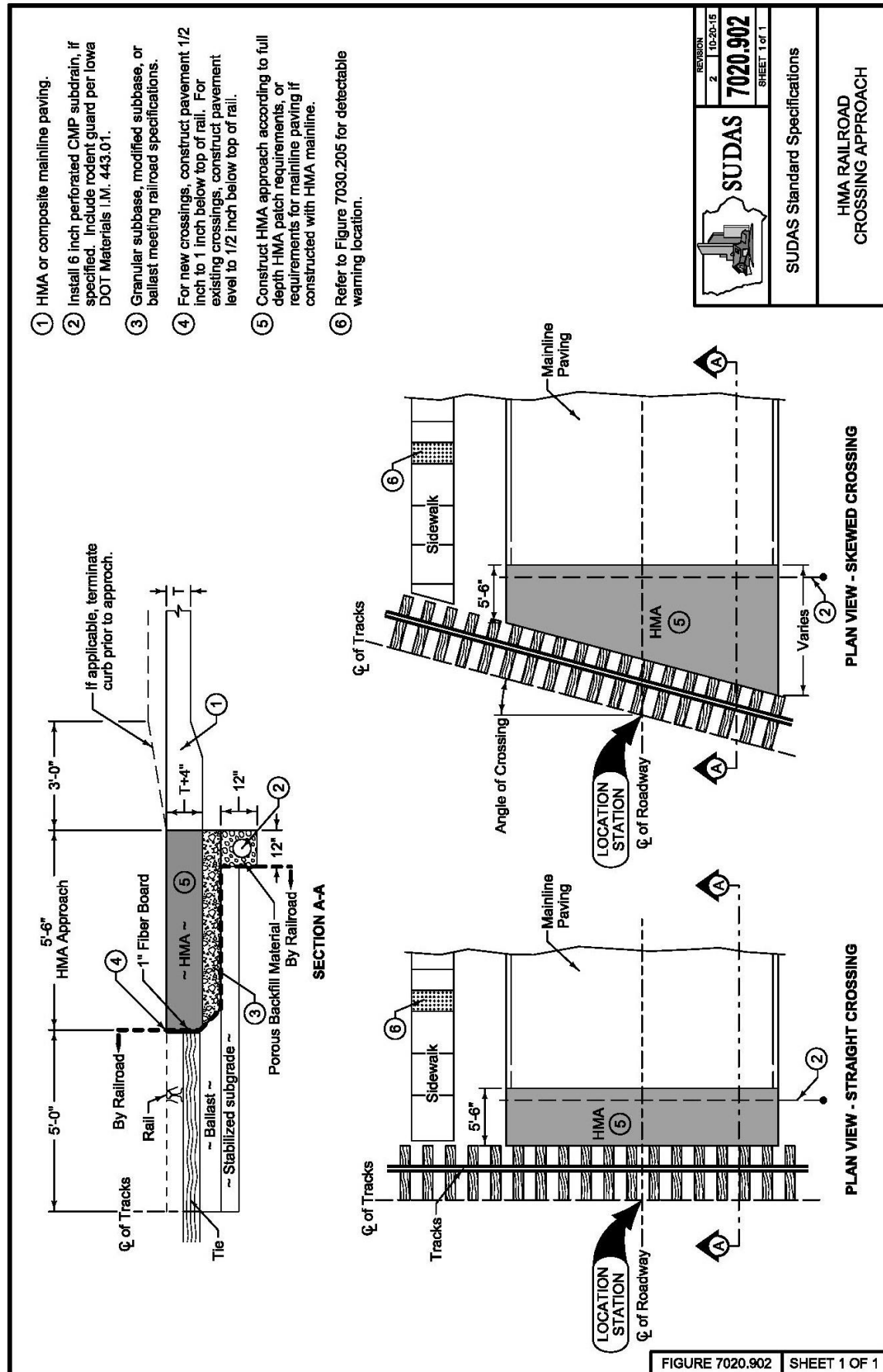
3.07 REMOVAL OF PAVEMENT

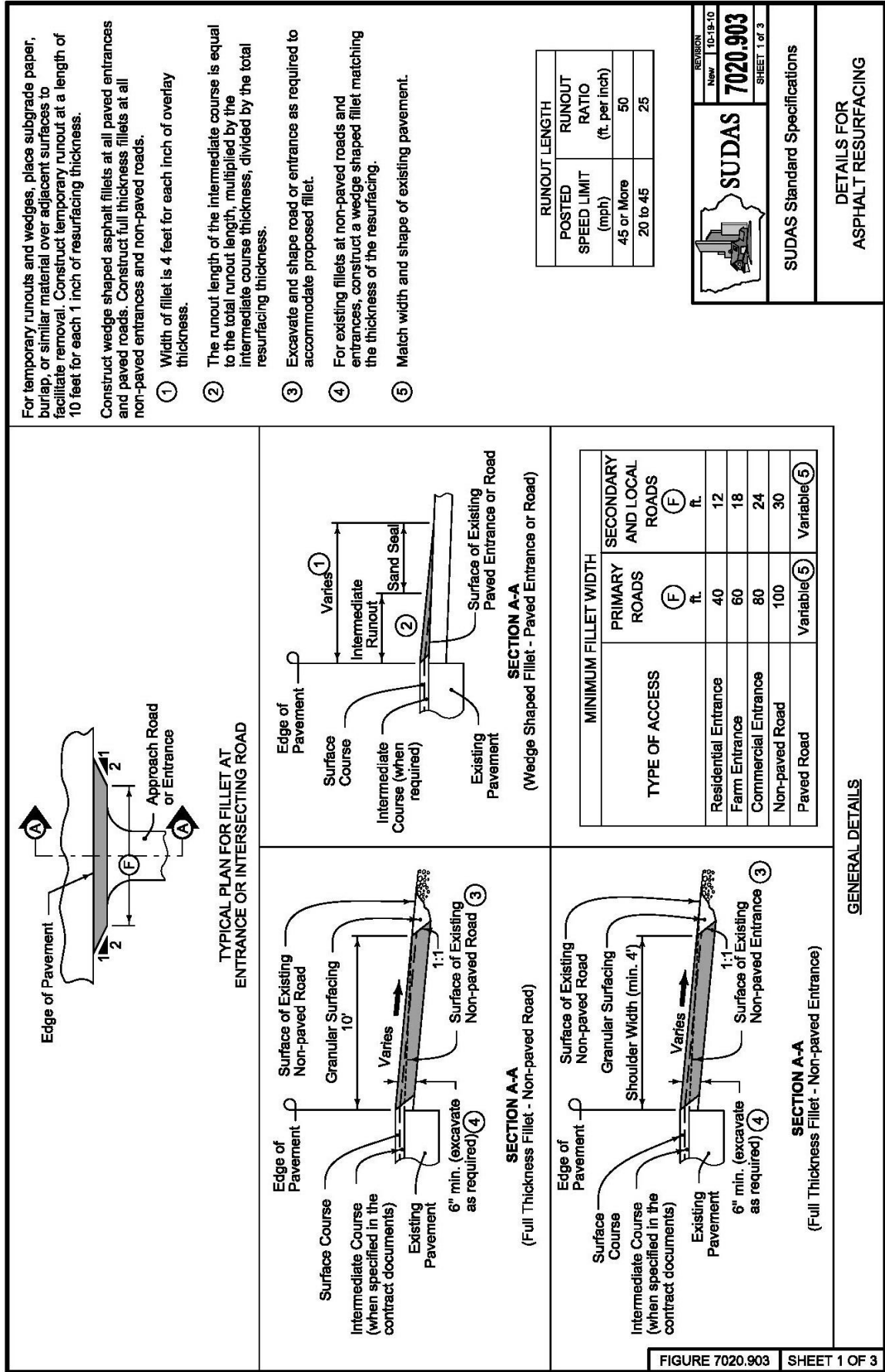
Comply with Section 7040.











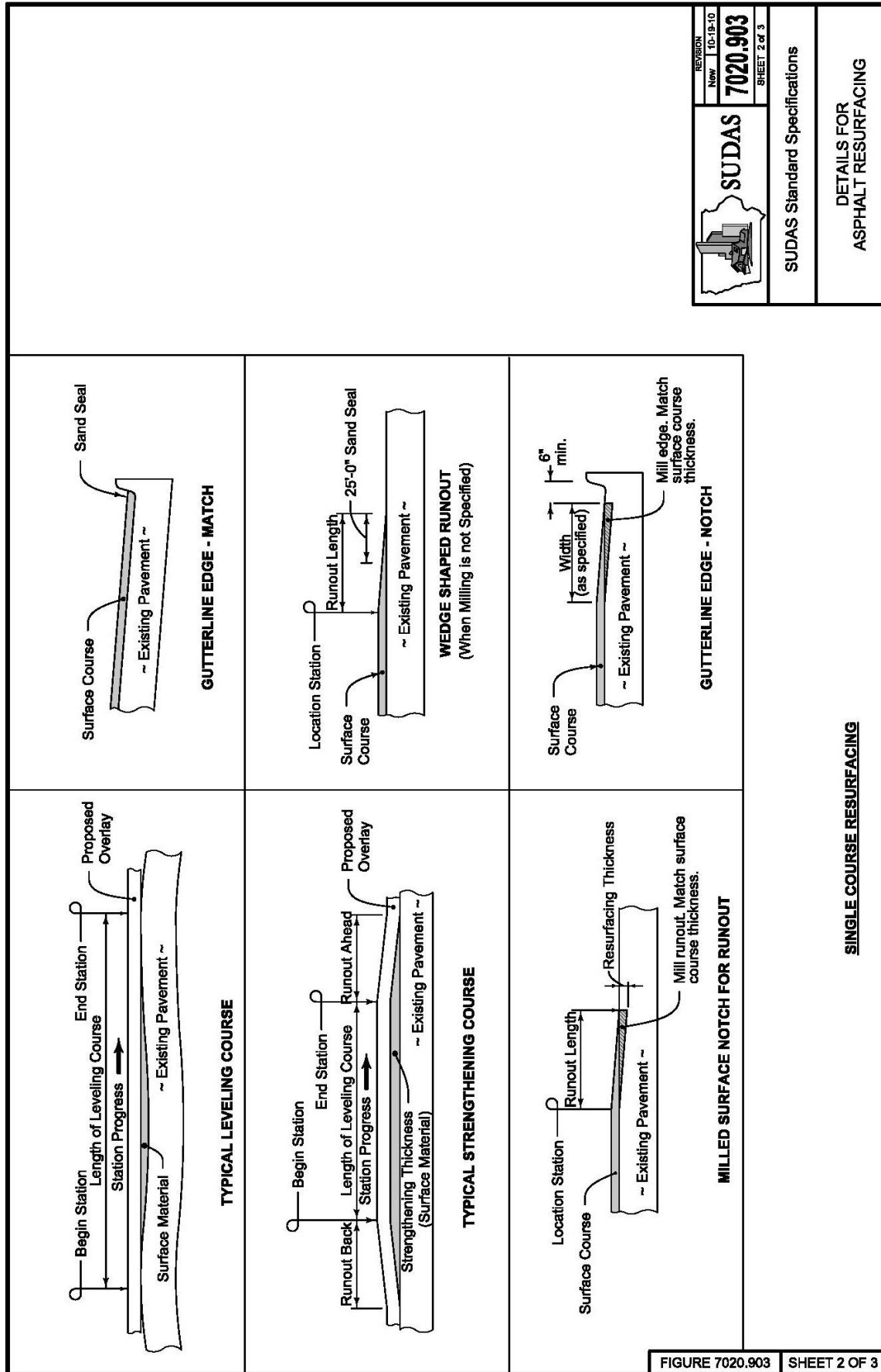
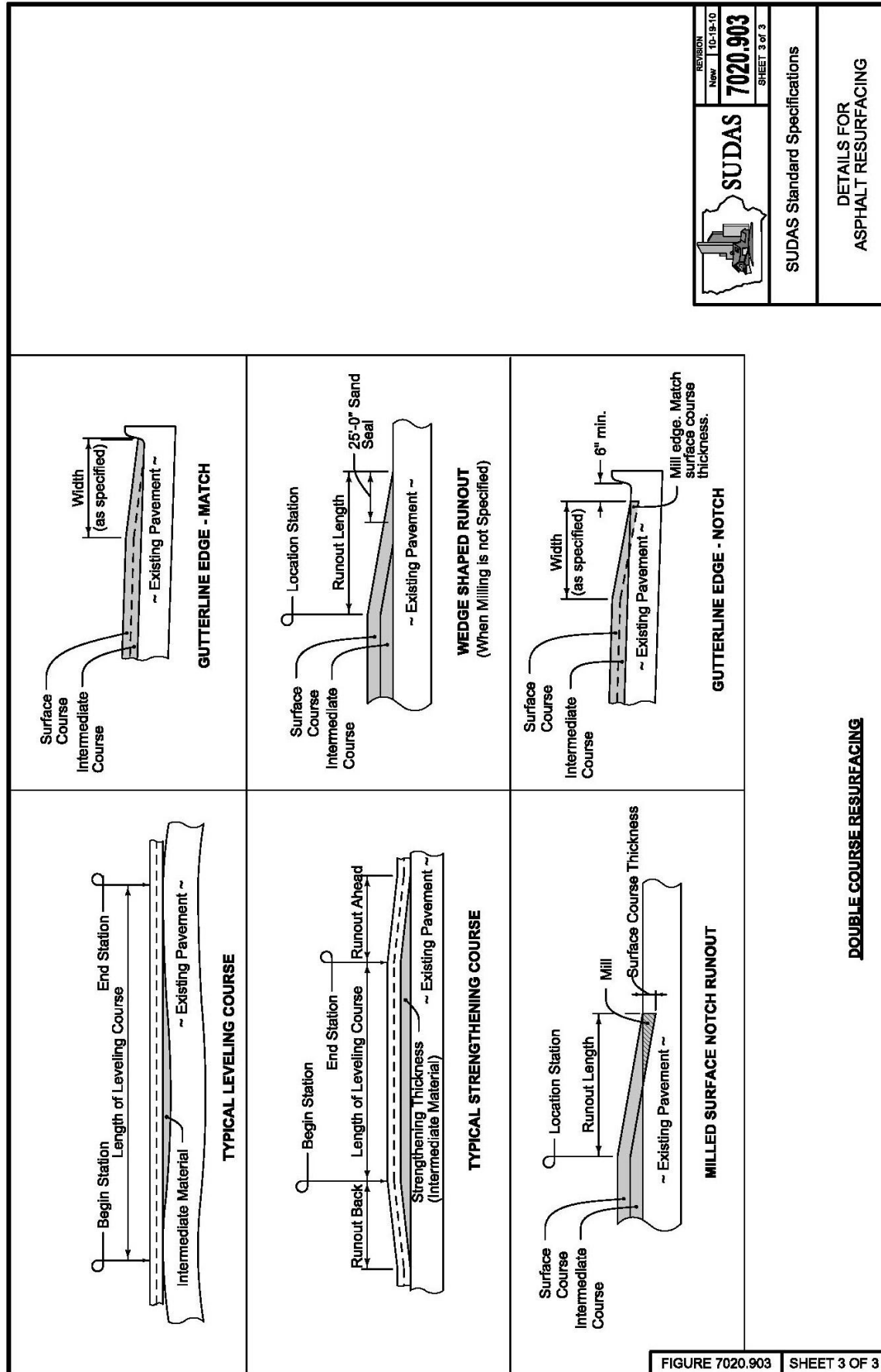


FIGURE 7020.903 SHEET 2 OF 3



REVISION
New 10-19-10
7020.903
SHEET 3 of 3

SUDAS Standard Specifications

DETAILS FOR
ASPHALT RESURFACING

SECTION 7021 - HOT MIX ASPHALT OVERLAYS

PART 1 -GENERAL

1.01 SECTION INCLUDES

HMA Overlays

1.02 DESCRIPTION OF WORK

Includes the requirements for the construction of HMA overlay surface course placed upon an existing pavement.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants and Section 7020, 1.03.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, HANDLING, AND SALVAGING

Comply with Division 1 - General Provisions and Covenants and Section 7020, 1.05.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants, as well as Section 7020, 1.06.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT

Comply with Section 7020, 1.08, except as modified herein:

A. HMA Overlay by Ton:

1. **Measurement:** Measurement will be in tons of HMA overlay.
2. **Payment:** Payment will be at the unit price per ton of HMA overlay.
3. **Includes:** Unit price includes, but is not limited to, asphalt mix with asphalt binder, tack coats between layers, construction zone protection, and quality control.

B. HMA Overlay by Square Yards:

1. **Measurement:** Measurement will be in square yards for each different thickness of HMA overlay. The area of manholes, intakes, or other fixtures in the pavement will not be deducted from the measured pavement area.
2. **Payment:** Payment will be at the unit price per square yard for each thickness of HMA overlay.
3. **Includes:** Unit price includes, but is not limited to, asphalt mix with asphalt binder, tack coat, construction zone protection, and quality control.

PART 2 -PRODUCTS**2.01 HMA OVERLAY MATERIALS**

Comply with Iowa DOT Section 2303, with the following exception:

Follow the procedure outlined in Iowa DOT Materials I.M. 510 for HMA mixture designs, except replace Table 1 in Appendix A, HMA Mixture Design Criteria with the SUDAS HMA Mixture Design Criteria (Table 7020.01) (Tables 2 through 4 in Appendix A still apply).

2.02 WARM MIX ASPHALT MATERIALS

If use of warm mix asphalt (WMA) is approved by the Jurisdiction, comply with Iowa DOT Section 2303.

2.03 RECYCLED ASPHALT MATERIALS

When recycled asphalt materials (RAM) are used and they exceed 20% replacement of the total binder, the binder grades may need to be modified. Comply with Iowa DOT Materials I.M. 510.

- A. **Recycled Asphalt Pavement:** If use of recycled asphalt pavement (RAP) is approved by the Jurisdiction, comply with Iowa DOT Section 2303.
- B. **Recycled Asphalt Shingles:** If use of recycled asphalt shingles (RAS) is approved by the jurisdiction, comply with Iowa DOT Section 2303.

2.04 BINDER GRADES

- A. **Conventional Overlays:** Use the specified binder grade.
- B. **HMA Interlayer:** Use PG 58-34E meeting AASHTO T 321 with minimum 100,000 cycles to failure. Comply with Iowa DOT Materials I.M. 510A. Do not use RAP.
- C. **High Performance Thin Lift:** Use PG 58-34E+ meeting AASHTO T-324 with minimum 90% elastic recovery. Comply with Iowa DOT I.M. 510A. Do not use RAS.

2.05 HIGH PERFORMANCE THIN LIFT**A. Mix Design:**

Design Gyration	50
Design Voids Target (based on %Gmm)	≤ 2.0
Film Thickness	8.0 to 13.0
Aggregate Quality	A
Minimum crushed content	50%
FAA minimum	40
Minimum sand equivalency	50
VMA	16%
Friction Aggregate	Minimum 50% Type 4 or better

- B. **Replacement:** Do not use more than 15% binder replacement. Do not use RAS.

C. **Hamburg Testing:** Compact to 3.5% air voids. No more than 8 mm rutting in first 8,000 passes.

D. **Gradation:**

Sieve Size	Minimum Percent Passing	Maximum Percent Passing
1 1/2"		
1"		
3/8"	91	100
No. 4		90
No. 8	27	63
No. 16		
No. 30		
No. 50		
No. 100		
No. 200	2	10

2.06 NOMINAL AGGREGATE SIZE FOR ASPHALT OVERLAYS

Nominal aggregate size dictates lift thickness. Minimum lift thickness should be at least 3 times the nominal maximum aggregate size to ensure aggregate can be aligned during compaction to achieve required density. Therefore, desired lift thickness can direct the decision on nominal aggregate size to use.

PART 3 -EXECUTION

3.01 HMA OVERLAY

Comply with Section 7020, Iowa DOT Section 2303, Section 7040, and the following:

A. Preparation of Existing Pavement:

1. Remove pavement by milling as required by the contract documents. Mill to the depth, cross-section, or profile specified.
2. Sweep existing pavement with approved broom. Provide dust control during brooming.
3. If milling is not required, correct irregularities in existing pavement cross slope with partial patching, full-depth patching, and leveling base coat prior to placing the overlay. Use base or intermediate course mixes to correct irregularities. Surface course thickness per plan.

B. Special Requirements for Thin Lift Overlays and HMA Interlayer:

1. Apply tack coat prior to placement of thin lift overlay and HMA interlayer. Comply with Section 7020.
2. Compact with static steel wheel roller.

3.02 PROTECTION FROM TRAFFIC

Comply with Section 7020, 3.03.

3.03 DEFECTS OR DEFICIENCIES

Comply with Section 7020, 3.04.

3.04 PAVEMENT SMOOTHNESS

Comply with Section 7020, 3.05.

3.05 QUALITY CONTROL

A. **General:** Comply with Section 7020, 3.06.

B. **Special Requirements for Thin Lift Overlays and HMA Interlayer:**

1. Complete field voids for Class II compaction as defined in Iowa DOT Section 2303.
2. Sample and test from windrow or hopper. Apply Iowa DOT Article 2303.05, A, 3 for AAD acceptance. Air void target is based on approved JMF.
3. Take at least one cold feed each day for gradation control.

3.06 REMOVAL OF PAVEMENT

Comply with Section 7040.

END OF SECTION

SECTION 7030 - 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 Division 1 - General Provisions and Covenants, as well as the following:

- A. PCC mix design.
- B. HMA 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 Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants, as well as the following:

- A. **Portland Cement Concrete:** See Section 7010.
- B. **Hot Mix Asphalt:** See Section 7020.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

Provide 10 calendar days advance notification of a pedestrian path closure to the Engineer and the National Federation of the Blind of Iowa (www.nfbi.org).

1.08 MEASUREMENT AND PAYMENT

A. Removal of Sidewalk, Shared Use Path, or Driveway:

1. **Measurement:** Measurement will be in square yards for the area of sidewalks, shared use paths, or driveways removed.
2. **Payment:** Payment will be at the unit price per square yard for the area of sidewalk, shared use path, or driveway removal.
3. **Includes:** Unit price includes, but is not limited to, sawing, hauling, and disposal of materials removed.

B. Removal of Curb:

1. **Measurement:** Measurement will be in linear feet for removal of curb by grinding or sawing, measured along the back of curb.
2. **Payment:** Payment will be at the unit price per linear foot for the removal of curb.
3. **Includes:** Unit price includes, but is not limited to, hauling and disposal of materials removed.

C. Shared Use Paths:

1. **Measurement:** Each type and thickness of shared use paths will be measured in square yards. The area of manholes, intakes, or other fixtures in the pavement will not be deducted from the measured pavement area.
2. **Payment:** Payment will be at the unit price per square yard for each type and thickness of shared use path.
3. **Includes:** Unit price includes, but is not limited to, subgrade preparation, jointing, sampling, smoothness testing and correction, and testing.

D. Special Subgrade Preparation for Shared Use Paths:

1. **Measurement:** Measurement will be in square yards for special subgrade preparation. Measured area will include 2 feet outside of the pavement on either side of the path.
2. **Payment:** Payment will be at the unit price per square yard for the area of special subgrade preparation.
3. **Includes:** Unit price includes, but is not limited to, water required to bring subgrade moisture content to within the required limits.

E. PCC Sidewalk:

1. **Measurement:** Each thickness of PCC sidewalk will be measured in square yards. The area of manholes, intakes, or other fixtures in the pavement will not be deducted from the measured pavement area.
2. **Payment:** Payment will be at the unit price per square yard for each thickness of PCC sidewalk.

3. **Includes:** Unit price includes, but is not limited to, minor grade adjustments at driveways and other intersections, subgrade preparation, formwork, additional thickness at thickened edges, jointing, sampling, smoothness testing and correction, and testing.

F. Brick/Paver Sidewalk with Pavement Base:

1. **Measurement:** Measurement will be in square yards for the area of brick/paver sidewalk placed on a pavement base. The area of pavement base will not be measured separately.
2. **Payment:** Payment will be at the unit price per square yard for the area of brick/paver sidewalk.
3. **Includes:** Unit price includes, but is not limited to, subgrade preparation, pavement base, setting bed, neoprene asphalt adhesive for asphalt setting bed, setting the bricks/pavers, installing weep holes and associated materials, and sand/cement joint filler.

G. Detectable Warnings:

1. **Measurement:** Measurement will be in square feet for the area of detectable warnings installed. Paved area beneath detectable warnings will be measured with sidewalk or shared use path item.
2. **Payment:** Payment will be at the unit price per square foot for the area of detectable warnings installed.
3. **Includes:** Unit price includes, but is not limited to, steel bar supports and manufactured detectable warning panels.

H. Driveways:

1. Paved Driveways:

- a. **Measurement:** Each type and thickness will be measured in square yards. The area of manholes, intakes, or other fixtures in the pavement will not be deducted from the measured pavement area.
- b. **Payment:** Payment will be at the unit price for each type and thickness of driveway.
- c. **Includes:** Unit price includes, but is not limited to, excavation, subgrade preparation, jointing, sampling, and testing.

2. Granular Surfacing for Driveways:

- a. **Measurement:** Measurement will be in square yards or tons, as specified in the contract documents, for the quantity of granular surfacing placed.
- b. **Payment:** Payment will be at the unit price per square yard or ton, as specified.
- c. **Includes:** Unit price includes, but is not limited to, excavation and preparation of subgrade.

I. Sidewalk, Shared Use Path, and Driveway Assurance Testing:

1. The Contractor will not be responsible for concrete compression or HMA density testing unless otherwise specified in the contract documents.
2. If the contract documents specify that the Contractor is responsible for concrete compression and HMA density testing, performed by an independent testing laboratory hired by the Contractor, measurement and payment will be as follows:
 - a. Measurement: Lump sum item; no measurement will be made.
 - b. Payment: Payment will be at the contract lump sum price.
3. The Contractor will be responsible for payments associated with all retesting resulting from failure of initial tests.

PART 2 - PRODUCTS

2.01 PORTLAND CEMENT CONCRETE

- A. Class B or C concrete with materials complying with Section 7010. 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 B or C	Class B 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 HOT MIX ASPHALT

- A. Comply with Section 7020 for mix design.
- B. Use Low Traffic (LT), 1/2 inch or 3/8 inch mix.
- C. For shared use paths adjacent to pavement that also functions as the pavement shoulder, use Low Traffic (LT), 1/2 inch mix.
- D. Use asphalt binder complying with Section 7020 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 or 1/8 inch.

2.04 SETTING BED FOR BRICKS/PAVERS

A. HMA:

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 7020 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.

- B. **Pre-mixed High Performance Cold Mix:** If allowed, substitute a pre-mixed high performance cold mix product for the HMA setting bed generally meeting the HMA mixture requirements noted above.

- C. **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 2010.
3. Proof roll compacted subgrade according to Section 2010.

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 5020, 6010, or 8010 as appropriate.

3.04 PCC SIDEWALKS, SHARED USE PATHS, AND DRIVEWAYS

- A. **Form Setting:** Comply with Section 7010 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%.
 6. 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 7010.
 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 7010, 3.01, C, 3. Smooth by use of a straightedge.
 - f. Do not contaminate freshly mixed concrete with earth or other foreign materials.
3. **Driveways:** Comply with Figures 7030.101 and 7030.102 and Section 7010. The use of a paving machine is not required.

C. Finishing:

1. **Shared Use Paths and Driveways:**

- a. Comply with Section 7010.
- 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:** When curing is specified in the contract documents, comply with Section 7010.

E. **Form Removal:** Comply with Section 7010.

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 7010.

b. Sidewalks and Driveways:

- 1) Space sidewalk contraction joints equal to the width of the sidewalk. Space driveway contraction joints so panel length does not exceed 12 feet.
- 2) 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.

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 7010, 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.

3.05 HMA SHARED USE PATHS AND DRIVEWAYS

Comply with Section 7020.

3.06 BRICK/PAVER SIDEWALKS WITH A PAVEMENT BASE

A. General:

1. Comply with 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 HMA 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 HMA 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.

3.07 DETECTABLE WARNING INSTALLATION

Set detectable warning panels in fresh concrete according to the manufacturer's recommendations and Figure 7030.210.

3.08 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.

3.09 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.

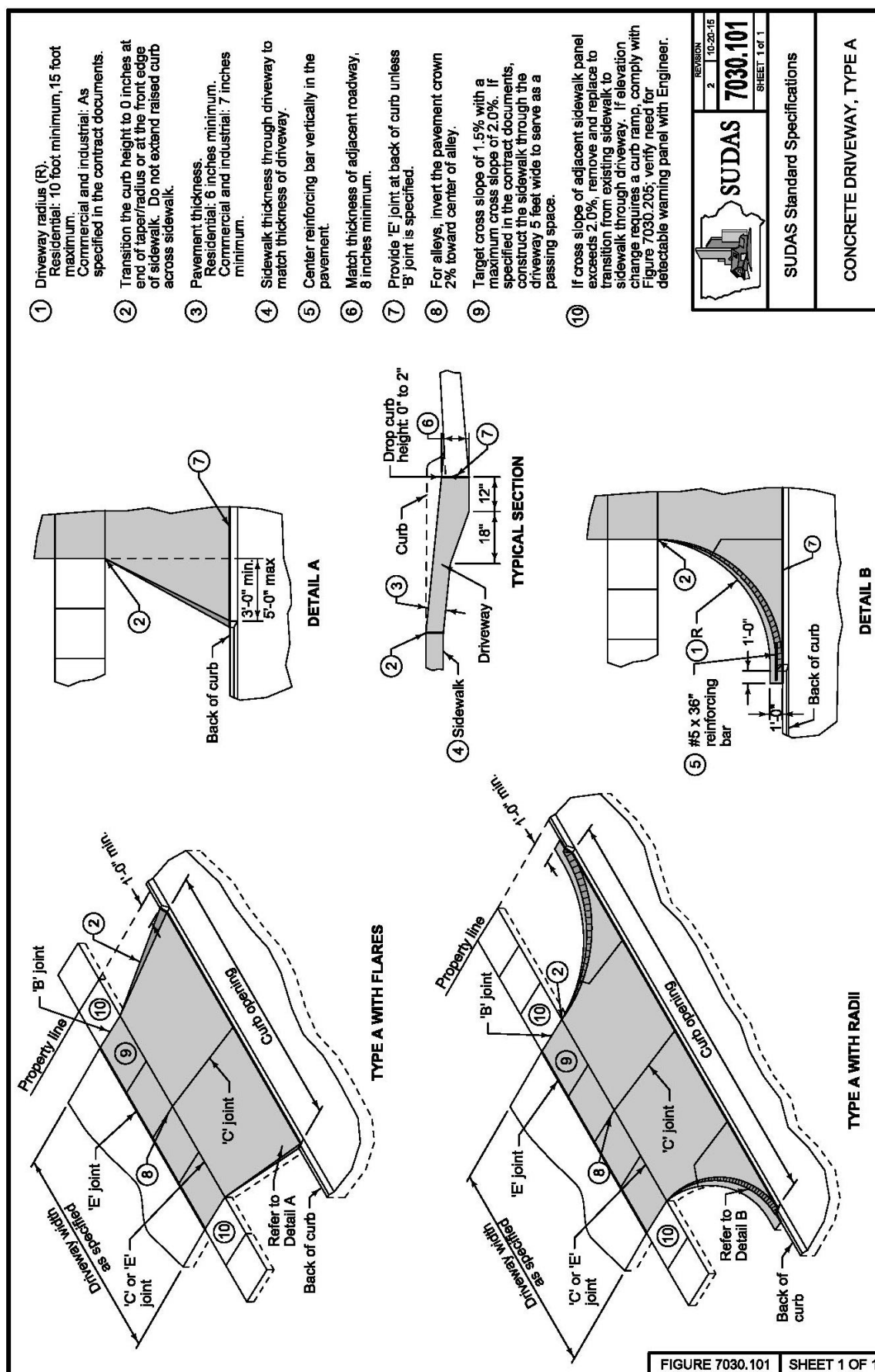
3.11 MATERIAL TESTING

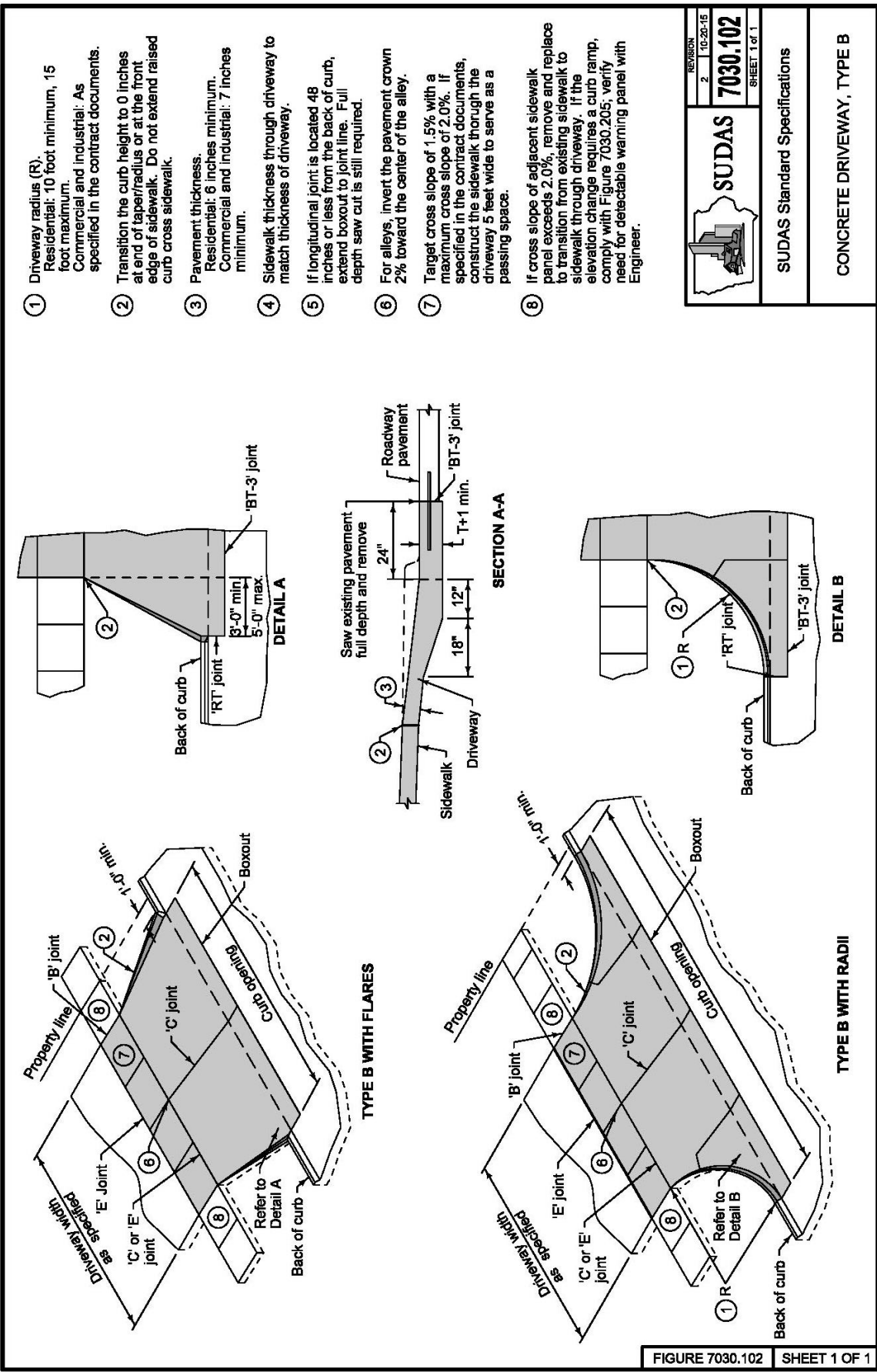
- A. **General:** When testing is specified in the contract documents as the Contractor's responsibility, provide testing using the services of an independent testing laboratory approved by the Engineer.
- B. **Concrete Compression Tests:** When the concrete volume placed on a single day exceeds 20 cubic yards, comply with the following test requirements. When deficiencies are encountered, comply with Section 7010, 3.07, E.
 - 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. **HMA Density and Thickness Tests:** When the area of HMA placed on a single day exceeds 100 square yards, comply with the following test requirement. When deficiencies are encountered, comply with Section 7020, 3.04, A.
 - 1. Prepare at least two cores per day.
 - 2. If the area of HMA 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

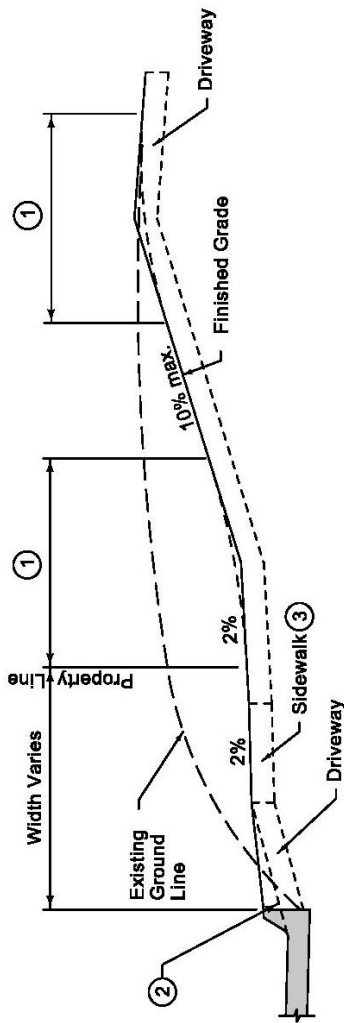
Compliance with cross slopes and grades, as well as all other elements, for sidewalks and curb ramps is crucial. If the construction cannot be completed as specified in the contract documents, it may be necessary to adjust slopes within the accepted legal limitations. Contact the Engineer prior to placement of the concrete if changes from the values specified in the contract documents are being made.

END OF SECTION

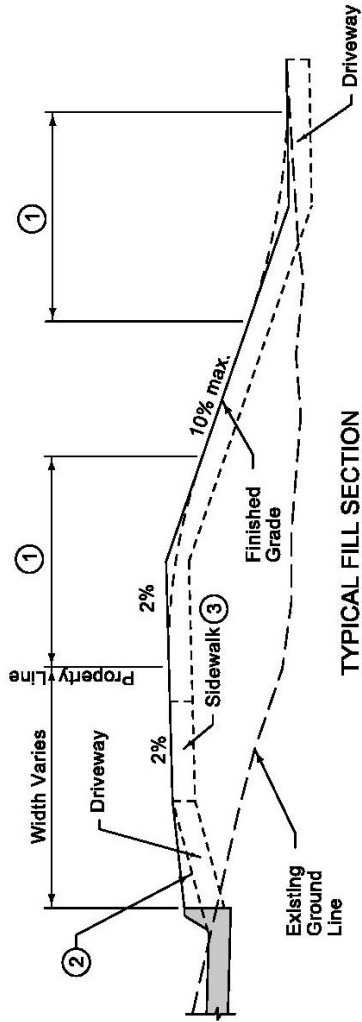




- ① 10 foot vertical curve required for 5% or greater change in grade.
- ② Slope varies. See contract documents.
- ③ Target cross slope of 1.5% with a maximum cross slope of 2.0%.



TYPICAL CUT SECTION



TYPICAL FILL SECTION



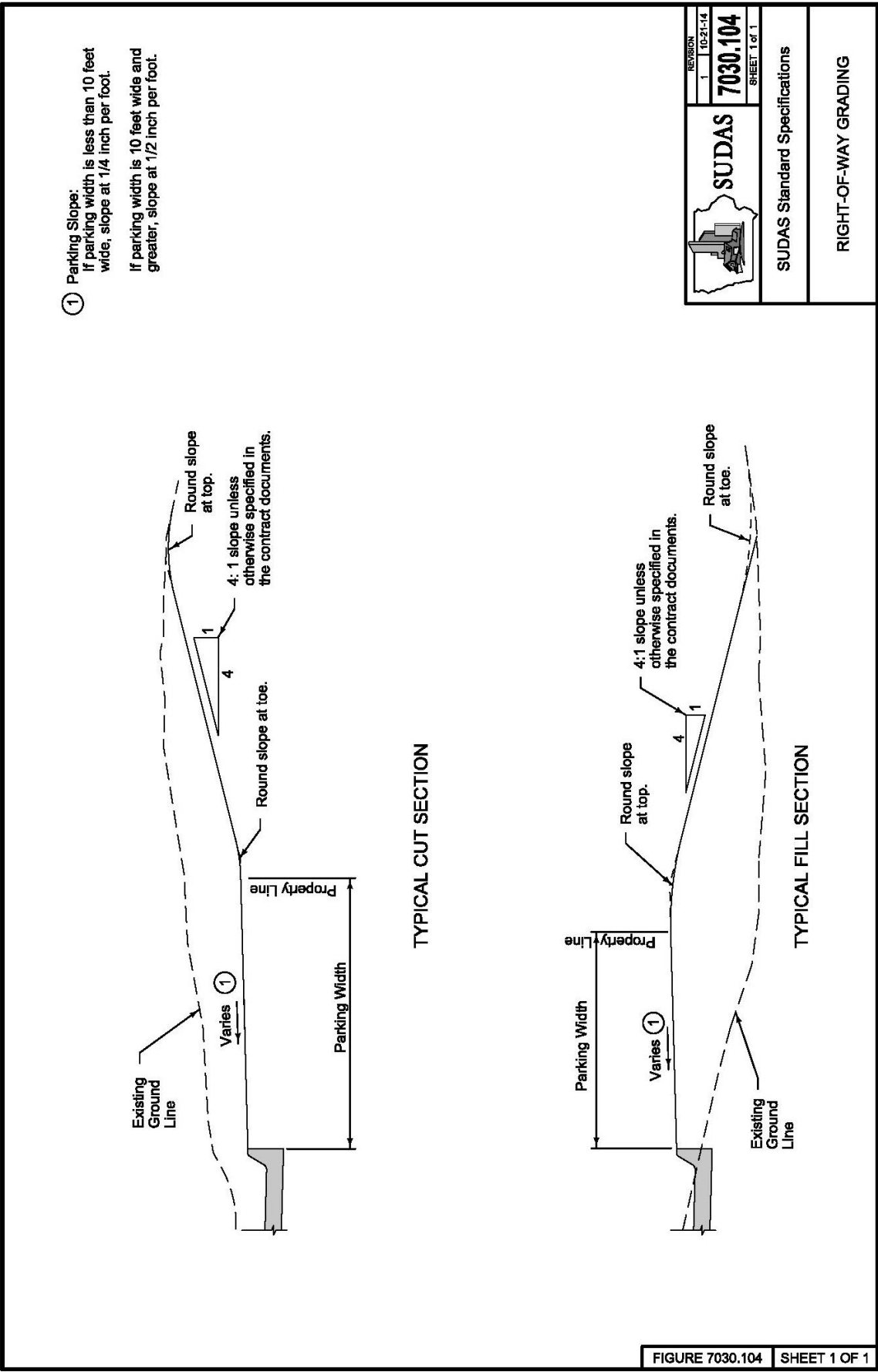
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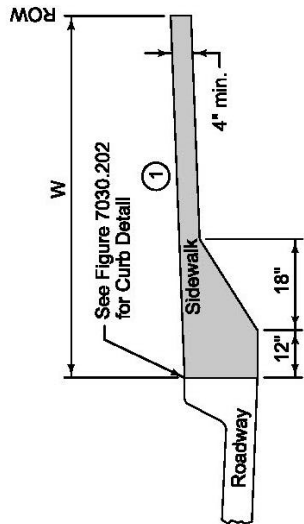
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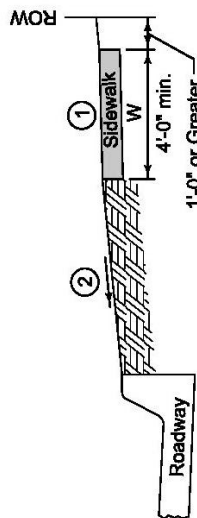
DRIVEWAY GRADING

FIGURE 7030.103 SHEET 1 OF 1

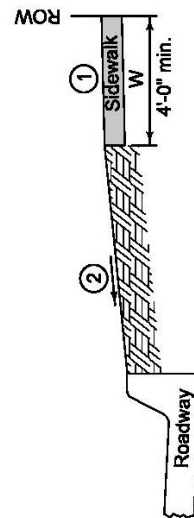




CLASS A SIDEWALK
(Sidewalk extends from back of curb to ROW)



CLASS B SIDEWALK



CLASS C SIDEWALK

- ① Target cross slope of 1.5% with a maximum cross slope of 2.0% (including sidewalk through driveway).
- ② Parking Slopes:
If parking width is less than 10 feet wide, slope at $\frac{1}{4}$ inch per foot.
If parking width is 10 feet wide and greater, slope at $\frac{1}{2}$ inch per foot.
Special grade may be specified in the contract documents.

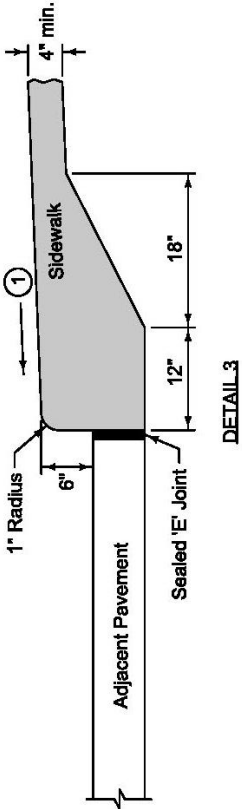
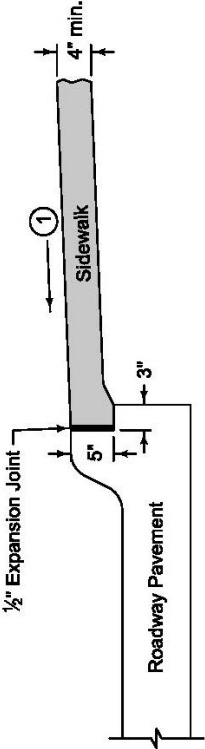
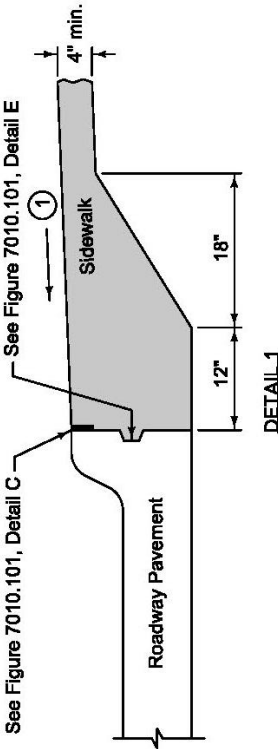
W = Sidewalk width as specified in the contract documents.

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CLASSES OF SIDEWALKS			

FIGURE 7030.201 SHEET 1 OF 1

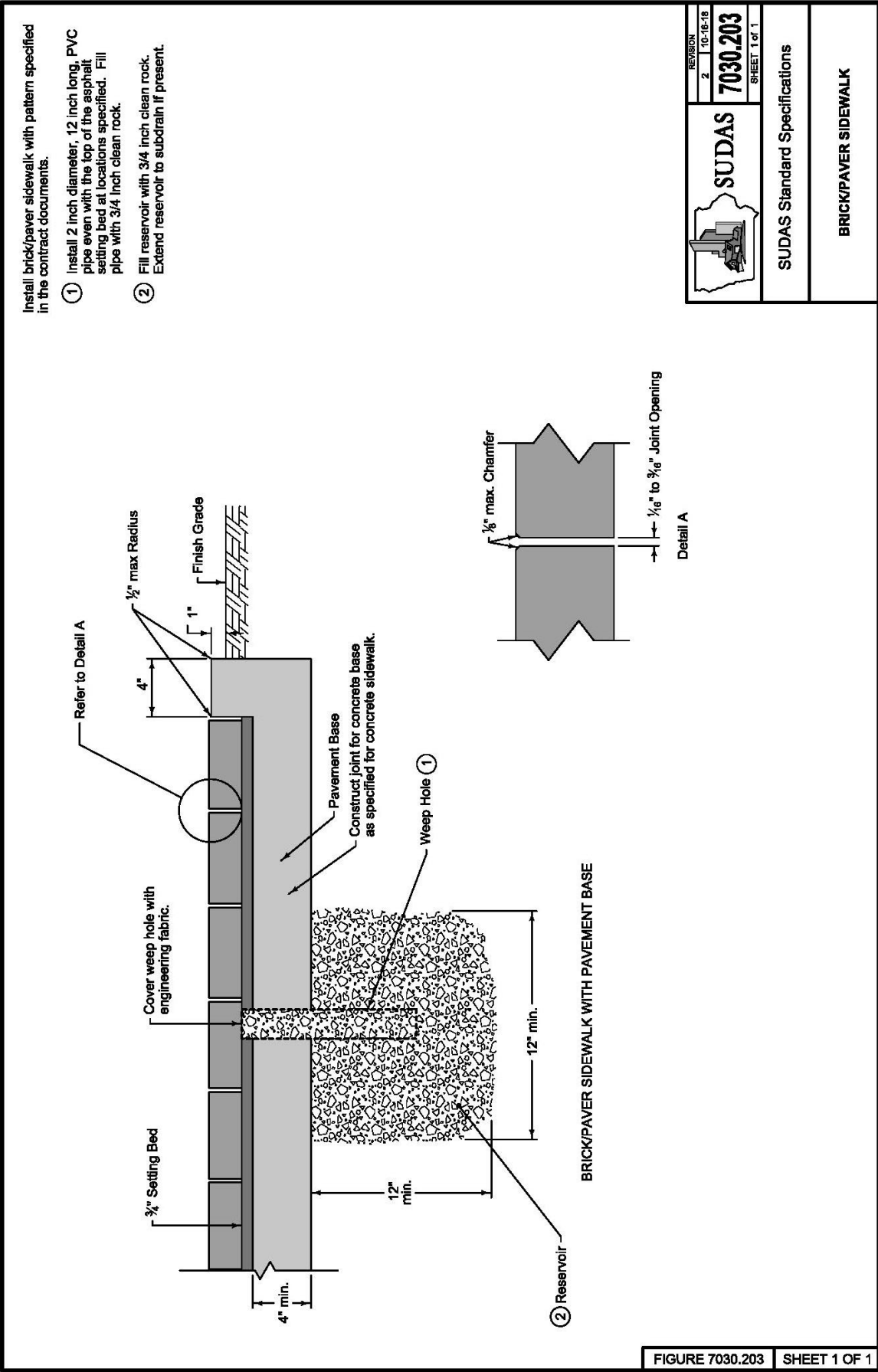
For new sidewalk with new curb and gutter, comply with Detail 1 or Detail 2. Comply with Detail 3 for new sidewalk adjacent to existing pavement or when specified in the contract documents.

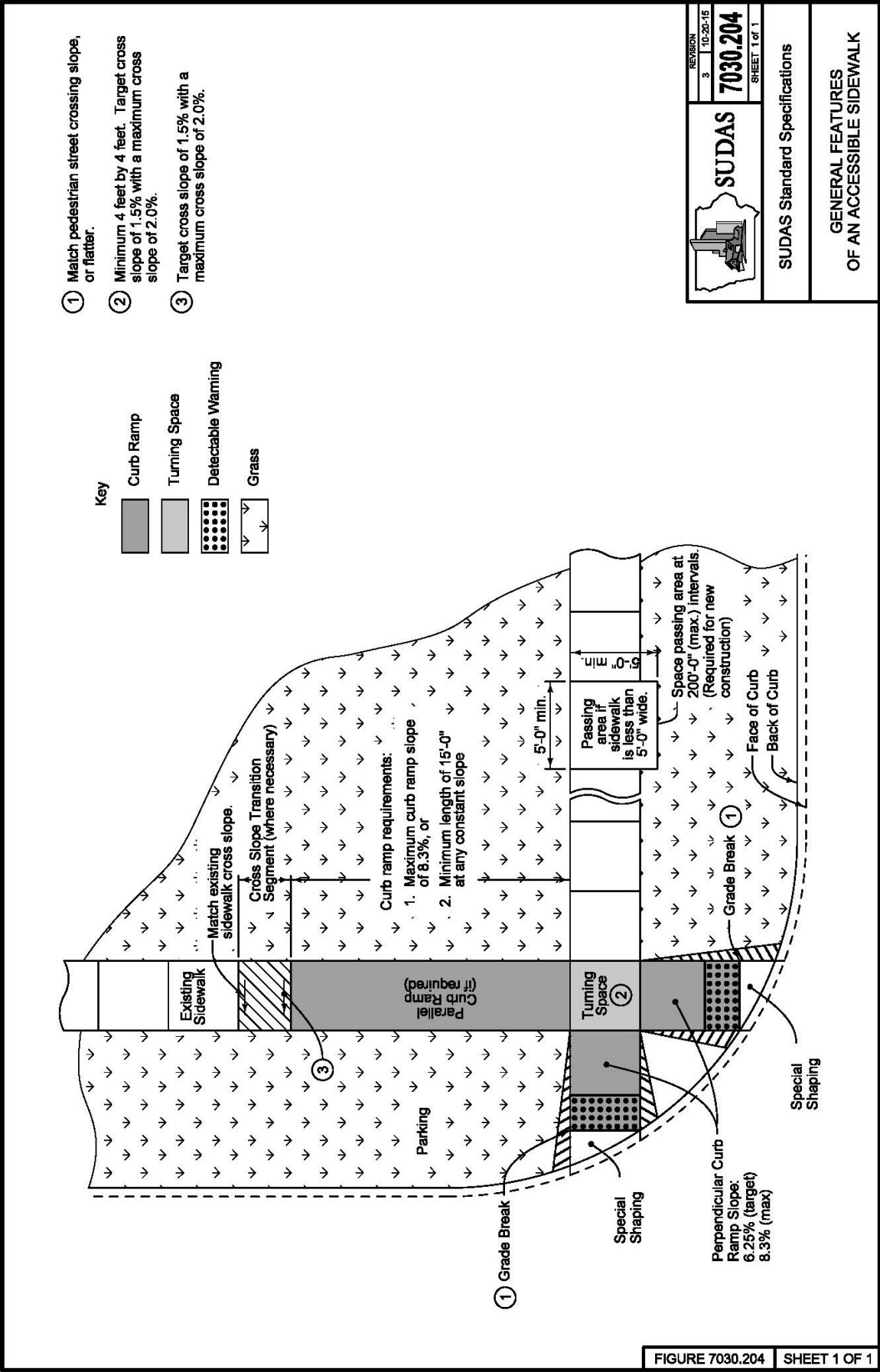
- ① Target cross slope of 1.5% with a maximum cross slope of 2.0%.

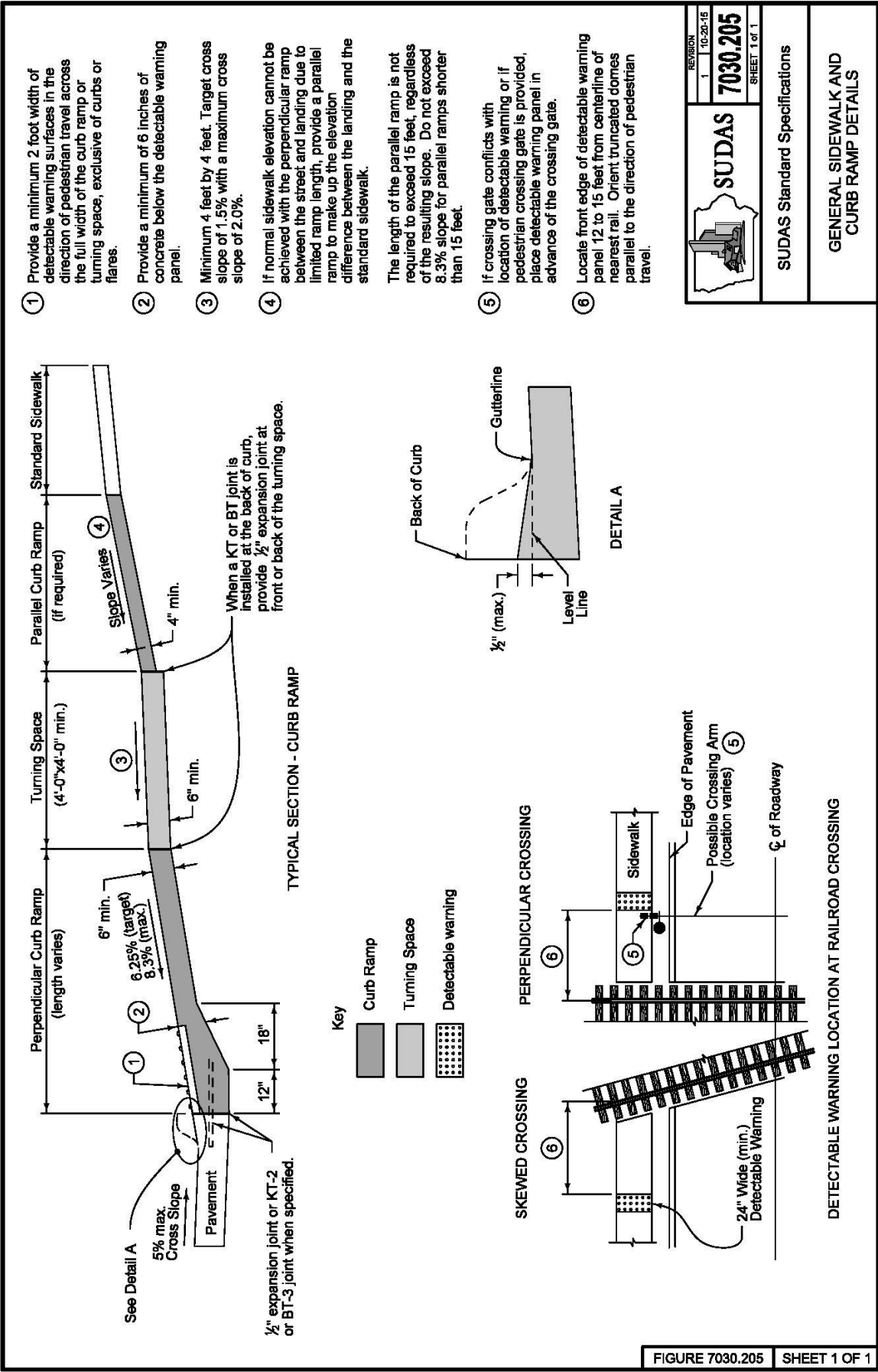


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CURB DETAILS FOR CLASS A SIDEWALK			

FIGURE 7030.202 SHEET 1 OF 1







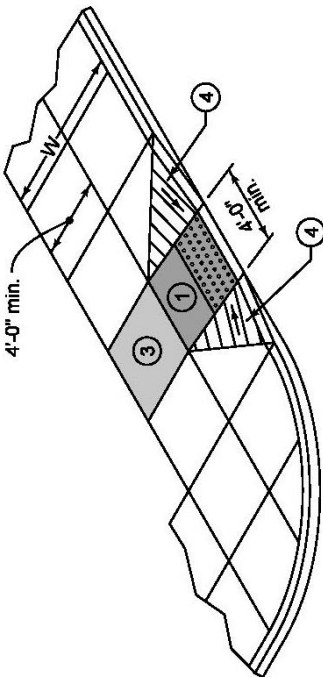
- ① Perpendicular Curb Ramp: Target running slope of 6.25% with maximum running slope of 8.3%. Match pedestrian street crossing cross slope at back of curb. At mid-block crossings, cross slope may exceed 2.0% to match roadway grade.
- ② Parallel Curb Ramp: Target cross slope of 1.5% with a maximum cross slope of 2.0%. The length of the parallel ramp is not required to exceed 15 feet, regardless of resulting slope. Do not exceed 8.3% slope for parallel ramps shorter than 15 feet.
- ③ Turning Space: Target slope of 1.5%, with a maximum slope perpendicular to the travel directions of 2.0%. At mid-block crossings, cross slope of landing may exceed 2.0% to match roadway grade. Minimum 4 feet by 4 feet.
- ④ Flare (10:1 max.) required if ramp is contiguous with sidewalk.

Key

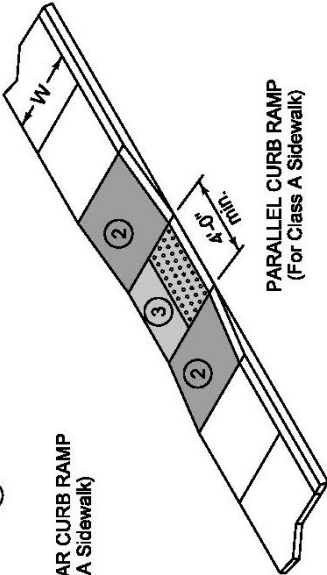
Curb Ramp

Turning Space

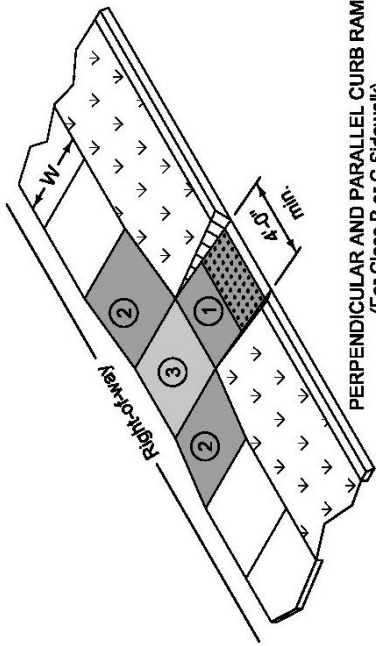
Detectable Warning



PERPENDICULAR CURB RAMP
(For Class A Sidewalk)



PARALLEL CURB RAMP
(For Class A Sidewalk)



PERPENDICULAR AND PARALLEL CURB RAMP
(For Class B or C Sidewalk)

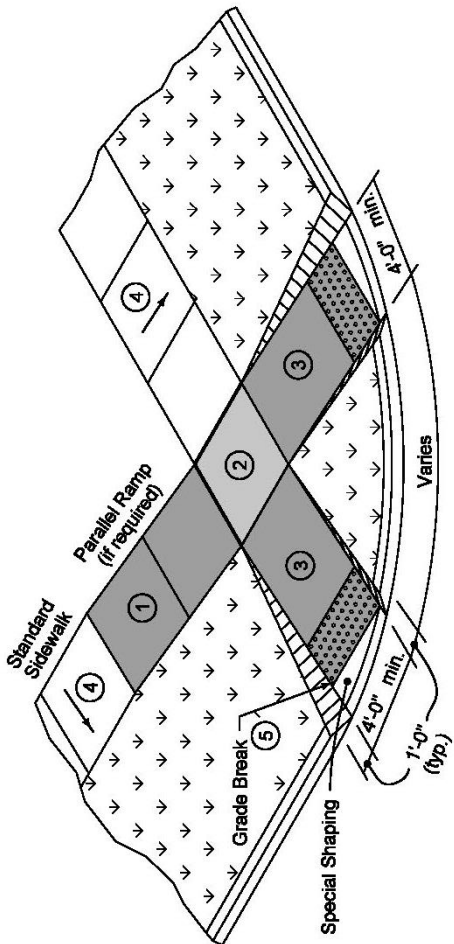
REVISION
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CURB RAMPS OUTSIDE OF INTERSECTION RADIUS

- ① Parallel Curb Ramp: If normal sidewalk elevation cannot be achieved with the perpendicular ramp between the street and landing due to limited ramp length, provide a parallel ramp to make up the elevation difference between the landing and the standard sidewalk.

The length of the parallel ramp is not required to exceed 15 feet, regardless of the resulting slope. Do not exceed 8.3% slope for parallel ramps shorter than 15 feet.
- ② Turning Space: Target slope of 1.5% with maximum slope perpendicular to the travel directions of 2.0%. Minimum 4 feet by 4 feet.
- ③ Perpendicular Curb Ramp: Target running slope of 6.25% with maximum running slope of 8.3%.
- ④ Target cross slope of 1.5% with a maximum cross slope of 2.0%.
- ⑤ Match pedestrian street crossing cross slope or flatter.



Key

- Curb Ramp
- Turning Space
- Detectable warning
- Grass



REVISION

New

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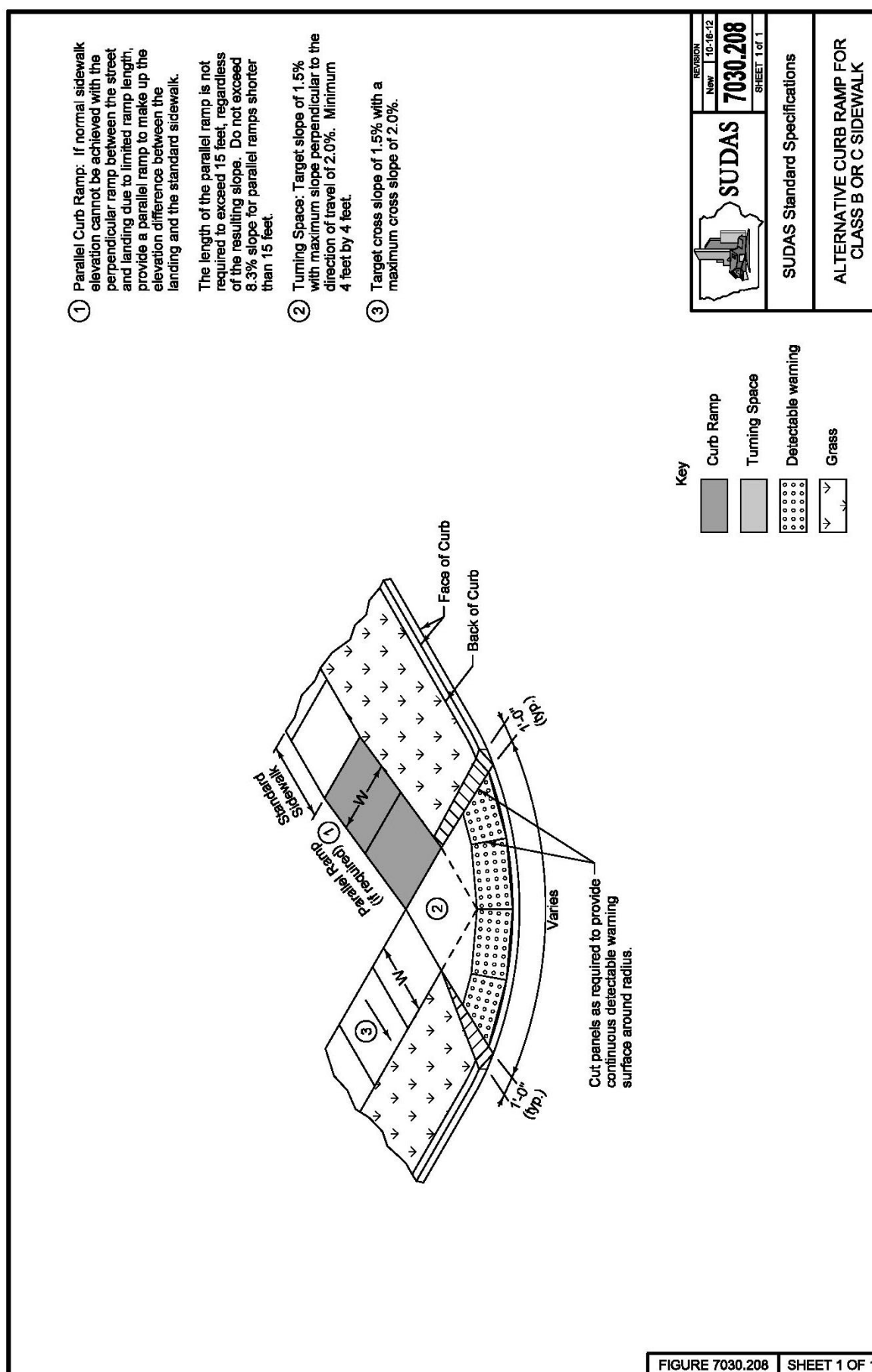
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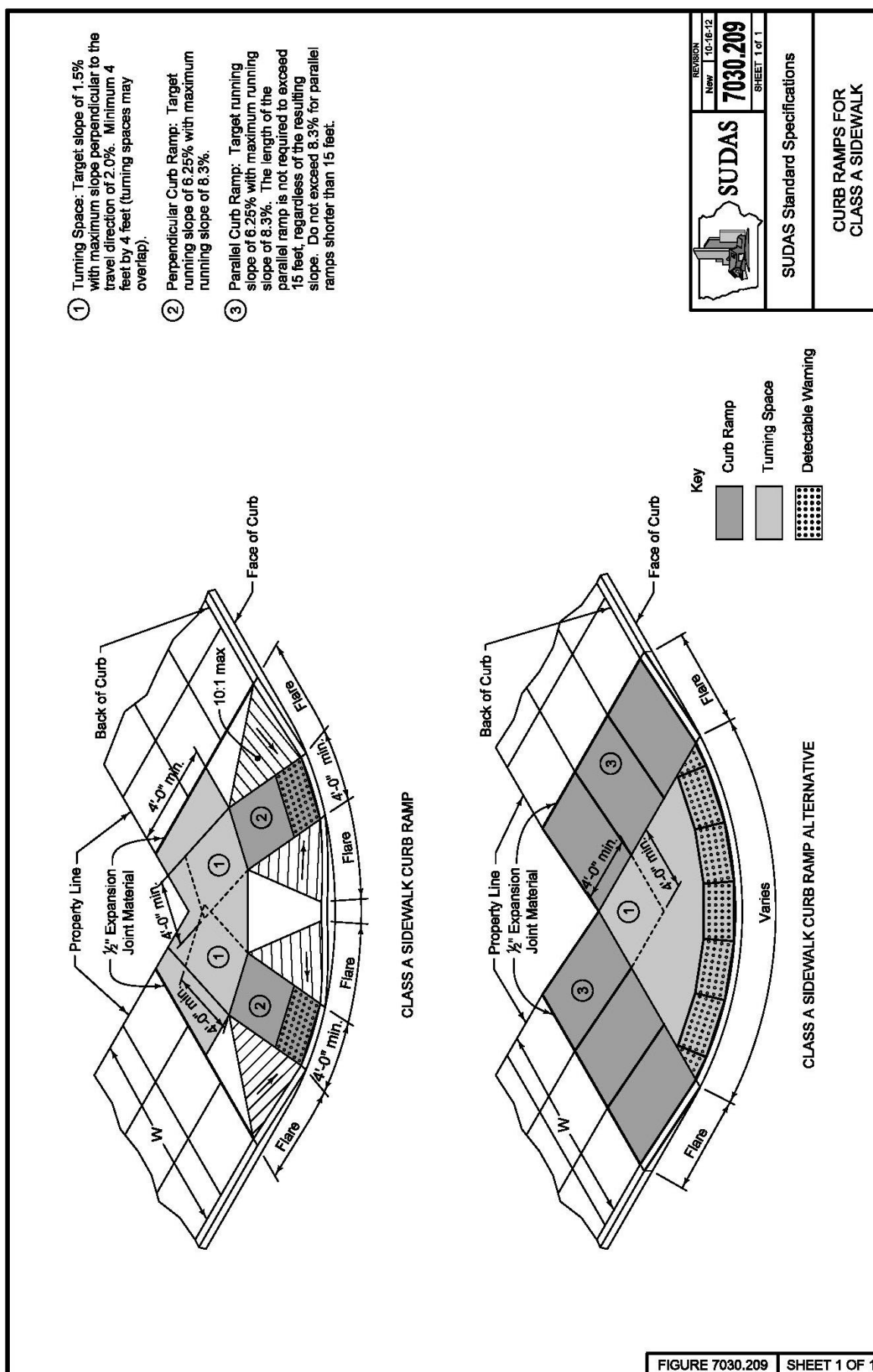
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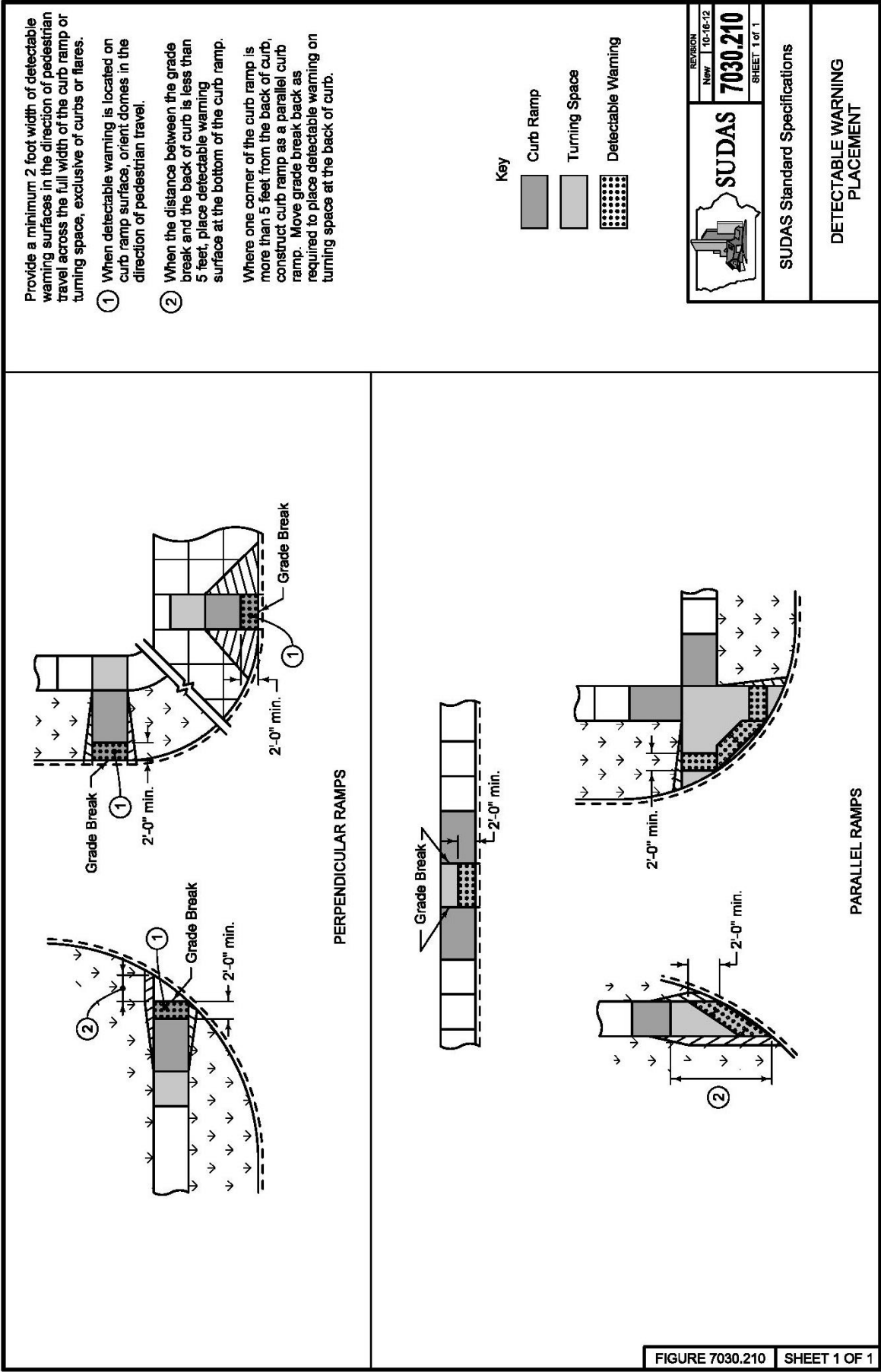
SUDAS Standard Specifications

CURB RAMP FOR CLASS B OR C SIDEWALK

FIGURE 7030.207 SHEET 1 OF 1







SECTION 7040 - PAVEMENT REHABILITATION

PART 1 -GENERAL

1.01 SECTION INCLUDES

- A. Full and Partial Depth PCC Patches
- B. Full and Partial Depth HMA Patches
- C. Full Depth Composite Patches
- D. Diamond Grinding
- E. Milling
- F. Cleaning and Filling Joints and Cracks
- G. Curb and Gutter Replacement
- H. Dowel Bar Retrofit

1.02 DESCRIPTION OF WORK

- A. Construct full depth PCC, HMA, and composite patches.
- B. Construct partial depth PCC and HMA patches.
- C. Grind existing PCC pavement surface for profile improvement using a diamond grinder.
- D. Mill the surface of HMA or PCC pavement to improve the surface profile and cross-section in preparation for resurfacing.
- E. Clean and fill longitudinal and transverse joints and random cracks in PCC and HMA pavement.
- F. Remove existing pavement and curb and gutter.
- G. Install epoxy coated dowel bars on transverse joints and cracks.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants as well as the following:

- A. PCC mix design.
- B. HMA mix design.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, HANDLING, AND SALVAGING

Comply with Division 1 - General Provisions and Covenants, as well as the following:

- A. PCC: See Section 7010.
- B. HMA: See Section 7020.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT

A. Full Depth Patches

1. **Measurement:** Measurement will be in square yards for each type of full depth patch. Patches less than 2 square yards in area will be considered 2 square yards.
2. **Payment:** Payment will be made at the unit price per square yard for each type of full depth patch.
3. **Includes:** Unit price includes, but is not limited to, sawing, removing, and disposing of existing pavement and reinforcing; restoring the subgrade; furnishing and installing tie bars and dowel bars; furnishing and placing the patch material, including the asphalt binder and tack coat; forming and constructing integral curb; surface curing and pavement protection; joint sawing and filling; and placing backfill and restoring disturbed surfaces.

B. Subbase Over-excavation:

1. **Measurement:** Measurement will be in tons of subbase material placed for authorized over-excavation.
2. **Payment:** Payment will be made at the unit price per ton of subbase material.
3. **Includes:** Unit price includes, but is not limited to, removal of existing subbase or subgrade, disposal of materials removed, furnishing and placing subbase material, and any additional excavation required for subbase placement.

C. Partial Depth Patches:

1. **Measurement:** Measurement will be in square feet for each type of partial depth patch. Patches less than 1 square foot in area will be considered 1 square foot.
2. **Payment:** Payment will be made at the unit price per square foot for each type of partial depth patch.
3. **Includes:** Unit price includes, but is not limited to, sawing, removing, and disposing of existing pavement; furnishing tack coat or bonding agent; furnishing and placing the patch material; curing; joint filling (PCC patches only); placing backfill; and restoring disturbed surfaces.
4. **Extra Payment:** When partial depth patches are constructed to full depth at the direction of the Engineer, payment will be at 2 times the unit price per square foot for each type of partial depth patch.

D. Crack and Joint Cleaning and Filling, Hot Pour:

1. **Measurement:** Measurement will be in linear feet measured along the cracks or joints.
2. **Payment:** Payment will be made at the unit price per linear foot of crack and joint cleaning and filling.
3. **Includes:** Unit price includes, but is not limited to, furnishing crack and joint filler material and routing, sawing, cleaning, and filling joints or cracks.

E. Crack Cleaning and Filling, Emulsion:

1. Crack Cleaning and Filling, Emulsion:

- a. **Measurement:** Measurement will be in linear feet measured along the cracks. Map cracked areas will not be measured.
- b. **Payment:** Payment will be made at the unit price per linear foot of crack cleaning and filling.
- c. **Includes:** Unit price includes, but is not limited to, furnishing emulsified crack filler material, cleaning cracks, placing soil sterilant, and filling cracks.

2. Hot Mix Asphalt for Crack Filling:

- a. **Measurement:** Measurement will be in tons of HMA used for filling cracks greater than 1 inch. Quantity will be based upon scale tickets. Mixture not used in the work will be deducted based upon scaled weights.
- b. **Payment:** Payment will be made at the unit price per ton for HMA used in filling cracks over 1 inch.
- c. **Includes:** Unit price includes, but is not limited to, cleaning, applying tack coat, and furnishing and placing HMA for crack filling.

F. Diamond Grinding:

1. **Measurement:** Measurement will be in square yards for the area of diamond grinding.
2. **Payment:** Payment will be made at the unit price per square yard of diamond grinding.
3. **Includes:** Unit price includes, but is not limited to, diamond grinding pavement, testing for smoothness according to the contract documents, and removal of slurry and residue from the project site.

G. Milling:

1. **Measurement:** Measurement will be in square yards for the area of milling.
2. **Payment:** Payment will be made at the unit price per square yard of milling.
3. **Includes:** Unit price includes, but is not limited to, milling pavement; furnishing water; and salvaging, stockpiling, and removing cuttings and debris.

H. Pavement Removal:

1. **Measurement:** Measurement will be in square yards. No deduction in area will be made for manholes, storm sewer intakes, valve boxes, or other structures less than 2 square yards in area. Pavement removal for patching is included as part of the patching item and will not be measured separately.
2. **Payment:** Payment will be made at the unit price per square yard.
3. **Includes:** Unit price includes, but is not limited to, sawing, breaking, removing, and disposing of existing pavement and reinforcing steel.

I. Curb and Gutter Removal:

1. **Measurement:** Measurement will be in linear feet measured along the back of curb.
2. **Payment:** Payment will be made at the unit price per linear foot of curb and gutter removed.
3. **Includes:** Unit price includes, but is not limited to, sawing, breaking, removing, and disposing of existing curb and gutter.

J. Dowel Bar Retrofit:

1. **Measurement:** Measurement will be by count of the number of dowel bars satisfactorily placed.
2. **Payment:** Payment will be made at the contract unit price per bar.
3. **Includes:** Unit price includes, but is not limited to, cutting the slots, preparing the slots, placing and grouting the bars, and curing the surface.

- K. **Sampling and Testing:** Required sampling and testing for pavement repair and rehabilitation work is incidental to other project costs and will not be paid for separately.

PART 2 -PRODUCTS**2.01 MATERIALS****A. PCC:**

1. **Standard Patching:** Use Class C mix complying with Section 7010. Comply with Iowa DOT Materials I.M. 401. Construct all patches as standard patches unless otherwise specified in the contract documents.
2. **High Early Strength Patching:** Use Class M mix complying with Section 7010. Do not use calcium chloride unless otherwise specified in the contract documents.
3. **Partial Depth Patching:** Use a coarse aggregate in concrete mix complying with Iowa DOT Article 4109.02, Gradation No. 5 in the Aggregate Gradation Table.

- B. **HMA:** Provide a minimum Low Traffic (LT) mixture complying with Section 7020, unless otherwise specified in the contract documents. Provide mixture with an asphalt binder meeting or exceeding PG 58-28S.
- C. **Crack and Joint Filler Material:**
1. **Hot Pour Crack and Joint Filler:** Comply with Iowa DOT Section 4136.
 2. **Emulsified Asphalt Crack Filler:** Provide CRS-2 or CRS-2P emulsions complying with Iowa DOT Section 4140.
 3. **HMA for Filling Cracks:**
 - a. Provide a 3/4 inch, 1/2 inch, or 3/8 inch HMA mixture complying with Section 7020, or a similar mixture from a commercial source subject to approval from the Engineer.
 - b. Upon approval of the Engineer, a high performance bituminous cold premix may be used, depending on the availability of the specified hot mix asphalt.
 4. **Blotting Material:** Provide sand complying with Iowa DOT Sections 4124 or 4125, or similar sand approved by the Engineer.
 5. **Soil Sterilant:** Provide soil sterilant as specified in the contract documents.
- D. **Primer or Tack Coat Bitumen:** Comply with Iowa DOT Article 2303.02.
- E. **Epoxy for Bonding Dowel and Tie Bars:** Comply with Iowa DOT Materials I.M. 491.11.
- F. **Tie Bars and Dowel Bars:** Provide epoxy coated bars complying with Iowa DOT Section 4151.
- G. **Subbase Material:** Unless otherwise specified in the contract documents, use modified subbase complying with Section 2010.
- H. **Liquid Curing Compound:** Comply with Iowa DOT Section 4105.
- I. **Sand-cement Grout:** Provide a sand-cement grout mixture with a ratio of one part water to one part sand and two parts cement.
- J. **Preformed Compression Relief Material:** Provide 1/4 inch polystyrene, 1/4 inch polyethylene, 1/4 inch Styrofoam, or 3/16 inch waxed coated cardboard.
- K. **Epoxy Coated Dowel Bars:** Comply with Figure 7010.101 and Iowa DOT Section 4151 for the length and diameter specified. Uniformly coat dowel bars with approved bond breaker according to Iowa DOT Article 4151.02, B. Include tight fitting nonmetallic end caps that allow a minimum of 1/4 inch movement at each end.
- L. **Dowel Chairs:** Prevent movement of the dowel bar during grout placement with epoxy coated or nonmetallic dowel chair devices which provide a minimum clearance of 1/2 inch between the bottom of the bar and the surface upon which the bar is placed and also between the bar and the end walls of the slot.

- M. **Caulking Filler:** Any commercial caulk designed as a concrete sealant that is compatible with the grout material being used.
- N. **Foam Core Inserts:** Provide 3/8 inch $\pm$ 1/8 inch thick closed cell foam core board filler faced with film, foil, or poster board material on both sides.
- O. **Rapid Set Patch Material:** Provide a shrinkage compensated rapid set patch material meeting Iowa DOT Materials I.M. 491.20 and the following strength requirements:
- 3 hour minimum compressive strength of 3,000 psi according to ASTM C 39.
 - 24 hour minimum compressive strength of 5,000 psi according to ASTM C 39.
 - 24 hour bond to dry PCC strength of 1,000 psi according to ASTM C 882.

Extend rapid set patch material according to the manufacturer's recommendations using pea gravel meeting Iowa DOT Section 4112 and the following gradation:

Sieve Size	Percent Passing
1/2 inch	100
3/8 inch	85 to 100
No. 8	0 to 8

PART 3 - EXECUTION

3.01 GENERAL

- A. Conduct all operations to minimize inconvenience to traffic. Confine operations to one traffic lane, unless the road is to be closed to traffic. Minor encroachment into the adjacent lane, such as for sawing and installing forms, will be acceptable with the use of a flagger according to MUTCD.
- B. Do not remove pavement for either full depth or partial depth patching unless the patch can be completed before the end of the working day.
- C. Construct full depth and partial depth patches to the dimensions specified in the contract documents or as marked by the Engineer in the field. Construct all full depth patches to full panel width.
- D. Make saw cuts parallel or perpendicular to the centerline.
- E. Remove and dispose of materials not designated for salvage.
- F. Restore the area outside the pavement by placing and compacting backfill material, placing topsoil, and sodding or seeding as specified in the contract documents.

3.02 FULL DEPTH PATCHING

A. Pavement Removal:

1. Saw pavement to full depth at the edges of the patch. A second saw cut, 2 inches inside the initial saw cut, may be required to prevent damage to adjacent pavement.
2. Do not damage pavement that is to remain. Do not use heavy equipment adjacent to new concrete until the opening strength is achieved.

B. Restoring Subgrade or Subbase:

1. Excavate 2 inches below the bottom of the existing pavement. If more than 2 inches is excavated, place and compact new subbase material as required to bring the subbase to a level 2 inches below the bottom of the existing pavement. Correct unauthorized over excavation at no additional cost to the Contracting Authority.
2. Compact the exposed subgrade or subbase by a minimum of four complete passes with a plate-type vibratory compactor with a minimum force rating of 3,500 pounds.
3. When unstable material or excessive moisture is encountered, the Engineer may order removal and replacement of the unstable material.
4. Remove existing unstable subgrade or subbase, or both, to the depth directed by the Engineer.
5. Place and compact new subbase material as required to bring the subbase to a level 2 inches below the bottom of the existing pavement.

C. Placing PCC Patches:

1. Equipment: Comply with Iowa DOT Article 2301.03, A, specifications on equipment for standard concrete pavement.
2. Tie Bars and Dowel Bars: Comply with Section 7010, and the figures in Sections 7010 and 7040.
 - a. When there is a common line between two adjacent patches, a bent bar may be placed in a keyway and later straightened.
 - b. Coat dowel bars extending into the patch area with a bond breaker. Do not coat tie bars.
3. **Forms:** Comply with Section 7010, 3.02, D, as well as the following.
 - a. Use forms on all exposed edges and along the centerline for patches that extend into an adjacent lane, unless full pavement width patches are constructed.
 - b. Rigid wood forms may be used in lieu of steel. Wood forms must be full-depth of pavement thickness.

4. Placing, Consolidation, and Finishing the Concrete:

- a. Moisten the subbase or subgrade.
 - b. Except for preplanned joints, place the patch continuously until the patch is completed.
 - c. When a delay of 45 minutes cannot be avoided, construct a day's work ('DW') joint.
 - d. Carefully place concrete into the patch area to avoid segregation; spread into place and consolidate with a mechanical vibrator. Place full lane width patches over 25 feet in length with a suitable finishing machine that has at least one vibrating screed. Avoid excessive vibrating.
 - e. Finish patches per Section 7010, 3.02, H.
 - f. For joints with tie bars, tool the edge. For joints with dowel bars, saw to a depth of approximately 1 1/8 inch, leaving an opening of at least 3/8 inch in width to provide a reservoir for joint filler.
 - g. Texture the patch to match the adjacent surface.
5. **Curing:** Comply with Section 7010, 3.02, I. Cure the concrete, including exposed vertical edges, immediately after the concrete has been finished and the surface water has evaporated.
6. **Joints:** Construct and fill joints according to Section 7010, 3.02. Place joints at locations specified in the contract documents.
7. **Pavement Protection:** Comply with Section 7010, 3.04.
8. **Use of Pavement:** Comply with opening strength requirements of Section 7010, 3.05. Maturity testing is not required.
9. **Depth:** The PCC pavement will be a minimum of 7" for composite patches and 8" for PCC patches.

D. Placing HMA Patches:

1. Use equipment complying with Iowa DOT Article 2303.03. Use of a paving machine is not required.
2. Apply tack coat to the vertical edges of the remaining pavement at a rate of 0.10 to 0.15 gallons per square yard.
3. Place HMA patch mixture in lifts that will not exceed 3 inches in thickness after compaction, with the top lift not exceeding 2 inches in thickness when compacted.
4. Compact each lift while hot by rolling or compacting with a vibratory compactor. Subsequent lifts may be placed as soon as the preceding lift has been properly compacted.
5. Smooth the final lift with a steel-tired finish roller. Ensure the final compacted surface is level with, or no more than 1/8 inch above, the adjacent pavement and has a smooth riding surface. If the patch becomes distorted for any

reason, smooth the surface by blading, scraping, grinding, filling, or other approved means.

6. Do not extend patch material beyond the edge of the existing pavement; remove patch material that extends outside the patch limits.
7. Do not open to traffic until the mixture has cooled sufficiently to provide stability.

3.03 PARTIAL DEPTH PATCHING

A. Pavement Removal:

1. Ensure all patches are square or rectangular in shape.
2. For removal by the saw and chip method, cut at the designated removal limits to a minimum depth of 2 inches and a maximum depth of T/2 or the top of the dowels in PCC pavement. For PCC patches, taper the sides of the removal area 30 to 60 degrees from vertical using a pneumatic hammer to eliminate the polished face.
3. Using a 15 pound maximum size pneumatic hammer, remove the deteriorated pavement down to sound pavement. A 30 pound pneumatic hammer may be used if it does not result in damage to the patch area and edges.
4. In lieu of sawing and removal with a pneumatic hammer, the designated patch area may be milled to the prescribed depth. Milling equipment must provide tapered edges 30 to 60 degrees from vertical for PCC patches. Chip out secondary spalling resulting from milling at no additional cost to the Contracting Authority.
5. Remove pavement to the appropriate depth. Do not damage steel reinforcement during the removal process on PCC pavements. Damaged steel will be the responsibility of the contractor. If the end of a dowel bar is exposed, cut and remove the bar. Place duct tape, form oil, grease or use other method approved by the Engineer as a bond breaker on dowels not removed. If the required depth to sound pavement exceeds the maximum T/2 removal depth, construct a full depth patch.

B. PCC Patch Placement:

1. Clean removal area by sandblasting or water blasting, followed by air blasting, until the area is clean and dry. Ensure the compressed air used for cleaning is oil and moisture free. Place concrete the same day as cleaning.
2. Install preformed compression relief material in joints or cracks or tool the joint in the plastic concrete. Use material equal in width to the adjacent joint or crack at the patch boundary. For wide openings, use multiple thicknesses. Compression relief material is to extend at a minimum of 1/4 inch below the bottom of the patch so as to completely separate all patching material on both sides and 3 inches beyond the patch boundaries. If tooling of the joint is

specified, complete a relief saw cut to the full depth of the patch plus 1/4 inch as soon as the concrete has reached proper set.

3. Thoroughly coat the bottom and sides of the patch area with a cement grout immediately prior to placement of concrete. Do not allow grout to set prior to placement of concrete. Remove grout set by sandblasting and reapply.
4. Deposit concrete in the patch; finish patch from the center outward. Ensure concrete does not infiltrate into existing cracks or joints.
5. Apply joint filler material to expansion joints. At the interface between the patch and the slab, apply sand-cement grout to fill and seal the edge.
6. Texture the patch similar to the adjacent surface.
7. Cure patch according to Section 7040, 3.02.
8. Fill joints according to Section 7040, 3.06. Complete filling within 5 calendar days after patch is placed.

C. HMA Patch Placement:

1. Clean removal area by air blasting until the area is clean and dry. Ensure the compressed air used for cleaning is moisture free.
2. Cover the entire removal area with tack coat at a rate of 0.10 to 0.15 gallons per square yard.
3. Place HMA patch mixture in lifts that will not exceed 3 inches in thickness after compaction, with the top lift not exceeding 2 inches in thickness when compacted.
4. Compact each lift while hot by rolling with an adequately weighted pneumatic tire roller or by tamping with a mechanical tamper. Succeeding lifts may be placed as soon as the preceding lift has been properly compacted.
5. Smooth the final lift with a steel-tired finish roller. Ensure the final compacted surface is level with, or no more than 1/8 inch above, the adjacent pavement and has a smooth riding surface. If the patch becomes distorted for any reason, smooth the surface by blading, scraping, grinding, filling, or other approved means.
6. Do not open to traffic until the mixture has cooled sufficiently to provide stability.

3.04 DIAMOND GRINDING

- A. Use equipment complying with Iowa DOT Article 2532.03, A.
- B. Grind and texture the entire surface of the pavement parallel to the centerline until the pavement surface on both sides of transverse joints and all cracks are in the same plane with no greater than 1/16 inch difference between adjacent sides of joints and cracks and the pavement surface meets the required smoothness. Feather grind into existing structures such as manholes and water valves in a manner that eliminates abrupt edges or drops and provides a uniform texture.

- C. Ensure the ground surface is of uniform texture. In each lane, ensure at least 95% of the area in each 100 foot section has a newly textured surface. Depressed pavement areas due to subsidence or other localized causes and areas containing feathering due to pavement structures will be exempted from texturing requirements.
- D. Except at joints and cracks, ensure grinding depth does not exceed 1/2 inch. At joints and cracks, ensure grinding depth does not exceed 3/4 inch.
- E. For multiple passes, ensure overlaps do not exceed 1 inch. Begin at the crown of the roadway, proceeding toward the pavement edge with each subsequent pass. Ensure each subsequent pass is at least as deep as the previous pass in order to provide transverse drainage. All passes are to begin and end at the same station location. Ensure no unground areas are left between passes. For grinding adjacent to an unground turn lane or other pavement surface, feather smoothly from the edge of the ground surface to the unground surface leaving no more than a 1/8 inch ridge. If street surface to be ground includes a curb and gutter section, extend grinding to within 4 inches of the curb face and feather to provide proper drainage.
- F. Assemble and adjust the grinding head as necessary during the project to produce the following tolerances on pavements with the indicated coarse aggregates. Both the distance between grooves and the texture depth must be within the specified range to be in compliance. Assemble the grinding head to produce the tolerances indicated below for the type of coarse aggregate in the pavement.

	Crushed Stone	Gravel/Quartzite
Width of Land Area Between Grooves*	0.090" to 0.110"	0.080" to 0.095"
Texture Depth**	Target of 1/8" with average between 1/16" and 3/16"	

*Based on an average of a minimum of ten measurements across the ground width for one pass.

**Based on an average of a minimum of six measurements across the ground width for one pass.

- G. Prior to enforcement of the tolerances listed above, a test area 300 feet long and the width of the grinding head will be allowed for a new head that has been restacked, provided a surface texture in reasonable conformance with the specifications, as determined by the Engineer, is being produced.
- H. Ensure the transverse slope of the ground pavement is uniform to a degree that there are no depressions or misalignment of slope greater than 1/4 inch in 12 feet when tested by string line or straightedge placed perpendicular to the centerline.
- I. Continuously remove all slurry or residue resulting from the grinding operations with a well-maintained vacuum system and remove from the project limits. Ensure residue from grinding operations does not flow across lanes occupied by public traffic or into gutters, storm sewers, ditches, or other drainage facilities.
- J. Measure smoothness with a 10-foot straightedge. Regrind high spots to ensure no surface deviations greater than 1/8 inch remain. When profilograph testing is specified in the contract documents, comply with Iowa DOT Materials I.M. 341 and the following requirements:

1. Prior to performing any grinding work, provide a control profilogram for each lane and/or segment over 50 feet in length that is to be ground. Ensure pavement is relatively clean and free of debris prior to establishing the control profilogram.
 2. Ensure each segment of the finished ground surface has a final profile index less than or equal to 35% of the control profilogram trace or 22 inches per mile, whichever is greater, and does not include any bumps exceeding 1/2 inch in 25 feet.
 3. Depressed pavement areas due to subsidence or other localized causes and areas where the maximum cut restricts further grinding will be excluded from testing with the profilograph when approved by the Engineer.
- K. Recheck smoothness following any regrinding activities to ensure compliance with the above requirements.

3.05 MILLING

- A. Use equipment complying with Iowa DOT Article 2531.03, A.
- B. Mill the entire pavement area designated to the depth specified in the contract documents. Mill in straight lines. Make sufficient passes, or cuts, such that all irregularities or high spots are eliminated.
- C. Control milling operations to provide a surface that is true within a nominal tolerance of 1/4 inch and 1/4 inch at longitudinal joints where adjacent passes meet. The profile may be inspected by checking with a 10 foot surface checker placed parallel to the centerline. Correct variations greater than 1/4 inch.
- D. Load cuttings directly into dump trucks and remove the remaining small cuttings and debris from the street. Sweep the scarified surface with a rotary broom before opening to traffic. Unless otherwise specified in the contract documents, all materials removed are property of the Contractor.
- E. Do not operate metal tracked equipment on streets, other than those being milled.
- F. Ensure excessive dust does not become airborne during construction. Additional water may be required at any time for dust control.
- G. Mill around manholes and utility valves. Correct any damage to manholes or valves by the milling operation at no additional cost to the Contracting Authority.
- H. Do not leave a vertical drop of more than 2 inches at the centerline or lane line overnight. Taper the ends of milled sections subject to traffic to provide a uniform and gradual transition.

3.06 CRACK AND JOINT CLEANING AND FILLING, HOT POUR

A. General:

1. Use equipment complying with Iowa DOT Articles 2541.03 (HMA) and 2542.03 (PCC).

2. Rout or saw joints and cracks with an average opening of 3/8 inch or less to provide a minimum sealant reservoir of 3/8 inch wide by a nominal 1/2 inch deep.

B. Crack and Joint Cleaning:

1. Clean cracks or joints of existing joint filler material, backer rod, vegetation, dirt, and other foreign material.
2. Clean joints or cracks by air blasting or by other methods as necessary to remove debris.
3. If specified in the contract documents, clean wet sawn joints with high pressure water immediately after sawing to remove residue produced by the sawing operation.
4. When cleaned joints or cracks are contaminated before being filled, clean them again before filling.

C. Crack and Joint Filling:

1. Ensure cracks and joints are dry prior to placement of filler material.
2. Heat, handle, and apply joint filler material to the proper level as specified in the contract documents and as recommended by the manufacturer.
 - a. PCC Pavement: Do not overfill joint or crack with filler material. Immediately remove filler material placed on the pavement surface.
 - b. HMA Pavement: Slightly overfill the entire crack reservoir with filler material. Smooth with a narrow V-shaped squeegee immediately after placement of the filler material to within 1/2 inch on each side of the crack edge.
3. Place joint filler material when the pavement and ambient air temperatures are 40°F or higher. When near this minimum, additional air blasting or drying time, or both, may be necessary to ensure a satisfactory bond to the joint surfaces.
4. Lanes may be opened to traffic only after the filler material has set sufficiently so it will not pick up under traffic. Blotting material may be applied to the filler material, but only after the surface has set to avoid penetration of the blotting material into the filler material.

3.07 CRACK CLEANING AND FILLING, EMULSION

Use emulsified asphalt for filling cracks in HMA surfaces only. Do not use on PCC pavements.

A. General:

1. Clean cracks with either high pressure air or water equipment. Do not use water when freezing temperatures exist or are forecasted.
2. Ensure vegetation is removed from cracks. Alternative cleaning methods may be necessary to remove vegetation.

3. When specified in the contract documents, apply a soil sterilant in crack prior to placing the filler material.
4. For filling cracks, use a hand operated wand or pouring pot, capable of placing the filler material into the crack and filling to the adjacent surface. Use a spout or nozzle small enough to place the filler material into the crack without soiling the adjacent surface.
5. Immediately after placement of the filler material, tightly spread the emulsion using a 2 inch, or less, V-shaped rubber-edged squeegee. Take proper measures to hold the filler in place and prevent runout at edge of pavement or at low areas.

B. Cracks Wider Than 1 inch:

1. Clean the cracks of loose and spalled material, sand, and other foreign debris to a depth of 3 inches using high pressure water.
2. When specified in the contract documents, utilize additional methods to clean cracks of old crack filler.
3. Blow the cleaned cracks free of water with high pressure air.
4. Lightly apply a tack coat to the crack surfaces.
5. Fill the cracks with hot mix asphalt.
 - a. Ensure mix is warm and pliable when placed.
 - b. Rod and tamp the mix into place level with the adjacent surface.
 - c. Place mixture prior to filling cracks with emulsion.
6. Place a thin application of emulsion over the hot mix asphalt and tightly spread with a squeegee.

C. Cracks 1/4 inch to 1 inch in Width:

1. Clean the cracks of loose and spalled material, sand, and other foreign debris with high pressure air or high pressure water. Clean crack down to sound material, but a depth greater than 3 inches will not be required.
2. When specified in the contract documents, utilize additional methods to clean cracks of old crack filler.
3. Fill cracks with emulsion filler material.

D. Cracks Less Than 1/4 inch in Width:

1. Clean sufficiently to remove sand and other foreign debris.
2. Fill cracks with emulsion filler material.

E. Map-cracked (Alligator) Areas:

1. Cover area with emulsion filler material.
2. Spread emulsion over area with squeegee, working emulsion into cracks. Provide a thin, smooth application.

3. Promptly cover the filler material with a light application of blotter material.

3.08 PAVEMENT REMOVAL

- A. Saw full depth at pavement removal limits.
- B. Extend pavement removal limits to existing joint lines as directed by the Engineer.
- C. Protect existing pavement, beyond removal limits, from damage. Remove to a new saw line and replace, at no additional cost to the Contracting Authority, all concrete broken or damaged beyond the removal limits designated by the Engineer.

3.09 CURB AND GUTTER REMOVAL

- A. Saw longitudinally along the existing gutter joint or at a location directed by Engineer. Saw transversely at the curb and gutter removal limits.
- B. Remove existing curb and gutter without damaging the existing pavement to remain.

3.10 DOWEL BAR RETROFIT

A. Cutting and Preparing Slots:

1. Cut slots to the required width and depth with gang saw capable of cutting a minimum of three slots in each wheel path simultaneously. Multiple cuts in each slot may be required.
2. Use 30 pound maximum pneumatic hammers operated at a 45 degree angle or less to remove concrete from the slots. Prevent damage to surrounding concrete. Smooth and level the bottom of the slots with a lightweight bush hammer.
3. Sandblast or waterblast to clean exposed surfaces of slot and fill transverse contraction joint on the bottom and sides of the slot with caulking filler.

B. Placing Dowel Bars:

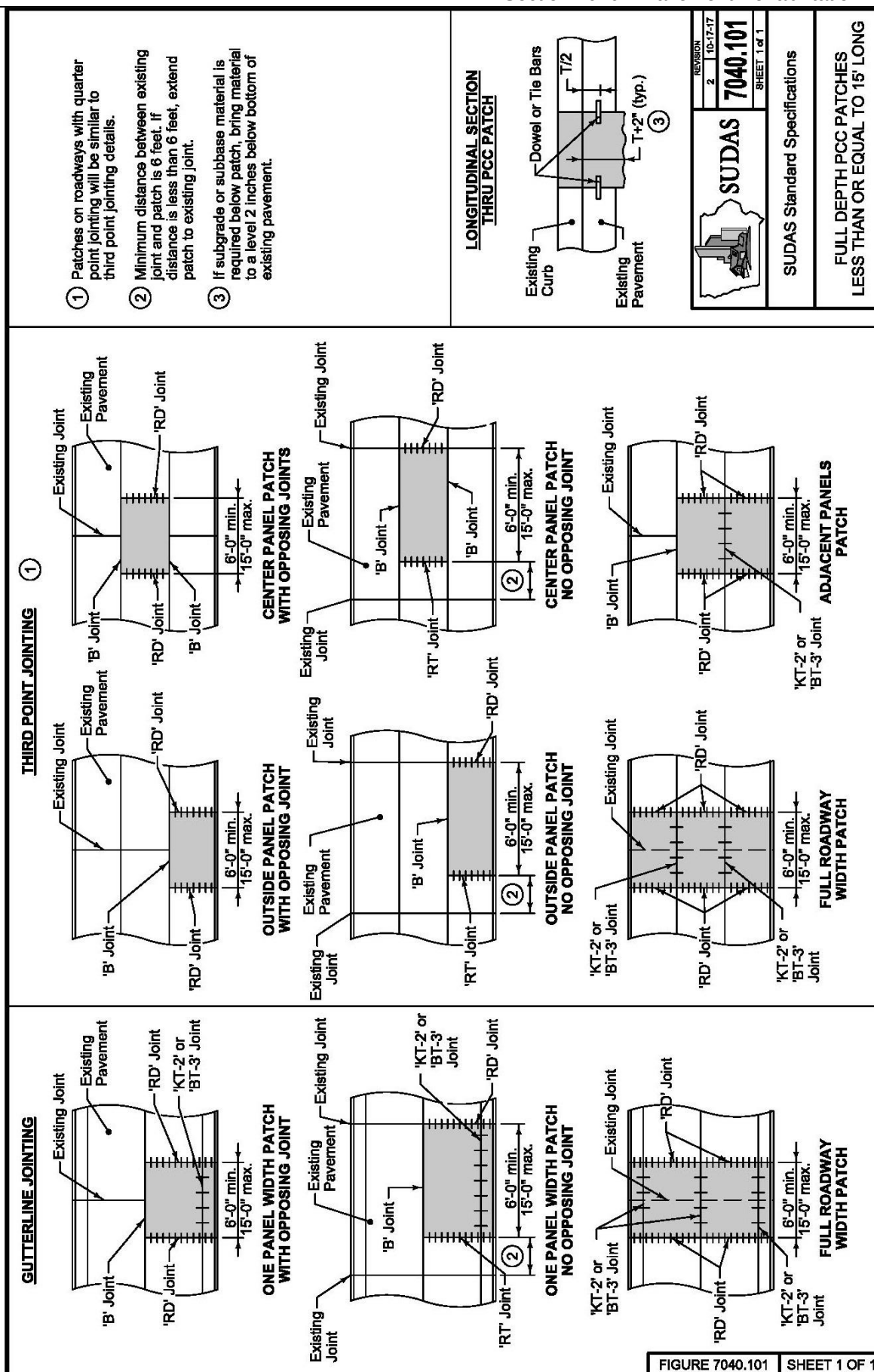
1. Set dowel bars at the depth shown on the plans with chair devices.
2. Ensure dowel bars are parallel to the centerline of the pavements and to the pavement surface.
3. Place dowel bars within 1/4 inch of required alignment.
4. Center dowel bars over transverse joints or cracks so a minimum of 6 inches extends into adjacent panel.
5. Cut foam core material and place at center of dowel bar so the material is flush with the pavement surface or slightly recessed and in line with the joint or crack. Maintain foam core material in vertical position, tight to the slot edges during grout placement.

C. Grouting:

1. Thoroughly moisten all surfaces of the slot immediately prior to filling with grout. Remove any excess water with compressed air.

2. Produce grout with a portable mixer and place immediately after mixing and before grout has attained initial set. Do not retemper grout with water.
 3. Place grout according to manufacturer's recommendations. Consolidate with hand held vibrator. If pavement is to be diamond ground place grout 1/8 inch higher than surrounding pavement. Place grout flush if the pavement is not to be ground.
 4. Thoroughly coat grout with white pigment curing compound immediately after placement.
- D. **Re-establish Joints or Cracks:** After grout has attained sufficient strength, re-establish joint or crack above the foam core insert within 8 hours of grout placement by means of sawing. If foam board is visible, sawing is not required.

END OF SECTION



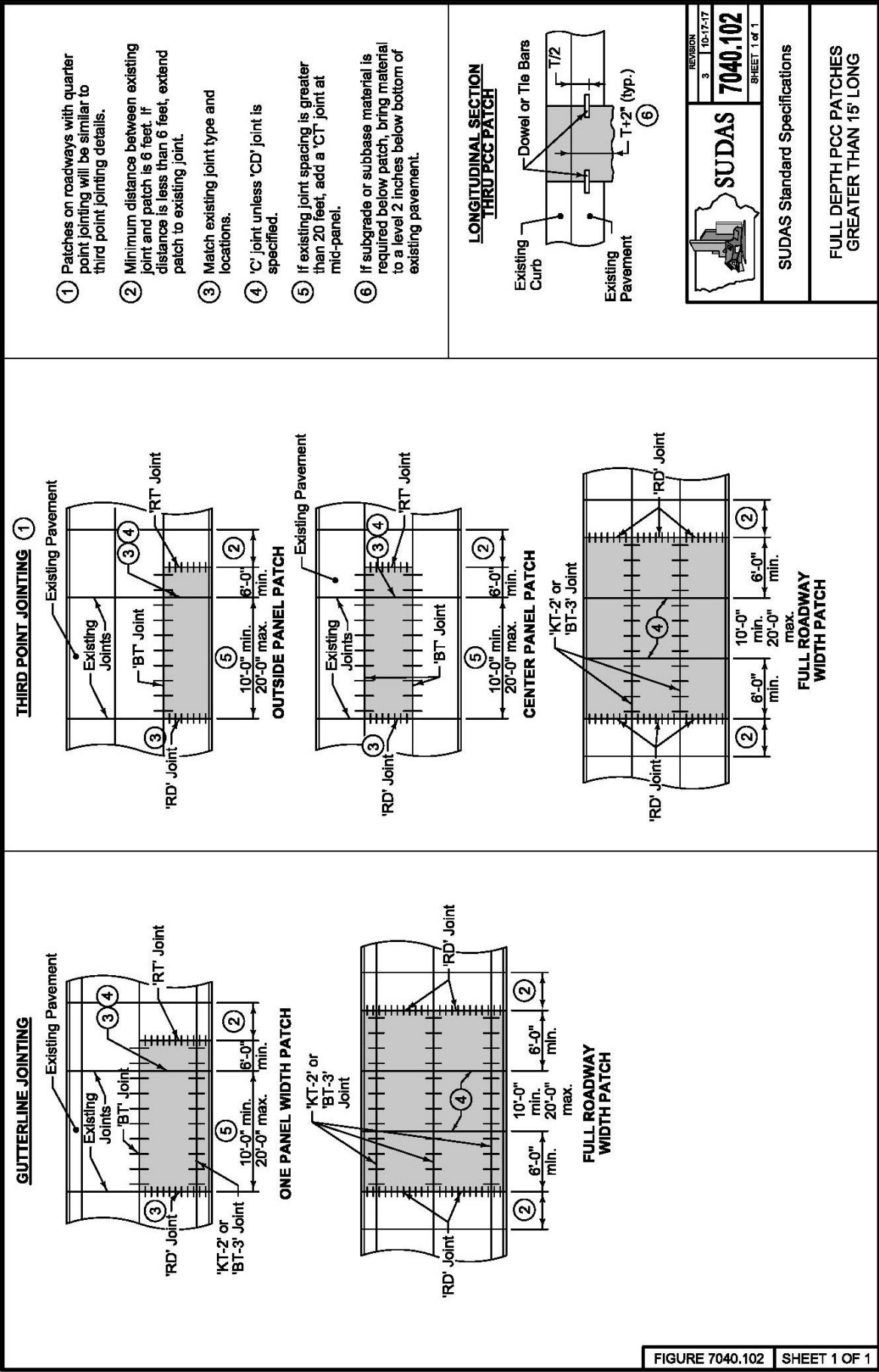
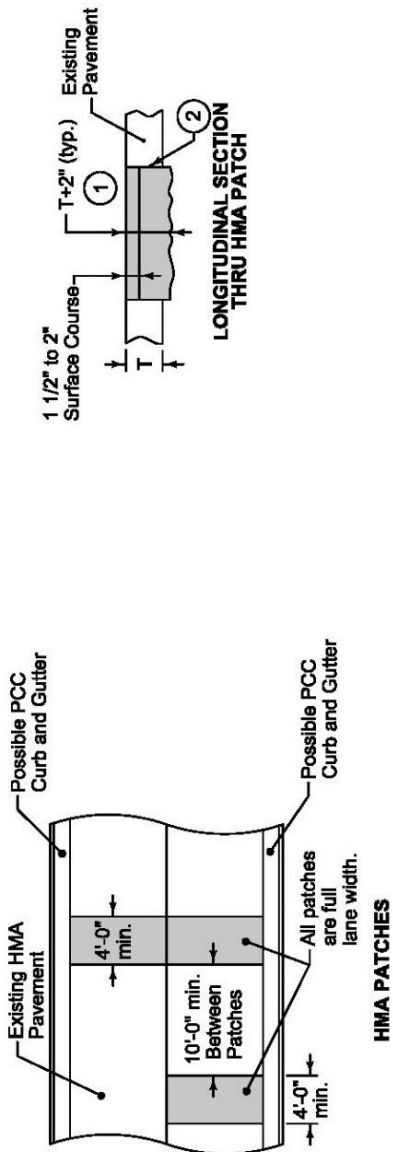


FIGURE 7040.102 SHEET 1 OF 1

- ① If subgrade or subbase material is required below patch, bring material to a level 2 inches below bottom of existing pavement.
- ② When removing pavement, saw to full depth or 10 inches, whichever is less.



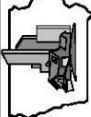
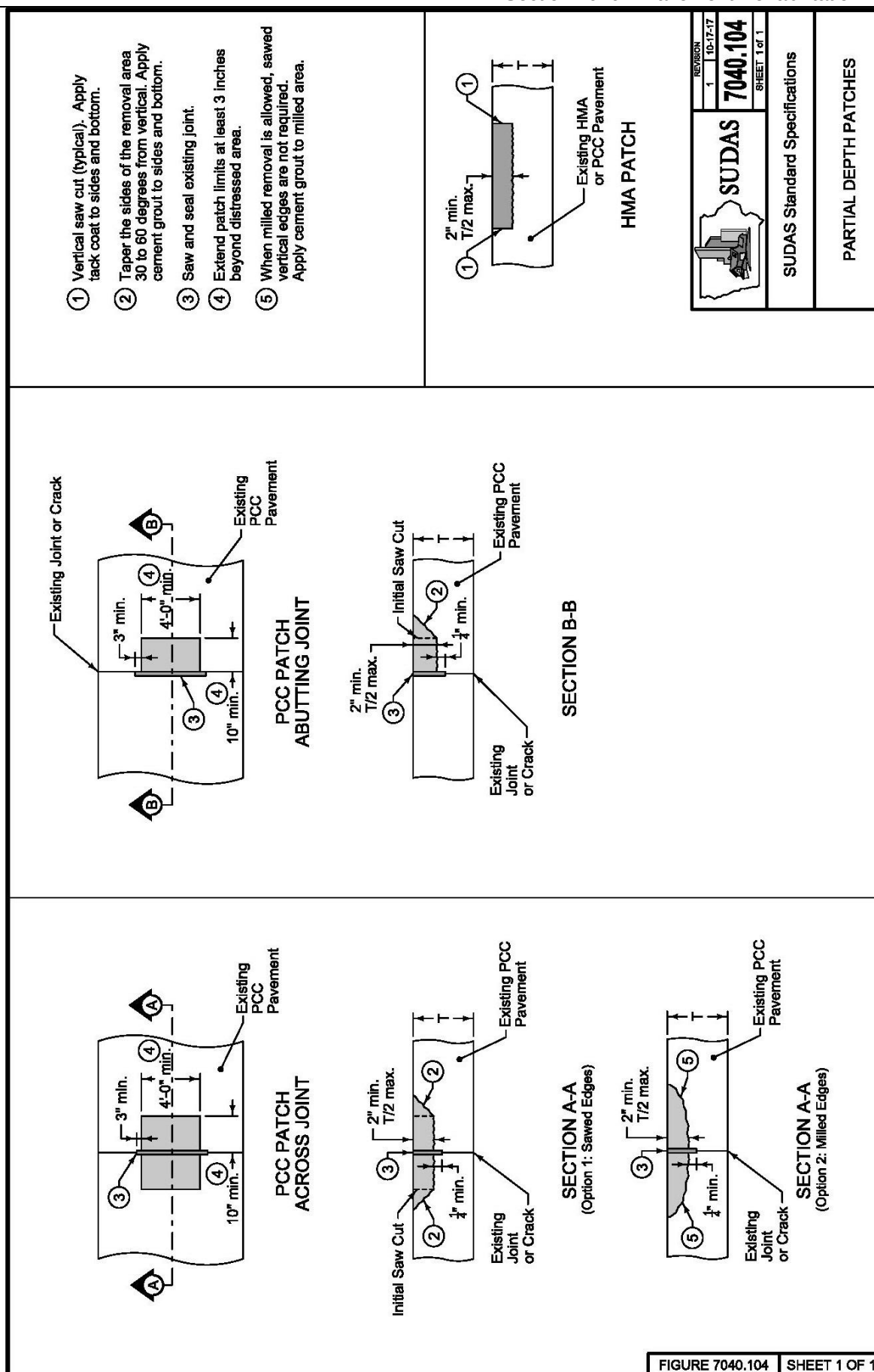
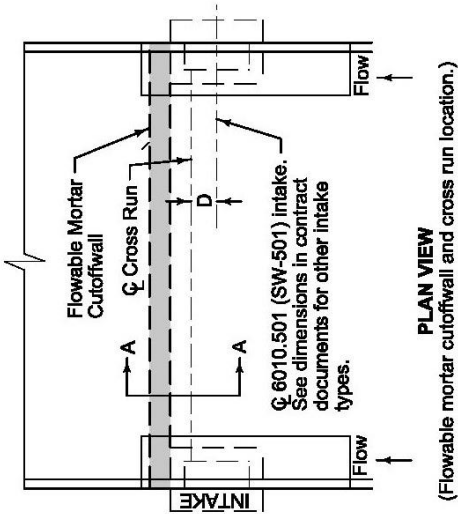
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SUDAS Standard Specifications			
FULL DEPTH HMA PATCHES			

FIGURE 7040.103 SHEET 1 OF 1

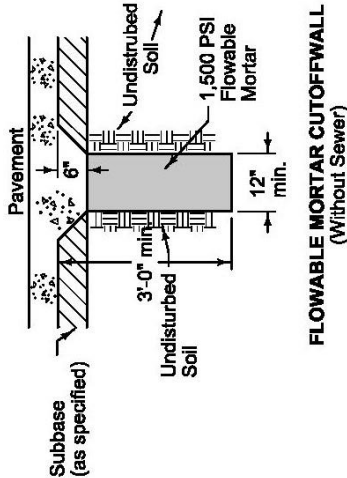


Length of cutoffwall to be back of curb to back of curb.

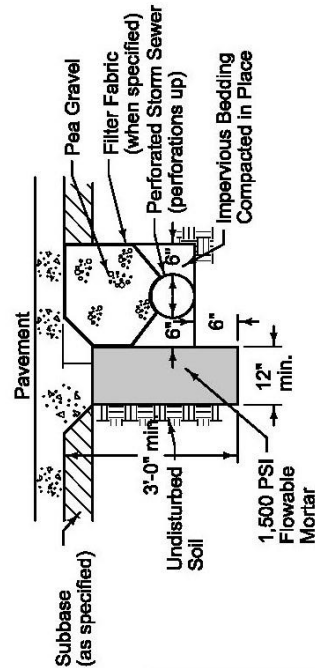


PLAN VIEW

(Flowable mortar cutoffwall and cross run location.)

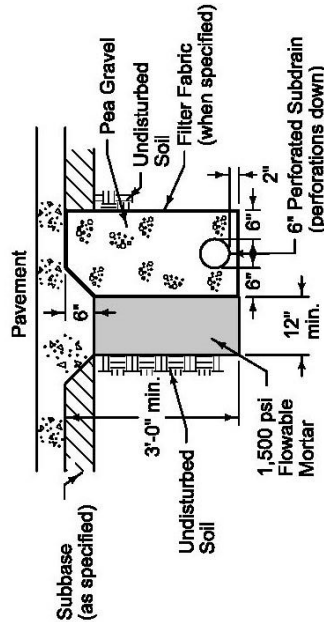


FLOWABLE MORTAR CUTOFFWALL
(Without Sewer)



SECTION A-A

(Flowable mortar cutoffwall and storm sewer)



FLOWABLE MORTAR CUTOFFWALL
(With Subdrain)

DISTANCE FROM $\bar{Q}$ INTAKE TO $\bar{Q}$ CROSSRUN	
Size	D
15" RCP	0.7'
15" CMP	0.8'
18" RCP	0.5'
18" CMP	0.7'



REVISION

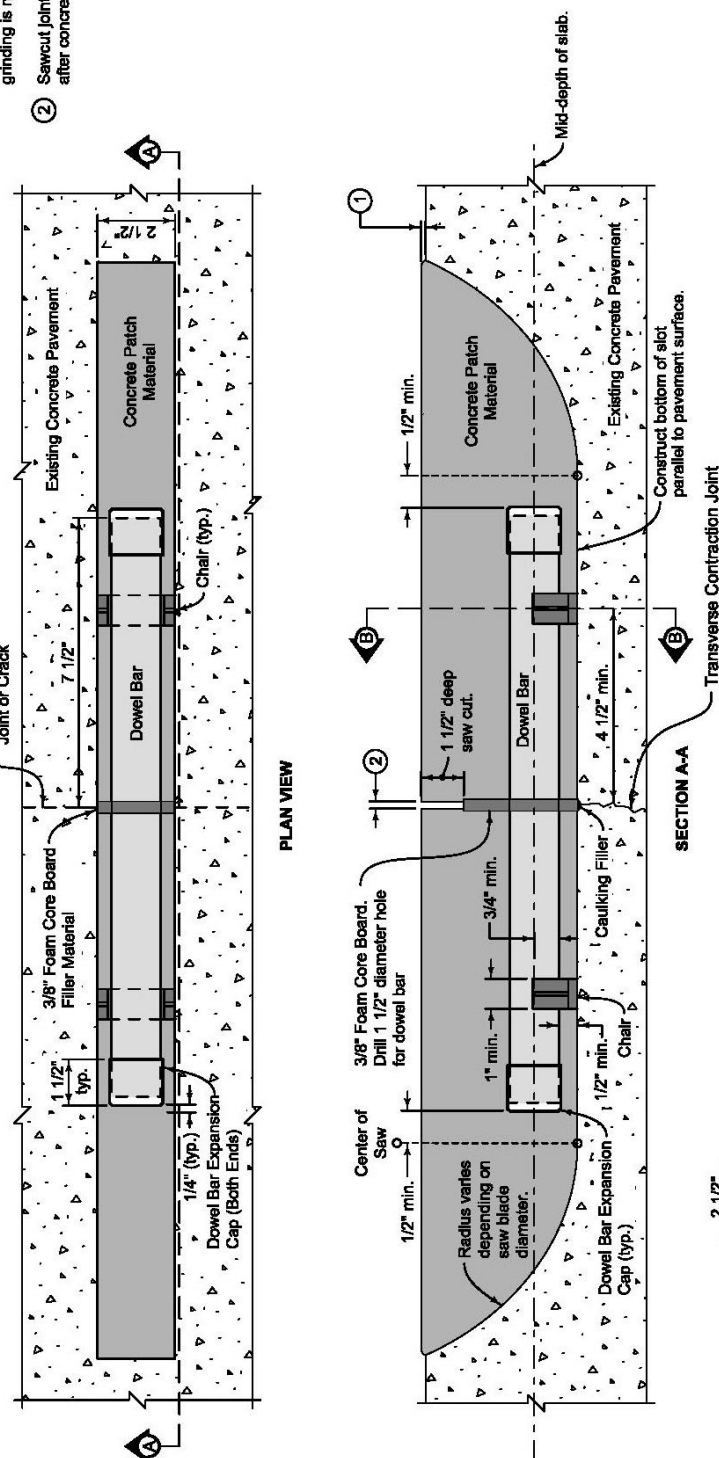
New 10-19-10

7040.105

SUDAS Standard Specifications

FLOWABLE MORTAR CUTOFFWALL

- ① Extend concrete patch material 1/8" above existing concrete surface for projects to be diamond ground; construct flush if diamond grinding is not required.
- ② Sawcut joint width 3/16" min to 5/16" max. Saw after concrete patch material has set.



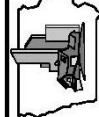
	REVISION	7040.106
	New 10-17-17	
SHEET 1 of 1		
SUDAS Standard Specifications		
DOWEL BAR RETROFIT		

FIGURE 7040.106 SHEET 1 OF 1

SECTION 7050 - ASPHALT STABILIZATION

PART 1 -GENERAL

1.01 SECTION INCLUDES

Asphalt Stabilization for existing unpaved roadways

1.02 DESCRIPTION OF WORK

Asphalt stabilization consists of a mixture of emulsified asphalt, imported mineral aggregate, and existing roadway material; properly proportioned, mechanically mixed, spread evenly on the surface specified, compacted in place and surfaced to the thickness, width, and crown specified in the plans.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT

A. Asphalt Stabilization:

1. **Measurement:** Measurement will be in square yards for asphalt stabilization.
2. **Payment:** Payment will be at the unit price per square yard of asphalt stabilization.
3. **Includes:** Unit price includes, but is not limited to, furnishing and spreading imported material, applying and incorporating asphalt stabilization, blending of the materials, grading and compacting the blended materials, and final clean up.

B. **Fixture Adjustment:** Comply with Section 6010 for adjustment of manholes and intakes and Section 5020 for adjustment of water valves and fire hydrants.

C. **Re-shaping Ditches:** Comply with Section 2010 for Class 10, Class 12 or Class 13 Excavation.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. **Asphalt Emulsion:** Comply with the slow setting cationic emulsified asphalt; CSS-1 per ASTM D 2397.
- B. **Aggregate:** Pit-run gravel, crushed stone, or reclaimed material as specified in the contract documents.

PART 3 - EXECUTION

3.01 EQUIPMENT

Comply with Iowa DOT Section 2001 for all equipment, tools, and machines used in the performance of this work.

- A. **Motor Grader:** Include attachments for scarifying, shaping, ditching, grading, and sloping. A basic motor grader does not weigh less than 22,000 pounds.
- B. **Asphalt Distributor:** Ensure the tank is insulated and range in capacity from 500 to 1,500 gallons. The truck mounted asphalt distributor must have a circulating system, spray bar (fully circulating), and calibration controls.
- C. **Pug-mill Mixer:** Use a road reclaiming machine or similar tractor mounted or towed mechanical mixers for blending, emulsion, and roadway aggregates.
- D. **Rollers:** A vibratory type roller compactor, minimum static weight 10,000 pounds, and minimum dynamic force of 15,000 pounds is recommended. Rollers must be capable of compacting a 6 inch lift of blended asphalt stabilized material to a minimum density of 95% of maximum Standard Proctor Density.

3.02 RE-SHAPING DITCHES

- A. Remove excess and undesirable material from side ditches and properly dispose of material.
- B. Shape ditches as shown on typical cross-section. Do not place excess material excavated from ditch on the roadway but dispose of material off of the roadway.

3.03 PREPARE / PLACE BASE MATERIAL

- A. Reclaim present surface material by pulverizing the existing roadway surface to a minimum depth of 4 inches or the depth specified by the Engineer for the full length and width of the designated roadway.
- B. Spread the imported aggregate as uniformly as possible on center 15 feet of roadway at the rate of 10 pounds per square foot for the full length of designated roadway.

3.04 SURFACE FIXTURE ADJUSTMENT

Adjust manhole frames and other fixtures within area to be paved to conform to finished surface. Comply with Section 6010, 3.04 for manhole adjustments and Section 5020, 3.04 for water fixture adjustments.

3.05 APPLICATION AND MIXING OF ASPHALT EMULSION

- A. Do not apply asphalt stabilization during rainfall, when excessive moisture content exists, when the air temperature is below 50o F in the shade, or during night conditions.
- B. Incorporate asphalt emulsion with a pug-mill mixer, road reclaimer, or similar machine, capable of thoroughly mixing and/or incorporating the emulsion in a single pass.
- C. Alternately, a distributor truck may be used to apply the asphalt emulsion. Apply one-half of the required emulsion. Thoroughly blade mix to incorporate the emulsion into the aggregate. Once the emulsion is worked into the aggregate, windrow the mixture and apply the second half of the emulsion and incorporate as noted above.
- D. Adjust the application rate to obtain a minimum of 3% residual asphalt.

3.06 GRADE AND COMPACT MATERIAL

- A. Blade blended material on the roadway to form a uniform mat over the final design cross-section.
- B. Obtain final cross-section and smoothness by compaction with a sheepfoot and subsequent rolling with vibratory and pneumatic rollers and alternating final blade shaping. Continue rolling until compacted to a minimum of 95% of maximum Standard Proctor Density.
- C. Following compaction, open roadway to traffic.

3.07 SURFACE TREATMENT

After a minimum of 48 hours, re-close the roadway and apply the surface treatment specified in the contract documents. Comply with Section 7060, Bituminous Seal Coat; Section 7070, Emulsified Asphalt Slurry Seal; or Iowa DOT Article 2306, Bituminous Fog Seal. Blot fog seal with sand prior to reopening of the roadway to prevent tracking of the asphalt emulsion.

END OF SECTION

SECTION 7060 - BITUMINOUS SEAL COAT

PART 1 -GENERAL

1.01 SECTION INCLUDES

Bituminous Seal Coat Surface

1.02 DESCRIPTION OF WORK

Includes preparation of surface, heating of bituminous materials and placing of the seal coat bitumen, spreading aggregate, and rolling the aggregate.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT

A. Bituminous Seal Coat by Area:

1. **Measurement:** Measurement will be in square yards for bituminous seal coat.
2. **Payment:** Payment will be at the unit price per square yard of bituminous seal coat.
3. **Includes:** Unit price includes, but is not limited to, surface preparation including protection of street fixtures; furnishing and placing of materials, including fillets at intersecting streets, driveways, and turnouts; and final clean up.

B. Bituminous Seal Coat by Units:

1. **Cover Aggregate:**
 - a. **Measurement:** Measurement will be in tons of cover aggregate. If sand is required for bleeding control, it will be measured the same as cover aggregate.
 - b. **Payment:** Payment will be at the unit price per ton of cover aggregate. If sand is required for bleeding control, it will be paid at 75% of the unit price as cover aggregate.

- c. **Includes:** Unit price includes, but is not limited to, surface preparation including protection of street fixtures; furnishing and placing of materials, including fillets at intersecting streets, driveways, and turnouts; and final clean up.
2. **Binder Bitumen:**
- a. **Measurement:** Measurement will be in gallons of binder bitumen furnished and incorporated, including street surface, fillets, and turnouts.
- b. **Payment:** Payment will be at the unit price per gallon of binder bitumen furnished and incorporated.
- c. **Includes:** Unit price includes, but is not limited to, furnishing and placing of materials, including fillets at intersecting streets, driveways, and turnouts; and final clean up.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. **Aggregates:** Use an aggregate cover that is washed and composed of crushed, hard durable gravel, crushed stone, or mixture with abrasion loss by AASHTO T 96 not exceeding 40%. Gradation complying with the following:

Sieve Size	Percent Passing									
	1/2"		3/8"		1/4"		No. 4		Sand	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
3/4"	100									
1/2"	97	100	100							
3/8"	40	90	90	100	100				100	
1/4"							100			
No. 4	0	30	10	55	55	85	85	100		
No. 8	0	15	0	20	0	10	10	40	60	90
No. 30			0	7			0	85		40
No. 200	0	2	0	1.5	0	1.5	0	1.5	0	1.5

- B. **Bituminous Material:** Unless the contract documents specify a specific grade, use cationic emulsion CRS-2P binder bitumen complying with Iowa DOT Section 4140. Other grades include CRS-2 according to Iowa DOT Section 4140 or HFRS-2 complying with AASHTO T 59.

Use cut back asphalt MC-800 or MC 3000, meeting Iowa DOT Section 4138, if specified in the contract documents.

Use grade CSS-1, CSS-1H, or SS-1H, meeting Iowa DOT Section 4140, if specified in the contract documents for dust control. Dilute with water prior to application. Use an initial dilution rate of seven parts water to one part emulsion.

PART 3 -EXECUTION

3.01 EQUIPMENT

A. Aggregate Spreaders:

1. Spreader:

- Self-propelled, mounted on pneumatic tires, with a width of spread not less than 12 feet.
- Capable of spreading aggregate specified above at a rate desired from 3 to 50 pounds per square yard of surface covered without contact of the wheels of the spreader with the treated surface until the aggregate has been spread.
- Sufficient power to propel itself at uniform speed on gradients up to 6%.
- Have cutoff plates to allow the width of spread to be reduced in increments of 1 foot from the maximum width down to 4 feet wide.

2. Hopper: Minimum capacity of 5 tons.

B. Bitumen Distributors:

- Mount on dependable motor trucks equipped with pneumatic tires.
- Provided with burners with heating coils and an accurate thermometer indicating temperature of the bitumen in the tank.
- Supply bitumen to spray bars to produce an even spray at rates varying from 0.03 gallon to 0.5 gallon per square yard in a smooth uniform coating at a forward speed of up to 20 mph.
- Adjust the spray bars vertically and provide a total spray width of no less than 12 feet.
- When emulsion binder bitumen is used, use a distributor spray bar equipped with nozzles specifically designed to apply emulsion.
- Before the work is started, provide the Engineer with a written statement indicating the size or part number of the nozzles recommended by the manufacturer and certifying the nozzles are installed on the distributor.
- Operate distributors according to manufacturer's instructions for use for spray bar height above surface, nozzle size, angle of spray fan, and tables of rates of distribution in gallons per square yard for tachometer readings. Verify distributor before using.

C. Brooms: A power-driven rotary or pick-up broom is required for cleaning surfaces before the bitumen is applied.

- Driven by an auxiliary motor or by power take-off.
- When using a power broom to remove loose aggregate from a newly seal coated surface, ensure it is capable of exerting uniform down pressure (for

the full width of the broom and without vibration or bounce) sufficient to remove loose aggregate without dislodging particles that are stuck in the binder bitumen.

D. Rollers:

- Self-propelled, pneumatic tire rollers, with tires no smaller than 7.50 by 15 size.
- Load rollers to produce a compressive force of no less than 200 pounds per inch width of the roller.
- Ensure tire inflation is no less than 60 psi.
- Do not use steel rollers unless authorized by the Engineer.

3.02 SURFACE PREPARATION

A. Hard Surfaced Streets:

1. If specified, complete patching and joint filling according to Section 7040.
2. Immediately before bitumen is applied, clean the entire surface to be treated, as well as the adjacent gutters, of all foreign material, including dust and weeds.
3. Sweep, clean, and perform work required to produce a clean surface. If the power broom fails to remove dust from depressions and pockets, use hand brooms.
4. Remove the material that was cleaned from the surface. This material becomes the property of the Contractor.
5. Use a suitable covering to protect the items below from being soiled by bitumen. Leave the protective covering in place until the bitumen has set and no splashing occurs under traffic.
 - Curbs and handrails of bridges
 - Guardrails
 - Headwalls of culverts
 - Pavements
 - Curbs and gutters
 - Manholes and utility accesses
 - Intakes
 - Water and gas valves
 - Railroad flangeways
 - Other installations requiring protection

6. Place suitable covering, as required, to prevent cover aggregate from entering intakes or other similar structures during placement and while brooming excess cover aggregate.

B. **Rock Surfaced Streets:** Comply with Section 7050.

3.03 HEATING BITUMINOUS MATERIAL

Heat bituminous materials to the temperature that allows uniform spreading. It is estimated that temperatures between the following limits will produce the desired viscosity. Material that has been damaged by overheating will be rejected.

Designation	Temperature
CRS-2	125-185
CRS-2P	125-185
HFRS-2	125-185
MC-800	175-255
MC-3000	215-290
MC-70	145-165

3.04 SPREADING BITUMINOUS MATERIAL

- A. **General:** Do not apply seal coats after September 15 unless temperatures in the shade are 60°F and rising and the work is approved by the Engineer. Do not spread until the distributor has been tested to ensure a uniform distribution of bitumen. Minimize longitudinal overlap of adjacent bitumen applications. Spread between 95% and 105% of the bituminous material the Engineer prescribes. Correct the rate of application for temperature to deliver the desired volume at 60°F.
- B. **Spreading Binder Bitumen:** Do not place seal coat on a wet surface or in night conditions. Apply bitumen to the prepared base at the rate shown in the table below, if not otherwise specified in the contract documents.

Aggregate	Application rate (Gal/SY)
1/2"	0.27
3/8"	0.24
1/4"	0.21
No. 4	0.18
Sand	0.15

Close adjacent applications of bitumen with a minimum longitudinal lap. For CRS-2P and CRS-2, spread the binder bitumen on an area no greater than can be covered with aggregate and initially rolled within 2 minutes. Place the bitumen spreader and aggregate spreader as close as possible, but no more than 150 feet apart. Do not allow the length of spread to be greater than can be completely rolled within 30 minutes after the bitumen spread has been completed. Maintain initial roller coverage as close to the aggregate spreader as possible, not to exceed 200 feet.

For HFRS-2 emulsions, allow a slight skim to be formed on the surface before spreading aggregate.

C. Joints:

1. Secure binder bitumen distribution at the specified rate of application using paper placed at the start of each distributor run. Use commercial grade building paper that is approved by the Engineer and is no less than 36 inches wide.
2. When the end of the run joins newly placed seal coat, place paper at that joint also. Cut the joint straight along the off edge of the paper. Remove the seal coat material on the paper adjacent to the off edge from the roadbed surface. Ensure a smooth ride is obtained.

- D. Spreading Cover Aggregate:** Promptly after spreading bitumen on any section, spread cover aggregate of the size specified uniformly over the treated area as noted in the table below, if not otherwise specified in the contract documents.

Aggregate	Application Rate (lbs/SY)
1/2"	24
3/8"	21
1/4"	18
No. 4	18
Sand	18

- E. Maintenance During Construction Period:** If bleeding occurs during construction, cover area with 15 pounds of sand per square yard to control bleeding. Rolling is not required.

3.05 ROLLING

- A. Complete initial pass of pneumatic tired roller within 2 minutes after spreading the cover aggregate. Complete rolling operations within 30 minutes after binder bitumen has been sprayed. Operate rollers at a speed of no more than 5 mph.
- B. Five passes of a roller is required for cover aggregate; one pass is required for sand applied as cover.
- C. Do not apply succeeding applications of binder bitumen until rolling operations are completed for the previous course.

3.06 TWO COURSE SEAL COATS

- A. First Course Construction:** Complete as specified above.

- B. Second Course Construction:**

1. Preparation of Roadbed:

- a. After completing the first course, prepare the roadbed for the second course either:
 - With a vacuum machine, or

- By lightly brooming the full surfaced width with the power sweeper to remove all loose material.
 - b. After cleaning, roll the entire surface once with a roller.
 - c. Complete the preparation of the roadbed in sections just prior to application of bitumen for the second course.
2. **Spreading Binder Bitumen:** Spread bitumen on the prepared surface at the rate specified in the contract documents.
 3. **Spreading Cover Aggregate:** Spread cover aggregate of the size specified over the treated area at the rate specified in the contract documents, promptly after spreading bitumen on any section of roadbed.

3.07 CLEAN UP

After final rolling operation, use a sweeper with a dust suppressant system to pick up loose aggregate. Complete clean up as directed by the Engineer, but no more than 21 days after application. For rural-type pavements, the Engineer may determine that sweeping is not necessary.

END OF SECTION

SECTION 7070 - EMULSIFIED ASPHALT SLURRY SEAL

PART 1 -GENERAL

1.01 SECTION INCLUDES

Emulsified Asphalt Slurry Seal

1.02 DESCRIPTION OF WORK

Includes the requirements for surface treatment of an existing pavement with an application of an emulsified asphalt slurry seal. In addition, the work may involve the following items:

- A. **Slurry Leveling:** Use fine slurry mixtures to fill shallow depressions in the pavement and over cracks.
- B. **Strip Slurry Treatment:** Applications of fine or coarse slurry mixtures as specified in the contract documents

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants, as well as the following:

Keep the various aggregate products separate, and make adequate provisions to prevent intermingling. Handle stockpiling and processing in a manner that will ensure uniform incorporation of the aggregate into the mix.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT

A. Emulsified Asphalt Slurry Seal by Area:

- 1. **Measurement:** Measurement will be in square yards for emulsified asphalt slurry seal.
- 2. **Payment:** Payment will be at the unit price per square yard of emulsified asphalt slurry seal.
- 3. **Includes:** Unit price includes, but is not limited to, surface preparation and furnishing and placing of materials, including fillets at intersecting streets, driveways, and turnouts.

B. Emulsified Asphalt Slurry Seal by Units:

1. **Aggregate:**
 - a. **Measurement:** Measurement will be in tons of aggregate.
 - b. **Payment:** Payment will be at the unit price per ton.
 - c. **Includes:** Unit price includes, but is not limited to, surface preparation and furnishing and placing of materials, including fillets at intersecting streets, driveways, and turnouts.
2. **Asphalt Emulsion:**
 - a. **Measurement:** Measurement will be in gallons of asphalt emulsion furnished and incorporated, including street surface, fillets, and turnouts.
 - b. **Payment:** Payment will be at the unit price per gallon of asphalt emulsion furnished and incorporated.
 - c. **Includes:** Unit price includes, but is not limited to, surface preparation and furnishing and placing of materials, including fillets at intersecting streets, driveways, and turnouts.

PART 2 - PRODUCTS**2.01 MATERIALS**

- A. **Asphalt Emulsion:** Use a Grade CSS-1H (AASHTO M 208) or SS-1H (AASHTO M 140) emulsified asphalt meeting the requirements of Iowa DOT Section 4140.
- B. **Aggregate:**
 1. Mineral aggregate consisting of natural or manufactured sand, slag, crusher fines, and others, or a combination thereof.
 2. Smooth-textured sand not exceeding 50% of the total combined aggregate.
 3. Clean and free from vegetable matter and other deleterious substances.
 4. When tested according to AASHTO 96, shows a loss of no more than 40.
 5. When specified, use crushed aggregates meeting the requirements of Iowa DOT Section 4124
 6. Mineral fillers such as Portland cement, limestone dust, fly ash, and others are considered part of the blended aggregate; use in minimum required amounts. Only use fillers if needed to improve the workability of the mix or gradation of the aggregate.
- C. **Mixture Gradation:** Use composite aggregate, excluding mineral filler that complies with the following gradation limits for the specified slurry mixture required:
 1. **Fine Slurry Mixture:** Use aggregate meeting the requirements of Iowa DOT Article 4109.02, Gradation No. 22 of the Aggregate Gradation Table.

2. **Coarse Slurry Mixture:** Use aggregate meeting the requirements of Iowa DOT Article 4109.02, Gradation No. 23 of the Aggregate Gradation Table.

D. **Water:** Use water that is potable and free of harmful soluble salts in the slurry mixture.

2.02 COMPOSITION OF THE SLURRY MIX

A. Blend the amount of asphalt emulsion with the aggregate as specified in the contract documents and as adjusted in the field.

B. A minimum amount of water may be added as necessary to obtain a fluid and homogeneous mixture. Mix until the consistency is such that it “rolls” in the spreader box in a continuous mass.

C. Slurry that segregates in the spreader box, so that flowing of liquids (water and emulsion) is evident, is not acceptable.

D. Provide the Engineer with a copy of the certified gradations of aggregate proposed for use.

E. Asphalt Binder Content:

1. Estimated Asphalt Residue Content: 7% to 14% of the dry weight of the aggregate.

2. Mixture Design Film Thickness: 7.5 microns (target value) with a ± 0.75 microns permissible range.

F. Handling and Sampling Slurry Materials:

1. Stockpiling of Aggregate:

a. Take precautions to prevent stockpile contamination with oversized rock, clay, silt, or moisture in excess of which would interfere with the amount of asphalt emulsion required in producing the desired homogeneous slurry mixture.

b. Place the stockpile in a well-drained area. Do not allow the aggregate to become segregated.

c. Control the moisture in the aggregate to be within $\pm 1.5\%$ of the moisture content of the aggregate at the time of calibration.

2. Storage:

a. Provide suitable storage facilities for the asphalt emulsion. Use a container equipped to prevent water from entering the emulsion.

b. Provide suitable and adequate heat to prevent freezing and to facilitate handling of the asphalt emulsion.

3. Sampling: Furnish samples of materials during the process of the work as directed by the Engineer.

2.03 MIX DESIGN

- A. **General:** Develop the mix design for the slurry mixture using the services of an independent testing laboratory that is certified by the International Slurry Surfacing Association (ISSA). Verify the functioning of the set regulating additives and present certified test results for the Engineer's approval prior to the work commencing. The Engineer will verify the laboratory tests required in ISSA A105 have been conducted.
- B. **Proportions:** Meet following limits.

Mineral Aggregate, dry weight lb/sq yd	15 to 25
Emulsified Asphalt Residue, % by weight of aggregate	7.5 to 13.5%
Latex Base Modifier (if required)	As required with % by weight of binder, min. of 5.0
Mix Set Additive	As required
Mineral Filler, % by weight of aggregate	0.5 to 2.0% depending on weather conditions

- C. **Compatibility:** Verify the compatibility of the aggregate, emulsified asphalt, mineral filler, and other additives with the mix design. Meet the following requirements for ISSA A105:

ISSA Test No.	Description	Specifications
ISSA TB-139	Wet Cohesion @ 30 minutes min. (set) @ 60 minutes min. (traffic)	12 kg-cm min. 20 kg-cm min. or Near Spin min.
ISSA TB-109	Excess Asphalt by LWT Sand Adhesion	50 gm/sq ft max.
ISSA TB-114	Wet Stripping	Pass (90% min.)
ISSA TB-100	Wet-Track Abrasion Loss One-hour Soak	75 gm/sq ft max.
ISSA TB-113	Mix Time @ 77°F	Controllable to 180 seconds, min.
ISSA TB 106	Consistency	0.79-1.18 inches
ISSA TB 113	Mix Time at 77°F	Controllable to 180 seconds, min.

Check the mixing test and set time test at the highest temperatures expected during construction.

- D. **Submittal:** In the mix design, report the quantitative effects of moisture content on the unit weight of the aggregate (bulking effect). Clearly show the proportions of aggregate, mineral filler (minimum and maximum), water (minimum and maximum), additive usage, and asphalt emulsion based on the dry weight of the aggregate.

For the aggregate blend in the mix design, provide the test results for AASHTO T 176 with the mix information to the Engineer. The Engineer's review and approval will be required for aggregate test values below 45.

- E. **Approval:** Show the percentages of each individual material required in the laboratory report. Obtain approval from the Engineer for the mix design prior to its use. After approval, substitutions will not be allowed unless approved by the Engineer. Maintain continuous control of the emulsified asphalt to dry aggregate proportioning to conform to the approved mix design within a tolerance of ± 2 gal/ton.

PART 3 - EXECUTION

3.01 EQUIPMENT

A. **Slurry Mixing Equipment:**

1. Use a continuous flow mixing unit capable of accurately delivering a predetermined proportion of aggregate, water, control additives, and asphalt emulsion to the mixing chamber, and discharging the thoroughly mixed product on a continuous basis.
2. Pre-wet the aggregate immediately prior to mixing with the emulsion. Use a pugmill capable of thoroughly blending all ingredients together.
3. When required, use a mixing machine equipped with an approved fines feeder that provides an accurate metering device, or method, to introduce a predetermined proportion of mineral filler into the mixer at the same time and location that the aggregate is fed.
4. Use an aggregate feed to the mixer equipped with a revolution counter or similar device so the amount of aggregate used may be determined at any time.
5. Use a positive displacement type emulsion pump equipped with a revolution counter or similar device so that the amount of emulsion used may be determined at any time.
6. For adding water to the mixer, use a pump equipped with a valve to establish the required water flow.
7. Mechanically tie all controls to ensure accurate proportioning of all materials at all times, including starts and stops. On some machines, this can be a simultaneous start and stop of all materials. On other machines, depending on where the materials are introduced into the mixing chamber, the feeds must be properly synchronized.
8. Use a one-lever or one-button operation with no means for the operator to adjust the mix proportions, except for the water.
9. Use revolution counters that count 0.1 revolutions on mechanisms that turn less than 100 rpm.
10. Attach a metering device to the slurry machine for the addition of additive to the mixture or any component material. Use a device that has positive, quick-acting controls, is easily calibrated, and maintains accurate and uniform flow.

11. Provide a means for calibrating the mixer. Calibrate and properly mark the controls for proportioning each material to be added to the mix. Use equipment with controls placed so they are readily accessible for calibration and so the Engineer may determine the amount of each material being used at any time. A minimum of three aggregate gate settings will be required for calibration and, if changes in emulsion delivery are necessary, a minimum of three pump changes will be required.

12. Use a mixing machine that:

- Is equipped with a water pressure system and fog type spray bar adequate for complete fogging of the surface preceding spreading equipment,
- Is controllable to an application range of 0.05 gallon per square yard, and
- Provides sufficient machine storage capacity to properly mix and apply a minimum of 5 tons of the slurry, except when the mixing machine is operated in a continuous manner and is supplied by separate nurse type equipment.

B. Slurry Spreading Equipment:

1. Full Width, Slurry Wedge, Strip Slurry Treatment:

- a. Use a mixer machine with an attached mechanical type squeegee distributor equipped with flexible material in contact with the surface to prevent loss of slurry from the distributor. Maintain the squeegee to prevent loss of slurry on varying grades and crown. Include a steering device and a flexible strike off.
- b. Use a spreader box capable of placing the slurry mixture to the width specified in the contract documents. Use a spreader box equipped with vertical adjustment devices attached to horizontal support devices (such as runners) located a minimum of 6 inches inside both ends at the side of the box. This is to ensure uniform distribution on varying grades and crowns. Use vertical adjustment devices of sufficient weight (mass) to keep the horizontal support devices in contact with the roadway surface during operation. Use flexible strike off material of sufficient stiffness to produce the desired texture and rate of application.
- c. Keep the spreader box clean. Do not allow buildup of asphalt and aggregate on the box.

2. **Slurry Leveling:** Use metal lutes of varying widths for spreading the slurry mixture in the depressed areas. Ensure the face of each lute is indented (arched) slightly (1/8 inch to 3/16 inch) to aid in controlling the spread.

C. **Cleaning Equipment:** Use power brooms, power blowers, air compressors, water flushing equipment, or hand brooms for cleaning the surface and cracks.

D. **Auxiliary Equipment:** Furnish hand squeegees, shovels, and other equipment as necessary to perform the work.

- E. **Screening Unit:** Use a screening unit to remove objectionable oversize and foreign material that may be encountered. Screen material before loading the slurry machine and/or weighing for payment.

3.02 SURFACE PREPARATION

- A. If specified, complete pavement patches and joint or crack filling per Section 7040.
- B. Immediately prior to applying the slurry, clean the surface of all loose material, mud spots, vegetation, and other objectionable material.
- C. Any standard cleaning method used to clean pavements such as power brooms, compressed air, high-pressure water, and hand tools will be acceptable, except water flushing will not be allowed in areas where considerable cracks are present in the pavement surface. The surface preparation is subject to approval of the Engineer prior to placement of the slurry material.
- D. Use a suitable covering to protect the items below from being soiled by bitumen. Leave the protective covering in place until the bitumen has set.
- Pavements adjacent to the beginning and end of placement.
 - Manholes and Utility accesses.
 - Intakes.
 - Water and gas valves.
 - Railroad flange ways.
 - Other installations requiring protection.

3.03 APPLYING SLURRY MATERIAL

- A. When directed by the Engineer, fog the surface of the pavement with water immediately preceding the pass of the spreader. Apply the water fog at such a rate that the entire surface is damp (approximately 0.05 gallon per square yard) with no apparent flowing water in front of the slurry box.
- B. Ensure the slurry mixture is of the desired consistency such that it “rolls” in the spreader in a continuous mass prior to deposit on the surface. Do not exceed 4 minutes for the total time of mixing.
- C. Ensure a sufficient amount of slurry is carried in all parts of the spreader at all times so complete coverage is obtained. Avoid overloading of the spreader. Apply the slurry seal at a rate of 10 to 18 pounds per square yard for fine aggregate and 15 to 22 pounds per square yard for coarse aggregate or as specified in the contract documents. Spread the paving mixture to fill minor cracks and shallow potholes and leave a uniform surface. Verify the application rate from daily readings taken from the proportioning devices during the progress of the work.
- D. No lumping, balling, or unmixed aggregate is allowed. No segregation of the emulsion and aggregate fines from the coarse aggregate is allowed. If the coarse aggregate settles to the bottom of the mix, remove the slurry from the pavement.
- E. Avoid buildup on longitudinal or transverse joints.

- F. Apply a burlap drag to the surface when specified in the contract documents.
- G. Apply strip slurry treatment parallel to the centerline, edge line, or other reference using a guide extending at least 3 feet ahead of the application equipment.
- H. A mechanical device, such as an auger, may be used to distribute the slurry in the spreader box. The use of a mechanical device in the slurry distribution box for strip slurry treatment and slurry wedge application will generally not be required.
- I. Ensure the finished product is uniform in color and composition. Do not leave streaks, such as those caused by oversized aggregate, in the finished surface. If excess streaking develops, the job will be stopped until the Contractor proves to the Engineer that the situation has been corrected. Excessive streaking is defined as more than four drag marks greater than 1/2 inch wide and 4 inch long, or 1 inch wide and 3 inches long, in any 30 square yard area. No transverse ripples or longitudinal streaks of 0.25 inch in depth will be allowed, when measured by placing a 10 feet straightedge over the surface.
- J. Ensure the slurry seal possesses sufficient stability so that premature breaking of the material in the spreader box does not occur. Ensure the mixture is homogeneous during and following mixing and spreading. It must be free of excess water or emulsified asphalt and free of segregation of the emulsified asphalt and aggregate fines from the coarser aggregate. Do not spray water directly into the laydown box while placing slurry seal material.
- K. Provide a smooth, neat seam where two passes meet. Immediately remove excess material from the ends of each run. Repair any damage to, or irregularities in, the slurry seal, as directed by the Engineer. Make all repairs with a paver box, except areas designated as hand work areas.
- L. Those areas inaccessible to the spreader box and approved by the Engineer may be designated as hand work areas. Use approved squeegees to spread slurry in areas inaccessible to the slurry machine. Adjustments to the additive will be allowed to provide a slower setting time when hand spreading is needed. If hand spreading is necessary, pour the mixture in a small windrow along one edge of the surface to be covered and then spread uniformly by a hand squeegee or lute. Ensure hand work areas have an appearance consistent with the areas placed with a spreader box.
- M. Remove the slurry seal mix from all areas, such as manholes, gutters, and intersections, as directed by the Engineer. On a daily basis, remove any debris associated with the performance of the work.
- N. Check the yield of the application after the first 1,000 feet and throughout each day's paving, with a minimum of three tests per day. Furnish the yield check results to the Engineer daily.
- O. Submit a daily "run sheet" for each day's work as soon as all the data is available. On the run sheet, provide a breakdown of the actual meter numbers and quantities of all materials actually used each day, as well as the respective locations.

3.04 SLURRY LEVELING

- A. Ensure the surface to which the slurry leveling is to be applied is moist and clean of dust and foreign material. Scraping and sweeping may be necessary.
- B. Spread the slurry leveling mixture in depressions at and over cracks in the pavement. Spread to the full width of the depression. Level the slurry with a metal lute of the proper width to provide a smooth riding surface. Ensure the slurry leveling is neat in appearance. Do not allow spillage around and between leveled areas. Keep excess material at the pavement edge to a minimum. Scatter excess material across the adjacent shoulder.
- C. Allow the slurry leveling to cure until the area may be open to traffic without pick up or raveling of the leveling mixture.
- D. Ensure the cured slurry has a homogeneous appearance and a uniform texture, fills all cracks in the application area, and adheres to the surface.

3.05 LIMITATIONS

- A. Schedule slurry placement to ensure the traffic lanes are opened to traffic 30 minutes before sundown of the same working day. When traffic is maintained, keep the entire roadbed free of construction equipment during non-working hours.
- B. Place slurry mixture between May 1 and October 15, when the temperature is at least 50°F and rising, and the forecast for the next 24 hours is above 40°F.
- C. When this work is done in conjunction with crack cleaning and filling, clean and fill cracks before performing slurry work. The application of slurry and the crack cleaning and filling activity may be done as one coordinated operation.
- D. When placing a strip slurry treatment, both edges of the slurry box must run on the pavement surface.
- E. When the installation of strip slurry treatment is required at a pavement centerline or lane line, the Engineer may require such placement in two separate applications.

3.06 CURING AND OPENING TO TRAFFIC

Allow the treated area to cure until it may be opened to traffic without pick up or raveling of the slurry mixture. Repair or replace any damaged caused to the slurry surface by premature opening to traffic at no additional cost to the Contracting Authority.

END OF SECTION

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SECTION 7080 - PERMEABLE INTERLOCKING PAVERS

PART 1 -GENERAL

1.01 SECTION INCLUDES

- A. Subgrade Preparation
- B. Placement of Storage Aggregate
- C. Placement of Filter Aggregate
- D. Placement of Bedding Course
- E. Placement of Permeable Interlocking Pavers
- F. Quality Control
- G. Protection of the Pavement

1.02 DESCRIPTION OF WORK

Construct permeable interlocking pavement for mitigation of storm water runoff.

1.03 SUBMITTALS

- A. **Sample Pavers:** Representative of the type and color proposed for the project.
- B. **Installation Instructions:** Manufacturer's published installation instructions.
- C. **Material Certification:** Submit certification letter from paver manufacturer indicating compliance with the ASTM specifications and the contract documents.
- D. **Bedding, Filter, and Storage Aggregates:** Submit 5 pound samples of each aggregate type. Include aggregate type, source, gradation, and compacted void content.
- E. **Project Details:** Include schedule, construction procedures, and quality control plan that describes material staging; paving direction; details of placement and compaction of the storage, filter, and bedding aggregate; and the paver installation procedures.
- F. **Involved Parties:** Submit a list of all subcontractors, material suppliers, and testing laboratories.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

Install a 5 foot by 5 foot mock-up paver area on the prepared substrate to determine joint sizes, lines, laying patterns, paver edge treatments, colors, and texture of the project. If approved by the Engineer, it may be incorporated into the project.

1.08 MEASUREMENT AND PAYMENT

A. **Class 10, Class 12, or Class 13 Excavation:** Comply with Section 2010, 1.08, E.

B. **Engineering Fabric:**

1. **Measurement:** Measurement will be in square yards for the surface area covered with engineering fabric. Both horizontal and vertical areas covered with engineering fabric will be measured.
2. **Payment:** Payment will be made at the unit price per square yard of engineering fabric.
3. **Includes:** Unit price includes, but is not limited to, placing and securing filter fabric and any overlapped areas.

C. **Underdrain:**

1. **Measurement:** Each type and size of pipe installed will be measured in linear feet from end of pipe to end of pipe along the centerline of pipe, exclusive of outlets. The vertical height of cleanouts; the vertical height of observation wells; and lengths of elbows, tees, wyes, and other fittings will be included in the length of pipe measured.
2. **Payment:** Payment will be made at the unit price of each type and size of pipe.
3. **Includes:** Unit price includes, but is not limited to, furnishing and placing pipe, cleanouts, observation wells, and pipe fittings.

D. **Storage Aggregate:**

1. **Measurement:** Measurement will be in tons based upon scale tickets for the material delivered and incorporated into the project.
2. **Payment:** Payment will be made at the unit price per ton of storage aggregate.
3. **Includes:** Unit price includes, but is not limited to, furnishing, hauling, placing, and compacting storage aggregate.

E. **Filter Aggregate:**

1. **Measurement:** Measurement will be in tons based upon scale tickets for the material delivered and incorporated into the project.
2. **Payment:** Payment will be made at the unit price per ton of filter aggregate.
3. **Includes:** Unit price includes, but is not limited to, furnishing, hauling, placing filter, and compacting aggregate.

F. Permeable Interlocking Pavers:

1. **Measurement:** Measurement will be in square yards for the area of each type of permeable interlocking pavers installed. The area of manholes, intakes, or other fixtures in the pavement will not be deducted from the measured pavement area.
2. **Payment:** Payment will be made at the unit price per square yard of each type of permeable interlocking pavers.
3. **Includes:** Unit price includes, but is not limited to, testing, placement of bedding course, installing permeable interlocking pavers, placing joint/opening fill material, refilling joint after 6 months, and pavement protection.

G. PCC Edge Restraint:

1. **Measurement:** Measurement will be in linear feet for each type and size of PCC edge restraint. The area of manholes, intakes, or other fixtures in the pavement will not be deducted from the measured pavement area.
2. **Payment:** Payment will be at the unit price per linear feet for each type and size of PCC edge restraint.
3. **Includes:** Unit price includes, but is not limited to, final trimming of subgrade or subbase, bars and reinforcement, joints and sealing, surface curing and pavement protection, safety fencing, and boxouts for fixtures.

PART 2 - PRODUCTS**2.01 ENGINEERING FABRIC**

Comply with Iowa DOT Section 4196, requirements for subsurface drainage.

2.02 UNDERDRAIN

- A. Provide slotted or perforated pipe(s) complying with the requirements for Type 1 Sub-drain in Section 4040.
- B. Provide 6 inch diameter collector pipes unless otherwise specified in the contract documents.
- C. Provide 4 inch diameter lateral pipes unless otherwise specified in the contract documents.

2.03 AGGREGATE

Provide crushed stone with 90% fractured faces. Wash all stone materials to ensure less than 2% passing the No. 200 sieve.

- A. **Storage Aggregate:** Aggregate complying with Iowa DOT Section 4122, Gradation No. 13, Class 2 durability (AASHTO M 43/ASTM D 448, Size 2).
- B. **Filter Aggregate:** Aggregate complying with Iowa DOT Section 4115, Gradation No. 3, Class 2 durability (AASHTO M 43/ASTM D 448, Size 57).

- C. **Bedding/Joint/Void Filler Aggregate:** Crushed stone complying with Iowa DOT Section 4125, Gradation No. 29 (AASHTO M 43/ASTM D 448, Size 8).

2.04 PERMEABLE INTERLOCKING PAVERS

- A. **Interlocking Concrete Pavers:** Comply with ASTM C 936 for minimum 3 1/8 inch thick pavers.
- B. **Clay Brick Pavers:** Comply with ASTM C 1272 for minimum 2 3/4 inch thick, Type F brick for PX applications.

2.05 PCC EDGE RESTRAINT

Provide PCC edge restraint complying with Section 7010. A PCC edge restraint may be standard curb and gutter section, a vertical curb section, or a narrow concrete slab.

PART 3 - EXECUTION

3.01 PRE-INSTALLATION PROTECTION

- A. Complete grading, utility installation, and other earth disturbing operations prior to excavating for the permeable paver system.
- B. Prior to placing permeable interlocking pavers, install sediment control practices upstream to protect the area from sediment in storm water runoff from disturbed soil.

3.02 SUBGRADE PREPARATION FOR PERMEABLE INTERLOCKING PAVERS

- A. Excavate area to the elevations and grades specified in the contract documents.
- B. When underdrain is specified, excavate a minimum 12 inch wide by 8 inch deep trench at locations specified in the contract documents.
- C. Where fill materials are required, compact materials to 95% of maximum Modified Proctor Density. Do not over compact.
- D. Fill and lightly re-grade any areas damaged by erosion, ponding, or traffic compaction prior to placing the engineering fabric.

3.03 ENGINEERING FABRIC

- A. Install engineering fabric over completed subgrade, including trench for underdrain when specified.
- B. Overlap adjacent strips of fabric a minimum of 12 inches.
- C. Extend fabric up the sides of the subbase trench to the bottom of the proposed pavement.

3.04 UNDERDRAIN

- A. **Underdrain Collector Pipes:**
1. Place 2 inches of filter aggregate in the bottom of the underdrain trench over engineering fabric.

2. Begin underdrain collector installation at the outlet and continue upgrade.
3. Lay underdrain collector pipe to the proper line and grade. Place pipe with perforations down.
4. Place filter aggregate over installed pipe in layers no more than 6 inches thick. Thoroughly tamp each layer with mechanical tampers.
5. Provide cleanouts where specified in the contract documents. Comply with Figure 4040.232.
6. Connect underdrain collector to outlet. Comply with Figure 4040.233. Install rodent guard on all underdrain pipe 6 inches or smaller.
7. Install underdrain cleanout pipes and observation wells as specified in the contract documents.

B. Underdrain Lateral Pipes:

1. Place 2 inches of filter aggregate over the bottom of the prepared subgrade at lateral pipe locations specified in the contract documents.
2. Lay underdrain lateral over filter aggregate to the proper line and grade. Place pipe with perforations down.
3. Connect underdrain laterals to underdrain collector with wye or tee fitting.
4. Install plug or cap on upstream end of lateral pipe.
5. Place additional filter aggregate along each side of the lateral pipe to the spring-line of the pipe.

3.05 STORAGE AGGREGATE

- A. Place storage aggregate in 6 inch maximum lifts to the thickness specified in the contract documents. If underdrain system is specified, take care not to damage or displace pipe during placement of storage aggregate.
- B. Compact each lift with a vibratory drum roller until no visible movement can be seen in the aggregate layer. Do not crush aggregate. Do not operate compaction equipment directly over underdrain, until a minimum of 12 inches of storage aggregate is placed over the underdrain.
- C. Install storage aggregate to the elevation specified in the contract documents.

3.06 FILTER AGGREGATE

- A. Place filter aggregate directly over storage aggregate.
- B. Install aggregate in a single lift with a thickness of 4 inches.
- C. Lightly compact filter aggregate with one or two passes from a vibratory plate compactor or vibratory roller. If a vibratory roller is utilized, perform the final pass without vibration. Do not crush aggregate.

3.07 BEDDING AGGREGATE

- A. Place bedding aggregate directly over filter aggregate.

- B. Install aggregate in a single lift with a thickness of 2 inches.
- C. Use laser guided spreader or place screed rails on the completed filter aggregate layer. Use screed width no less than the full width of each cross-section component of the roadway and no less than 16 feet for parking areas. Surface variations must be within 3/8 inch when tested with a 10 foot straightedge prior to compaction.
- D. Lightly compact bedding aggregate with one or two passes from a vibratory plate compactor or vibratory roller. Recheck tolerance following compaction and make necessary corrections. Ensure surface is even, smooth with no roller ridges, and at the proper elevation to accommodate the pavers.
- E. Restrict pedestrians and equipment from screeded bedding prior to placement of pavers.

3.08 INSTALLING PCC EDGE RESTRAINT

Place PCC edge restraint according to Section 7010.

3.09 INSTALLING INTERLOCKING PERMEABLE PAVER SYSTEM

Place and install pavers according to the pattern specified, the paver manufacturer's published installation specifications, and the following:

- A. Where pavers are placed against a curb and gutter or other pavement, installation of an edge course or soldier course is required if the pavement edge is not straight. Trim pavers as required to compensate for deviations in the adjacent pavement edge. Do not cut pavers to less than 1/3 their original size.
- B. Install PCC edge restraint.
- C. Place chalk lines on the bedding course to maintain straight joint lines.
- D. After pavers have been installed on the bedding course, and all cut pavers have been inserted to provide a full and complete surface, inspect pavers for damaged units and irregular joint lines. Remove and replace pavers as required.
- E. After inspection and replacement of damaged pavers, fill joint openings with bedding stone. Sweep the surface clean.
- F. Compact pavement surface with two passes of a vibratory plate compactor capable of at least 5,000 pounds centrifugal compaction force. Do not operate plate compactor within 6 feet of an unrestrained pavement edge.
- G. Re-inspect pavers, and remove and replace all damaged units. Refill joint openings completely. Sweep pavers clean. Complete compaction with two passes of the plate compactor.
- H. Refill all paver joint openings with bedding aggregate 6 months after installation.

3.10 QUALITY CONTROL

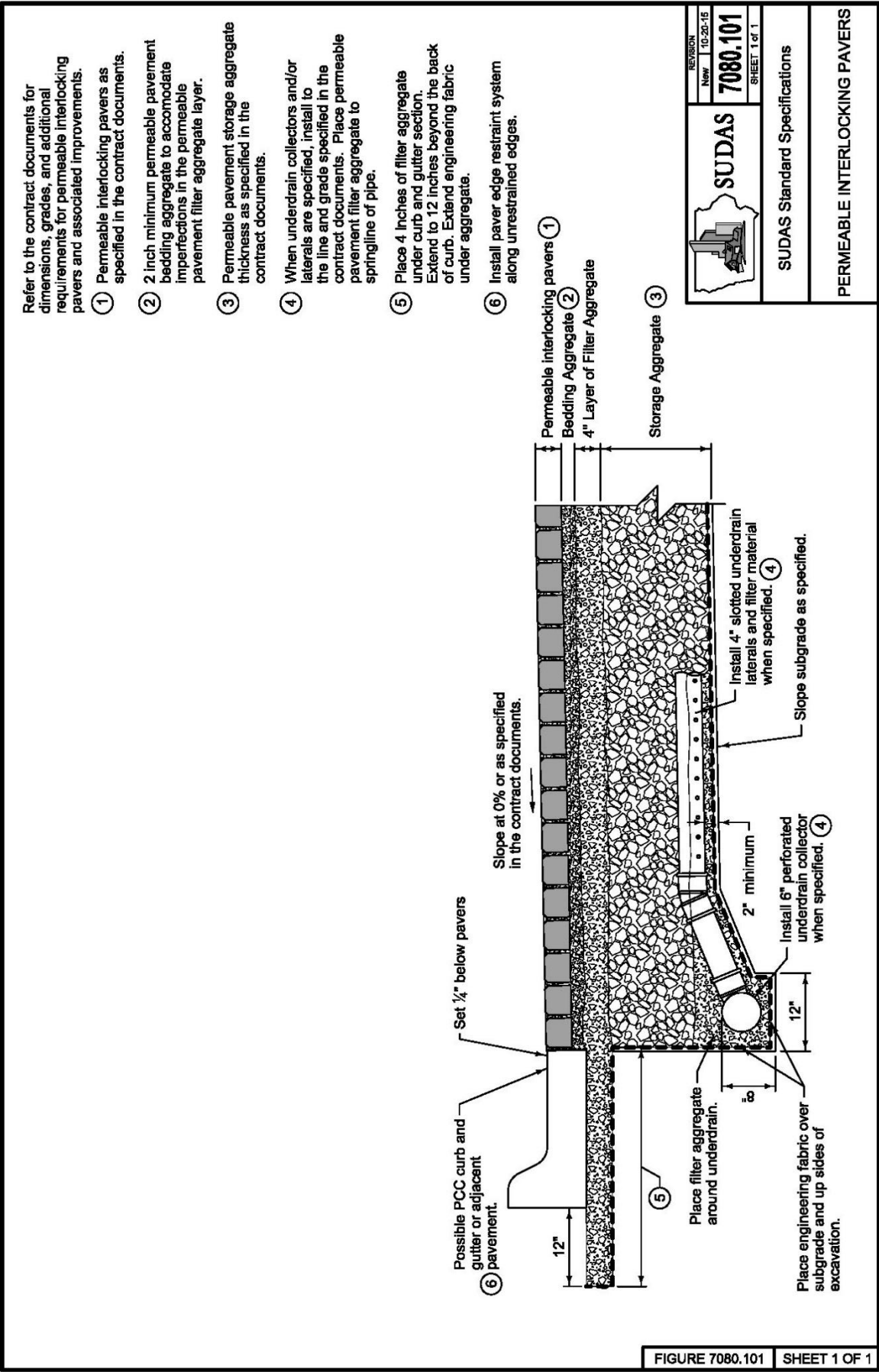
- A. Ensure horizontal alignment of the PCC edge restraint is within 1/2 inch of design alignment.
- B. Ensure final surface is within 3/8 inch when tested with a 10 foot straightedge.

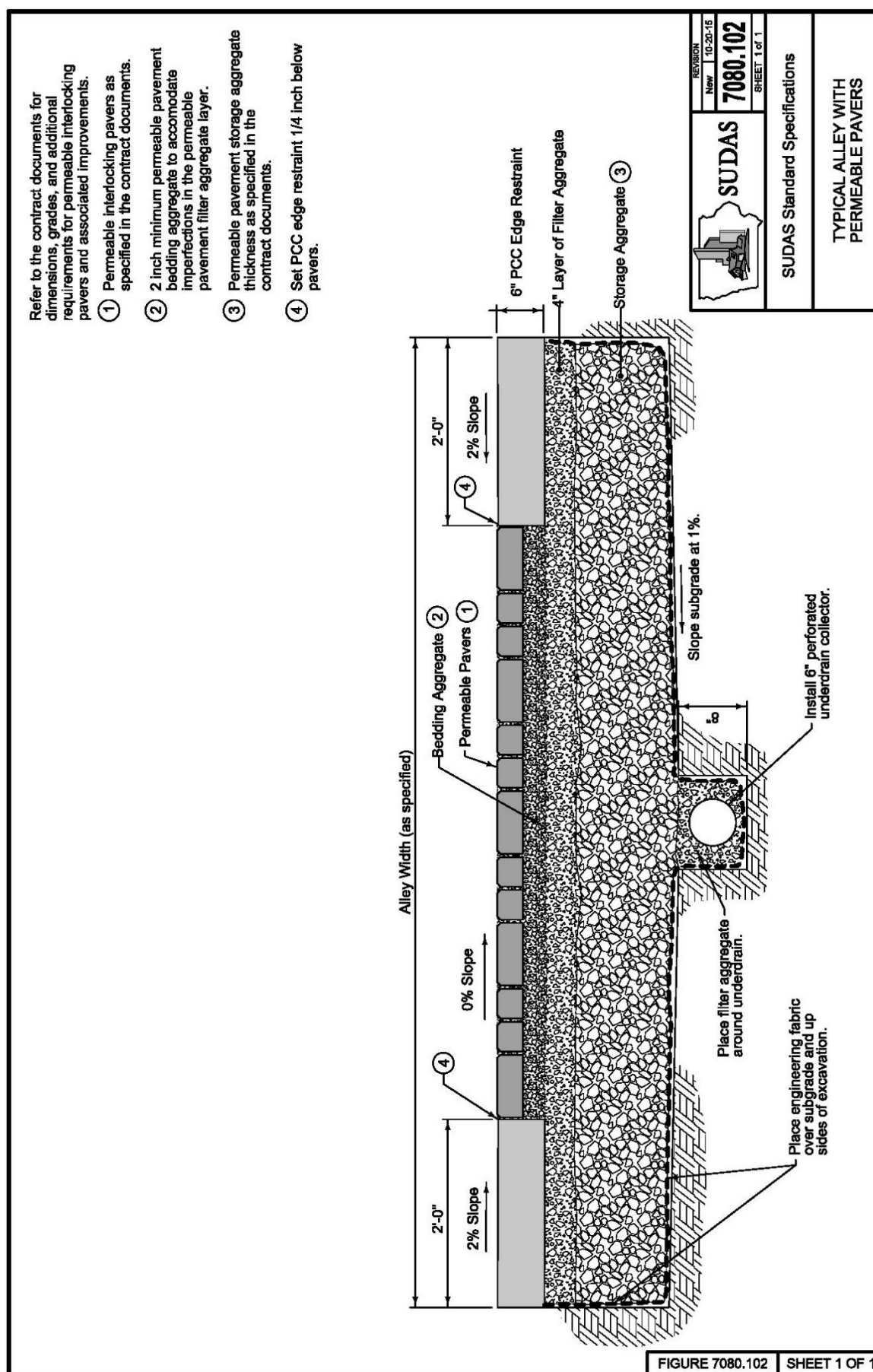
- C. Ensure no greater than 1/8 inch difference in height between adjacent pavers.
- D. Maintain surface elevation within 1/4 inch above adjacent drainage inlets, gutters, and other appurtenances.

3.11 PROTECTION OF PAVEMENT

- A. Protect pavement from heavy construction traffic, including trucks, skid steers, loaders, and all tracked vehicles.
- B. Provide barriers and protection as necessary.
- C. Do not place soil, mulch, sand, aggregate, or stockpile other materials on the pavement surface that may contaminate the pavement and plug the porous surface.
- D. Remove by vacuuming any base and bedding materials contaminated with sediment and replace with clean materials at no cost to the contracting authority.

END OF SECTION





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SECTION 7090 - COLD-IN-PLACE PAVEMENT RECYCLING

PART 1 -GENERAL

1.01 SECTION INCLUDES

Cold-in-place recycling (CIR) of asphalt roadways

1.02 DESCRIPTION OF WORK

Includes milling and mixing of existing asphalt materials, addition of recycling agents and additives if required, compaction of the reclaimed materials, and curing of the compacted street.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants as well as the following:

- A. Prepare and submit the job mix formula to the Engineer for approval prior to initiating full recycling operations.
- B. Provide quality control test results.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT

A. Cold-in-place Recycling:

1. **Measurement:** Measurement will be in square yards for the area of roadway recycled.
2. **Payment:** Payment will be at the unit price per square yard of roadway recycled.
3. **Includes:** Unit price includes, but is not limited to, milling and sizing of existing asphalt layers; protecting street fixtures; development of a job mix formula; adding and mixing recycling agents and additives, if required; supplying and incorporating water; compacting the reclaimed mix; shaping of the mix; completing secondary compaction, if required; removing any loose or excess material; and final clean up.

B. Bituminous Recycling Agents:

1. **Measurement:** Measurement will be in gallons of asphalt emulsion or foamed asphalt furnished and incorporated.
2. **Payment:** Payment will be at the unit price per gallon of asphalt emulsion or foamed asphalt furnished and incorporated.
3. **Includes:** Unit price includes, but is not limited to, furnishing and placing of materials and mixing the agent into the recycled mix.

C. Chemical Recycling Additives:

1. **Measurement:** Measurement will be in tons of chemical recycling additives.
2. **Payment:** Payment will be at the unit price per ton of chemical recycling additives.
3. **Includes:** Unit price includes, but is not limited to, furnishing and placing of materials and mixing the agent into the recycled mix.

D. **Fixture Adjustment:** Comply with Section 6010 for adjustment of manholes and intakes and Section 5020 for adjustment of water valves and fire hydrants.

E. **Surface Course:** Comply with Section 7011 or Section 7021 for overlay pavement.

PART 2 -PRODUCTS**2.01 MATERIALS**

A. **Bituminous Recycling Agent:** Use asphalt emulsion (HFMS-2s or CSS-1) meeting the requirements of Iowa DOT Section 4140, or foamed asphalt using PG 52-34S asphalt binder meeting the requirements of Iowa DOT Sections 2318 and 4137.

B. Chemical Recycling Additives:

1. Cement complying with Iowa DOT Article 4101.01, A.
2. Hydrated lime complying with AASHTO M 216.
3. If approved by the Engineer, use other proprietary products according to the manufacturer's requirements.

C. **Water:** Comply with Iowa DOT Section 4102. Potable water obtained from an approved supply does not need to be tested.

2.02 JOB MIX FORMULA

Compile a job mix formula using an analysis of the existing asphalt pavement layers and the required strength of the recycled pavement section as specified in the contract documents. The job mix formula will identify the recycling agent and any additives; the rates for the recycling agent and additive, if needed; and the rate of water to reach the optimum moisture content. Tolerances should be included to allow the Contractor to adjust the mixture so that it is placed successfully.

PART 3 -EXECUTION**3.01 EQUIPMENT****A. General:**

1. Perform cold-in-place recycling between May 1 and October 1.
2. Perform recycling operations when weather conditions are such that proper mixing, shaping, and compacting the recycled mix can be accomplished.

General criteria Includes:

- a. Begin operations when air temperature is 55°F and rising.
- b. Cease operations when air temperature is 55°F or less and falling.
- c. Do not begin operations if the National Weather Service forecasts a temperature of 35°F or less in the next 24 hours or if the weather is rainy or foggy.

B. Equipment:

1. Furnish a self-propelled machine capable of milling the existing paving material to the width and depth specified in the contract documents. Ensure the equipment meets the following:
 - a. Equipped with automatic depth control to maintain a constant depth and width.
 - b. Capable of milling the existing roadway to the required gradation in one pass.
 - c. Accurately controls the rate of flow and total delivery of the recycling agent and additives, if needed, into the recycled mixture in relation to the speed and quantity of the material being recycled.
 - d. Capable of mixing the recycled material and any recycling agent and additive required by the job mix formula into a homogeneous mixture.
2. If specified in the contract documents, use an asphalt foaming system that accurately and uniformly adds the required percent of water to the hot asphalt binder. Use equipment fitted with a test nozzle to provide field samples of the foamed asphalt. Equip tankers supplying the hot asphalt binder with a thermometer to continuously monitor the temperature of the asphalt in the bottom third of the tank.
3. Use a bituminous paver complying with Iowa DOT Article 2001.19. Heating the screed will not be allowed.
4. Have the following rollers available for use:
 - a. Double drum steel roller (static and vibratory)
 - b. Pneumatic tire roller (25 ton or greater)

3.02 PREPARATION

Prior to initiating the recycling process, undertake the following tasks:

- A. Identify and protect all affected utilities.
- B. Remove excess dirt, vegetation, raised pavement markings, standing water, and any other objectionable materials.

3.03 UTILITIES

All utilities within the project limits should be protected prior to the milling. Locate and lower manholes, water valve boxes, and other fixtures a minimum of 2 inches below the bottom of the recycled section. Re-set manhole castings, water valves, and other fixtures to the proper elevations following completion of the compaction of the recycled mixture and placement of any surface course. Protect storm water intakes by preventing recycled material from entering the drainage system.

3.04 CONTROL STRIP

Construct a control strip during the first day of production to verify that the equipment, construction methodology, and workmanship meet the specifications. Adequately size the control strip to verify that the optimal rates of water, recycling agent, and additives can be achieved. Establish a rolling pattern that will result in optimum compaction. The Engineer may waive the control strip provided the Contractor provides proof that the work will meet the specifications based on previous experience using the same equipment, personnel, and materials.

3.05 MILLING THE PAVEMENT

Mill the existing asphalt pavement and underlying areas to initiate the recycling process.

- A. Mill the full depth of the asphalt layers in a single pass.
- B. Verify the gradation of the pulverized material meets the specifications.
- C. Provide a 3 inch overlap of the longitudinal joint and 24 inches between transverse joints

3.06 RECYCLING AGENT APPLICATION

For single unit recycling trains, add the bituminous agent in the cutting drum. For two-unit trains, add it in the mix paver and for multi-unit trains add the bituminous agent in the pugmill. Ensure residual asphalt content is $\pm 0.5\%$ of the target established in the job mix formula. Maintain foamed asphalt binder $\pm 20^{\circ}\text{F}$ of the optimum temperature established by the job mix formula.

3.07 RECYCLING ADDITIVES

Add chemical recycling agents as additives to applications that use bituminous recycling agents at the rates required by the job mix formula. Apply the chemical additive in dry or slurry form by adding it on the pavement ahead of the milling operation, adding it directly to the mixing chamber, or spraying it over the cutting teeth of the milling machine.

3.08 COMPACTION

Ensure recycled material is $\pm 2\%$ of the optimum moisture content.

- A. **Timing:** Compact the mixed recycled roadway materials based on the type of recycling agent used as follows.
 - 1. **Asphalt Emulsion:** Complete compaction at or just after the emulsion breaks.
 - 2. **Foamed Asphalt:** Initiate immediately after mixing and complete prior to the mixture drying out.
- B. **Process:** Follow the rolling pattern established with construction of the control strip regarding type and size of roller. Perform initial rolling with the pneumatic tired roller and final rolling with the steel wheeled roller. Set the vibratory amplitude/frequency, tire pressure for pneumatic, and static weight of all rollers based on the depth of the recycled mixture to be compacted. Uniformly compact the mixture to a minimum of 94% of maximum dry density according to AASHTO T 134 on a moving average of five consecutive tests with no individual test below 92%.
- C. **Shaping:** Complete rolling to achieve the required density. Ensure the crown of the compacted recycled roadway is within 6 inches of the established centerline, unless otherwise specified in the contract documents.

3.09 SECONDARY COMPACTION

If necessary, complete secondary compaction to eliminate wheel marks and minor consolidation caused by construction traffic prior to opening. Complete secondary compaction during daylight hours and when the minimum ambient temperature is 80°F. Suspend operations if cracking of the mat occurs.

3.10 SMOOTHNESS

Ensure surface of recycled base course is free of bumps, ruts, indentations, segregation of aggregates and conforms to the required elevations. Check surface with a 10 foot straightedge and correct any irregularity 3/8" or larger. Complete corrective measures at no cost to the contracting agency.

3.11 SURFACE COURSE

Protect the CIR surface from damage prior to adding the surface course. Any damage will be repaired at Contractor's expense. Restrict application of overlays and other surface treatments until one of the following has been met:

- A. Average moisture content of the CIR layer is no more than 0.3% above the residual moisture content according to Iowa DOT Materials I.M. 504 or 3.5%, whichever is greater.
- B. The moisture content of the CIR layer has reached a plateau of less than 5% and has remained constant (within $\pm 0.3\%$) for a minimum of 3 calendar days.
- C. The CIR layer has been completed for 21 calendar days.
- D. The Engineer may adjust this drying period depending on field conditions.

3.12 QUALITY CONTROL

The Contractor is responsible for the quality control of the materials and the CIR process.

- A. Sample and test the asphalt recycling agent according to Iowa DOT Materials I.M. 204.
- B. Apply the asphalt recycling agent at the target application rate ± 0.06 gallon per square yard per inch for standard emulsion and ± 0.33 gallon per square yard per inch for foamed asphalt.

END OF SECTION

SECTION 7091 - FULL DEPTH RECLAMATION

PART 1 -GENERAL

1.01 SECTION INCLUDES

Full depth reclamation of asphalt roadways

1.02 DESCRIPTION OF WORK

Includes pulverizing and mixing of existing asphalt and underlying materials; addition of stabilizing agents and additives if required; compaction of the reclaimed materials and curing of the compacted street.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants as well as the following:

A. Prepare and submit the job mix formula to the Engineer for approval prior to initiating full reclaiming operations.

VVVVVVVV. Provide quality control test results.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT

A. Full Depth Reclamation:

1. **Measurement:** Measurement will be in square yards for the area of roadway reclaimed.
2. **Payment:** Payment will be at the unit price per square yard of roadway reclaimed.
3. **Includes:** Unit price includes, but is not limited to, pulverizing and sizing of existing asphalt layers; incorporating and mixing of existing underlying materials; protecting street fixtures; development of a job mix formula; adding and mixing stabilizing agents and additives, if required; compacting the reclaimed mix; shaping of the mix; removing any loose or excess material; curing; and final clean up.

B. Mechanical Stabilization Agents:

1. **Measurement:** Measurement will be in tons of aggregate.
2. **Payment:** Payment will be at the unit price per ton of aggregate.
3. **Includes:** Unit price includes, but is not limited to, furnishing and placing of aggregate and blending of the aggregates.

C. Bituminous Stabilization Agents:

1. **Measurement:** Measurement will be in gallons of asphalt emulsion or foamed asphalt furnished and incorporated.
2. **Payment:** Payment will be at the unit price per gallon of asphalt emulsion or foamed asphalt furnished and incorporated.
3. **Includes:** Unit price includes, but is not limited to, furnishing and placing of materials and mixing the agent into the reclaimed mix.

D. Chemical Stabilization Agents:

1. **Measurement:** Measurement will be in tons of chemical stabilization agents.
2. **Payment:** Payment will be at the unit price per ton of chemical stabilization agents.
3. **Includes:** Unit price includes, but is not limited to, furnishing and placing of materials and mixing the agent into the reclaimed mix.

E. Microcracking

1. **Measurement:** Measurement will be in square yards for the area of roadway microcracked.
2. **Payment:** Payment will be at the unit price per square yard of roadway microcracked.

F. Interlayer for Cement Stabilized Base

1. **Measurement:** Measurement will be in square yards for each type and thickness of interlayer.
2. **Payment:** Payment will be at the unit price per square yard for each type and thickness of interlayer.
3. **Includes:** Unit price includes, but is not limited to, surface cleaning, furnishing, and placing of the interlayer (if specified).

- G. **Fixture Adjustment:** Comply with Section 6010 for adjustment of manholes and intakes and Section 5020 for adjustment of water valves and fire hydrants.

PART 2 -PRODUCTS**2.01 MATERIALS**

- A. **Mechanical Stabilizing Agents:** Use virgin crushed aggregates, RAP, or crushed PCC in the gradation called for in the job mix formula.

- B. **Bituminous Stabilizing Agent:** Use asphalt emulsion (HFMS-2s) meeting the requirements of Iowa DOT Section 4140, or foamed asphalt using PG 52-34S asphalt binder meeting the requirements of Iowa DOT Section 4137.
- C. **Chemical Stabilizing Agent:**
1. Cement complying with Iowa DOT Article 4101.01, A.
 2. Class C or Class F Fly Ash complying with Iowa DOT Section 4108.
 3. Hydrated Lime complying with AASHTO M 216.
 4. Calcium Chloride complying with Iowa DOT Section 4194.
 5. If approved by the Engineer, use proprietary products according to the manufacturer's requirements.
- D. **Fog Seal Cure:** Comply with Iowa DOT Section 2306.
- E. **Water:** Comply with Iowa DOT Section 4102. Potable water obtained from an approved supply does not need to be tested.
- F. **Interlayer:**
1. Class A crushed stone complying with Iowa DOT Article 4120.04.
 2. HMA interlayer complying with Section 7021, 2.04, B.

2.02 JOB MIX FORMULA

Compile a job mix formula using an analysis of the existing asphalt pavement layers and the subbase/subgrade and the required strength of the reclaimed pavement section as specified in the contract documents. The job mix formula will identify the stabilizing agent and any additives; the rates for the stabilizing agent and additive, if needed; and the rate of water to reach the optimum moisture content. Allowable tolerances should be included to allow the Contractor to adjust the mixture so that it is placed successfully.

PART 3 - EXECUTION

3.01 EQUIPMENT

- A. **General:**
1. Perform full depth reclamation between April 1 and November 1.
 2. Perform reclaiming operations when weather conditions are such that proper mixing, shaping, and compacting the reclaimed mix can be accomplished.
- B. **Equipment:**
1. Furnish a self-propelled machine capable of reclaiming the existing paving material to the width and depth specified in the contract documents. Ensure the equipment meets the following:
 - a. Equipped with automatic depth control to maintain a constant depth and width.

- b. Capable of pulverizing the existing roadway to the required gradation.
 - c. Accurately controls the rate of flow and total delivery of the stabilizing agent and additives, if needed, into the reclaimed mixture in relation to the speed and quantity of the material being recycled.
 - d. Capable of mixing the reclaimed material and any stabilizing agent and additive required by the job mix formula into a homogeneous mixture.
- 2. If specified in the contract documents, use an asphalt foaming system that accurately and uniformly adds the required percent of water to the hot asphalt binder. Use equipment fitted with a test nozzle to provide field samples of the foamed asphalt. Equip tankers supplying the hot asphalt binder with a thermometer to continuously monitor the temperature of the asphalt in the bottom third of the tank.
 - 3. Have the following rollers available for use:
 - a. Sheepfoot roller
 - b. Double drum steel roller (static and vibratory)
 - c. Pneumatic tire roller (25 ton or greater)
 - 4. Provide a motor grader with grade and cross-slope control.

3.02 PREPARATION

Prior to initiating the reclaiming process, undertake the following tasks:

- A. Identify and protect all affected utilities.
- B. Remove excess dirt, vegetation, raised pavement markings, standing water, and any other objectionable materials.

3.03 UTILITIES

All utilities within the project limits should be protected prior to the pulverization. Locate and lower manholes, water valve boxes, and other fixtures a minimum of 4 inches below the bottom of the reclaimed section. Re-set manhole castings, water valves, and other fixtures to the proper elevations following completion of the compaction of the reclaimed mixture. If lowering of fixtures is not practical, excavate material from around the fixture to a location where it can be pulverized by the reclaimer. Move the pulverized material back around the fixture after mixing and compact with smaller compaction equipment to the required densities. Protect storm water intakes by preventing reclaimed material from entering the drainage system.

3.04 CONTROL STRIP

Construct a control strip during the first day of production to verify that the equipment, construction methodology, and workmanship meet the specifications. Adequately size the control strip to verify that the optimal rates of water, stabilizing agent, and additives can be achieved. Establish a rolling pattern that will result in optimum compaction. The Engineer may waive the control strip provided the Contractor provides proof that the work will meet the specifications based on previous experience using the same equipment, personnel, and materials.

3.05 PULVERIZING

Pulverize the existing asphalt pavement and underlying areas to initiate the reclaiming process.

- A. Pulverize the full depth of the asphalt layers and the underlying materials in a single pass, unless multiple passes are specified in the contract documents.
- B. If multiple passes are specified, leave a minimum of 1 inch of the underlying layer intact with the initial pulverizing pass.
- C. Prior to the second pulverizing/mixing pass, complete light compaction and reshaping to establish a solid working base.
- D. Verify the gradation of the pulverized material meets the job mix formula.
- E. Provide a 6 inch overlap of the longitudinal joint and 24 inches between transverse joints when multiple passes are required.

3.06 REMOVAL OF EXCESS MATERIAL

Following the initial pulverization pass and prior to the mixing pass, if required, remove any excess reclaimed material from the project area to a site designated by the Engineer as a means to meet final design elevations.

3.07 STABILIZING AGENT APPLICATION

- A. **Mechanical:** Spread aggregate in a uniform layer ahead of the pulverizer. Placement can be completed during the initial pulverizing pass or as a part of a mixing pass.
- B. **Chemical:** Spread dry chemical stabilizers onto the reclaimed material between the pulverizing pass and the mixing pass. Take corrective measures if dust is a problem. Apply chemical stabilizers in slurry form through the reclaimer's on-board liquid additive system, if so equipped, or directly on the reclaimed material in advance of the mixing pass. Disburse slurry uniformly over the entire reclaimed roadway. Do not exceed 30 minutes from the time the slurry is applied until the mixing begins. Ensure chemical stabilizer application rate is $\pm 0.5\%$ as required by the job mix formula.
- C. **Bituminous:** Inject the asphalt emulsion or foamed asphalt at the required rate through the reclaimer's on-board liquid additive system. Ensure residual asphalt content is $\pm 0.5\%$ of the target established in the job mix formula. Maintain foamed asphalt binder $\pm 20^{\circ}\text{F}$ of the optimum temperature established by the job mix formula.

3.08 STABILIZING ADDITIVES

Add chemical stabilizing agents as additives to applications that use bituminous stabilizers at the rates required by the job mix formula. Apply the chemical additive in dry form, slurry form, or through the reclaimer's liquid injection system after the pulverizing pass.

3.09 COMPACTION

Ensure reclaimed material is within 2% of the optimum moisture content.

- A. **Timing:** Compact the mixed reclaimed roadway materials based on the type of stabilizing agent used as follows:
1. **Mechanical:** Upon completion of all mixing passes.
 2. **Chemical:**
 - a. **Cement:** Do not exceed two hours between mixing and final compaction.
 - b. **Hydrated Lime and Kiln Dust:** Initiate compaction 4 hours after mixing. Maintain moisture content above the optimum level during that time.
 3. **Bituminous:**
 - a. **Asphalt Emulsion:** Complete compaction at or just after the emulsion breaks.
 - b. **Foamed Asphalt:** Initiate immediately after mixing and complete prior to the mixture drying out.
- B. **Process:** Follow the rolling pattern established with construction of the control strip with respect to type and size of roller. Perform initial rolling with sheepsfoot roller until the roller pads walk out of the reclaimed mix. Set the vibratory amplitude/frequency, tire pressure for pneumatic, and static weight of all rollers based on the depth of the reclaimed mixture to be compacted. Uniformly compact the mixture to a minimum of 98% of maximum dry density according to AASHTO T 134 on a moving average of five consecutive tests with no individual test below 96%.
- C. **Shaping:** Following sheepsfoot roller walk out, cut the reclaimed road bed and shape to required grade and cross-section to remove roller marks. Complete rolling to achieve the required density. Ensure the crown of the compacted reclaimed roadway is within 6 inches of the established centerline, unless otherwise specified in the contract documents. If grade control is required, stake according to Section 11,010, 3.03, A.

3.10 CURING

- A. **Moisture:** Following final finishing, maintain the surface moisture by completing regular applications of a light spray of water. Continue moisture cure for a minimum of 7 days. Apply water spray such that the surface is not eroded.
- B. **Bituminous:** Apply bituminous fog seal within 24 hours of finishing operations. Maintain moisture cure until bituminous cure is placed. Prior to application of fog seal, clean all loose and extraneous materials from the surface. Complete fog seal cure according to Iowa DOT Section 2306. If traffic is allowed on the roadway prior to the fog seal drying so that material is picked up on tires, add a sand blotter to the entire roadway width.

3.11 MICROCRACKING

If specified in the contract documents, complete microcracking of the cement stabilized reclaimed roadway starting within 24 to 48 hours after moisture curing was initiated. Use a 10 to 12 ton vibratory steel drum roller with vibration set at maximum

amplitude and speed limited to 2 mph. Use 3 to 4 passes over the entire roadway except the outside 1 foot on uncurbed sections. Continue moisture curing or apply fog seal cure following completion of microcracking.

3.12 INTERLAYER

If specified in the contract documents, complete placement of the HMA interlayer according to Section 7021. Complete placement of the Class A crushed stone interlayer by complying with Iowa DOT Section 2312.

END OF SECTION

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SECTION 8010 - TRAFFIC SIGNALS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Underground
- B. Detection
- C. Communications
- D. Cabinet and Controller
- E. Poles, Heads, and Signs

1.02 DESCRIPTION OF WORK

SECTION This part of the specifications includes the furnishing of all material and equipment necessary to complete, in place and operational, traffic control signal(s) as described in the project plans.

1.01 SUBMITTALS

SECTION Comply with Division 1 - General Provisions and Covenants, as well as the additional requirements listed below. All of the following must be submitted within 30 days after awarding of the contract for the project. Verify the method of submittal with the Jurisdiction.

- A. **Schedule of Unit Prices:** Submit a completed schedule of unit prices. Estimates of the work performed on the project will be made by the Jurisdiction and the unit costs will be used to prepare progress payments to the Contractor.
- B. **Material and Equipment List:** Submit a completed list of materials and equipment to the Jurisdiction for written approval before any equipment or materials are ordered.
- C. **Contractor Certification:** Submit the name(s) and contact information of the International Municipal Signal Association (IMSA) Level II Certified Traffic Signal Technician(s) working on the project and a copy of their IMSA certificate.
- D. **Shop Drawings:** Submit shop drawings for traffic signal poles and structures to be furnished on the project. Submit catalog cuts and manufacturer's specifications for all items in the equipment list.

1.02 SUBSTITUTIONS

SECTION Comply with Division 1 - General Provisions and Covenants.

1.01 DELIVERY, STORAGE, AND HANDLING

SECTION Comply with Division 1 - General Provisions and Covenants.

1.01 SCHEDULING AND CONFLICTS**SECTION** Comply with Division 1 - General Provisions and Covenants.**1.01 SPECIAL REQUIREMENTS****SECTION** Comply with the current edition of the MUTCD as adopted by the Iowa DOT.**1.01 MEASUREMENT AND PAYMENT****A. Traffic Signal:**

1. **Measurement:** Lump sum item; no measurement will be made.
2. **Payment:** Payment will be at the lump sum price for traffic signal installation.

B. Temporary Traffic Signal:

1. **Measurement:** Lump sum item; no measurement will be made.
2. **Payment:** Payment will be at the lump sum price for temporary traffic signal installation.

PART 2 - PRODUCTS**2.01 UNDERGROUND****A. Handhole:****1. General:**

- a) **Cable Hooks:** Provide four galvanized steel cable hooks with a minimum diameter of 3/8 inch and a minimum length of 5 inches.
- b) **Granular Base:** Comply with the following gradations; however, the Engineer may authorize a change in gradation, subject to materials available locally at the time of construction.

Sieve	Percent Passing
2"	100
1 1/2"	80 to 90
1"	15 to 20
3/4"	0 to 0.5

- c) **Cover:** Include "TRAFFIC SIGNAL" as a message on the cover. Alternate messages may be required as specified in the contract documents.

2. Precast Concrete Handhole:

- a) **Pipe:** Comply with ASTM C 76. Minimum Class III, Wall B (Iowa DOT Class 2000D). Four, 8 inch knockouts (conduit entrance points) equally spaced around the handhole.

- b) **Casting:** Gray cast iron and certified according to requirements of AASHTO M 306 for a 16,000 pound proof-load (HS-20).
- 3. **Composite Handhole and Cover:** Composed of mortar consisting of sand, gravel, and polyester resin reinforced by a woven glass fiber mat or of resin mortar and fiberglass. Ensure the handhole and cover withstands a load of 20,000 pounds. Provide a skid resistant surface on the cover. Provide two 3/8-16 UNC stainless steel hex head bolts with washers.

B. Conduit:

1. General:

- a) Furnish weatherproof fittings of identical or compatible material to the conduit. Use standard factory elbows, couplings, and other fittings.
- b) Use a manufactured conduit sealing compound that is readily workable material at temperatures as low as 30°F and will not melt or run at temperatures as high as 300°F.

2. Steel Conduit and Fittings:

- a) Comply with ANSI C80.1.
- b) Use weatherproof expansion fittings with galvanized, malleable iron, fixed and expansion heads jointed by rigid steel conduit sleeves. As an option, the fixed head may be integral with the sleeve, forming a one piece body of galvanized malleable iron.
- c) Provide steel bushings.

3. Plastic Conduit and Fittings:

a) PVC:

- 2) PVC Schedule 40 plastic conduit and fittings complying with NEMA TC-2 (pipe), NEMA TC-3 (fittings), and UL 651 for Schedule 40 heavy wall type.
- 3) Solvent welded, socket type fittings, except where otherwise specified in the contract documents.
- 4) Threaded adaptors for jointing plastic conduit to rigid metal ducts.
- 5) Provide bell end fittings or bushings.

a) HDPE:

- 6) Comply with ASTM F 2160 (conduit) and ASTM D 3350 (HDPE material), SDR 13.5.
- 7) Use orange colored conduit.
- 8) Continuous reel or straight pieces to minimize splicing.
- 9) For dissimilar conduit connections, provide an adhesive compatible with both materials.

- C. **Wiring and Cable:** Provide wire that is plainly marked on the outside of the sheath with the manufacturer's name and identification of the type of the cable.
1. **Power Cable:** Comply with Iowa DOT Article 4185.11.
 2. **Signal Cable:** Comply with IMSA Specifications 19-1 (PVC jacket) or 20-1 (polyethylene jacket) for polyethylene insulated, 600 volt, solid, multi-conductor copper wire, #14 American Wire Gauge (AWG).
 3. **Tracer Wire:** Comply with #10 AWG, single conductor, stranded copper, type thermoplastic heat and water resistant, nylon-coated (THWN), with UL approval, and an orange colored jacket.
 4. **Communications Cable:** Comply with IMSA Specifications 39-2 or 40-2 for #19 AWG, solid copper conductor, twisted pairs. Use polyethylene insulated, aluminum shielded, complying with REA Specification PE-39 for paired communication cable with electrical shielding.
 5. **Category 5E (Cat5E) Cable:** Provide outdoor use rated cable.
 6. **Fiber Optic Cable and Accessories:**
 - a. Furnish fiber optic cable of the mode type, size, and number of fibers specified in the contract documents, and all associated accessories.
 - b. Meet the latest applicable standard specifications by ANSI, Electronics Industries Association (EIA), and Telecommunications Industries Association (TIA).
 - c. Multimode Fiber:
 - Core Diameter: $62.5\ \mu\text{m} \pm 1.0\ \mu\text{m}$
 - Cladding Diameter: $125.0\ \mu\text{m} \pm 1.0\ \mu\text{m}$
 - Core Concentricity: $\pm 1\%$
 - Max. Attenuation: 3.50 dB/km @ 850 nm
 - d. Single-Mode Fiber:
 - Typical Core Diameter: $8.3\ \mu\text{m} \pm 1.0\ \mu\text{m}$
 - Cladding Diameter: $125.0\ \mu\text{m} \pm 1.0\ \mu\text{m}$
 - Core Concentricity: $\pm 1\%$
 - Attenuation Uniformity: No point discontinuity greater than 0.1 dB at either 1310 nm or 1550 nm
 - Max. Attenuation: 0.25 dB/km @ 1550 nm, 0.35 dB/km @ 1310 nm
 - e. Dual layer UV cured acrylate coating applied by the fiber manufacturer, mechanically or chemically strip-able without damage to the fiber.
 - f. Glass reinforced plastic rod central member designed to prevent the buckling of the cable. Cable core interstices filled with water blocking tape

to prevent water infiltration. Dielectric fillers may be included in the cable core where needed to lend symmetry to the cable cross-section.

- g. Buffer tubes of dual layer construction with a polycarbonate inner layer and polyester outer layer. Each buffer tube filled with a water-swellaable yarn or tape. Buffer tubes stranded around the central member using reverse oscillation or "SZ" stranding process. Gel-free cable and buffer tubes.
- h. Buffer tubes and fibers meeting TIA/EIA-598A, "Color coding of fiber optic cables," with 12 fibers per buffer tube.
- i. Cable tensile strength provided by a high tensile strength aramid yarn and/or fiber glass.
- j. All dielectric cables, without armoring, sheathed with medium density polyethylene (1.4 mm minimum nominal jacket thickness). Jacketing material applied directly over the tensile strength members and flooding compound. Jacket or sheath marked in a contrasting color with the manufacturer's name and the words "Optical Cable," the year of manufacture, and sequential meter or feet marks. Additionally, provide a durable weather proof label on the cable jacket showing the actual attenuation of each fiber expressed in dB/km.
- k. Cable fabricated to withstand a maximum pulling tension of 600 pounds during installation (short term) and 135 pounds upon installation (long term).
- l. Shipping, storing, and operating temperature range of the cable: -40° C to + 70° C. Installation temperature range of cable: -10° C to + 60° C.
- m. Each fiber of all fiber optic cable tested by manufacturer at the 100% level for the following tests:
 - Proof tested at a minimum load of 50 kpsi (350 Mpa)
 - Attenuation
- n. Meet the appropriate standard Fiber Optic Test Procedure for the following measurements:
 - Fluid Penetration
 - Compound Drip
 - Compressive Loading Resistance
 - Cyclic Flexing
 - Cyclic Impact
 - Tensile Loading and Bending
- o. Make cable ends available for testing. Seal cable ends to prevent moisture impregnation.

- p. Fiber Distribution Panel: Provide a fiber distribution panel capable of terminating a minimum of 24 fibers, or as specified in the contract documents.
 - q. Fiber Optic Connectors:
 - 1) ST type connectors of ceramic ferrule and physical contact end finish to terminate multi-mode fibers to equipment.
 - 2) SC type connectors of ceramic ferrule and physical contact end finish to terminate single-mode fibers to equipment.
 - 3) ST or mechanical connectors not allowed for cable splices.
 - 4) Maximum attenuation per connector: 0.75 dB.
 - r. Fiber Optic Jumpers/Patch Cords: For connections in the cabinet, provide factory- assembled duplex pigtail jumpers with dielectric strength member, durable outer jacket and ST or SC compatible connectors. Provide adequate length for connections and 2 feet minimum slack.
 - s. Fiber Optic Breakout Kits: Provide breakout kits for separation and protection of individual fibers, with buffering tube and jacketing materials suitable for termination of the fiber and fiber optic connector.
 - t. Splices/ Splice Enclosures: Fusion splice continuous fiber runs or branch circuit connections in splice enclosures as allowed or specified in the contract documents. Provide environmentally protected outside plant splice enclosures with adequate number of trays to splice all fibers. Maximum attenuation per splice: 0.3 dB.
- D. Footings and Foundations:**
- 1. Use Class C structural concrete complying with Iowa DOT Section 2403.
 - 2. Use uncoated reinforcing steel complying with Iowa DOT Section 4151.
- E. Bonding and Grounding:**
- 1. Ground Rods: Provide 5/8 inch by 8 foot copper clad, steel ground rod.
 - 2. Bonding Jumper or Connecting Wire: Provide #6 AWG bare conductor, copper wire.

2.02 DETECTION

- A. Inductive Loop Vehicle Detector:** A detector consists of a conductor loop or series of loops installed in the roadway, lead-in (feeder) cable, and a sensor (amplifier) unit with power supply installed in a traffic signal controller cabinet.
- 1. **Cables:** All cables must be UL approved.
 - a. **Tube Loop Detector Cable:** Comply with IMSA Specifications 51-5.
 - b. **Preformed Loop Detector Cable:** As approved by the Engineer.
 - c. **Loop Detector Lead-in Cable:** Comply with IMSA Specifications 50-2.

2. Detector Loop Sealant:

- a. Use a rapid cure, high viscosity, liquid epoxy sealant formulated for use in sealing inductive wire loops and leads embedded in pavement. Ensure the cured sealer is unaffected by oils, gasoline, grease, acids, and most alkalis.
- b. Use a sealant complying with Iowa DOT Materials I.M. 491.18.

3. Sensor (Amplifier) Unit:

- a. Use a sensor unit that is solid state, digital, providing detection channel(s) with an inductance range of 0 to 2,000 micro-henries. Output circuits of the sensor unit will be provided by relays. Vehicle presence will result in a continuous call indication.
- b. Provide a sensor unit with the following qualities:
 - 1) Sensitivity adjustment to allow as a minimum the selection of high, medium, or low sensitivity.
 - 2) Be capable of providing reliable detection of all licensed motor vehicles.
 - 3) Provide an indicator light for visual indication of each vehicle detection.
 - 4) Will not require external equipment for tuning or adjustment.
 - 5) Provide operation in the pulse mode or presence mode. Ensure mode switch is readily accessible.
 - 6) Provide a self-tuning system that is activated automatically with each application of power. Provide automatic and continuous fine tuning to correct for environmental drift of loop impedance.
 - 7) Provide for fail-safe operation (continuous call) in the event of detector loop failure.
 - 8) Ensure each detector channel will respond to a frequency shift in an increasing or decreasing value as occurs with temperature shifts in the pavement without requiring a locked call.
 - 9) Use detector units with delay and extension timing. The delay feature is selected and adjusted externally on the sensor unit housing. Digitally derived timing is selectable in 1 second increments from 0 to 30 seconds. Ensure delay timing inhibits detector output until presence has been maintained for the time selected. Restart delay timer at each new detection.
 - 10) Use a sensor unit capable of normal operation without interference and false calls between sensor units ("crosstalk") when installed in the physical environment of the controller cabinet and the electrical environment of the associated electronic equipment installed therein, including other detectors.

B. Pedestrian Push Button Detectors:**1. Assembly:**

- a) Ensure the entire assembly is weather tight, secure against electrical shock, withstands continuous hard usage.
- b) Provide a removable contact assembly mounted in a die cast aluminum case.
- c) Ensure contacts are normally open with no current flowing except at the moment of actuation.
- d) Ensure the contacts are entirely insulated from the housing and operating button with terminals for making connections.
- e) Provide housing with one outlet for 1/2 inch pipe.

2. Accessible Pedestrian Signals (APS) Push Button Stations:

- a) **Housing:** Die cast aluminum, weather tight, secure against electrical shock and withstands continuous hard usage.
- b) **Audible and Vibrotactile Features:** Audible walk indication tone, vibrotactile arrow, and locator tone complying with MUTCD.
- c) **Voice Messages:** As specified in the contract documents and per MUTCD.
- d) **Speaker:** Weatherproof with automatic volume adjustment to 5 dBA over ambient sound. Maximum volume 100 dB at 3 feet.
- e) **Push Button:** Nonrusting metal alloy, ADA compliant, 2 inch diameter with tactile arrow and 3 pounds maximum operational force.
- f) **Switch:** Solid state rated at 20 million operations minimum.
- g) Program and Audio File Updates: USB or Ethernet.
- h) Operating Temperature: -30 to + 165°F.

3. Solid State Pedestrian Push Buttons (non-APS):

- a) **Housing:** Die cast aluminum, weather tight, secure against electrical shock and withstands continuous hard usage.
- b) **Push Button:** Nonrusting metal alloy, ADA compliant, 2 inch diameter with 3 pounds maximum operational force.
- c) **Switch:** Solid state rated at 20 million operations minimum.
- d) Operating Temperature: -30 to + 165°F.

4. Signs: Furnish signs complying with MUTCD.**C. Video Detection Camera System:** Detects vehicles by processing video images and providing detection outputs to the traffic signal controller.

1. Video Detection System and Processors:

- a. Processor to be card rack mounted or located within camera. Compatible with NEMA TS-1, TS-2, and Type 170 controllers and cabinets.
- b. Must be capable of the following:
 - 1) Shadow rejection without special hardware.
 - 2) Non-impaired operation under light intensity changes.
 - 3) Maintained operation during various weather conditions (e.g. rain, fog, snow).
 - 4) Anti-vibration, 5% rejection based on image change.
 - 5) Ability to select direction of flow parameters.
 - 6) Ability to properly detect directionally.
 - 7) Operate in presence mode with less than 4% error.
- c. Provide user-defined detection zone programming via a graphical user interface (GUI) and any necessary equipment for future programming. Store detection zones in non-volatile memory.
- d. Comply with NEMA TS-1 and TS-2 environmental and physical standards with an operating temperature of -34°C to +60°C, and 0% to 95% relative humidity.
- e. Ensure a factory certified representative from the supplier provides on-site VDS programming and testing.

2. Video Cameras:

- a. Provide a charge-coupled device (CCD) image sensor with variable focus color or black and white lens providing a minimum of 4 to at least a 40 degree horizontal field of view.
- b. Equipped with internal thermostatically controlled heater and external sunshield.
- c. Meet NEMA-4 or NEMA-6P environmental standards.
- d. Use camera cable(s) meeting the manufacturer's recommendations. Provide a continuous run, without splices, from the camera to the controller cabinet.

D. Microwave Vehicle Detectors: Detects all vehicles moving within the field of detection at speeds from 2 to 80 mph.

- 1. Must be capable of the following:
 - a. Minimum detection range from 3 to 200 feet for all vehicles.
 - b. Pattern spread of the detection field no more than 16 degrees.
 - c. Self-tuning and capable of continuous operation over a temperature range of -35°F to 165°F.

- d. Side-fire mount or overhead mount.
- e. Detecting directional traffic and the direction user selectable.
- 2. Microprocessor based using Doppler microwave at an operating frequency of 10.525 GHz.
- 3. FCC certification and tested to the applicable FCC specifications.
- 4. Enclosure constructed of aluminum or stainless steel and water resistant.
- 5. All user operated controls and adjustments must be clearly marked and easily accessible.
- 6. Relay detection output to the controller with a minimum 5 amp rating and designed to place a constant call to the controller in the event of any failure.
- 7. Easily accessible indicator showing activation of detection relay.
- 8. Required wiring as recommended by the manufacturer.
- 9. Provide mounting hardware for the type of mounting specified in the contract documents and power supply equipment as recommended by the manufacturer.

2.03 COMMUNICATIONS

- A. **Traffic Monitoring System:** Provide as specified in the contract documents including, video camera in dome, dome mounting bracket and hardware, camera controller, cabling from camera to controller cabinet, and all accessories and hardware necessary for a complete and operational system.
 - 1. Pan/tilt/zoom (PTZ) color camera with automatic conversion to monochrome during low light levels, auto focus, auto-iris control, electronic image stabilization, privacy masking and high resolution 1/4 inch CCD imager. Minimum optical zoom: 25X. Minimum digital zoom: 12X.
 - 2. Camera system provided in a NEMA 4X or IP66 certified rugged weather-resistant package.
 - 3. Provide all required lightning protection for electronics control, power, and coax video outputs.
 - 4. Operating temperature range: -40°C to +50°C.
 - 5. Maximum cable length as specified by camera manufacturer.
 - 6. Provide full 360 degree endless pan and 220 degree tilt under PTZ control.
 - 7. Dome electronics capable of programming a minimum of 64 preset views and nine preprogrammed pattern sequences of preset views. All views selectable by the central office computer or a remote control device.
 - 8. Provide encoder and decoder devices as needed to transmit video over existing or proposed communication systems at 30 frames per second.
 - 9. Provide all necessary rack support devices for video viewing and PTZ control.

10. Provide ability to control PTZ and view video remotely.

B. **Fiber Optic Hub Cabinet:** As specified in the contract documents.

C. **Wireless Interconnect Network:** Provides two-way data communication between the on- street master controller and local traffic signal controllers.

1. **Data Transceiver:**

- a. Utilize a license-free spread spectrum radio frequency (902-928 MHz) with frequency hopping technology.
- b. Completely programmable by software. Furnish software to the Jurisdiction.
- c. Built-in diagnostics capabilities.
- d. Configurable as master, slave, or repeater with store and forward capability.
- e. Maintains user selectable power output levels between 0.1 and 1 watt.
- f. Operates with input voltages between 6 VDC and 30 VDC.
- g. RS-232 interface with 115.2 kbps capability.
- h. Operating temperature of -40°C to +75°C.
- i. Receiver sensitivity of -108 to -110 dBm at 10^{-6} BER.
- j. Protected from power surges.
- k. Rack or shelf mounted in controller cabinet and connections for antenna, power, and controller.

2. **Antenna:**

- a. Capable of transmitting and receiving data between intersections.
- b. Mount near the top of the signal pole nearest the controller cabinet or as specified in the contract documents. Provide engineer-approved mounting hardware.
- c. Connect to transceiver via appropriate cable from pole to signal cabinet in same conduit as traffic signal cable. Conceal cable within a watertight

2.04 CABINET AND CONTROLLER

A. **NEMA Controller, Cabinet, and Auxiliary Equipment:** Comply with the latest edition of NEMA TS1 or TS2 standards.

1. **Controller:**

- a. Solid state modular design with digital timing and capable of accommodating at least eight phases.
- b. Fully prompted, front panel keyboard with menu driven programmability.
- c. Local time base scheduler including automatic accommodation for daylight savings time.

- d. Local coordination control.
 - e. Local preemption control with at least four programmable internal preemption sequences.
 - f. Current software and documentation.
 - g. Data retained in a memory medium that does not require battery backup.
2. **Cabinet:**
- a. Unpainted aluminum cabinet according to NEMA standards.
 - b. Aluminum cabinet riser with same dimensions as cabinet and 12 to 18 inch height, as specified in the contract documents.
 - c. Police door with auto/flash switch, manual/stop time switch, and on/off power switch for signal heads only. Controller to remain in full operation regardless of switch positions.
 - d. Maintenance panel on inside of the main door containing the following test switches.
 - 1) Controller power switch.
 - 2) Detector test switches.
 - 3) Stop time switch.
 - 4) Signal flash switch.
 - e. Heavy-duty clear plastic envelope attached to inside wall of cabinet or cabinet door, for cabinet wiring diagrams, 12 inches by 18 inches minimum.
 - f. GFI electrical outlet and lamp in accessible location near the front of the cabinet. GFI outlet fused separately from main AC circuit breaker. Fluorescent or LED cabinet lamp connected and fused with GFI outlet.
 - g. Back panel positions to accommodate phasing and expansibility specified in the contract documents.
 - h. Power protection devices including AC power circuit breakers, radio interference suppressors, and lightning and surge protectors.
 - 1) AC field service single pole, nonadjustable, magnetic breaker rated for 117 VAC operation, NEC approved.
 - 2) Radio interference suppressors (RIS) as required to minimize interference in all broadcast transmission and aircraft frequency bands.
 - 3) Lightning arrestor/surge protector capable of withstanding repeated (minimum of 25) 30,000 ampere surges.
 - i. Neatly train wiring throughout the cabinet and riser. Bundle and attach wiring to interior panels using nonconductive clamps or tie-wraps.

3. **Auxiliary Equipment:** Conflict monitor/malfunction management unit, flasher, load switches, terminals and facilities, and miscellaneous equipment and materials according to NEMA standards.
- B. **Uninterruptible Power Supply Battery Backup System:** Monitors 120VAC input from the electric utility source and automatically switches to/from a system consisting of batteries and electronics.
 1. Include a maintenance bypass switch to allow operation of the traffic signal system while repairs are made to the battery backup system.
 2. Designed to provide a minimum of 4 hours of normal operation.
 3. Use cabinet equipment that is plug connected and shelf mounted.
 4. Designed to cover a temperature range from -30°F to +165°F and include a surge suppressor.
- C. **Emergency Vehicle Preemption System:** As specified in the contract documents.

2.05 POLES, HEADS, AND SIGNS

- A. **Vehicle Traffic Signal Head Assembly:** Comply with current MUTCD and ITE standards.
 1. **Housing:**
 - a. Individual signal sections made of a durable polycarbonate. Use color specified in the contract documents. Color to be an integral part of the materials composition.
 - b. Self-contained unit capable of separate mounting or inclusion in a signal face containing two or more signal sections rigidly and securely fastened together.
 - c. Equipped with openings and positive locking devices in the top and bottom so that it may be rotated between waterproof supporting brackets capable of being directed and secured at any angle in the horizontal plane.
 - d. Doors and lenses with suitable watertight gaskets and doors that are suitably hinged and held securely to the body of the housing by simple locking devices of non-corrosive material. Doors are to be easily removed and reinstalled without use of special tools.
 2. **Optical System:** Designed to prevent any objectionable reflection of sun rays even at times of the day when the sun may shine directly into the lens.
 3. **Lenses:** 12 inch diameter polycarbonate. Do not use glass lenses.
 4. **Visors:**
 - a. **Standard Installation:**
 - 1) Each signal lens is to have a visor with the bottom 25% open.
 - 2) Minimum 0.1 inch in thickness and black in color.

- 3) Fits tightly against the housing door with no filtration of light between the visor and door.
 - 4) Minimum length of 9 1/2 inches. Ensure the visor angle is slightly downward.
 - b. **Optically Programmed Sections:** Make sure the optical unit and visor are designed as a whole to eliminate the return of outside rays entering the unit from above the horizontal.
5. **Terminal Block:**
- a. Three-section signal equipped with a six position terminal block.
 - b. Four- and five-section signal equipped with an eight position terminal block.
6. **Backplate:**
- a. Manufactured one-piece, durable, black plastic capable of withstanding a 100 mph wind.
 - b. Provides 5 inches of black field around the assembly.
7. **Mounting Hardware:**
- a. **Fixed:** 1 1/2 inch aluminum pipe and fittings, natural aluminum finish for galvanized poles or match the pole color. Secure to pole with a minimum 5/8 inch wide stainless steel banding material.
 - b. **Universally Adjustable:** Rigid mounted, consisting of both top and bottom brackets and easily adjustable in both horizontal and vertical planes.
8. **LED Modules:** Comply with current ITE standards.
- B. **Pedestrian Traffic Signal Head Assembly:** Comply with current MUTCD and ITE standards.
1. **Housing:**
- a. Made of a durable polycarbonate. Use color specified in the contract documents. Color to be an integral part of the materials composition.
 - b. Self-contained unit capable of separate mounting or inclusion in a signal face containing one or more signal sections rigidly and securely fastened together.
 - c. Equipped with openings and positive locking devices in the top and bottom so that it may be rotated between waterproof supporting brackets capable of being directed and secured at any angle in the horizontal plane.
 - d. Doors and lenses with suitable watertight gaskets and doors that are suitably hinged and held securely to the body of the housing by simple locking devices of non-corrosive material. Doors are to be easily removed and reinstalled without use of special tools.

2. Visor:

- a. Tunnel type visor attached to the housing door by stainless steel screws.
- b. Fit tightly against the housing door to prevent any filtration of light between the door and the visor.
- c. Ensure the visor angle is slightly downward.

3. LED Module:

- a. Provide a LED unit(s) for the filled upraised hand symbol, walking person symbol, and countdown timer.
- b. Ensure immediate blank out of the countdown timer display upon recognizing a shortened "Walk" or a shortened "Flashing Don't Walk" interval.

C. Traffic Signal Poles and Mast Arms:**1. General:**

- a. Use mast arm length and vertical pole height as specified in the contract documents.
- b. Ensure the mast arms, poles, and supporting bases are galvanized on both interior and exterior surfaces according to ASTM A 123.
- c. Use continuously tapered, round, steel poles of the transformer base type. Fabricate poles from low carbon (maximum carbon 0.30%) steel of U.S. standard gauge.
- d. When a transformer base is not specified, provide a 6 inch by 16 inch handhole in the pole shaft for cable access. Provide a cover for the handhole. Secure the cover to the base with simple tools. Use corrosion resistant hardware.
- e. Ensure minimum yield strength of 48,000 psi after manufacture. Supply base and flange plates of structural steel complying with ASTM A 36 and cast steel complying with ASTM A 27, Grade 65-35 or better.
- f. Where a combination street lighting/signal pole is specified in the contract documents, ensure the luminaire arm is mounted in the same vertical plane as the signal arm unless otherwise specified. Use a luminaire arm of the single member tapered type. Fabricate the pole with a minimum 4 inch by 6 inch handhole and cover located opposite the signal mast arm.
- g. If allowed by the Engineer, poles and mast arms may be fabricated by shop welding two sections together, resulting in a smooth joint as follows:
 - 1) Ensure a minimum of 60% penetration for longitudinal butt welds in plates 3/8 inch and less in thickness, except within 1 foot of a transverse butt-welded joint. Ensure a minimum of 80% penetration for longitudinal butt welds in plates over 3/8 inch in thickness.

- 2) Ensure 100% penetration for longitudinal butt welds in poles and arms within 1 foot of a transverse butt-welded joint.
 - 3) Ensure 100% penetration for transverse butt welds by using a back-up ring or bar to connect the sections.
 - 4) Examine the full length of all transverse butt welds and 100% penetration longitudinal butt welds by ultrasonic inspection according to the requirements of ANSI/AWS D1.1.
 - 5) Comply with ANSI/AWS D1.1 except as modified by Iowa DOT Article 2408.03, B.
 - h. Provide non-shrink grout (complying with Iowa DOT Materials I.M. 491.13) or a rodent guard (complying with Iowa DOT Materials I.M. 443.01) for placement between the pole base and the foundation.
2. **Pole Design:** Comply with AASHTO 2013 Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals. Use a 90 mph basic wind speed with a 50 year mean recurrence interval for strength design. Use Category II for fatigue design. Apply only natural wind gust loads (i.e. do not apply galloping loads, vortex shedding loads, or truck-induced gust loads) for fatigue design. Install vibration mitigation devices on all traffic signal pole mast arms over 60 feet in length as shown on the figures.
3. **Hardware:**
- a. **General:**
 - 1) Equip poles and mast arms with all necessary hardware and anchor bolts to provide for a complete installation without additional parts.
 - 2) Furnish each anchor bolt with one leveling nut, one anchoring nut, and one jam nut (if required) on the exposed end and one of the following on the embedded end: nut, nut and plate, or nut and anchor bolt assembly ring plate. Use anchor bolts, nuts, and washers that comply with Iowa DOT Materials I.M. 453.08.
 - b. **Anchor Bolts:**
 - 1) Use straight full-length galvanized bolts.
 - 2) Comply with ASTM F 1554, Grade 105, S4 (-20°F).
 - 3) Threads are to comply with ANSI/ASME B1.1 for UNC thread series, Class 2A tolerance.
 - 4) The end of each anchor bolt intended to project from the concrete is to be color coded to identify the grade.
 - 5) Do not bend or weld anchor bolts.
 - c. **Nuts:**
 - 1) Comply with ASTM A 563, Grade DH or ASTM A 194, Grade 2H.
 - 2) Use heavy hex.

- 3) Use ANSI/ASME B1.1 for UNC thread series, Class 2B tolerance.
- 4) Nuts may be over-tapped according to the allowance requirements of ASTM A 563.
- 5) Refer to Section 8010, 3.05, B, 2 for tightening procedure and requirements.
- d. **Washers:** Comply with ASTM F 436 Type 1.
- e. **Galvanizing:** Galvanize entire anchor bolt assembly consisting of anchor bolts, nuts, and washers (and plates or anchor bolt assembly ring plate, if used) according to the requirements of ASTM B 695, Class 55 Type 1 or ASTM F 2329 with zinc bath temperature limited to 850°F. Galvanize entire assembly by the same zinc-coating process, with no mixed processes in a lot of fastener assemblies.

D. Traffic Signal Pedestal Poles:

1. Materials:

- a. **Pedestal:** The height from the bottom of the base to the top of the shaft as specified in the contract documents.
- b. **Pedestal Shaft:** Schedule 80 with satin brush or spun finish aluminum tubing. Top of the shaft outer diameter to be 4 1/2 inches and provided with a pole cap. Supply base collar for poles with shaft lengths greater than 10 feet.
- c. **Pedestal Base:** Cast aluminum, square in shape, with a handhole.
 - 1) **Handhole:** Minimum of 6 inches by 6 inches and equipped with a cast aluminum cover that can be securely fastened to the base with the use of simple tools.
 - 2) **Base:** Minimum weight of 20 pounds with a four bolt pattern uniformly spaced on a 12 1/2 inch diameter bolt circle. Meet or exceed AASHTO breakaway requirements.
- 2. **Anchor Bolts:** Four 3/4 inch by 15 inch steel, hot dip galvanized anchor bolts complying with ASTM F 1554, Grade 36, with right angle bend at the bottom end, complete with all hardware required for installation.

E. Pedestrian Push Button Post:

1. Material:

- a. **Post:** Standard weight (Schedule 40) pipe complying with ASTM F 1083, galvanized inside and out; 2 1/2 inches in diameter.
- b. **Cap:** Waterproof cap complying with ASTM F 626.
- c. **Anchor Bolts:** Four 1/2 inch by 24 inch steel, hot dip galvanized anchor bolts complete with all hardware required for installation.

- d. **Non-shrink Grout:** Comply with Iowa DOT Materials I.M. 491.13 or a rodent guard (complying with Iowa DOT Materials I.M. 443.01) for placement between the post base and the foundation.
- e. **Base Plate:** Provide a 5 inch square, 1/2 inch thick galvanized steel base plate with a 4 1/2 inch bolt circle.

F. Traffic Signs:

- 1. Comply with Iowa DOT Section 4186.
- 2. Use a universally adjustable mast arm mounted sign bracket.
- 3. Comply with MUTCD and the contract documents for the street name sign dimensions, letter height and font, and sheeting.

PART 3 - EXECUTION

3.01 UNDERGROUND

A. Handhole:

- 1. **Locations:**
 - a. Do not construct in ditch bottoms, low areas where ponding of water may occur, or where they will be subject to normal vehicular traffic.
 - b. With Engineer approval, additional handholes may be placed, at no additional cost to the Contracting Authority, to facilitate the work.
- 2. **Excavation:** Excavate as necessary to accommodate the handhole and granular base.
- 3. **Granular Base:** Install 8 inch thick granular base extending a minimum of 6 inches beyond the outside walls of the handhole.
- 4. **Placement:**
 - a. In paved areas, install the handhole at an elevation so the casting is level and flush with the pavement. In unpaved areas, install the handhole approximately 1 inch above the final grade.
 - b. Verify ring placement. Invert rings when installed in paved areas.
- 5. **Conduit:**
 - a. Remove knockouts as necessary to facilitate conduit entrance.
 - b. Extend conduit into the handhole, through a knockout, approximately 2 inches beyond the inside wall. Conduit to slope down and away from the handhole.
 - c. Place non-shrink grout (complying with Iowa DOT Materials I.M. 491.13) in the opening of the knockout area after placement of conduit.
- 6. **Cable Hooks:** Install cable hooks centered between the knockouts and the top of the handhole.

7. **Backfill:** Place suitable backfill material according to Section 3010.
8. **Casting:** Place the casting on the handhole. Ensure the final elevation meets the handhole placement requirements.

B. Conduit:

1. **General:**

- a. Place conduit to a minimum depth of 30 inches and a maximum depth of 60 inches below the gutterline. When conduit is placed behind the curb, place to a minimum depth of 24 inches and a maximum depth of 48 inches below top of curb.
- b. Change direction at handholes or by bending, such that the conduit will not be damaged or its internal diameter changed. Ensure bends are uniform in curvature and the inside radius of curvature of any bend is no less than six times the internal diameter of the conduit.
- c. On the exposed ends of conduit, place bell-end fittings on PVC or HDPE conduit and bushings on steel conduit prior to installing cable. Extend all conduits a minimum of 2 inches and a maximum of 4 inches above the finished surface of any foundation, footing, or structural base.
- d. When it is necessary to cut and thread steel conduit, do not allow exposed threads. Ensure conduits and fittings are free from burrs and rough places. Clean, swab, and ream conduit runs before cables are installed. Use nipples to eliminate cutting and threading where short lengths of conduit are required. Coat damaged galvanized finish on conduit with zinc rich paint. Use only galvanized steel fittings with steel conduit.
- e. Pack conduit ends with a conduit sealing compound.

2. **Trenched Installation:**

- a. Place backfill in layers not to exceed 12 inches in depth with each layer thoroughly compacted before the next layer is placed. Ensure backfill material is free of cinders, broken concrete, or other hard or abrasive materials.
- b. Remove all surplus material from the public right-of-way as soon as possible.

3. **Trenchless Installation:**

- a. When placing conduit under pavements, use the trenchless installation methods described in Section 3020.
- b. If trenchless methods that compact soils in the bore path are used, provide sufficient cover to prevent heaving of overlying paved surfaces.
- c. Do not allow pits for boring to be closer than 2 feet to the back of curb, unless otherwise specified in the contract documents.

C. **Wiring and Cable:**

1. Where practical, follow color codes so that the red insulated conductor connects to the red indication terminal, yellow to yellow, and green to green. Ensure cables are properly labeled at the controller by durable labels, or other appropriate methods, attached to the cables. Label home runs for cables as follows: northwest corner is red, southeast corner is blue, northeast corner is green, and southwest corner is orange.
2. Install continuous runs of vehicle and pedestrian signal cables from the vehicle or pedestrian signal head to the handhole compartment of the signal pole base. Install continuous runs of vehicle and pedestrian signal cables from the handhole compartment of the signal pole base to the terminal compartment in the controller cabinet. Do not splice signal cables in underground handholes.
3. Install continuous runs for video detection and emergency vehicle preemption cables from the unit to the controller cabinet.
4. Install continuous runs of power lead-in cables from the service point to the meter socket and from the meter socket to the controller cabinet.
5. Install continuous detector cable from each detector loop to the first handhole adjacent to the loop. Ensure cables are properly labeled at the controller by durable labels, or other appropriate methods, attached to the cables. Install continuous homerun cable from the splice made in the first handhole to the terminal compartment in the controller cabinet. Attach the drain wire of the shielded cable to the ground in the controller cabinet.
6. Provide a minimum of 4 feet of additional cable at each handhole and loosely coil the extra cable on the handhole cable hooks. Provide a minimum of 2 feet of additional cable at each signal pole (measured from the handhole compartment in the pole to the end of the cable). Provide a minimum of 10 feet of additional cable at each controller base.
7. Pull cables through conduit using a cable grip designed to provide a firm hold upon the exterior covering of the cable or cables, and minimize
8. Install a tracer wire in all conduits with the exception of conduits between detector loops and handholes. Use a silicon-filled wire nut to splice the tracer wire in each handhole and at the controller to form a continuous run.
9. Fiber Optic Cable and Accessories:
 - a. Use a suitable cable feeder guide between the cable reel and the face of the conduit to protect the cable and guide the cable directly into the conduit off the reel. During the installation, carefully inspect cable jacket for defects. If defects are found, notify the Engineer prior to any additional cable being installed. Take care when pulling the cable to ensure the cable does not become kinked, crushed, twisted, snapped, etc.
 - b. Attach a pulling eye to the cable and use to pull the cable through the conduit. Use a pulling swivel to preclude twisting of the cable. Lubricate cable prior to entering the conduit with a lubricant recommended by the

manufacturer. Use dynamometer or break away pulling swing to ensure the pulling tension does not exceed the specified force of 600 pounds or the cable manufacturer's recommendations, whichever is less. Do not allow the cable to twist, stretch, become crushed, or forced around sharp turns that exceed the bend radius or scar or damage the jacket. Manually assist the pulling of the cable at each pull point.

- c. Do not pull cable through any intermediate junction box, handhole, pull box, pole base, or any other opening in the conduit unless specified in the contract documents. Install cable by pulling from handhole or controller cabinet to the immediate next downstream handhole or cabinet. Carefully store the remaining length of cable to be installed in the next conduit run(s) in a manner that is not hazardous to pedestrian or vehicular traffic, yet ensures that no damage to the cable occurs. Storage methods are subject to Engineer approval.
 - d. At each handhole, visibly mark or tag cable, "CITY (or COUNTY) FIBER OPTIC"
 - e. Secure cables inside controller cabinet so that no load is applied to exposed fiber strands.
 - f. Ensure the radius of the bend for static storage is no less than 10 times the outside diameter of the cable, or as recommended by the manufacturer. Ensure the radius of the bend during installation is no less than 15 times the outside diameter of the cable, or as recommended by the manufacturer.
 - g. Provide cable slack in each handhole, junction box, and cabinet as specified in the contract documents. Where handholes or junction boxes lack sufficient area for cable storage or bend radius requirements, provide equivalent additional slack in adjacent facilities. Coil and bind slack cable at three points around the cable perimeter and support in its static storage position.
 - h. Install fiber optic accessories according to the manufacturer's recommendations and as specified in the contract documents.
- 10. Fiber Optic Cable Field Testing:** Provide for each fiber both on-reel testing prior to installation and final testing after installation using a high-resolution optical time domain reflectometer (OTDR). Conduct measurements for single-mode fibers at 1310 ± 30 nanometer wavelength. Conduct measurements for multimode fibers at 850 ± 30 nanometer wavelength. Record the identification, location, length, and attenuation measurements of each fiber, and furnish test reports to the Engineer. Replace any cable that fails testing, at no additional cost to the Contracting Authority.
- a. **On-reel Testing:** Perform testing for attenuation and continuity using OTDR and a pigtail splice. Complete testing in one direction only. Acceptable test results will be within $\pm 3\%$ of factory-supplied attenuation measurements. Except for access to and test preparation of one end of

the newly furnished cable, preserve the cable in its originally-shipped condition. Furnish test reports to the Engineer prior to installation.

- b. **Cable Segment Testing:** Perform an end-to-end attenuation test of each terminated fiber of each fiber optic cable. Perform testing using hand-held optical test sets. Include test results in documentation package provided to the Engineer at the conclusion of the project. Acceptable test results will not exceed the cumulative specified losses of the components. For example, at 850 nanometers, a one kilometer multimode fiber link with two splices and a connector on each end will not exceed 5.6 dB:

1.0 km x 3.5 dB/km:	3.5 dB
0.3 dB per splice x 2:	0.6 dB
0.75 dB per connector x 2:	<u>1.5 dB</u>
Maximum allowable loss:	5.6 dB

Repair or replace any cable segment that fails testing. Retest any repaired or replaced cable. Submit complete documentation of test results to the Engineer (hard copy or electronically).

- c. **Final System Testing:** After complete fiber optic system is installed and terminated, but prior to capping unused fibers, perform OTDR readings on all cables to ensure that each section is in compliance with the specifications. Provide copies of OTDR trace signatures for all fibers for all cable sections to the Engineer. Also provide test results for attenuation test for the installed fibers using the insertion loss procedure and the transmitter/receiver power level test and the continuity test.

D. **Footings and Foundations:**

1. **Excavation:** Excavate to the size, shape, and depth specified in the contract documents. Ensure the bottom of all foundations rest securely on firm undisturbed soil. Minimize over-excavation to ensure support and stability of the foundation.
2. **Foundation:** Provide a means for holding all of the following elements rigidly in place while the concrete is being placed.
 - a. **Forms:**
 - 1) Set the forms level or sloped to meet the adjacent paved areas.
 - 2) When adjacent to paved areas, shape the top 11 inches of the foundation to be square and flush with the surrounding paved area. Provide preformed expansion material between the foundation and paved areas.
 - 3) When installed in an unpaved area, set the top of the foundation 2 inches above the surface of the ground.
 - b. **Reinforcing Steel:** Install reinforcing steel.
 - c. **Conduit:** Install conduit.

d. Anchor Bolts:

- 1) Set anchor bolts using a template constructed to accommodate the specified elevation, orientation, and spacing according to the pole and controller manufacturer's requirements.
- 2) Center the pole anchor bolts within the concrete foundation.
- 3) Protect the anchor bolts until poles are erected.
- 4) Orient controller footing with the back of the cabinet toward the intersection such that the signal heads can be viewed while facing the controller, unless otherwise directed by the Engineer.

e. Concrete:

- 1) Place concrete to form a monolithic foundation. Consolidate concrete by vibration methods.
- 2) Finish the top of the base level and round the top edges with an edging tool having a radius of 1/2 inch. Provide a rubbed surface finish on the exposed surface of the footing or foundation.
- 3) Allow the foundation to cure a minimum of 4 days prior to erecting the poles and 7 days prior to installing the mast arms. Times may be shortened if supported by strength test results.

3. **Backfill:** Place suitable backfill material according to Section 3010.

E. Bonding and Grounding:

1. Ensure the traffic signal installation is grounded as required by the National Electric Safety Code.
2. Install a ground rod at each signal pole foundation and controller footing.
3. Use PVC conduit within the foundation or footing to accommodate the connection between the top of the concrete and the ground rod.
4. Bond poles to ground rods with copper wire. Connect ground wires to ground rods with approved mechanical connectors.
5. Bond rigid steel conduit ends in handholes with copper wire and approved fittings.

3.02 DETECTION**A. Detector Loop Cable Installation:**

1. Coordinate the location of the detector loop with the Engineer. Obtain the Engineer's approval prior to cutting the pavement.
2. Saw to ensure proper depth and alignment of the slot. Make a 2 inch deep clean, straight, well-defined 3/8 inch wide saw cut without damage to adjacent areas. Overlap the saw cuts where the detector loop changes direction to provide full depth at all corners. Do not use right angle or corners less than 90 degrees.

3. Before installing the detector loop cable, check the saw cuts for the presence of jagged edges or protrusions and remove if present. Clean and dry the saw cuts to remove cutting dust, grit, oil, moisture, or other contaminants. Clean by flushing with a stream of water under pressure. Use oil-free compressed air to dry the saw cuts.
 4. Install detector loop cable without damage. Place three turns of the detector loop cable into the saw cut. Seal the ends of the tubing at the time of placement to prevent entrance of moisture.
 5. Ensure the detector loop cables are in the bottom of the saw cut. Place detector loop sealant within the saw cut area. Comply with the manufacturer's instructions for mixing and using the detector loop sealant.
 6. Install preformed loop detector according to the manufacturer's recommendations.
 7. Identify each detector loop cable in the handhole by phase and location. Wind loops that are physically adjacent in an individual lane or adjacent lanes with opposite rotation (i.e. #1 clockwise, #2 counter-clockwise, #3 clockwise, etc.). Rotation reversal can be accomplished by reversing leads at the handhole.
 8. Twist, with at least five turns per foot, all lengths of loop wires and tubing that are not embedded in the pavement.
 9. Identify all detector loop lead-in cables with appropriate detector numbers.
 10. Use a detector loop cable splice kit for the electrical splice between the detector loop cable and the detector loop lead-in cable to the controller.
 - a. Ensure splice kit provides a watertight protective covering for the spliced wire, the shielding on the detector loop lead-in cable, and the end of the tubing containing the detector loop cable.
 - b. Use a manufactured electrical splice kit approved by the Engineer.
 11. Test all loops and document by using the following procedures:
 - a. Determine the insulation resistance of the loop wire using a "megger" with 500V applied to either loop wire to earth ground. The resistance is to be greater than 100 megohms.
 - b. Determine the inductance of the loop using a loop inductance meter.
- B. Pedestrian Push Button Detectors:
1. Install according to the manufacturer's recommendations.
 2. Seal the wire entrance into the pedestrian push button assembly.
- C. **Video Detection Camera System:** Install according to the manufacturer's recommendations and as specified in the contract documents.

3.03 COMMUNICATIONS

- A. **Traffic Monitoring System:** Install according to the manufacturer's recommendations and as specified in the contract documents, as well as the following:
1. Position camera dome on the pole as directed by the Engineer.
 2. Test installed system under the supervision of the Engineer, and certify as fully- functional.
- B. **Fiber Optic Hub Cabinet:** Install according to the manufacturer's recommendations and as specified in the contract documents.

3.04 CABINET AND CONTROLLER

- A. **Controller, Cabinet, and Auxiliary Equipment:**
1. Install according to the manufacturer's recommendations and as specified in the contract documents.
 2. Install on pre-placed caulking material on the concrete base. After the cabinet is installed in place, place caulking material around the base of the cabinet.
 - a. **Controller:** Install according to the manufacturer's recommendations and as specified in the contract documents.
 - b. **UPS Battery Backup System:** Install according to the manufacturer's recommendations and as specified in the contract documents.
 - c. **Emergency Vehicle Preemption System:** Install according to the manufacturer's recommendations and as specified in the contract documents.

3.05 POLES, HEADS, AND SIGNS

- A. **Vehicle and Pedestrian Traffic Signal Heads:**
1. Inspect each signal head assembly while still on the ground for the following:
 - a. Physical defects
 - b. Visor type
 - c. LED wattage
 - d. Lens orientation
 - a) Wiring connections
 2. Attach signal head mounting hardware according to the manufacturer's recommendations. Apply anti-seize compound to all mechanical fasteners.
 3. Adjust each signal head both vertically and horizontally to approximate a uniform grade of all like signal heads.
 4. During the course of construction and until the signals are placed in operation, cover signal faces or turn away from approaching traffic. When ready for operation, plumb and aim the heads.

B. Traffic Signal and Pedestal Poles and Pedestrian Push Button Posts:

1. Erect all poles and posts vertically under normal load.
2. Securely bolt the bases to the cast-in-place concrete foundations using the following procedures. Perform this work only on days with winds less than 15 mph. Tighten all of the nuts in the presence of the inspector. Once the tightening procedure is started, complete on all of the base plate nuts without pause or delay.
 - a. Use properly sized wrenches or sockets, or both, designed for tightening nuts or bolts, or both, to avoid rounding or other damage to the nuts. Do not use adjustable end or pipe wrenches.
 - b. Ensure base plates, anchor rods, and nuts are free of all dirt or debris.
 - c. Apply stick wax or bees wax to the threads and bearing surfaces of the anchor bolt, nuts, and washers.
 - d. Tighten top nuts so they fully contact the base plate. Tighten leveling nuts to snug tight condition. Snug tight is defined as the full effort of one person on a wrench with a length equal to 14 times the bolt diameter but not less than 18 inches. Apply full effort as close to the end of the wrench as possible. Perform tightening by leaning back and using entire body weight to pull firmly on the end of the wrench until the nut stops rotating. Perform a minimum of two separate passes of tightening. Sequence tightening in each pass so that the nut on the opposite side, to the extent possible, is subsequently tightened until all of the nuts in that pass have been tightened.
 - e. Tighten top nuts to snug tight as described for the leveling nuts.
 - f. Match-mark the top nuts and base plate using paint, crayon, or other approved means to provide a reference for determining the relative rotation of the nut and base plate during tightening. Further tighten the top nuts tightened in two passes, as listed in Table 8010.01, using a striking or hydraulic wrench. Follow a sequence of tightening in each pass so that the nut on the opposite side, to the extent possible, is subsequently tightened until all nuts in that pass have been turned. Do not allow the leveling nut to rotate during the top nut tightening.
 - g. Lubricate the jam nuts, place, and tighten to snug tight.

Table 8010.01: Bolt Tightening

Anchor Bolt Size	First Pass	Second Pass	Total Rotation
Less than or equal to 1 1/2 inch diameter	1/6 turn	1/6 turn	1/3 turn
Greater than 1 1/2 inch diameter	1/12 turn	1/12 turn	1/6 turn

3. A torque wrench should be used to verify that a torque at least equal to the computed verification torque, T_v , according to paragraph 6.9 of FHWA *Guidelines for the Installation, Inspection, Maintenance, and Repair of*

Structural Supports for Highway Signs, Luminaires, and Traffic Signals, is required to additionally tighten the top nuts. An inability to achieve this torque should be interpreted to indicate that the threads have stripped and should be reported to the Engineer.

4. After leveling the poles, use non-shrink grout or a rodent guard between the pole base and the foundation. When non-shrink grout is used, neatly finish exposed edges of grout to present a pleasing appearance, and place a weep hole in the grout.
5. Apply anti-seize compound to all mechanical fasteners on pole access doors.
6. Install pedestrian push button post caps with tamper-proof set screws per manufacturer's direction or by driving the cap a minimum of 1/2 inch onto the post.

C. **Traffic Signs:** Install signs using universally adjustable sign brackets banded to the pole. Apply anti-seize compound to all mechanical fasteners.

3.06 TEMPORARY TRAFFIC SIGNAL

Construct according to Figure 8010.107 and to the configuration specified in the contract documents.

3.07 SURFACE RESTORATION

- A. Replace or reconstruct features removed as a part of the work, such as sidewalks, driveways, curbs, roadway pavement, unpaved areas, or any other items.
- B. Complete restoration according the applicable sections of the SUDAS Standard Specifications or as directed by the Engineer.

3.08 TESTING

- A. Notify the Engineer 48 hours in advance of the time and date the signal or signal system will be ready for turn on. Do not turn on the signal or signal system without authorization of the Engineer.
- B. Ensure a representative from the manufacturer and/or supplier of signal controller or other authorized person is at the project site when the signal controllers are ready to be turned on to provide technical assistance including, as a minimum, programming of all necessary input data.
- C. All required signal timing data will be provided by the Engineer.
- D. A test period of 30 calendar days will start upon confirmation from the Engineer that the signal or signal system is operating consistent with the project requirements. Any failure or malfunction of the equipment furnished by the Contractor, occurring during the test period will be corrected by the Contractor at no additional cost to the Contracting Authority. Upon confirmation by the Engineer that any failure or malfunction has been corrected, a new test period of 30 calendar days will start, exclusive of minor malfunctions such as lamp

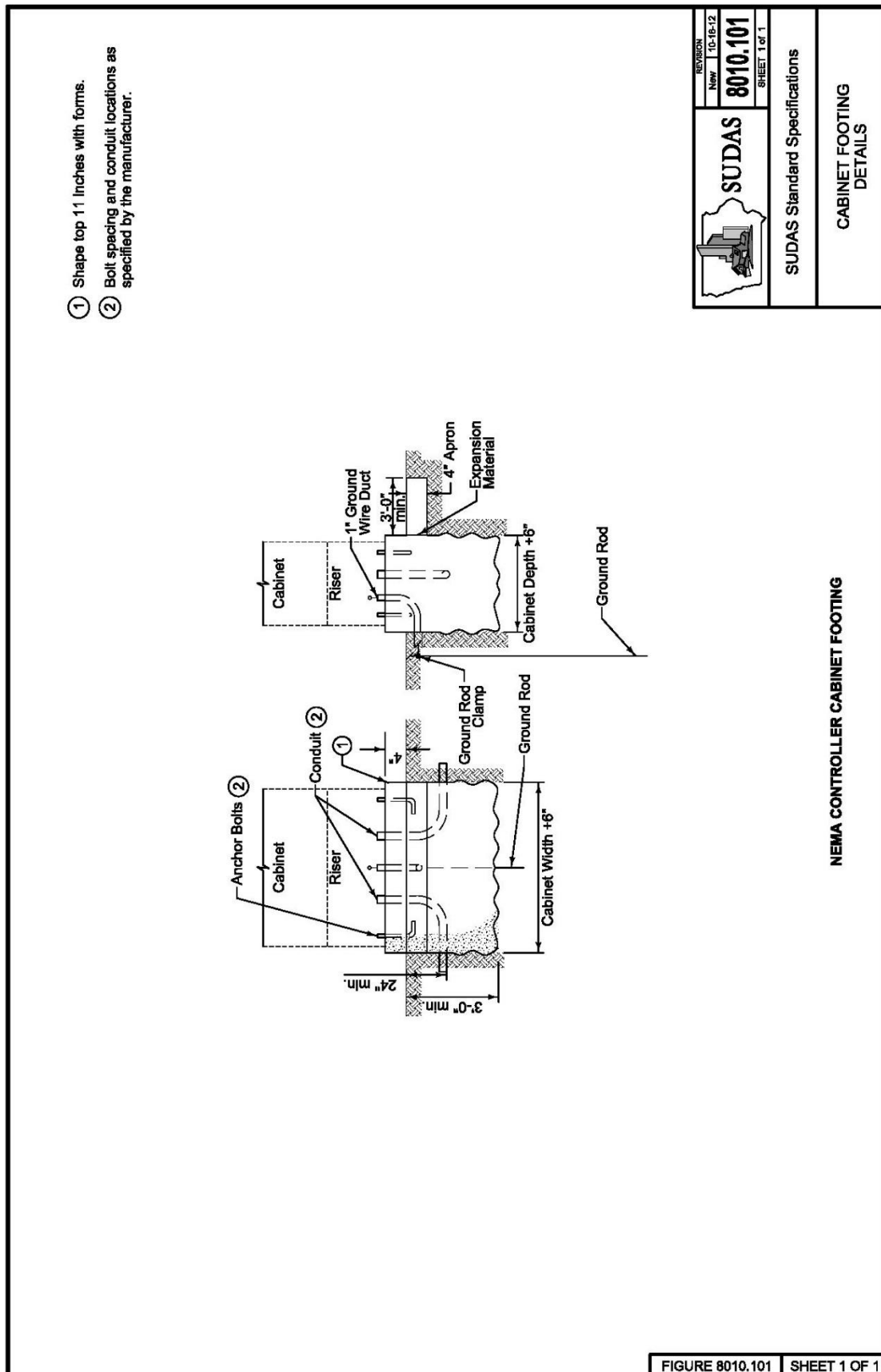
burnouts. Repeat this procedure until the signal equipment has operated satisfactorily for 30 consecutive calendar days.

- E. After signal turn on and prior to completion of the 30 calendar day test period, respond, within 24 hours, to perform maintenance or repair of any failure or malfunction reported.

3.09 DOCUMENTATION

- A. Provide file documentation packages with each signal system, consisting of the following:
 - 1. Complete cabinet wiring diagram.
 - 2. Complete physical description of the equipment.
 - 3. Controller printout or equal documentation of initial controller settings installed in the field or in the office.
 - 4. Product manuals for all cabinet equipment.
 - 5. Standard industry warranties on equipment supplied.
 - 6. Documentation of field cable labeling scheme.
 - 7. Diagram of phasing and detector locations.
 - 8. One set of as-built construction plans indicating changes from the original contract documents.
- B. Supply two complete sets of documentation. One set to be placed in the controller cabinet and the other set (less construction plan) to be delivered to the Engineer.

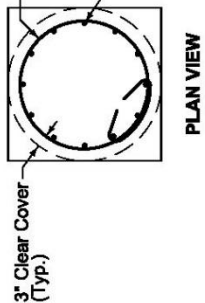
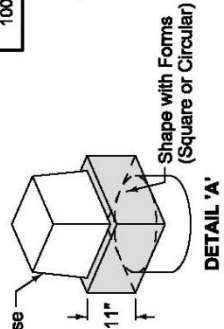
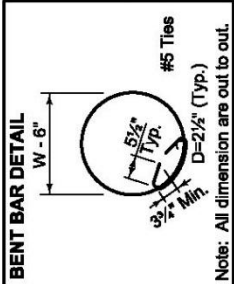
END OF SECTION



The Type A Foundation is the normally required foundation construction. Where rock is encountered, the Engineer may approve the use of the Type B or C Foundation. Prior to installing a foundation in rock, obtain a subsurface investigation certified by a geotechnical engineer licensed in the State of Iowa.

- ① Shape top 11 inches with forms. See Detail 'A'.
- ② Install rodent guard or non-shrink grout with weep hole.
- ③ Furnish nut, nut and plate, or nut and anchor bolt assembly ring plate on embedded end.

Max. Mast Arm Length	Foundation (W)	(L)	"V" Bars			Tie Bars		
			Count	Size	Length	Count	Upper Spacing # Spaces (S ₁)	Lower Spacing # Spaces (S ₂)
35'-0"	3'-0"	12'-0"	12	#8	11'-6"	17	9	12"
45'-0"	3'-0"	14'-0"	12	#8	13'-6"	19	11	12"
55'-0"	3'-0"	16'-0"	12	#8	15'-6"	25	12	8"
60'-0"	3'-0"	18'-0"	13	#8	17'-6"	28	15	8"
70'-0"	3'-6"	18'-0"	12	#10	17'-6"	28	15	8"
80'-0"	3'-6"	21'-0"	14	#10	20'-6"	40	22	6"
90'-0"	4'-0"	22'-0"	16	#10	21'-6"	42	24	6"
100'-0"	4'-0"	24'-0"	18	#10	23'-6"	47	32	6"



MAST ARM POLE FOUNDATION IN SOIL
TYPE A FOUNDATION

FIGURE 8010.102

TS-102

STANDARD ROAD PLAN

REVISION 3 04-18-19

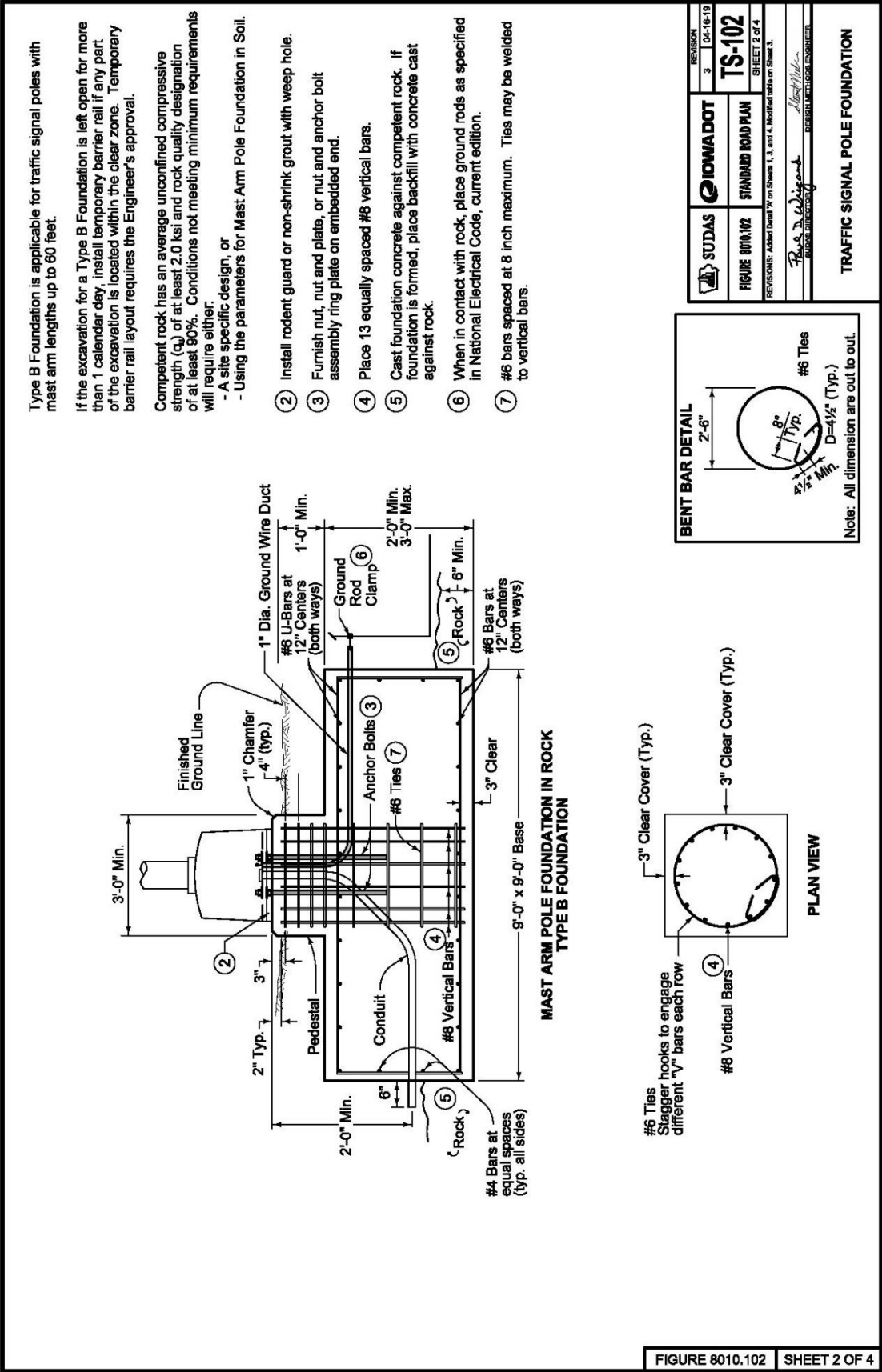
SHEET 1 OF 4

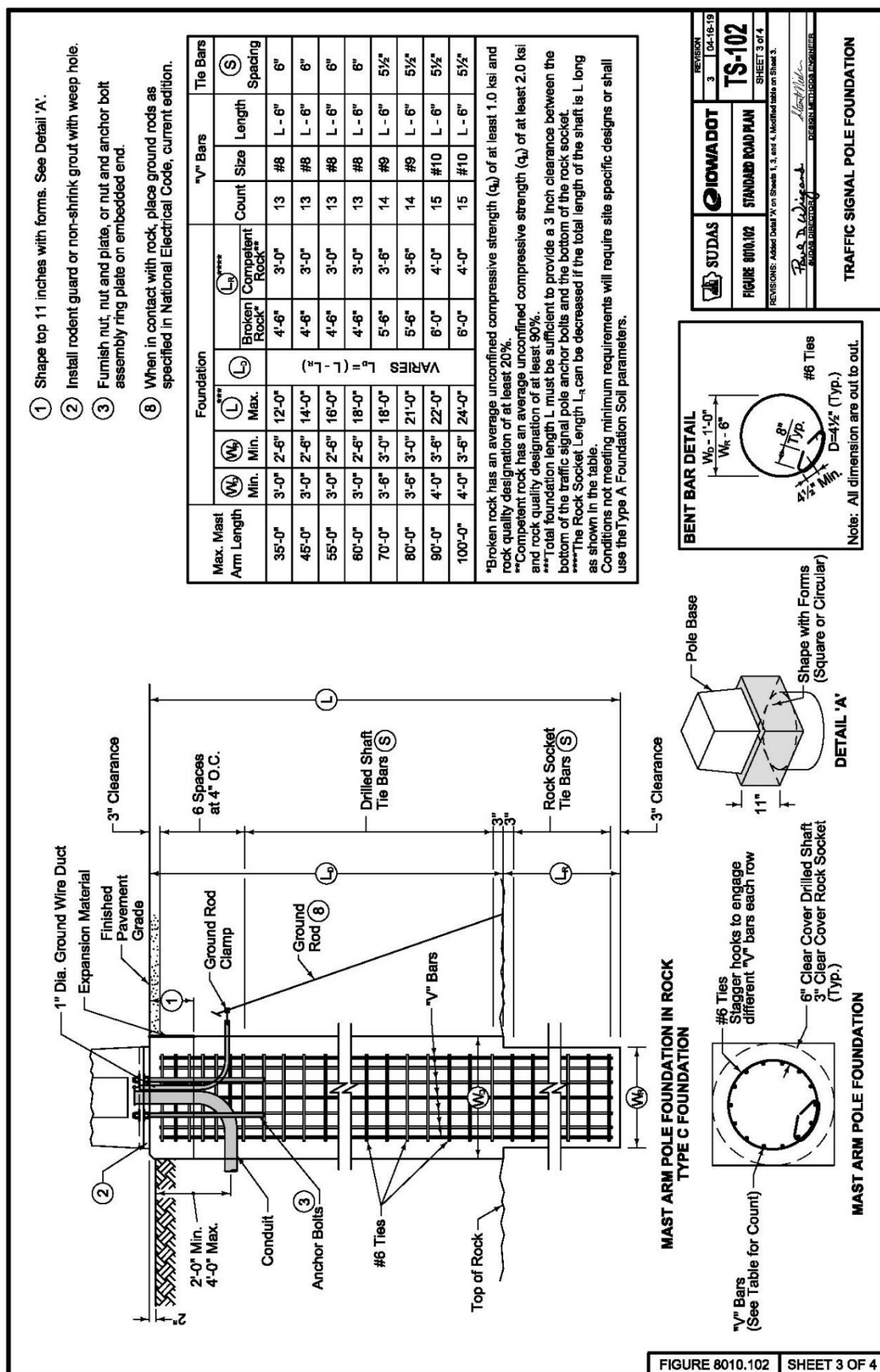
REVISIONS: Added Detail 'A' on Sheets 1, 3, and 4. Modified table on Sheet 3.

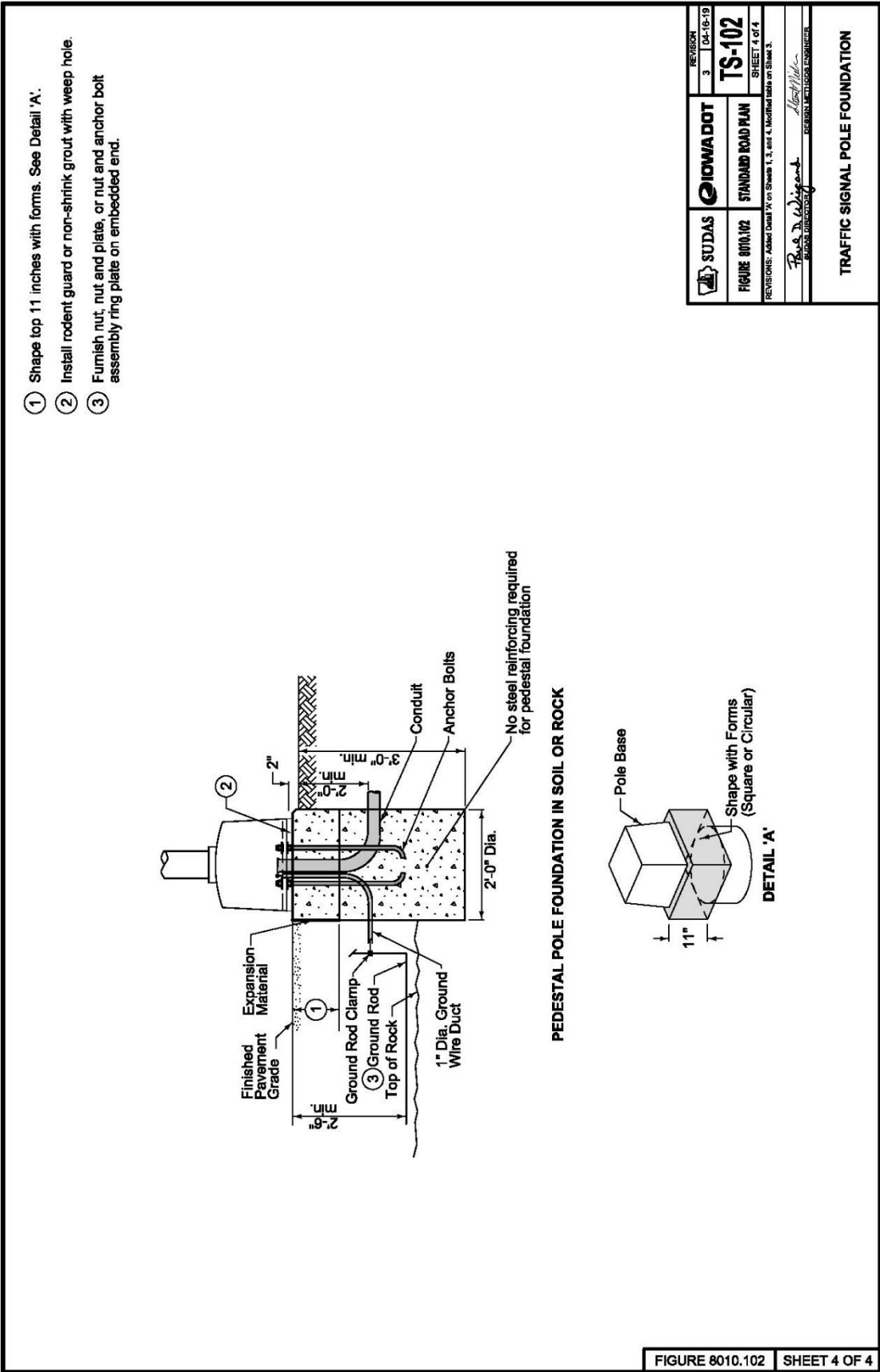
Paul D. Wiegand
SUDAS DIRECTOR

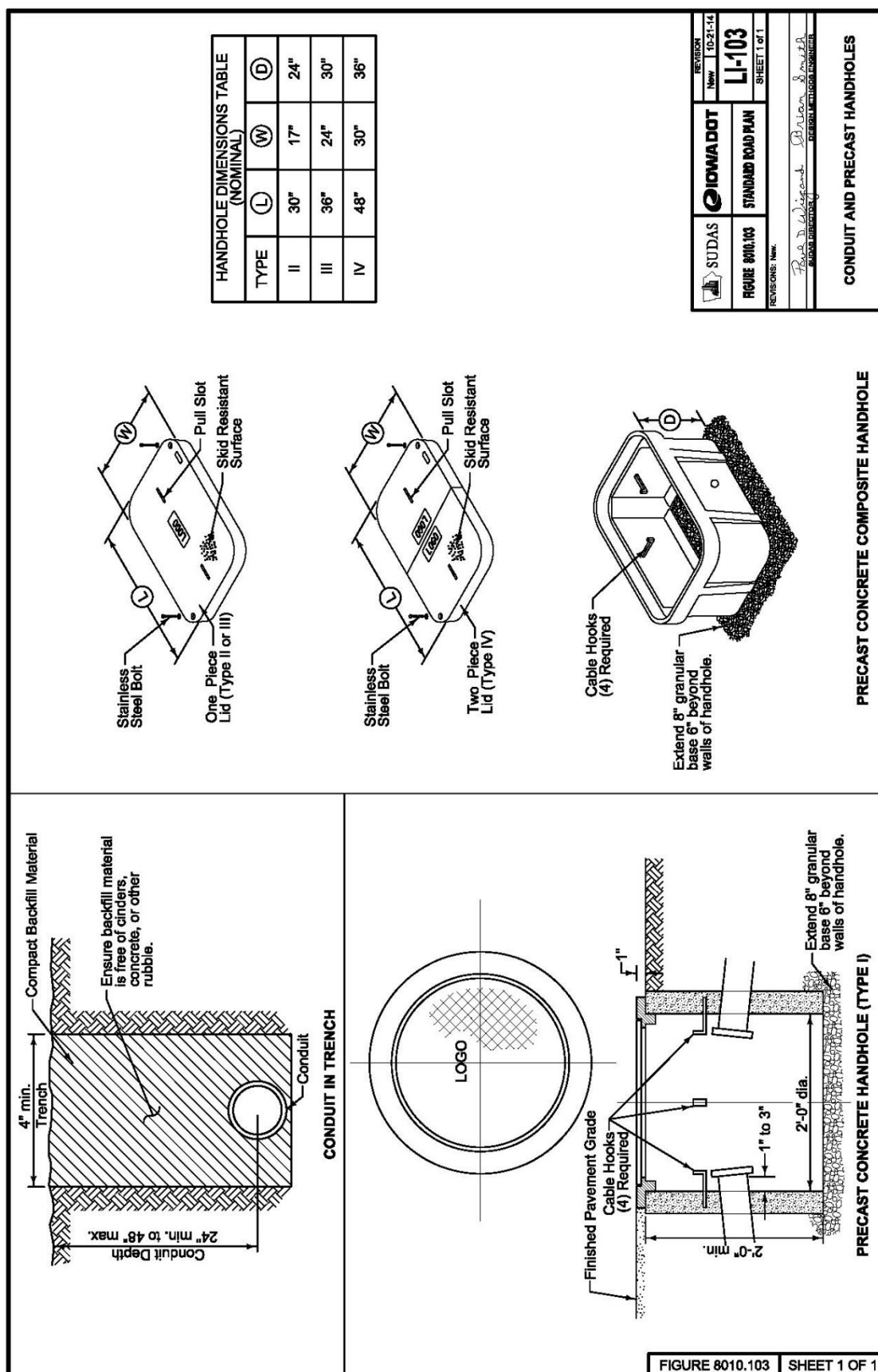
Shawn Miller
SUDAS ENGINEER

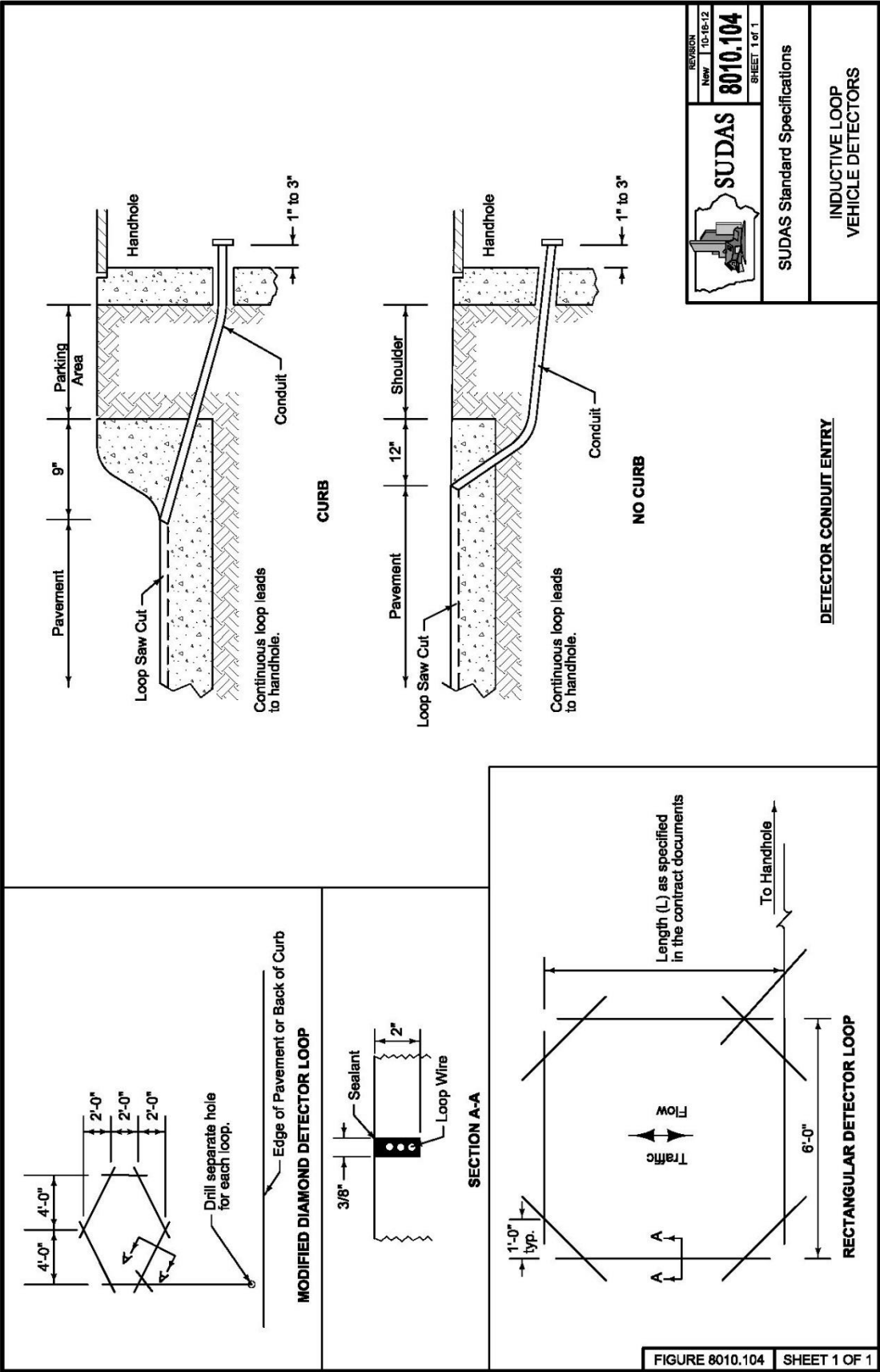
TRAFFIC SIGNAL POLE FOUNDATION

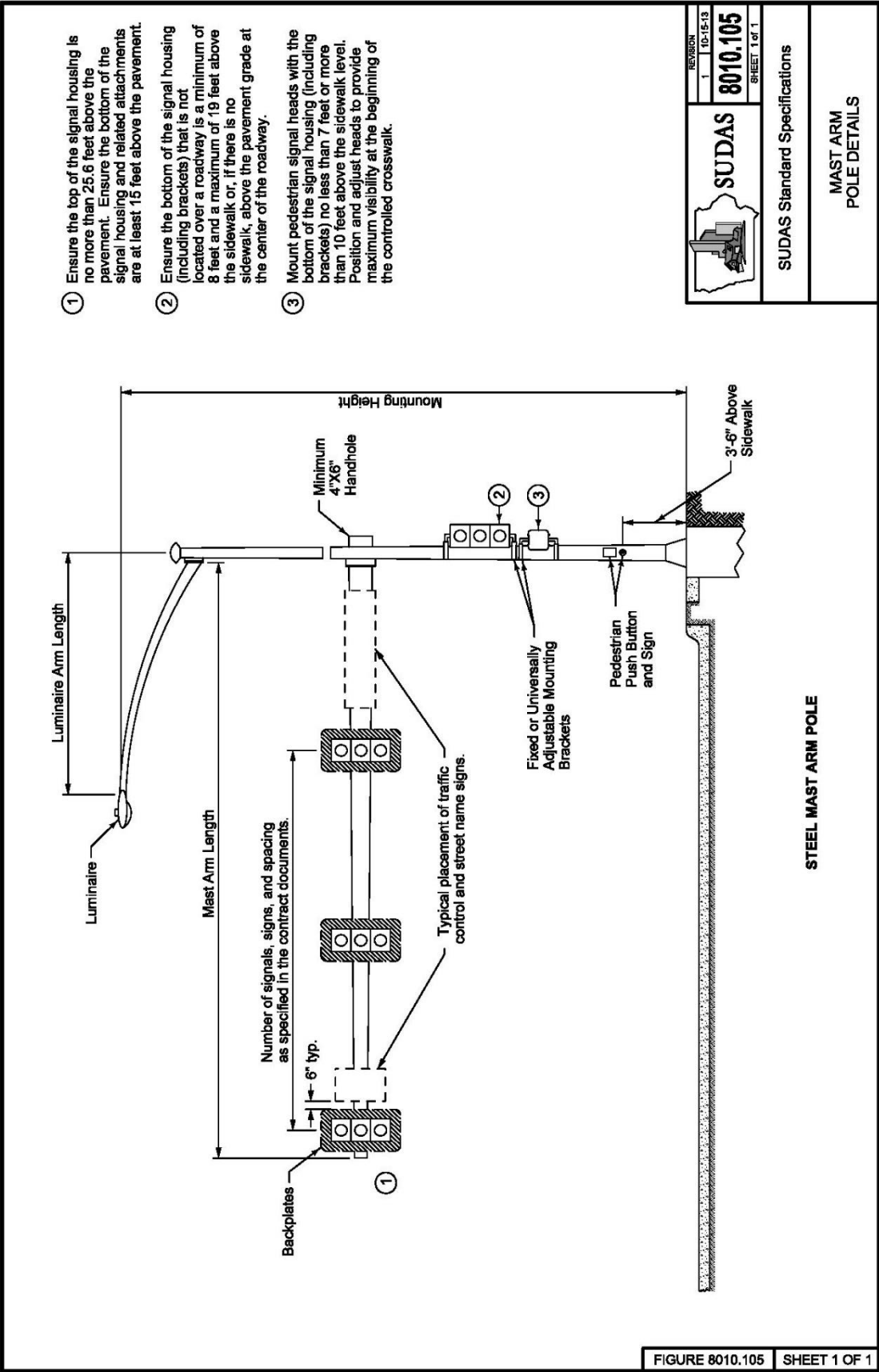


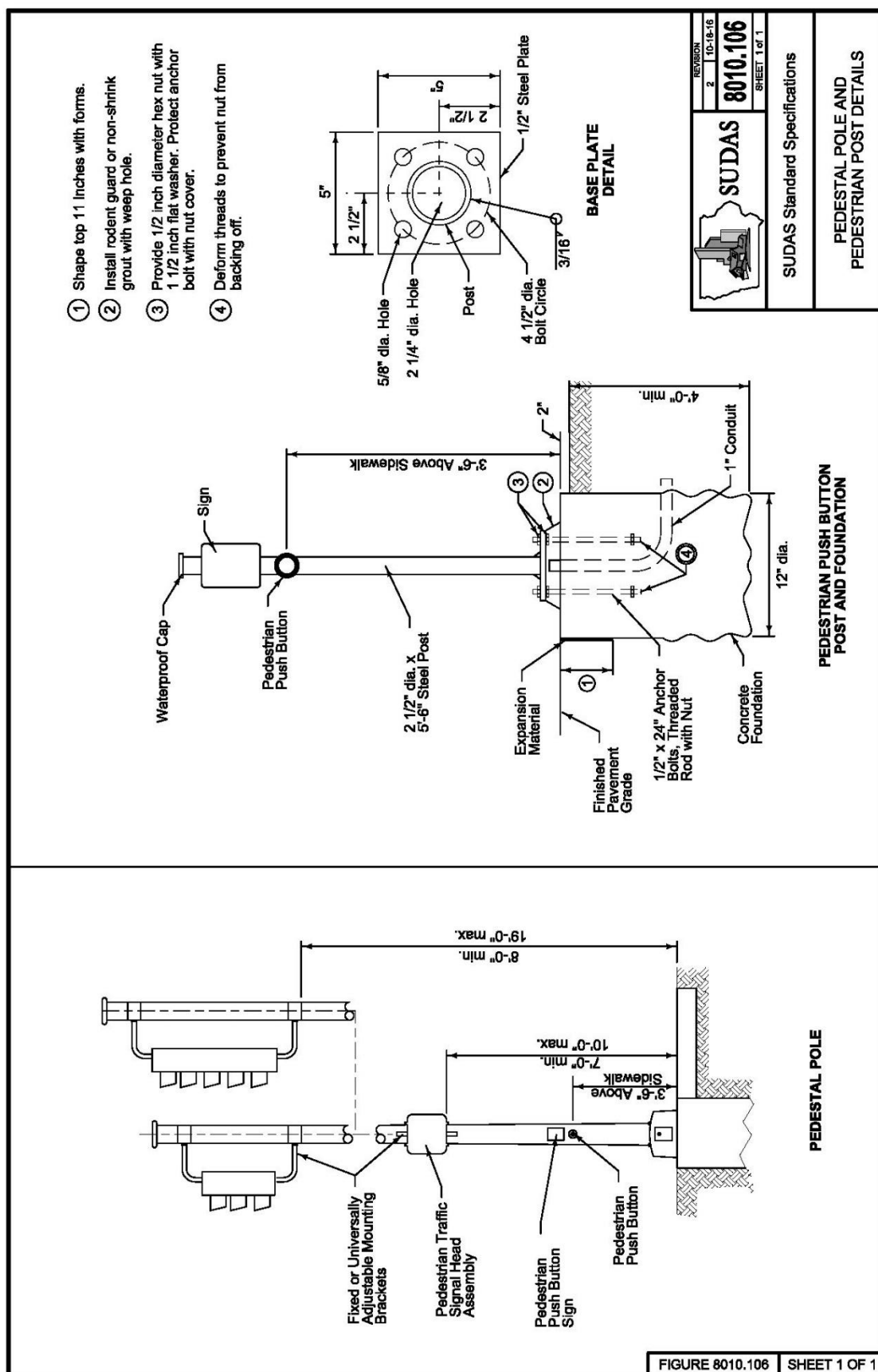


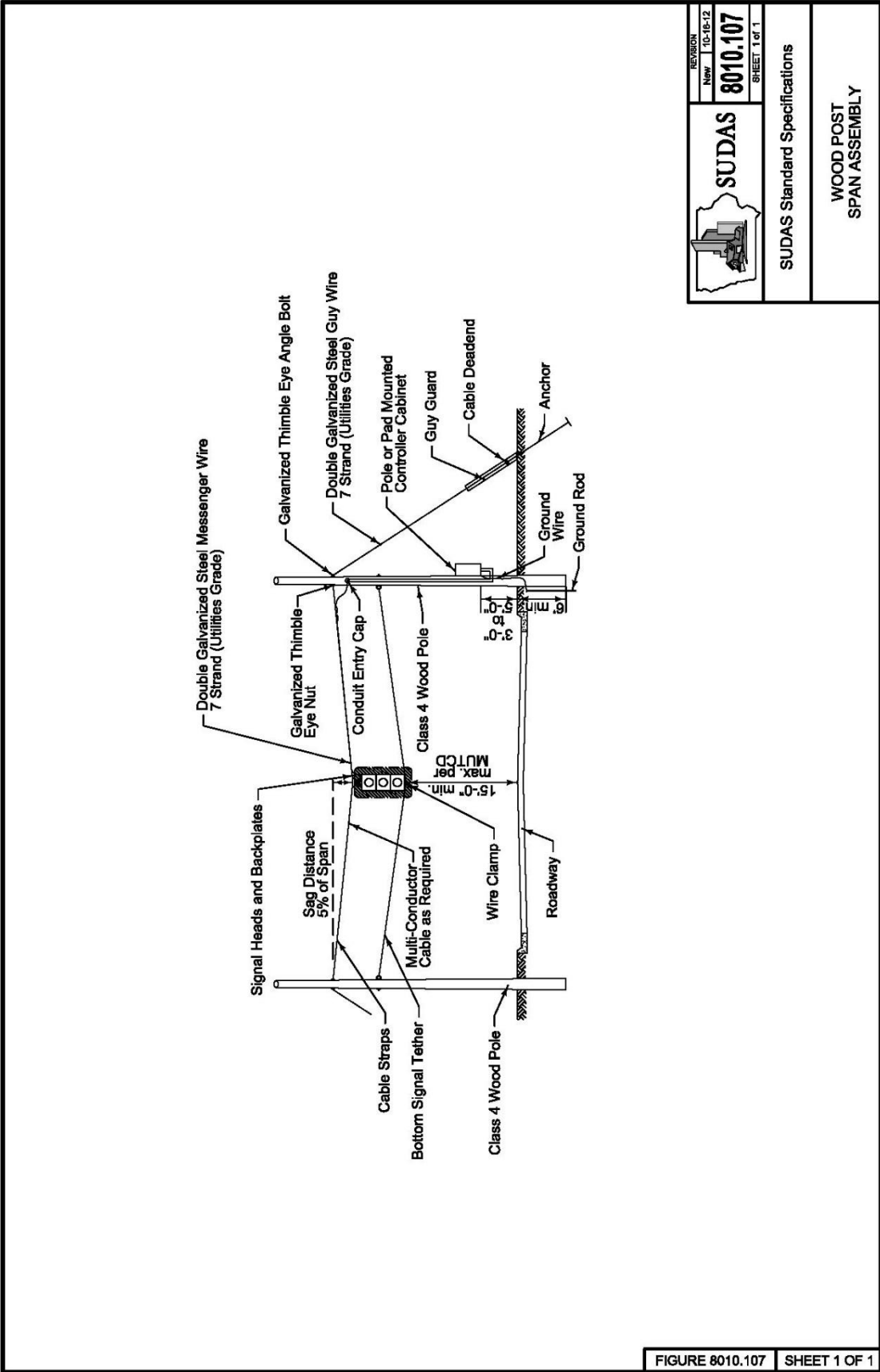












SECTION 8020 - PAVEMENT MARKINGS

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 Division 1 - General Provisions and Covenants, 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 Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT

A. General:

1. Painted, taped, or removed lines will be measured in stations based upon a single 4 inch width.
2. The length of each type of marking will be as specified in the contract documents and will consider measured field adjustments.
3. The measurement for dashed and dotted lines will be adjusted to exclude the skips.
4. Measured lengths of lines wider than 4 inches will be multiplied by a width factor as follows:
5. Width Factor = Actual Width / 4 inches

B. Painted Pavement Markings, Solvent/Waterborne:

1. **Measurement:** Each type of painted pavement marking will be measured in stations.
2. **Payment:** Payment will be made at the unit price for each type of painted pavement marking.
3. **Includes:** Unit price includes, but is not limited to, reflectorizing spheres, layout, surface preparation, and application of marking paint.

C. Painted Pavement Markings, Durable:

1. **Measurement:** Each type of painted pavement markings will be measured in stations.
2. **Payment:** Payment will be made at the unit price for each type of painted pavement marking.
3. **Includes:** Unit price includes, but is not limited to, layout, surface preparation, and application of marking paint.

D. Painted Pavement Markings, High-Build:

1. **Measurement:** Each type of painted pavement markings will be measured in stations.
 2. **Payment:** Payment will be made at the unit price for each type of painted pavement marking.
 3. **Includes:** Unit price includes, but is not limited to, layout, surface preparation, and application of marking paint.
- E. Permanent Tape Markings:
1. **Measurement:** Each type of marking tape will be measured in stations.
 2. **Payment:** Payment will be made at the unit price for each type of tape marking.
 3. **Includes:** Unit price includes, but is not limited to, layout, surface preparation, and application of marking tape.
- F. Wet, Retroreflective Removable Tape Markings:
1. **Measurement:** Wet, retroreflective removable tape markings will be measured in stations.
 2. **Payment:** Payment will be made at the unit price per station for wet, retroreflective removable tape markings.
 3. **Includes:** Unit price includes, but is not limited to layout, surface preparation, application, and removal.
- G. Painted Symbols and Legends:
1. **Measurement:** Each type of painted symbol and legend will be counted.
 2. **Payment:** Payment will be made at the unit price for each painted symbol and legend.
 3. **Includes:** Unit price includes, but is not limited to, layout, surface preparation, and application of each symbol and legend.
- H. Precut Symbols and Legends:
1. **Measurement:** Each type of precut symbol and legend will be counted.
 2. **Payment:** Payment will be made at the unit price for each precut symbol and legend.
 3. **Includes:** Unit price includes, but is not limited to, layout, surface preparation, and application of each symbol and legend.
- I. Temporary Delineators:
1. **Measurement:** Each temporary delineator installed and removed will be counted.
 2. **Payment:** Payment will be made at the unit price for each delineator.
 3. **Includes:** Unit price includes, but is not limited to, installation and removal of delineators.

J. Raised Pavement Markers:

1. **Measurement:** Each raised pavement marker installed and removed will be counted.
2. **Payment:** Payment will be made at the unit price for each marker.
3. **Includes:** Unit price includes, but is not limited to, installation and removal of pavement markers.

K. Pavement Markings Removed:

1. **Measurement:** Pavement markings removed will be measured in stations. Removable marking tape or markings obliterated during construction will not be measured.
2. **Payment:** Payment will be made at the unit price for pavement markings removed.
3. **Includes:** Unit price includes, but is not limited to, pavement marking removal and waste material collection, removal, and disposal.

L. Symbols and Legends Removed:

1. **Measurement:** Each symbols or legends removed will be counted.
2. **Payment:** Payment will be made at the unit price for each symbol or legend removed.
3. **Includes:** Unit price includes, but is not limited to, symbol and legend marking removal and waste material collection, removal, and disposal.

M. Grooves Cut for Pavement Markings:

1. **Measurement:** Measurement will be in stations and will be equivalent to the quantity of pavement markings associated with the grooving.
2. **Payment:** Payment will be made at the unit price per station.
3. **Includes:** Unit price includes, but is not limited to, layout, cutting grooves, collection and disposal of removed material, and additional groove width and transition length beyond the pavement marking dimensions.

N. Grooves Cut for Symbols and Legends:

1. **Measurement:** Each symbol or legend groove will be counted.
2. **Payment:** Payment will be made at the unit price for each symbol or legend groove.
3. **Includes:** Unit price includes, but is not limited to, layout, cutting grooves, and collection and disposal of removed material.

PART 2 - PRODUCTS**2.01 MATERIALS**

- A. Provide pavement marking materials that comply with Iowa DOT Section 2527.

- 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
 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.
 7. Capable of adjusting marking spacing's with City standard marking spacing's. Coordinate with Public Works Street Superintendent.
- 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 $\pm 1/4$ inch for 4 inch lines and $\pm 1/2$ 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 contaminants 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	3 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	0 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 or legend in a rectangular shape so no directionality may be observed from the removed symbol or legend.
 - 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 contaminants 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 with Rohm & Haas XSR Resin	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

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SECTION 8030 - TEMPORARY TRAFFIC CONTROL

PART 1 -GENERAL

1.01 SECTION INCLUDES

- A. Temporary Traffic Control Devices
- B. Installation
- C. Maintenance
- D. Quality Control

1.02 DESCRIPTION OF WORK

This part of the specifications includes materials, equipment, and procedures for traffic control during construction. Furnish, erect, operate, maintain, move, and remove all traffic control devices required. Comply with the current edition of the MUTCD as adopted by the Iowa DOT.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants, as well as the following:

- A. Submit a traffic control plan for review and approval prior to installation.
- B. Submit proposed modifications to the traffic control plan for review and approval prior to making changes.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, HANDLING, AND SALVAGING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

- A. When a bid item for Temporary Traffic Control is included on the proposal form, comply with this section for measurement and payment
- B. When the proposal form does not include a bid item for temporary traffic control, all costs incurred by the contractor for temporary traffic control are incidental to other work and will not be paid for separately.
- C. Provide 10 calendar days advance notification of a pedestrian path closure to the Engineer and the National Federation of the Blind of Iowa (www.nfbi.org).

1.08 MEASUREMENT AND PAYMENT

L. Temporary Traffic Control:

- 1. **Measurement:** Lump sum item; no measurement will be made.

2. **Payment:** Payment will be at the lump sum price for temporary traffic control. Proportional payments will be made equal to the percentage of the dollar amount paid on the original contract amount.
3. **Includes:** Lump sum price includes, but is not limited to, installation, maintenance, and removal of temporary traffic control; total roadway closures with installation and removal of detour signing as shown in the contract documents; removal and reinstallation or covering of permanent traffic control devices that conflict with the temporary traffic control plan; monitoring and documenting traffic control conditions; and flaggers. When required in the contract documents, the following are also included in traffic control unless a separate bid item is provided: portable dynamic message signs, temporary barrier rail, temporary flood lighting, and pilot cars.

PART 2 - PRODUCTS

2.01 GENERAL

Use products and materials complying with Part 6 of the MUTCD.

2.02 SIGNS

- A. **Material:** Sheet aluminum, galvanized steel, plywood, or flexible roll-up material complying with Iowa DOT Article 4186.02.
- B. **Size and Type:**
 1. **Regulatory Signs:** As indicated in the contract documents or recommended in the MUTCD.
 2. **Sidewalk Signs:** Minimum size 12 inch by 24 inch.
 3. **Warning Signs:** Comply with Table 8030.01.

Table 8030.01: Warning Signs

Speed Limit (mph)	Minimum Sign Size	Minimum Uppercase Letter Size	Minimum Plaque Size
< 25	30" x 30"	4"	18" x 18"
25 - 35	36" x 36"	5"	18" x 24"
>35	48" x 48"	7"	24" x 30"

- C. **Retroreflective Sheeting:** Comply with Iowa DOT Article 4186.03.
- D. **Posts:**
 1. **Wood Posts:** Comply with Iowa DOT Section 4164.
 2. **U-Shaped Rail Steel Posts:** 3.0 pounds per foot.
 3. **Perforated Square Steel Tube Posts:** 2 1/4 or 2 1/2 inch square 12 gage perforated steel tubing.

- E. **Portable Sign Stands:** Crashworthy per the test and evaluation criteria of NCHRP Report 350 or Manual on Assessing Safety Hardware (MASH). Must be stable in windy conditions.

2.03 CHANNELIZING DEVICES

Channelizing devices include cones, channelizers, tubular markers, vertical panels, drums, and barricades.

- A. **Retroreflective Sheeting:** Comply with Iowa DOT Article 4186.03.
- B. **Cones:** Minimum height of 18 inches for daytime and speed less than or equal to 35 mph. Minimum height of 28 inches with retroreflective bands for nighttime or speed greater than 35 mph.
- C. **Channelizers:** 42 inch height with retroreflective bands and 16 pound base.
- D. **Tubular Markers:** Minimum diameter 2 inches with retroreflective bands. Minimum height 18 inches for daytime and speed less than or equal to 35 mph. Minimum height 28 inches for nighttime or speed greater than 35 mph.
- E. **Vertical Panels:** Minimum height 36 inches with 8 to 12 inch panel width and 24 inch minimum panel height.
- F. **Drums:** Minimum width 18 inches. Minimum height 36 inches.
- G. **Barricades:** Minimum rail length 2 feet for Type I or Type II barricades. Minimum rail length 4 feet for Type III barricades. Minimum height of top rail for Type I and Type II equals 3 feet and minimum height to top rail of a Type III is 5 feet.

2.04 MISCELLANEOUS PRODUCTS

- A. **Orange Mesh Safety Fence:** Comply with Iowa DOT Article 4188.03.
- B. **Temporary Barrier Rail:** Unless otherwise specified, use precast concrete units. Comply with Iowa DOT Standard Road Plan BA-401.

2.05 EQUIPMENT

- A. **Warning Lights:**
 - 1. For nighttime installation, provide Type A warning lights visible to both directions of traffic.
 - 2. For 24 hour installations, provide Type B warning lights.
- B. **Arrow Boards:** When required, provide Type A, B, or C arrow boards operating in sequential chevron mode.
- C. **Portable Dynamic Message Signs:** Comply with Iowa DOT Article 4188.07.
- D. **Pilot Cars:** Pickup trucks or automobiles with G20-4 signs reading: PILOT CAR - FOLLOW ME. Mount two signs on each vehicle, visible from both directions of traffic. Mount signs with bottom of signs at least 1 foot above the top of the vehicle's roof.
- E. **Vehicle Warning Lights:** Supply amber, high-intensity rotating, flashing, oscillating, or strobe light.

2.06 FLAGGERS

- A. **General:** Comply with the current Iowa DOT Flagger's Handbook for flagger operations, equipment, and apparel.
- B. **Lighting:** Provide auxiliary lighting at flagger stations when nighttime flagging is required.
- C. **Training:** For other than short time, emergency, or relief assignment of flaggers, provide flagger training to include the following:
 - 1. Issuing a copy of the current Iowa DOT Flagger's Handbook to and review by each flagger.
 - 2. Presentation of the current Iowa Professional Flagging Video to each flagger.
 - 3. Issuing a flagger training card to each flagger, to be carried at all times and shown upon request. Include the following information on training card:
 - a. Employee name
 - b. Date of training
 - c. Name of instructor
 - d. Expiration date of December 31 of the year following the training date

PART 3 - EXECUTION

3.01 INSTALLATION

- A. **General:** Install temporary traffic control devices according to the Section 8030 figures and Part 6 of the MUTCD.
- B. **Sign Posts:** For durations more than 3 consecutive calendar days, mount the signs on fixed posts. For durations 3 consecutive calendar days or less, mount the signs on fixed posts or movable skids.
- C. **Temporary Barrier Rail:** Place at locations specified in the contract documents. Tie and anchor units as shown on Iowa DOT Standard Road Plan BA-401.
- D. **Sandbags:** Use sandbags to anchor all traffic control devices subject to movement by wind. Do not place sandbags on tops of barricades, drums, or vertical panels.
- E. **Conflicting Signs:** Cover or remove signs with messages conflicting with temporary traffic control as approved or directed by the Engineer.
- F. **Modifications:** Submit proposed traffic control plan modifications to the Engineer for review and approval prior to making changes.

3.02 MAINTENANCE

- A. **General:** Promptly repair, replace, reposition, or clean traffic control devices, as needed, or as directed by the Engineer.

- B. **Non-working Hours:** At the end of working hours, remove, cover, or turn down traffic control devices intended for working hours only.

3.03 QUALITY CONTROL

- A. **Traffic Control Technician:** Maintain a traffic control technician on staff, responsible for the Contractor's traffic control quality control program, that has attended and passed the exam in one of the following classes:
1. ATSSA Traffic Control Technician
 2. IMSA Work Zone Traffic Control
 3. Minnesota DOT Traffic Control Supervisor
 4. Texas Engineering Extension Service Work Zone Traffic Control
- B. **Monitoring and Documentation:** Provide 24 hour mobile phone number for the traffic control technician. On a daily basis, perform the following quality control work associated with monitoring and documenting traffic control conditions.
1. Review all traffic control operations for compliance with the contract documents.
 2. Monitor traffic operations and submit proposed traffic control plan changes to the Engineer for approval.
 3. Coordinate all changes to the traffic control plan.
 4. Coordinate all traffic control operations, including those of subcontractors and suppliers.
 5. Maintain a traffic control diary to be submitted at the end of the project or as requested by the Engineer, with the following information:
 - a. Listing and locating traffic control used each day, referenced to appropriate plan sheet or standard.
 - b. All reviews of traffic control devices and operations, whether satisfactory or unsatisfactory, and corrections made.
 - c. Approved changes to traffic control specified in the contract documents.
 - d. Incidentals affecting the efficiency and safety of traffic.
 - e. A list of trained flaggers used.

END OF SECTION

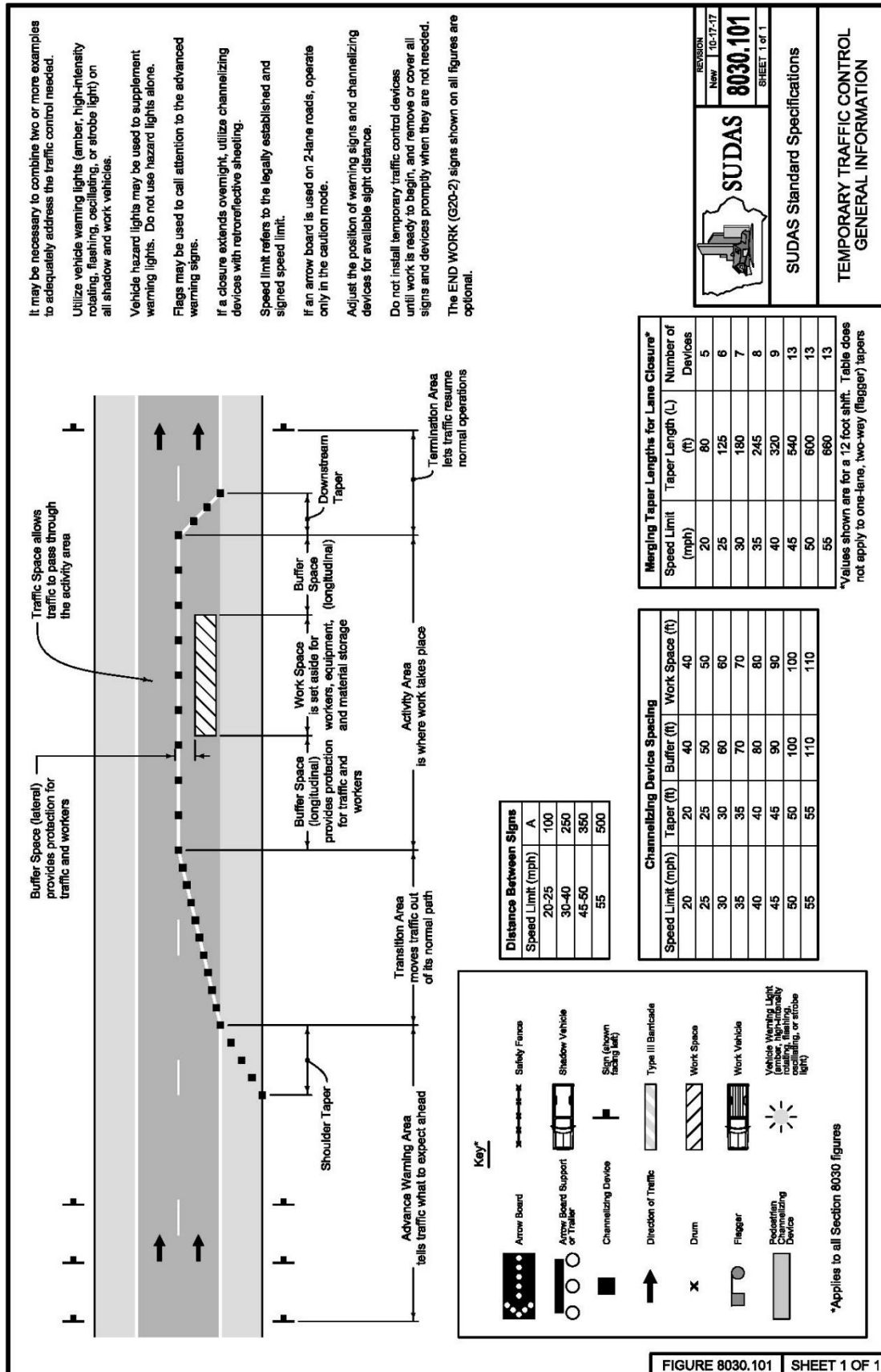


FIGURE 8030.101 SHEET 1 OF 1

Use only on minor, low speed (≤ 40 mph) streets.
Provide a lane closure for higher speed traffic conditions.

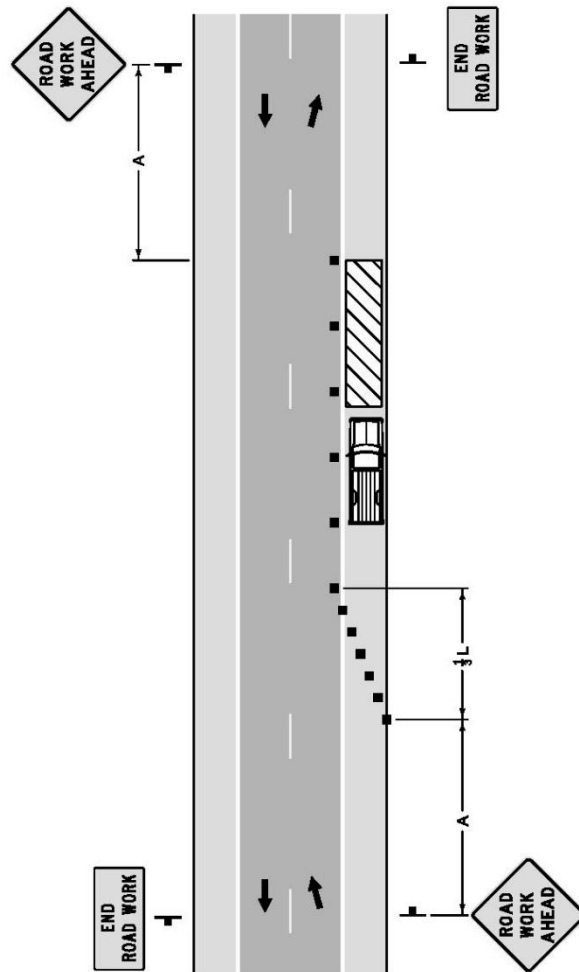
Maintain a minimum lane width of 10 feet as measured to the rear face of channelizing devices. For short-term use on low speed, low volume roads without wider heavy commercial vehicles, a minimum lane width of 9 feet may be used.

Where the opposite shoulder is suitable for carrying vehicular traffic, lanes may be shifted by using closely spaced channelizing devices provided the resulting lane widths are at least 10 feet wide.

Additional advanced warning may be appropriate, such as a ROAD NARROWS sign.

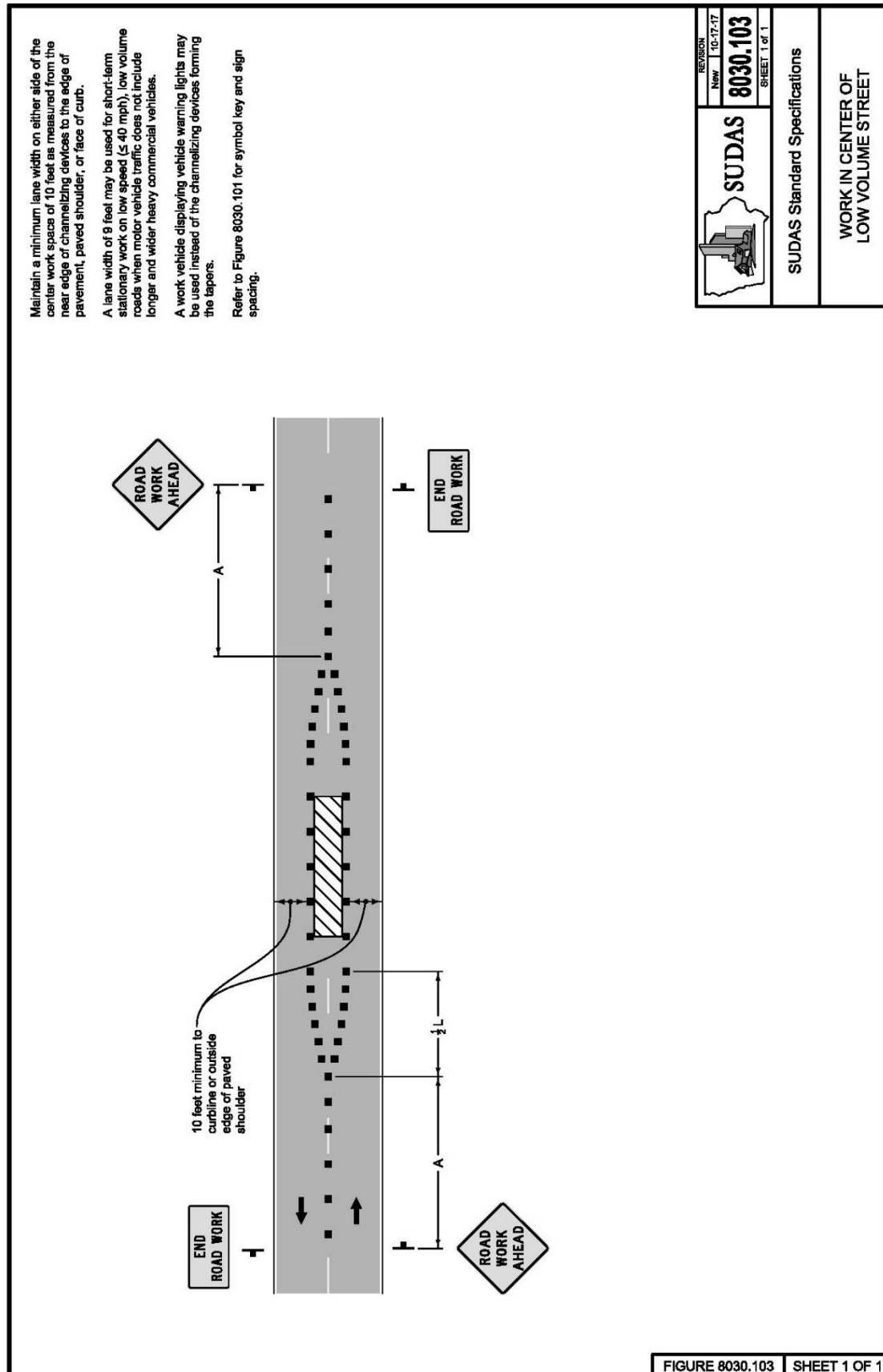
For short-term work, the taper and channelizing devices may be omitted if a shadow vehicle with activated vehicle warning lights is used.

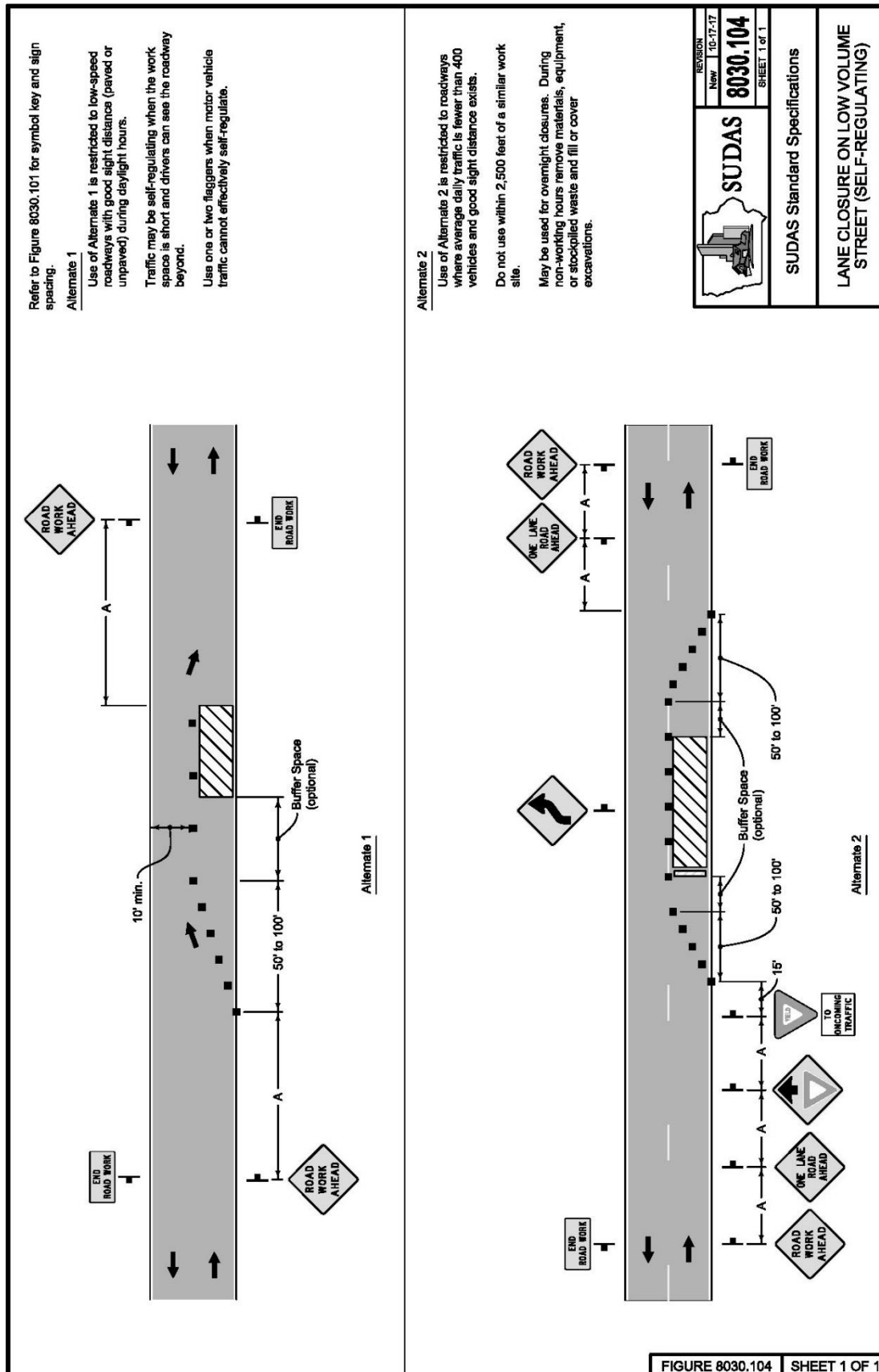
Refer to Figure 8030.101 for symbol key and sign spacing.

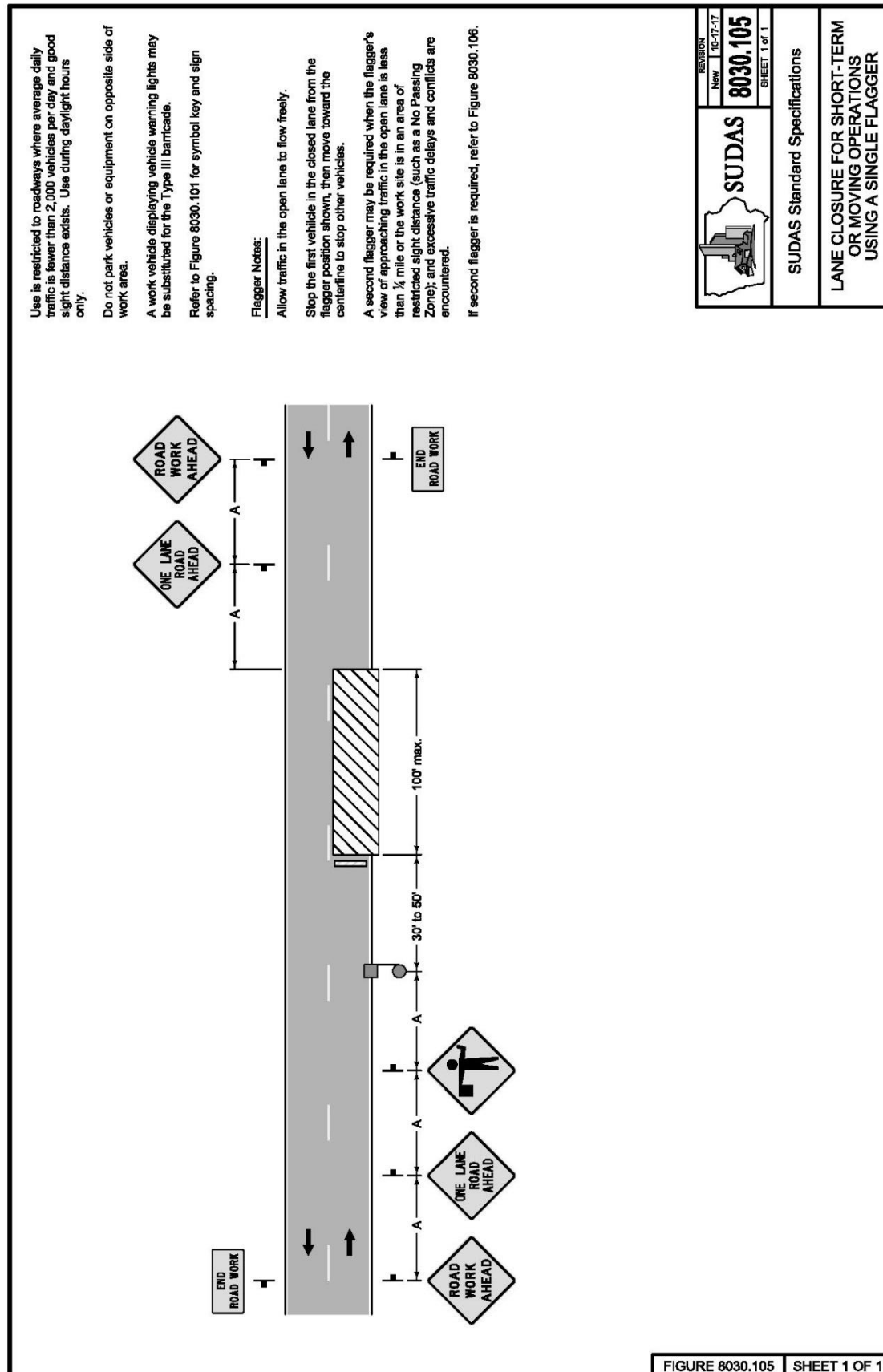


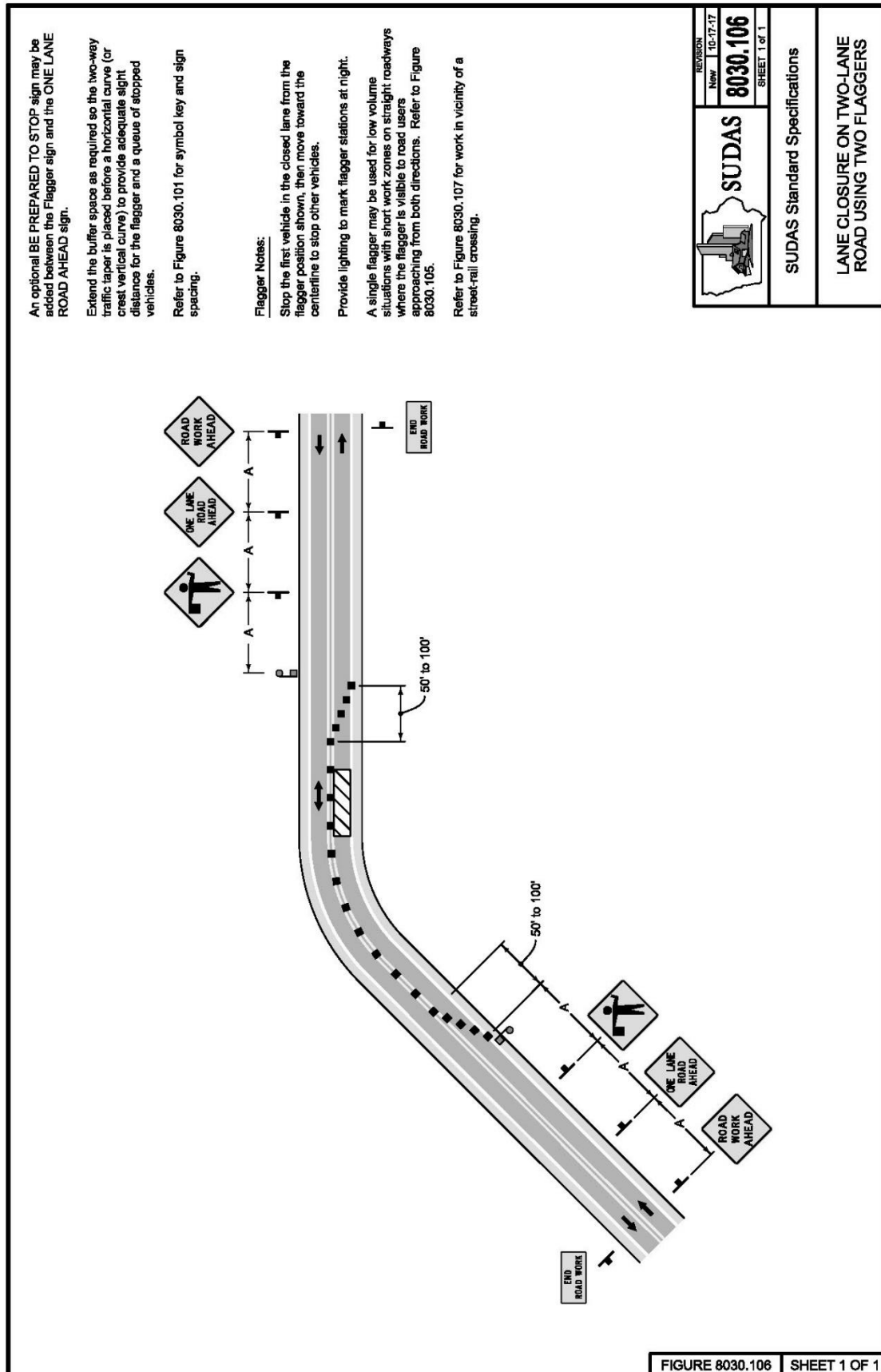
	REVISION
	NEW 10-17-17
8030.102	SHEET 1 of 1
SUDAS Standard Specifications	
WORK OFF OF PAVEMENT WITH MINOR ENCROACHMENT ONTO TRAVELED WAY	

FIGURE 8030.102 SHEET 1 OF 1

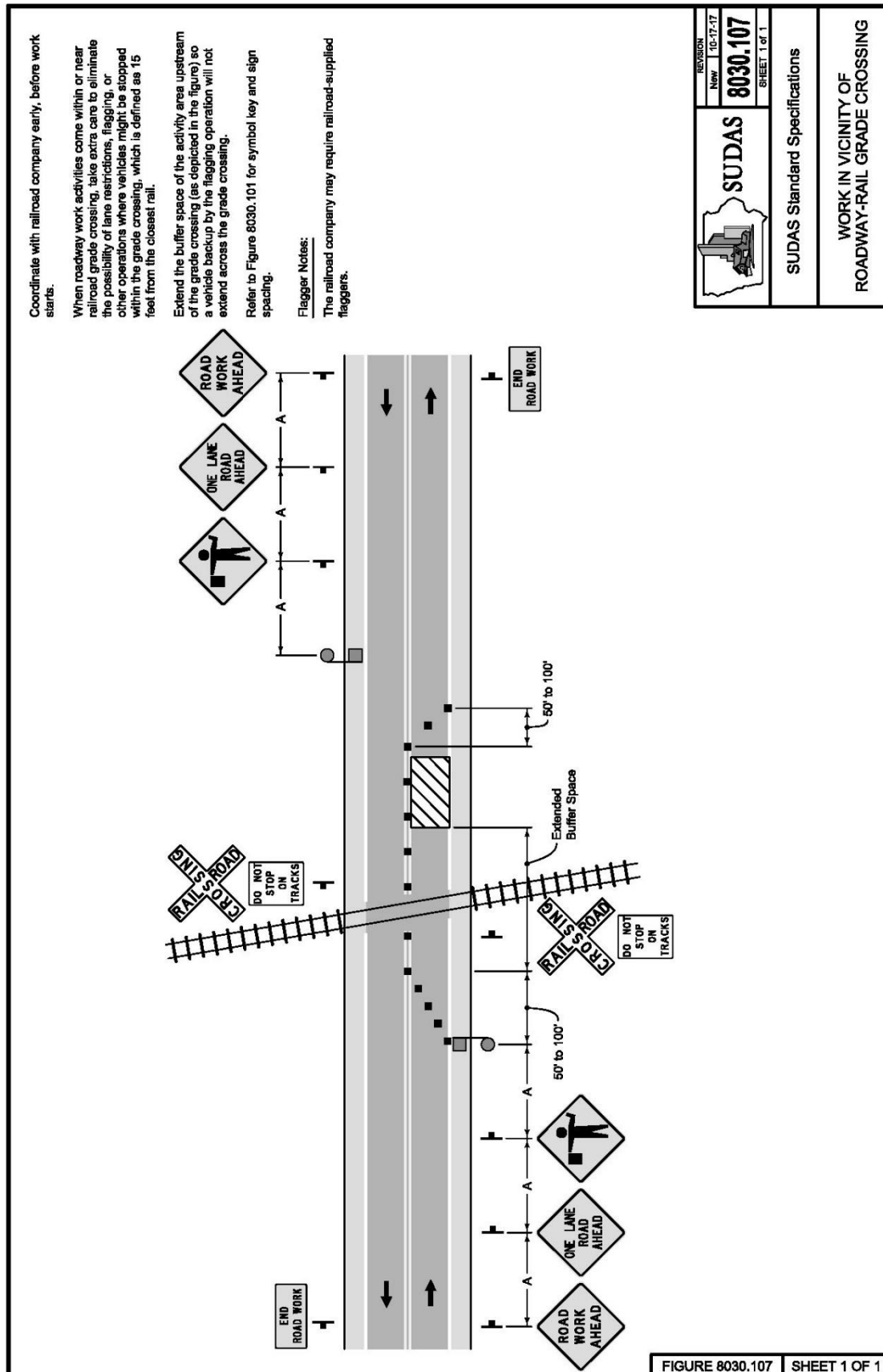








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	8030.106		
	SHEET 1 of 1		
	SUDAS Standard Specifications		
LANE CLOSURE ON TWO-LANE ROAD USING TWO FLAGGERS			

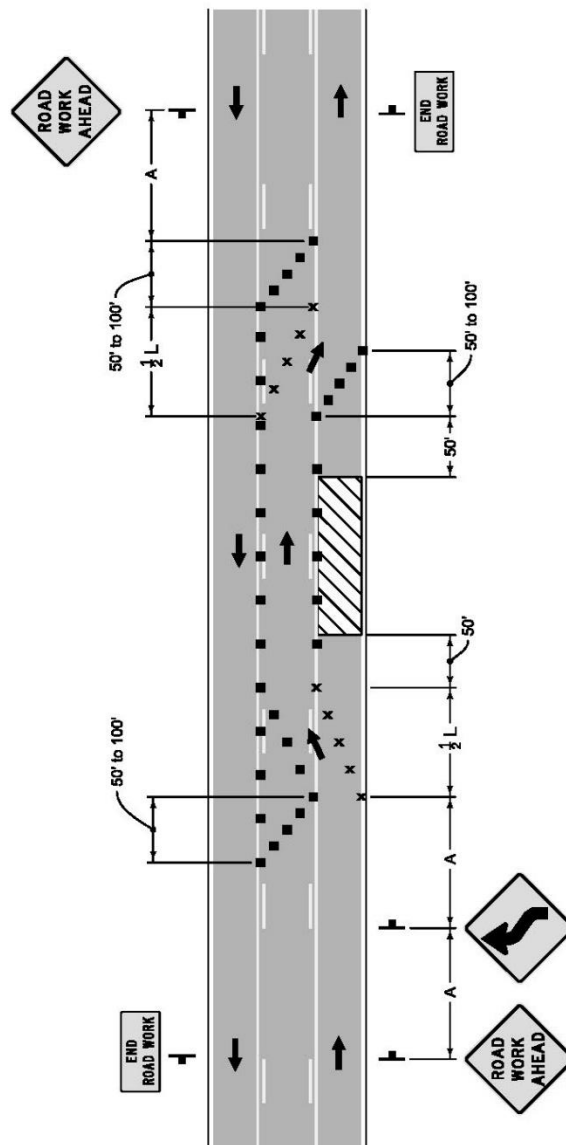


May be used for short-term daylight operations in urban areas on 3-lane street. Nighttime operations require additional traffic control and retroreflective sheeting.

Cones may be used as channelizing devices during daylight hours.

Flaggers and additional traffic control devices may be required for higher traffic volumes or commercial areas.

Refer to Figure 8030.101 for symbol key and sign spacing.



	REVISION	NEW	10-17-17
	8030.108		
SHEET 1 of 1			
SUDAS Standard Specifications			
TRAFFIC CONTROL FOR OUTSIDE LANE CLOSURE OF STREET WITH CONTINUOUS LEFT TURN LANE			

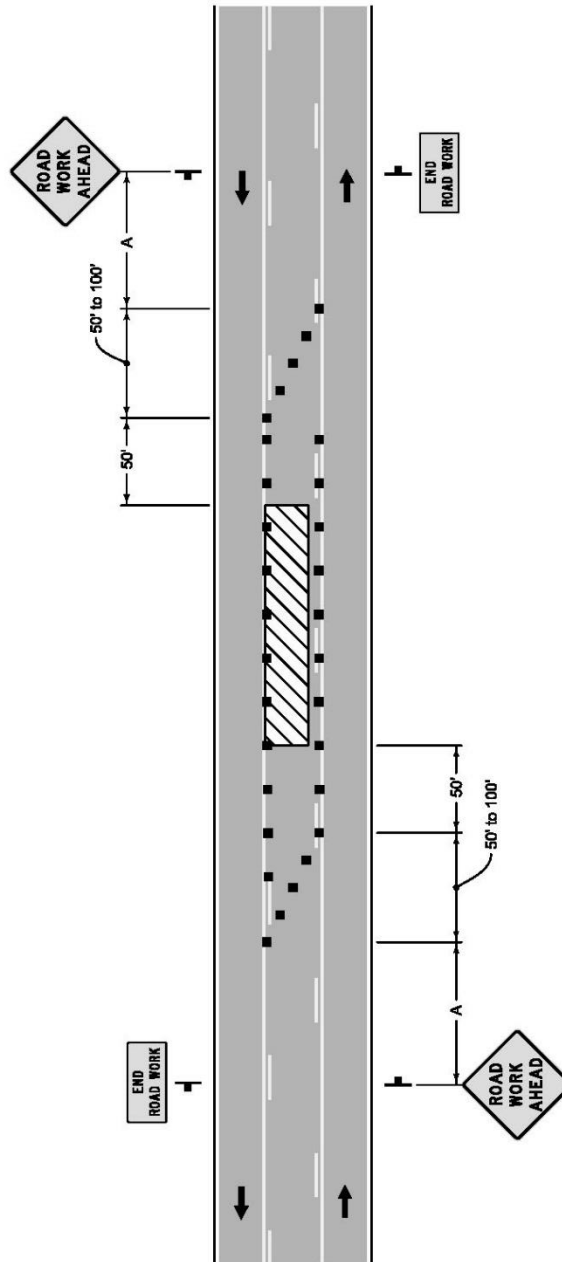
FIGURE 8030.108 SHEET 1 OF 1

May be used for short-term daylight operations in urban areas on 3-lane or 5-lane streets. Nighttime operations require additional traffic control and retroreflective sheeting.

Cones may be used as channelizing devices during daylight hours.

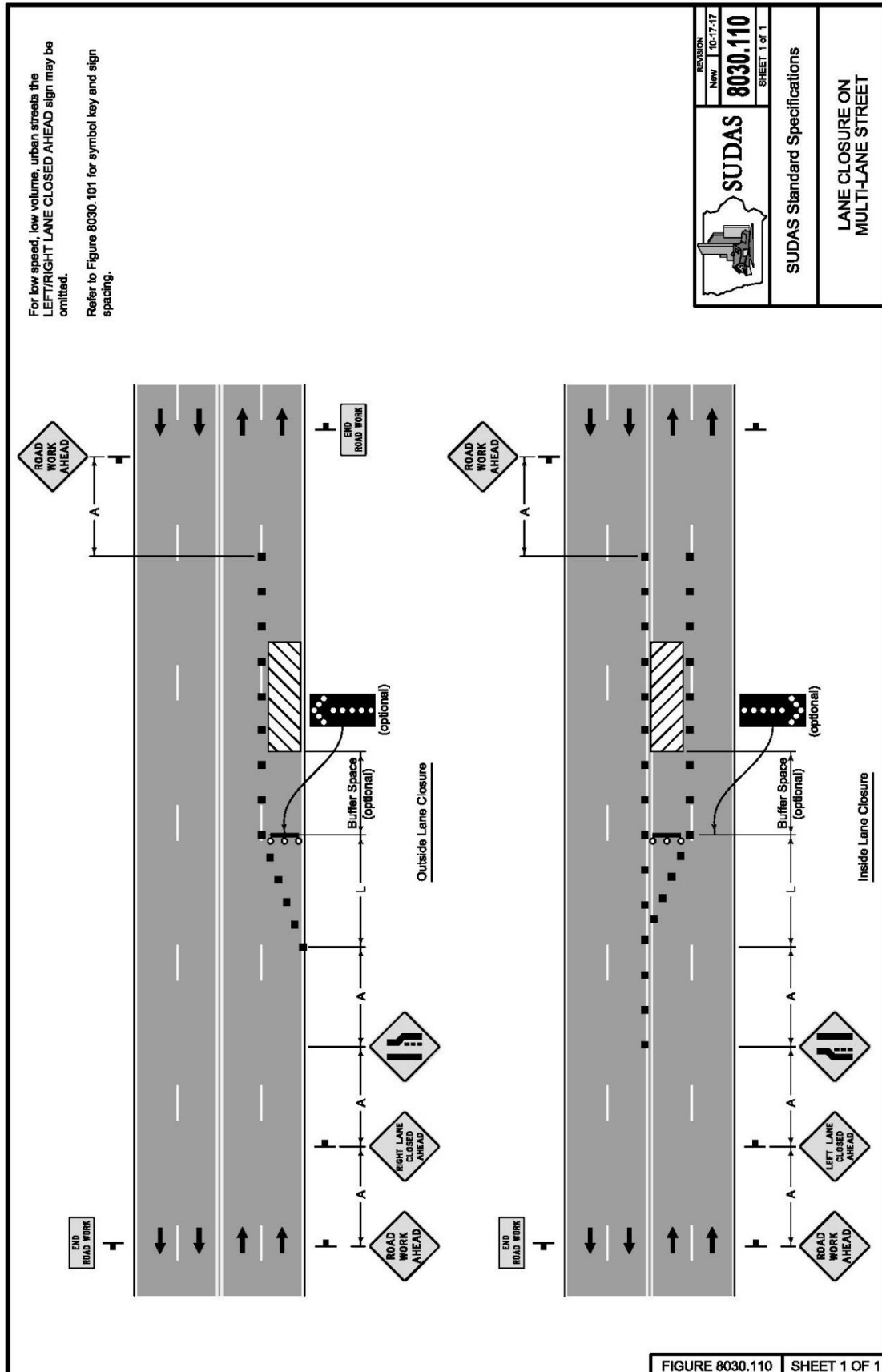
Flaggers and additional traffic control devices may be required for higher traffic volumes or commercial areas.

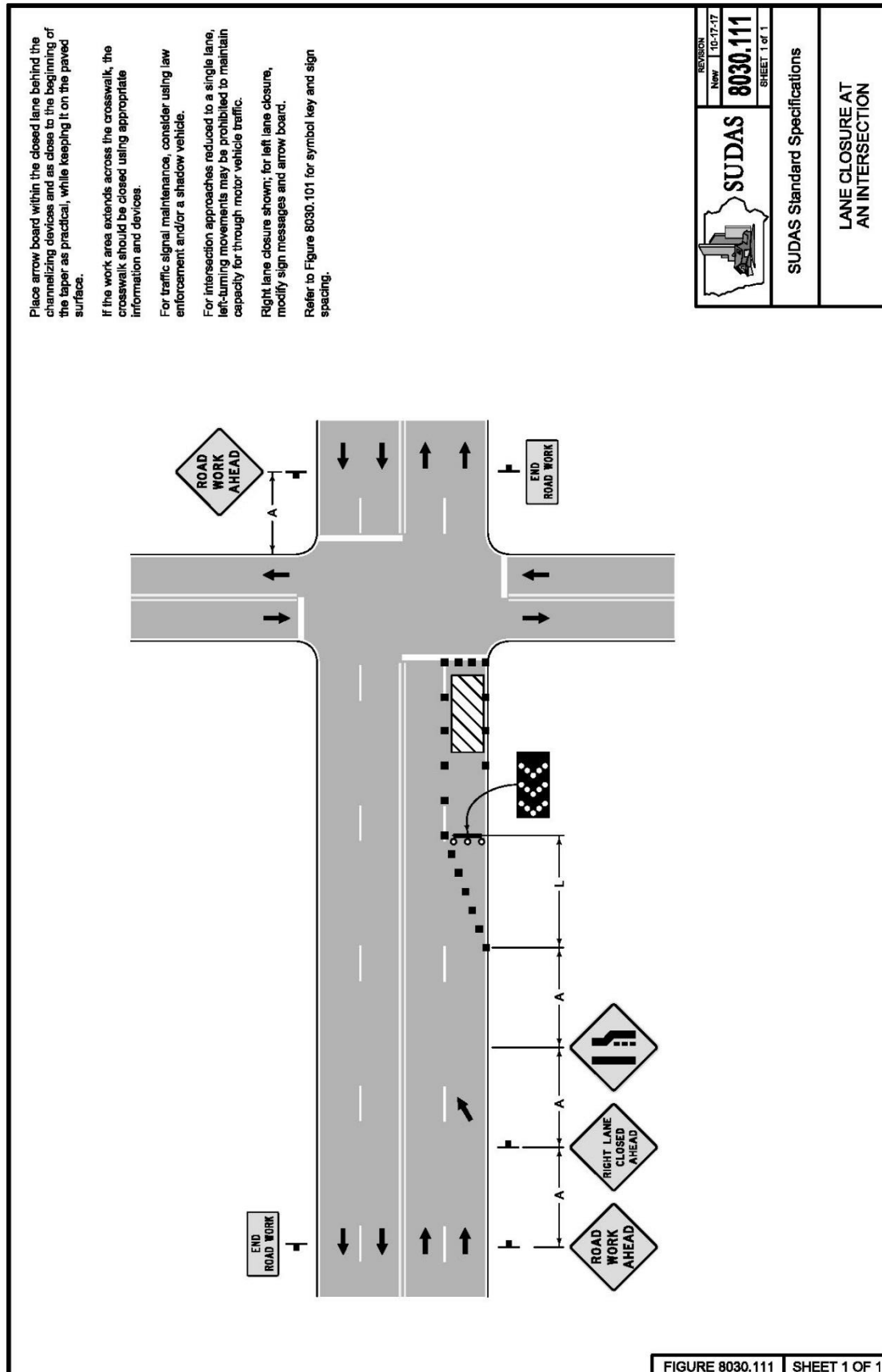
Refer to Figure 8030.101 for symbol key and sign spacing.

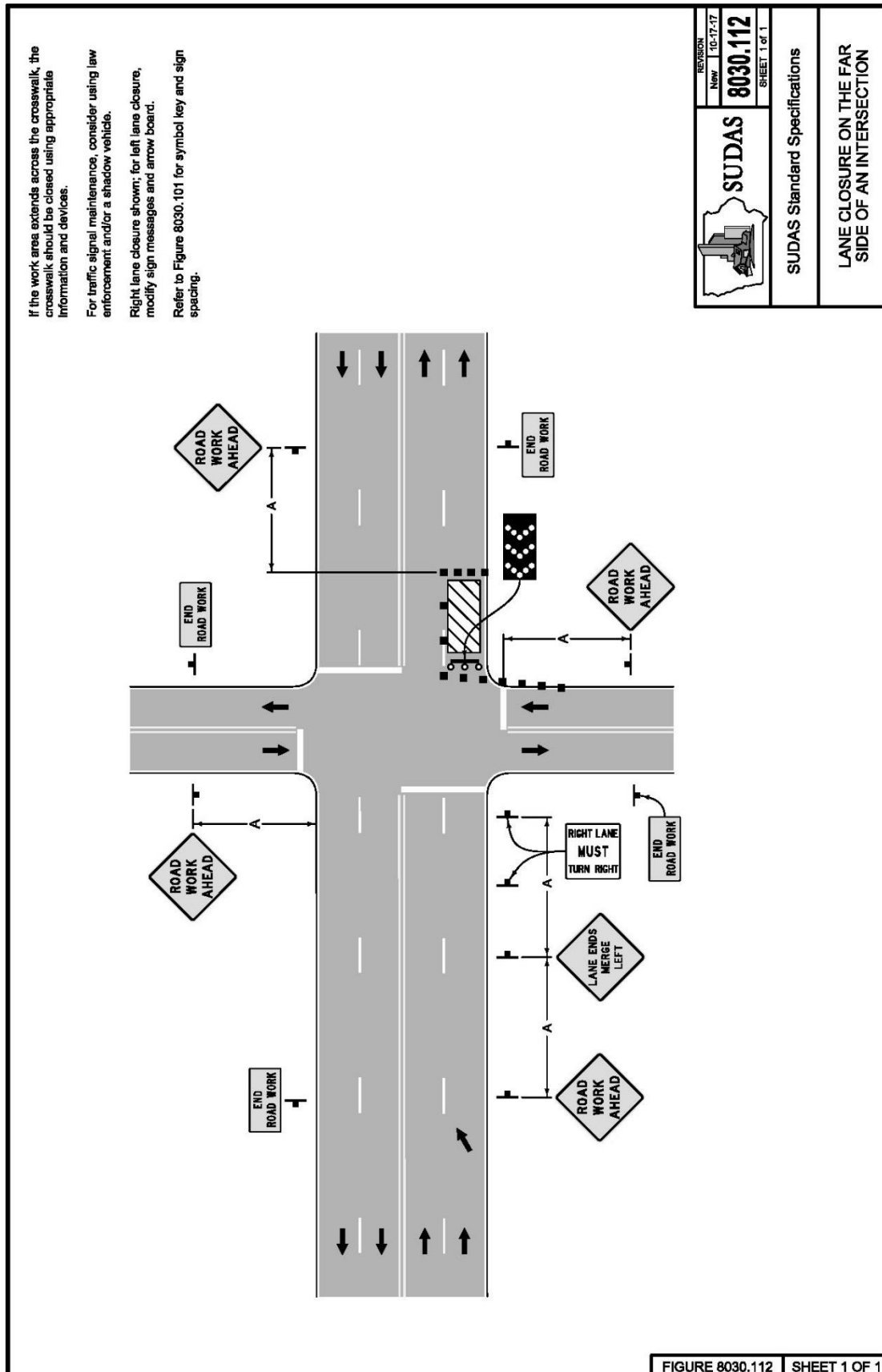


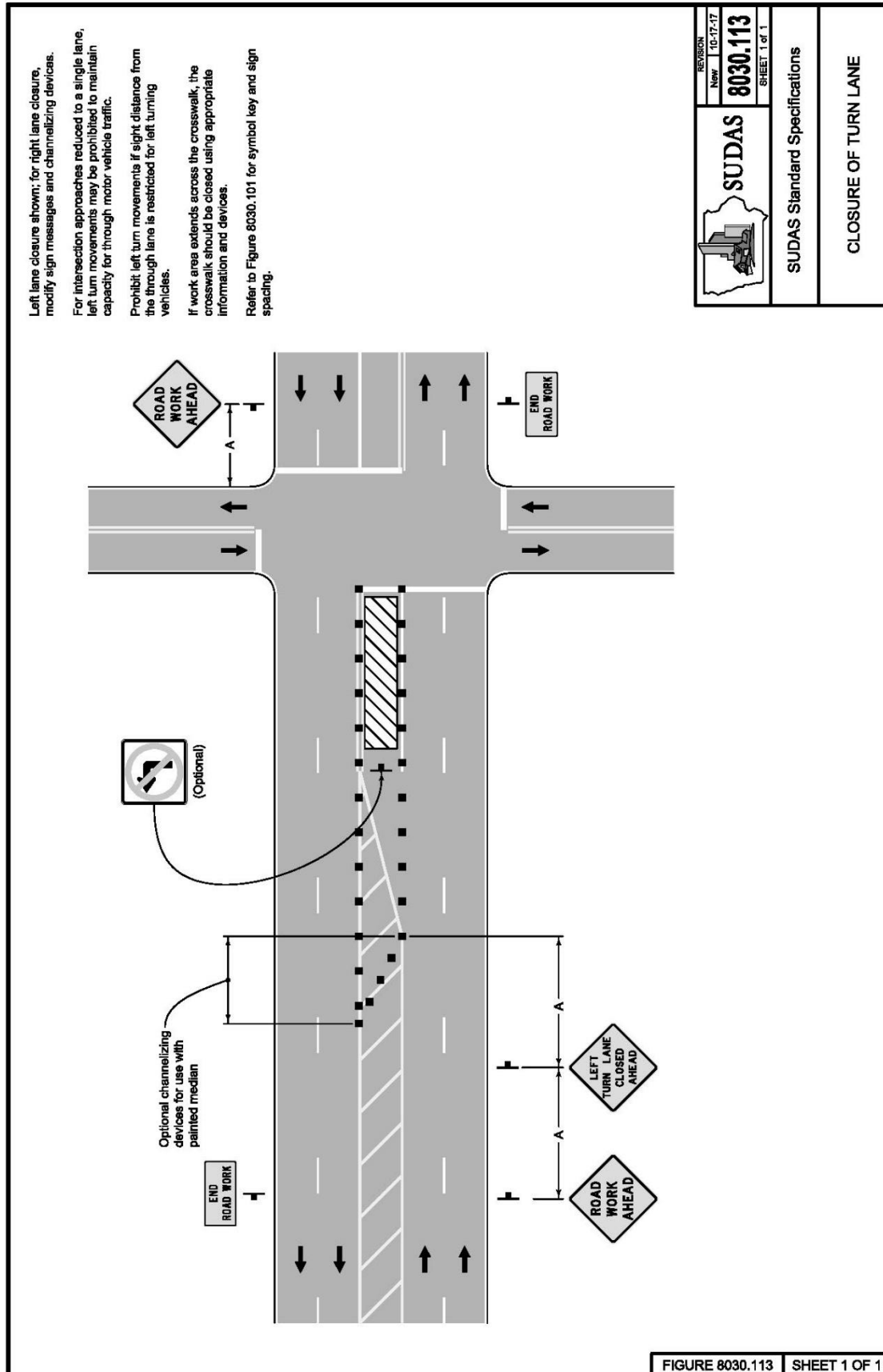
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	8030.109	
SHEET 1 of 1		
SUDAS Standard Specifications		
TRAFFIC CONTROL FOR CLOSURE OF CONTINUOUS LEFT TURN LANE		

FIGURE 8030.109 SHEET 1 OF 1







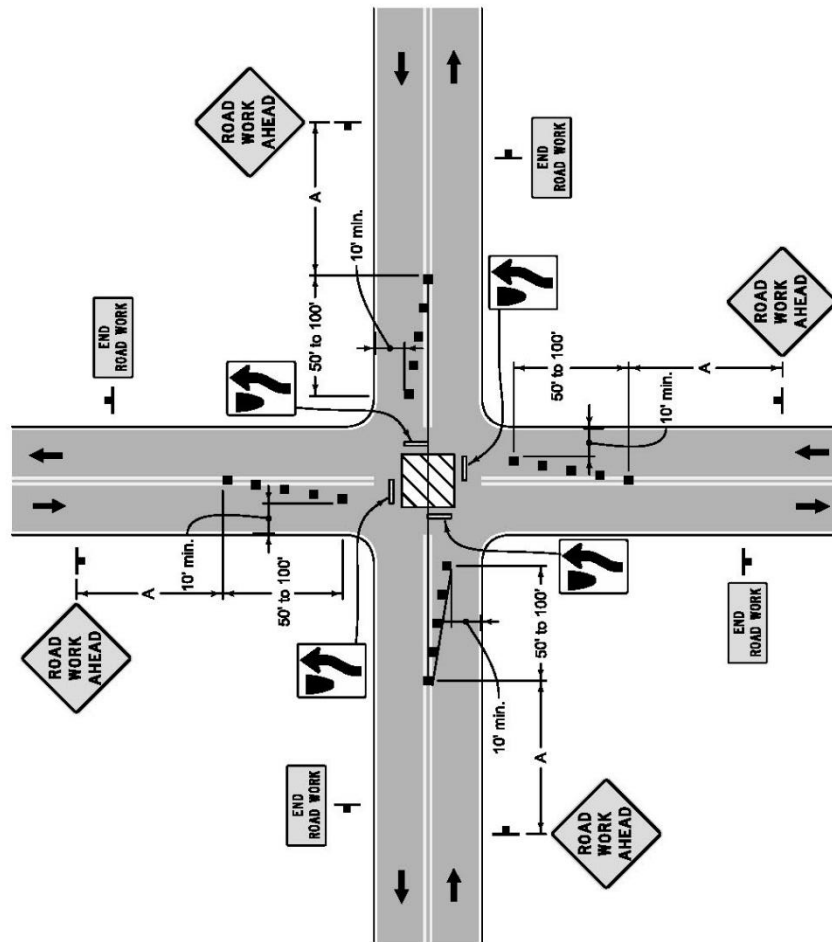


Maintain a minimum lane width of 10 feet as measured to the rear face of channelizing devices. For short-term use on low speed, low volume roads without wider heavy-commercial vehicles, a minimum lane width of 9 feet may be used.

Left turns may be prohibited as required by geometric and traffic conditions.

For short-duration work, the channelizing devices may be eliminated if a vehicle displaying vehicle warning lights is positioned in the work space. Arrow signs (W1-6) may be used to replace the KEEP RIGHT signs.

Refer to Figure 8030.101 for symbol key and sign spacing.



REVISION
New 10-17-17
8030.114

SHEET 1 of 1

SUDAS Standard Specifications

CLOSURE IN CENTER
OF INTERSECTION

FIGURE 8030.114 SHEET 1 OF 1

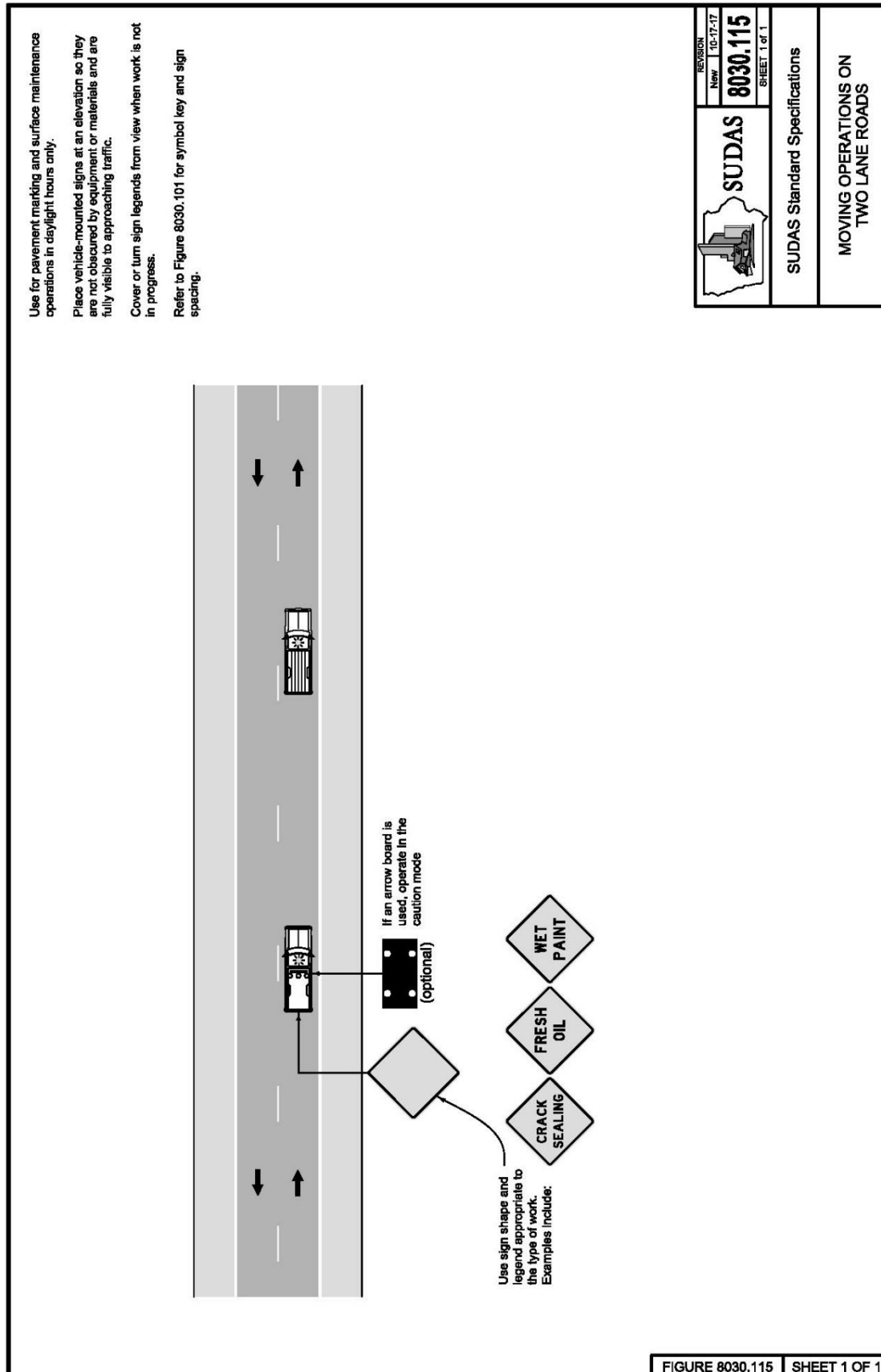
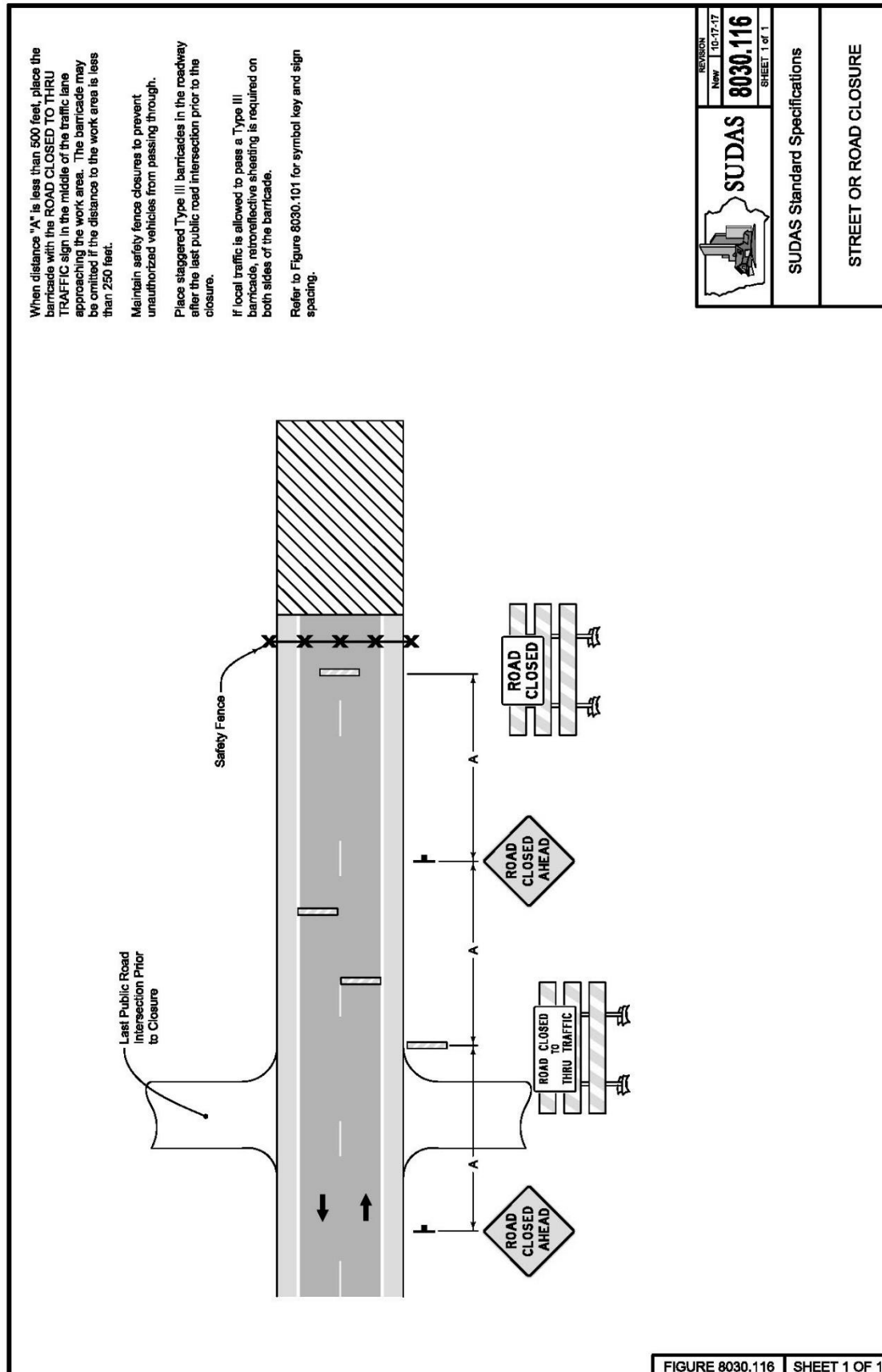
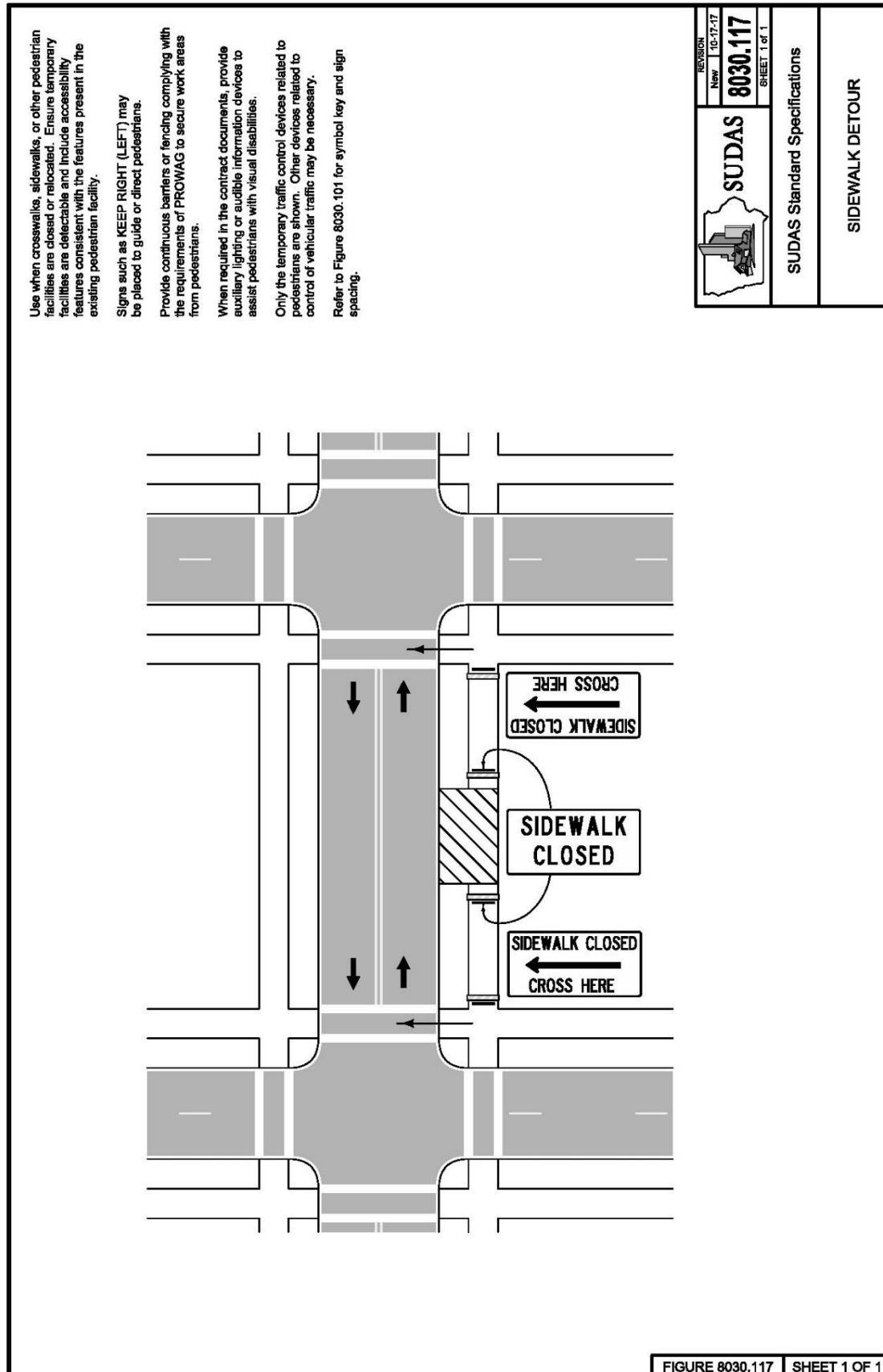
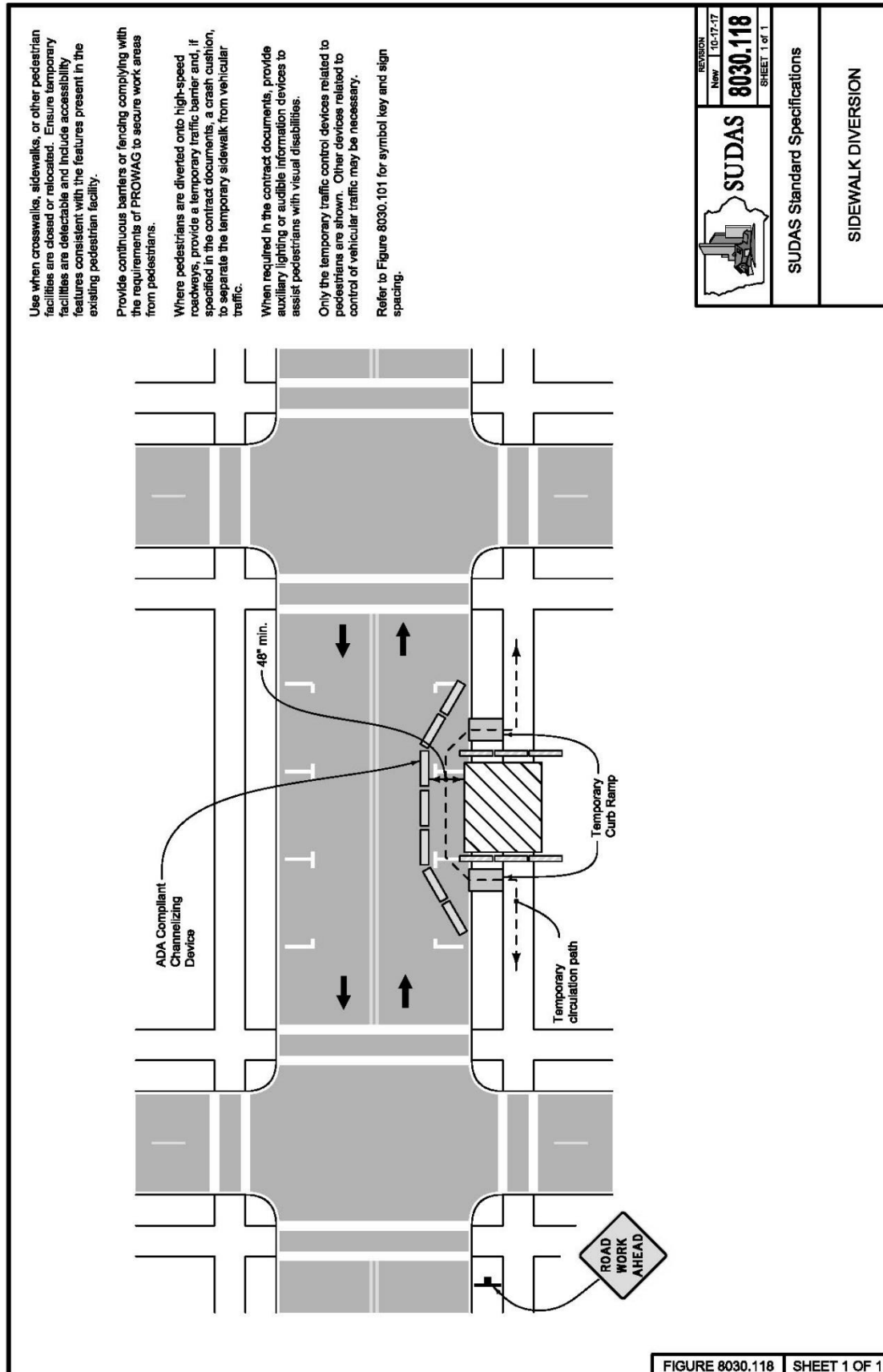
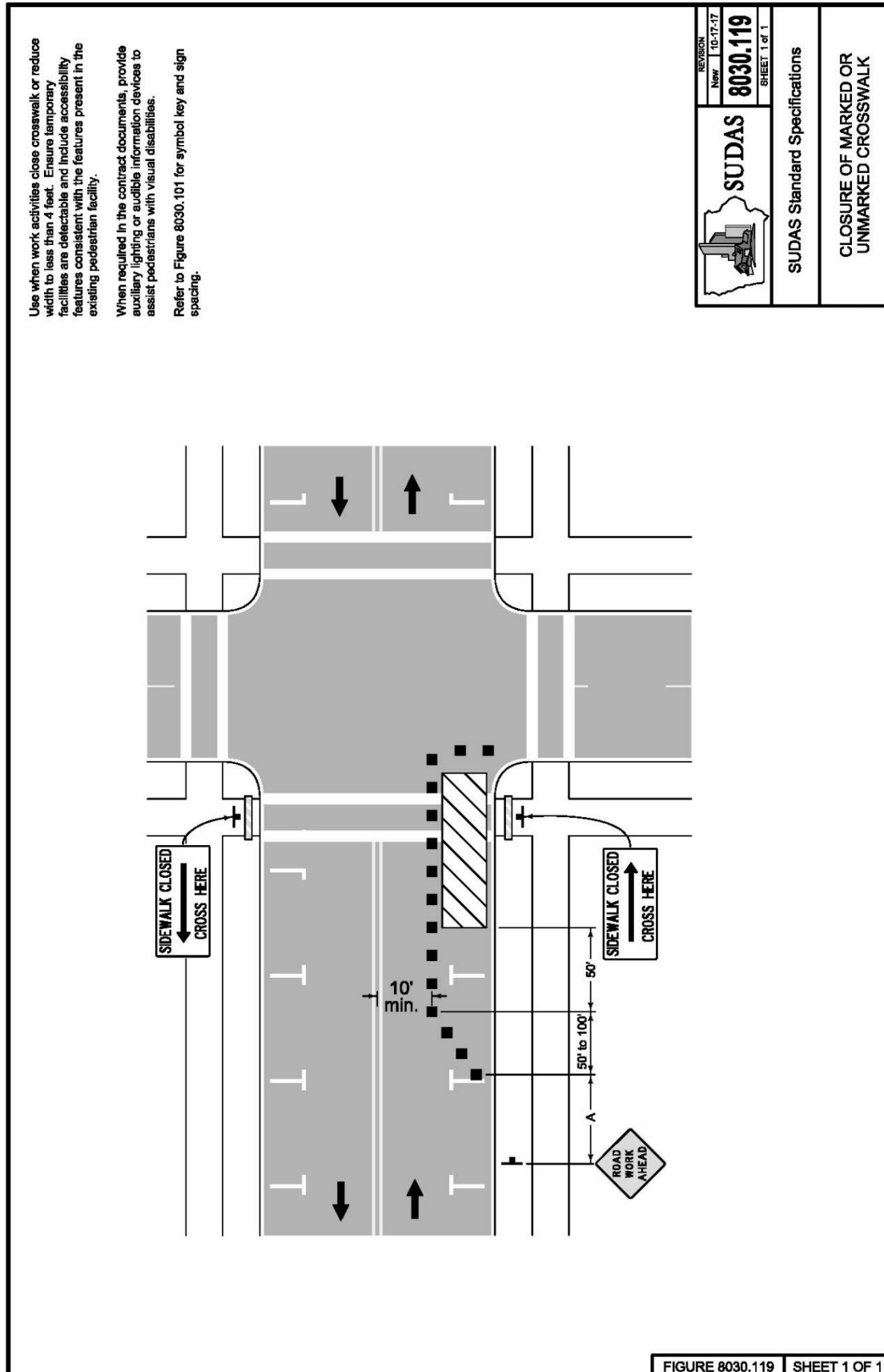


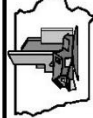
FIGURE 8030.115 SHEET 1 OF 1









	REVISION	Now	10-17-17
	8030.119		
SHEET 1 of 1			
SUDAS Standard Specifications			
CLOSURE OF MARKED OR UNMARKED CROSSWALK			

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SECTION 9010 - 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 Division 1 - General Provisions and Covenants, 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 Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants, 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 Division 1 - General Provisions and Covenants, 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.

1.08 MEASUREMENT AND PAYMENT

A. Conventional Seeding:

1. Seeding:

- a. **Measurement:** Measurement will be in acres for each type of seed.
- b. **Payment:** Payment will be in unit price per acre for each type of seed.
- c. **Includes:** Unit price includes, but is not limited to, removal of rock and other debris from the area; repairing rills and washes; preparing the seedbed; furnishing and placing seed, including any treatment required; furnishing and placing fertilizer and mulch; and furnishing water and other care during the care period, unless these items are bid separately.

2. Fertilizing:

- a. **Measurement:** Measurement will be in acres of fertilizer.
- b. **Payment:** Payment will be at unit price per acre of fertilizer.

3. Mulching:

- a. **Measurement:** Measurement will be in acres of mulch.
 - b. **Payment:** Payment will be in unit price per acre of mulch.
- B. Seeding, Fertilizing, and Mulching for Hydraulic Seeding:**
1. **Measurement:** Measurement will be in acres for each type of seed.
 2. **Payment:** Payment will be in unit price per acre for each type of seed.
 3. **Includes:** Unit price includes, but is not limited to, removal of rock and other debris from the area; repairing rills and washes; preparing the seedbed; furnishing and placing seed, including any treatment required; furnishing and placing fertilizer and mulch; and furnishing water and other care during the care period, unless these items are bid separately.
- C. Seeding, Fertilizing, and Mulching for Pneumatic Seeding:**
1. **Measurement:** Measurement will be in acres for each type of seed.
 2. **Payment:** Payment will be in unit price per acre for each type of seed.
 3. **Includes:** Unit price includes, but is not limited to, removal of rock and other debris from the area; repairing rills and washes; preparing the seedbed; furnishing and placing seed, including any treatment required; furnishing and placing fertilizer and mulch; and furnishing water and other care during the care period, unless these items are bid separately.
- D. Watering:**
1. **Measurement:** Measurement will be by metering of water applied. If metering is not available, measurement will be by counting the loads from a transporting tank of known volume and gauging the contents of the transporting truck for partial loads.
 2. **Payment:** Payment will be at the unit price per 1,000 gallons of water used.
- E. Warranty:**
1. **Measurement:** Lump sum item; no measurement will be made.
 2. **Payment:** Payment will be at the lump sum price for the warranty.
 3. **Includes:** Lump sum price includes, but is not limited to, all work required to correct any defects in the original placement of the seeding for the period of time designated.

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:

1. 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.
2. 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	Medicago 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

Table 9010.04: Native Grasses

Common Name	Scientific Name
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

Table 9010.05: Forbs

Common Name	Scientific Name
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 Mixture¹

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
Fawn fescue	100
Kentucky bluegrass	20
Ryegrass, perennial	75

- 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
<i>SPRING - March 1 - May 20</i>	
Annual ryegrass	40
Oats*	65
<i>SUMMER - May 21 - August 14</i>	
Annual ryegrass	50
Oats*	95
<i>FALL - August 15 - September 30</i>	

Common Name	Application Rate lb/acre
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
<i>March 1 - October 31</i>	
Canada wildrye	5 PLS/acre
Grain rye	50
Oats	50
<i>November 1 - February 28 (or 29)</i>	
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
Nublu 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*	Symphotrichum 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**
<u>GRASSES</u>		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
<u>FORBS (WILDFLOWERS)</u>		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	Symphotrichum ericoides	0.25
Ironweed	Veronia faxiculate	3.0
New England aster	Symphotrichum novae-angliae	1.25
Ohio spiderwort	Tradescantia ohiensis	7.0
Oxeye sunflower	Heliopsis helianthoides	12.0
Pale purple coneflower	Echinacea pallida	15.0

Common Name	Scientific Name	Application Rate**
Partridge pea	Chamaecrista fasciculata	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
<u>NURSE CROP</u>		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 (P₂O₅), and percent water soluble potassium (K₂O), 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 green 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) Contain a minimum of 90% organic material according to ASTM D 2974.
 - 5) Have a rainfall event (R-factor) of $140 < R$ according to ASTM D 6459.
 - 6) Have a cover factor of $C \leq 0.03$ according to ASTM D 6459.
 - 7) Vegetation Establishment of 400% minimum according to ASTM D 7322.
 - 8) Water Holding Capacity 600% minimum according to ASTM D 7367.
3. Mechanically-Bonded Fiber Matrix (MBFM):
 - a. Manufactured to be applied hydraulically.

- b. Dyed green 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) Contain a minimum of 90% organic material according to ASTM D 2974.
 - 5) Have a rainfall event (R-factor) of $175 < R$ according to ASTM D 6459.
 - 6) Have a cover factor of $C \leq 0.01$ according to ASTM D 6459.
 - 7) Vegetation establishment of 500% minimum according to ASTM D 7322.
 - 8) 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 MP 10-03, 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. **End-gate Cyclone Seeders:** End-gate 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 2010 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.
 - 3. 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.
 - 4. 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.
5. 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.
 6. 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, end-gate 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 end-gate 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 (Over-seeding):

- 1) Complete frost seeding, also referred to as over-seeding, 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.
5. Hydraulic mulch shall be required in urban areas. Straw mulch may be utilized if preapproved by City Engineer.

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 9010, 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 9010, 3.04.
- C. **Seed Preparation:** Follow seed preparation for conventional seeding in Section 9010, 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.
3. Projects without a separately-bid warranty will be accepted no sooner than 60 days from the date that all activities were completed.
4. When a warranty is established as a bid item and the warranty period excludes 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

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SECTION 9020 - SODDING

PART 1 - GENERAL

1.01 SECTION INCLUDES

Sod Installation

1.02 DESCRIPTION OF WORK

This section includes preparation of the sod bed, furnishing and installing sod, fertilizing, watering, and maintenance for completed sodded areas.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants, as well as the following:

- A. Sod grower's certification of grass species and location of sources.
- B. Certification of the fertilizer analysis.
- C. Written instructions recommending procedures for maintenance of sodded lawns, prior to final acceptance of sod.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants, as well as the following:

- A. Harvest, deliver, and transplant sod within a period of 24 hours unless a suitable preservation method is approved by the Engineer prior to delivery.
- B. Do not harvest or transport sod when moisture content may adversely affect sod survival.
- C. Protect sod that cannot be placed immediately on delivery from sun, wind, dehydration, and rain prior to installation.
- D. Sod showing visible signs of heating or dehydration will be rejected.
- E. Do not tear, stretch, or drop sod during handling and installation.
- F. Deliver fertilizer to the site in original, unopened, and non-damaged containers, each bearing the manufacturer's guaranteed analysis.
- G. Store packaged materials off the ground and protect from moisture and deterioration.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants, as well as the following:

- A. Notify the Engineer at least 3 calendar days prior to start of sodding operations.
- B. Perform sod installation after planting and other work affecting ground surface has been completed, or as approved by Engineer.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT**A. Sod:**

1. **Measurement:** Measurement will be in squares, each square containing 100 square feet of sod.
2. **Payment:** Payment will be at the unit price per square of sod.
3. **Includes:** Unit price includes, but is not limited to, preparation of sod and sod bed, stakes, fertilizing, watering, maintenance, and clean up. Also includes any necessary sod replacements during maintenance period.

PART 2 - PRODUCTS**2.01 SOD**

- A. Provide a well-established (no less than 18 months old), well rooted, healthy, nursery-grown sod blend of improved Kentucky Bluegrass with a uniform color, leaf texture, density, and varieties consisting of a minimum of three cultivars selected from the following list:

Allowed Kentucky Bluegrass Cultivars:

4-Seasons	Liberator
Arrowhead	Midnight
Award	NuBlue
Beyond	NuDestiny
Blue Chip Plus	NuGlade
Concerto	Rubicon
Everest	Rugby II
Everglade	Rush

- B. Sod grown in peat bedded soil will not be accepted.
- C. Ensure sod is free from objectionable grasses and broadleaf weeds, roots of trees or shrubs, stones, thatch, and other objectionable materials, nematodes and soil-born insects, and free from disease. Sod will be considered free of weeds if less than two such plants are found per 100 square feet of area.
- D. Mow at a height of 2 inches prior to cutting.
- E. Cut sod with a sod machine in strips of uniform width and length, with square ends. Cut to a uniform soil thickness of approximately 1 inch; thickness measurement excludes top growth.
- F. Ensure sod is moist when placed.

2.02 FERTILIZER

Comply with Iowa DOT Article 4169.03.

2.03 STAKES

- A. **Softwood Stakes:** 3/4 inch diameter and 8 inches long.
- B. **Steel Pins:** Tee shaped with a 4 inch head and 8 inch leg.

2.04 WATER

Unless otherwise specified in the contract documents, provide water and watering equipment such as hoses and sprinklers. Provide water free of substances harmful to plant growth.

PART 3 - EXECUTION**3.01 PREPARATION OF SOD BED**

- A. Limit preparation to areas that will be immediately sodded.
- B. Where weed growth has developed, remove all weeds and weed debris.
- C. Shape and fine grade sod bed to remove washes or gullies, water pockets, and irregularities. Provide an even surface, true to grade and cross-section.
- D. Rototill and cultivate sod bed to a fine and mellow condition to a minimum depth of 3 inches. Clear the top 3 inches of soil lumps, stones over 3/4 inch, and foreign material using hand labor as required.

3.02 FERTILIZING - FIRST APPLICATION

- A. Provide a guaranteed analysis of 20-26-6 commercial fertilizer or the equivalent units of nitrogen (N), phosphate (P), and potash (K) by weight at the rate of 200 pounds per acre.
- B. Incorporate fertilizer into soil to a depth of 1 1/2 inches prior to placing sod.

3.03 SOD INSTALLATION

- A. Do not install sod between the dates of June 15 and August 15, unless authorized by the Engineer.
- B. Do not lay frozen sod; do not lay sod on frozen soil or when freezing conditions are forecasted within 24 hours.
- C. Dampen dry soil prior to placing sod.
- D. Firm or heal in soil along the edges of the sodded areas.
- E. Carefully place sod in rows or strips evenly, with the longest edge parallel to the finished contours, and at right angles to the centerline of ditches and channels. On slopes, begin placing sod at the bottom and progress upward.
- F. Minimize traffic on newly laid sod during installation. Provide plank or wood sheets to protect sod already laid from equipment and vehicles.

- G. Tightly fit each strip against each other without voids. Do not overlap edges. Stagger joints at the ends of sod strips with adjacent strips of sod.
- H. Finish sod edges at walks, curbs, planting, mulch edges, and other vertical surface by cutting and fitting tightly to edge.
- I. Place sod mat approximately 1 inch below finished surface of walks, pavement, curbs, or other permanent features. Remove any sod not conforming to this requirement, adjust the subgrade, and re-lay the sod.
- J. Where new sod joins existing lawns, cut straight and neatly into existing lawn and level subgrade to match height.
- K. Stake sod on grades exceeding 4:1 and in drainage channels. Stake each roll at 2 foot intervals or as required to prevent movement during rainfall and storm water runoff events.
- L. Roll lightly-watered sod with a small mechanical or hand sod roller to sufficiently set or heal sod into soil and remove lumps. Roll as required to firm and level the sodded areas.

3.04 WATERING

- A. Water sod within 1 hour of placement. During initial watering, thoroughly wet sod and sod bed.
- B. Water all sodded areas during the maintenance period as necessary to maintain sod and soil moisture, supplement rainfall, promote growth and proper rooting, ensure sod survival, and prevent dormancy.
- C. Apply water uniformly and consistently on all sodded areas to prevent damage to sod, trees, and shrubs.

3.05 FERTILIZING - SECOND APPLICATION

Apply second application of fertilizer with a guaranteed analysis of 10-10-10 commercial fertilizer or the equivalent units of nitrogen (N), phosphate (P), and potash (K) at the rate of 300 pounds per acre 2 weeks after laying sod and prior to final acceptance.

3.06 MAINTENANCE

- A. Begin maintenance immediately following installation of sod and continue for a period until the sod is well established with sod rooted in place. The maintenance period will be for 30 days.
- B. Maintenance of sodded areas Includes:
 - 1. Watering.
 - 2. Weeding.
 - 3. Mowing. Once sod has grown to a height between 3 and 4 inches, mow to a 2 to 2 1/2 inch height.
 - 4. Remove and replace sodded areas that fail to survive.

3.07 CLEAN UP

- A. Remove all excess materials, debris, and equipment from site.
- B. Clean all paved surfaces.
- C. Repair any damage resulting from sodding operations.

3.08 ACCEPTANCE

- A. Sod acceptance will be based on the following criteria:
 - 1. All requirements for the completed installation and maintenance have been met.
 - 2. Sodded areas are healthy and even-colored, and a viable lawn is established, free from weeds, undesirable grass species, disease, and insects.
 - 3. Sod is knit down to the soil so that it cannot be pulled up.
 - 4. Sodded areas are without scattered bare spots and dead or dormant sod.
 - 5. Clean up operations are completed.
- B. Replacement sod work will be re-inspected before acceptance.

END OF SECTION

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SECTION 9030 - 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 and installing plant material.
- B. Constructing tree drainage wells.
- C. Maintaining and replacing plants for completed planting work.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants, 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 wrapping, 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 Division 1 - General Provisions and Covenants, as well as the following:

- F. 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 Division 1 - General Provisions and Covenants, 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. This will provide a healthy, vigorous plant when planted.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants, as well as the following:
Comply with the optimum planting dates specified in Section 9030, 3.01.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT

A. Plants, By Count:

1. **Measurement:** Each tree, shrub, or ground cover plant accepted in place will be counted.
2. **Payment:** Payment will be at the unit price for each tree, shrub, or ground cover plant. Payment will be made in increments according to the following schedule:
 - a. 70% of unit price at acceptance.
 - b. 30% of unit price at end of establishment period, upon installation of replacements.
3. **Includes:** Unit price includes, but is not limited to, delivery, excavation, installation, watering, placing backfill material, mulching, wrapping, staking or guying, herbicide, maintenance during the establishment period, and replacements.

B. Plants, By Count, With Warranty:

1. **Measurement:** Each tree, shrub, or ground cover plant accepted in place will be counted.
2. **Payment:** Payment will be at the unit price for each tree, shrub, or ground cover plant. Payment will be made in increments according to the following schedule:
 - a. 70% of unit price at acceptance.
 - b. 15% of unit price at end of 1 year establishment period, upon installation of replacements.
 - c. 15% of unit price at end of 2 year warranty period, upon installation of replacements.

3. **Includes:** Unit price includes, but is not limited to, delivery, excavation, installation, watering, placing backfill material, mulching, wrapping, staking or guying, herbicide, maintenance during the establishment and warranty periods, and replacements.

C. Plants, Lump Sum:

1. **Measurement:** Lump sum item; no measurement will be made.
2. **Payment:** Payment will be at the lump sum price for plants. Payment will be made in increments according to the following schedule:
 - a. 70% of lump sum price at acceptance.
 - b. 30% of lump sum price at end of establishment period, upon installation of replacements.
3. **Includes:** Unit price includes, but is not limited to, delivery, excavation, installation, watering, placing backfill material, mulching, wrapping, staking or guying, herbicide, maintenance during the establishment period, and replacements.

D. Plants, Lump Sum, With Warranty:

1. **Measurement:** Lump sum item; no measurement will be made.
2. **Payment:** Payment will be at the lump sum price for plants. Payment will be made in increments according to the following schedule:
 - a. 70% of lump sum price at acceptance.
 - b. 15% of lump sum price at end of 1 year establishment period, upon installation of replacements.
 - c. 15% of lump sum price at end of 2 year warranty period, upon installation of replacements.
3. **Includes:** Unit price includes, but is not limited to, delivery, excavation, installation, watering, placing backfill material, mulching, wrapping, staking or guying, herbicide, maintenance during the establishment and warranty period, and replacements.

E. Tree Drainage Wells:

1. **Measurement:** Each tree drainage well will be counted.
2. **Payment:** Payment will be at the unit price for each tree drainage well.
3. **Includes:** Unit price includes, but is not limited to, excavation, furnishing and placing rock, engineering fabric, and placing backfill material.

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 grown plants grown in the same climatic zone as the project.
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 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, 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.

E. Bare Root Plants (BR):

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. Acquire backfill material for plantings from soil excavated from the planting pit.
- B. Ensure backfill material is loose, friable, and free of clods 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. **Hose:**
 1. Reinforced garden hose no less than 1/2 inch inside diameter or fabric straps or other material approved by the Engineer.

2. Provide hose of adequate length to prevent contact of staking or guying wire with tree trunk.
- C. **Wire:** Provide wire of sufficient gauge to resist breaking during high winds.
- D. **Manufactured Staking System:** Upon approval of the Engineer, manufactured staking systems may be used in lieu of stakes, wire, and hose.

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. **Hose:** Comply with Section 9030, 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 WRAPPING MATERIAL FOR WINTER PROTECTION

4 inch wide bituminous impregnated tape, corrugated or crepe paper, specifically manufactured for tree trunk wrapping, having qualities to resist insect infestation, or similar material approved by the Engineer.

2.07 WATER

Provide water and watering equipment such as hoses and sprinklers. Provide water free of substances harmful to plant growth.

2.08 TREE DRAINAGE WELLS

- A. **Porous Backfill Material:** Comply with Iowa DOT Section 4131.
- B. **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 October 15 and prior to June 1, but not after candles exceed 1 inch.

- B. **Deciduous Plants (Balled and Burlapped and Container):** August 15 to November 15 and in the spring prior to June 1.
- 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 and tree drainage wells.
- 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 1 1/2 to 2 times larger than ball or root condition, with vertical sides and flat or saucer-shaped bottom. Excavate plant pit to a depth to match the nursery grade of the root crown for all balled and container root systems. Excavate plant pit to a depth 6 inches deeper for bare- rooted systems.
- B. Scarify sides of excavated pit.
- C. 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 Engineer determines the soils are too impervious, provide a planting well.

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. Place a minimum of 6 inches of backfill material in the bottom of the planting pit.
- 4. Place the plant centered, upright, plumb, and with desired orientation in the planting pit, with the root crown matching existing grade.
- 5. Spread and arrange roots in their natural position. Do not mat roots together.
- 6. Carefully place and compact 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 and form a 3 inch deep saucer around the plant.
- 8. Water the plant and surrounding area until thoroughly moist.

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 crown matching existing grade.
- 4. Balled and Burlapped Plants:

- a. Place plants centered, upright, plumb, and with desired orientation in planting pit with the root crown matching existing grade.
 - b. After plant placement, cut and remove burlap from root ball.
5. Carefully place and compact backfill material in layers, filling all voids until two thirds of plant pit is complete; fill pit with water and allow soil to settle.
6. Lightly compact the settled topsoil.
7. Continue placing backfill material and form a 3 inch deep saucer around plant.
8. Water plant and surrounding area until thoroughly moist.

C. Planting on Slopes:

1. Place the top of the root crown 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 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 18 inch radius area around tree trunks and shrub branch lines.
- D. Provide a continuous mulch area around plant groupings.
- E. Following mulch placement, pull mulch back 1 to 2 inches from the base of all trees and shrubs to allow air circulation.
- F. Thoroughly water mulched areas. Rake to a smooth finished surface.

3.08 WRAPPING

- A. When specified in the contract documents, or when directed by the Engineer, wrap 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. Wrap trunks spirally from ground line by overlapping one-half of the tree wrapping material and completely cover trunk to the height of the first branch.
- D. If necessary, secure wrapping material with twine or paper tape wound spirally downward in opposite direction, with ties around tree in at least three places in addition to top and bottom.
- E. Remove wrapping material by April 1 of the next spring.

3.09 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.
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 to with hose protector 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 hose 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 establishment period and remove from site.

3.10 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.

3.11 CLEAN UP

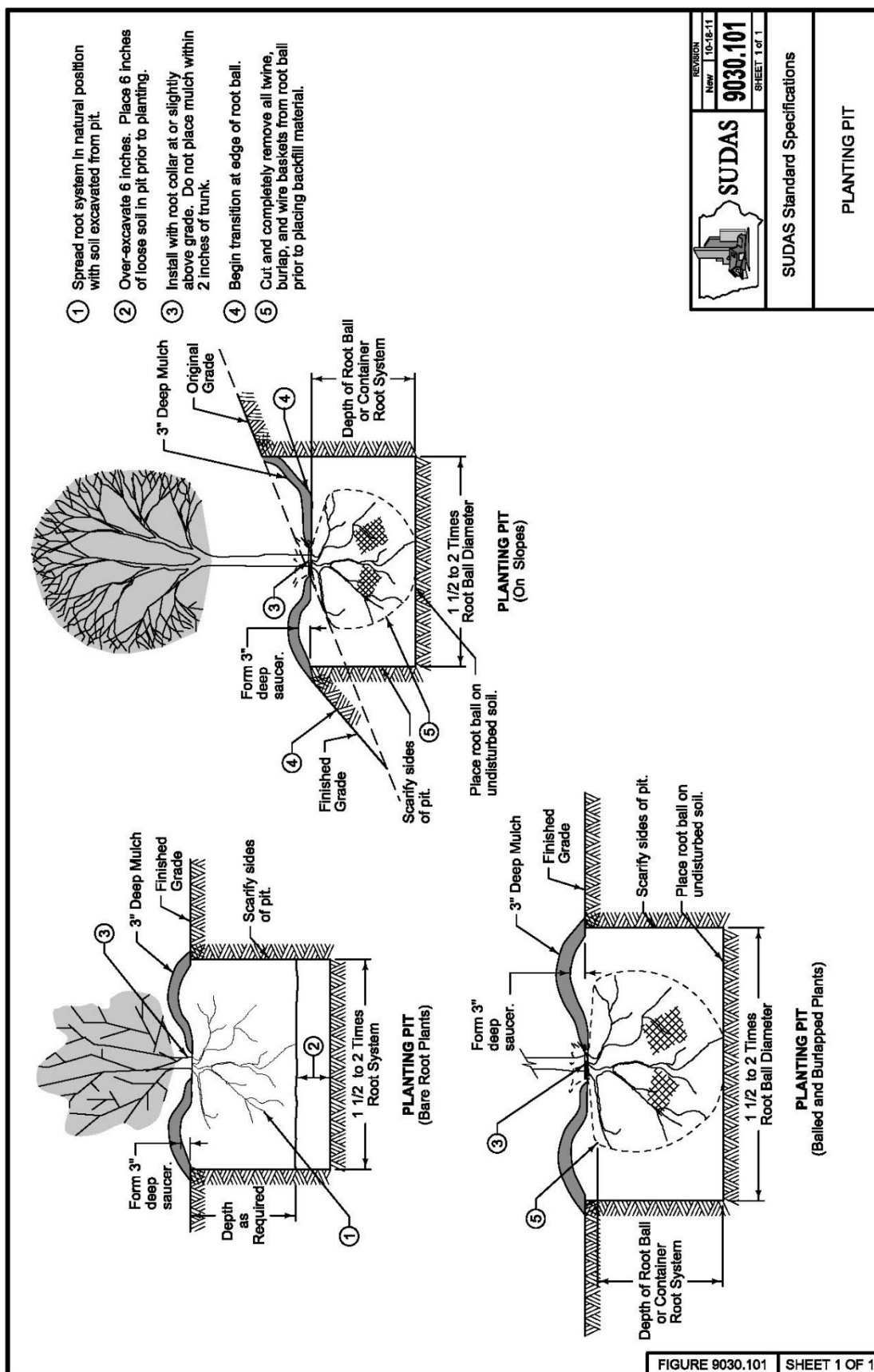
- A. Perform cleaning during installation and upon completion of work.
- B. Remove all excess materials, trimmings, branches, soils, debris, and equipment from the site.
- C. Repair any damage resulting from planting operations.
- D. Clean all paved areas with a broom.
- E. Remove all tags and labels from plants following acceptance by the Engineer.

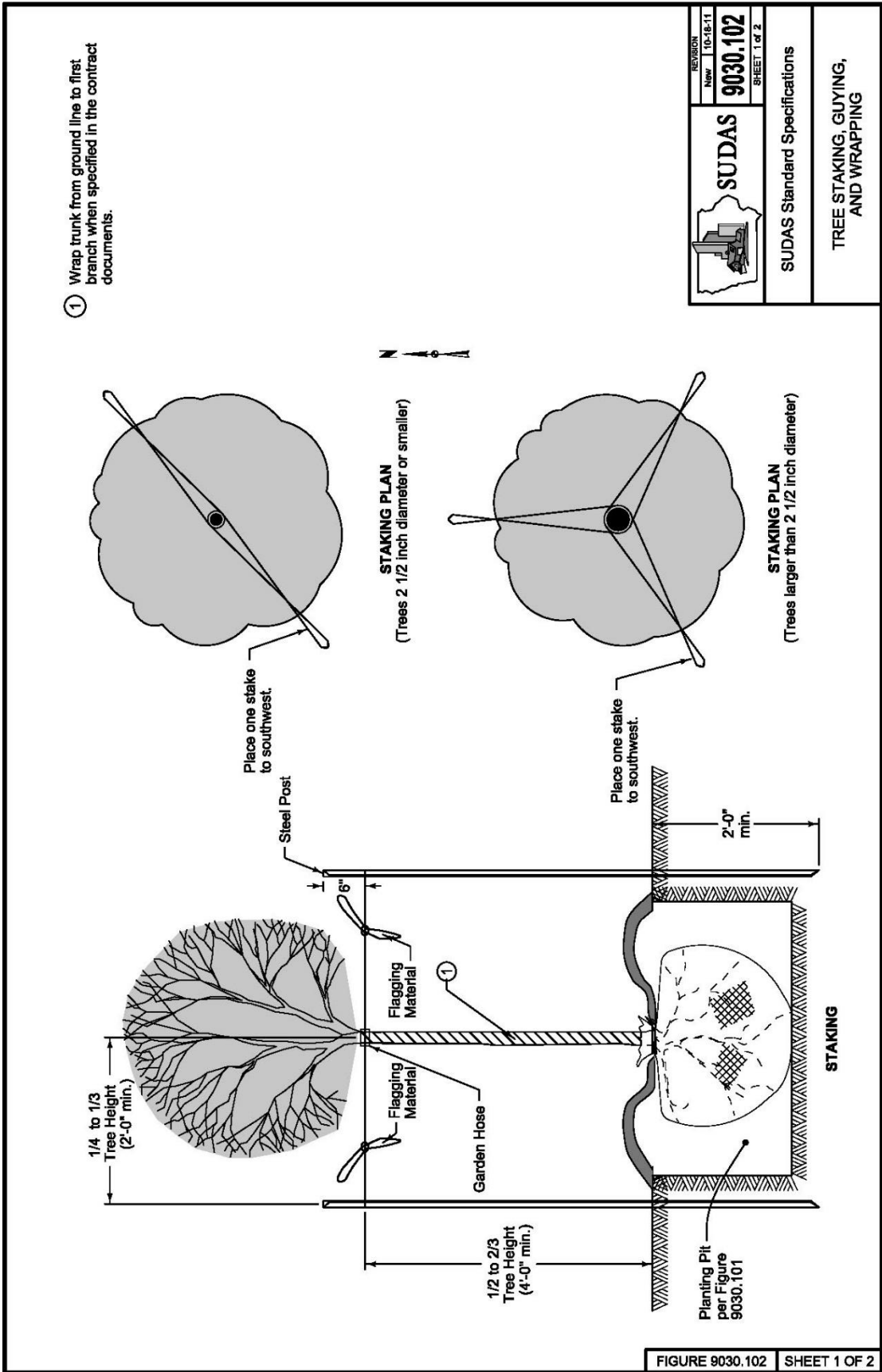
3.12 ESTABLISHMENT AND WARRANTY PERIODS AND ACCEPTANCE

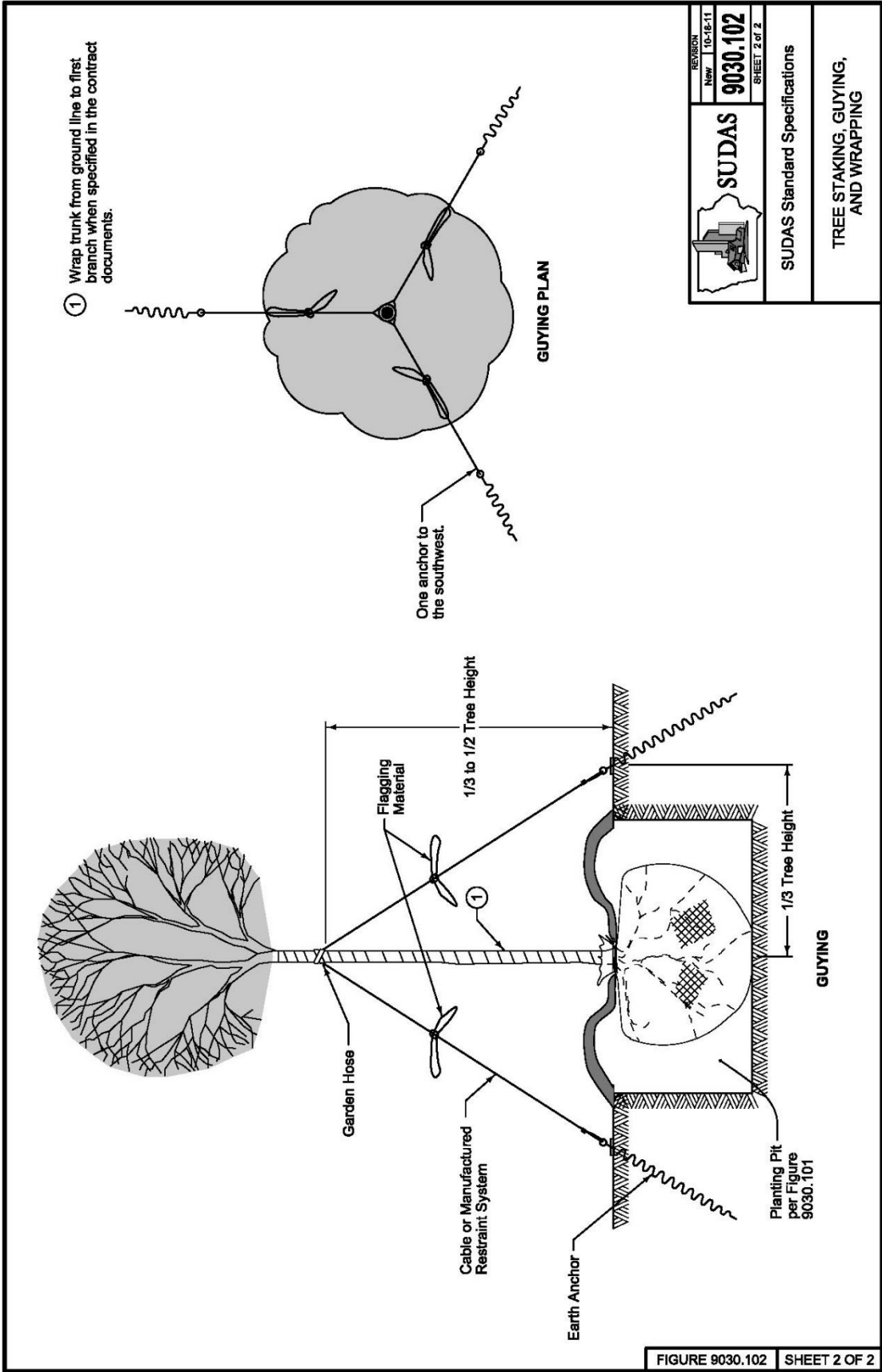
- A. **Establishment Period:** The plant establishment period is 1 year after the installation is accepted by the Engineer. A plant inspection will be made by the Engineer prior to the expiration of the establishment period.
- B. **Warranty Period:** If a plant warranty is specified in the contract documents, 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.

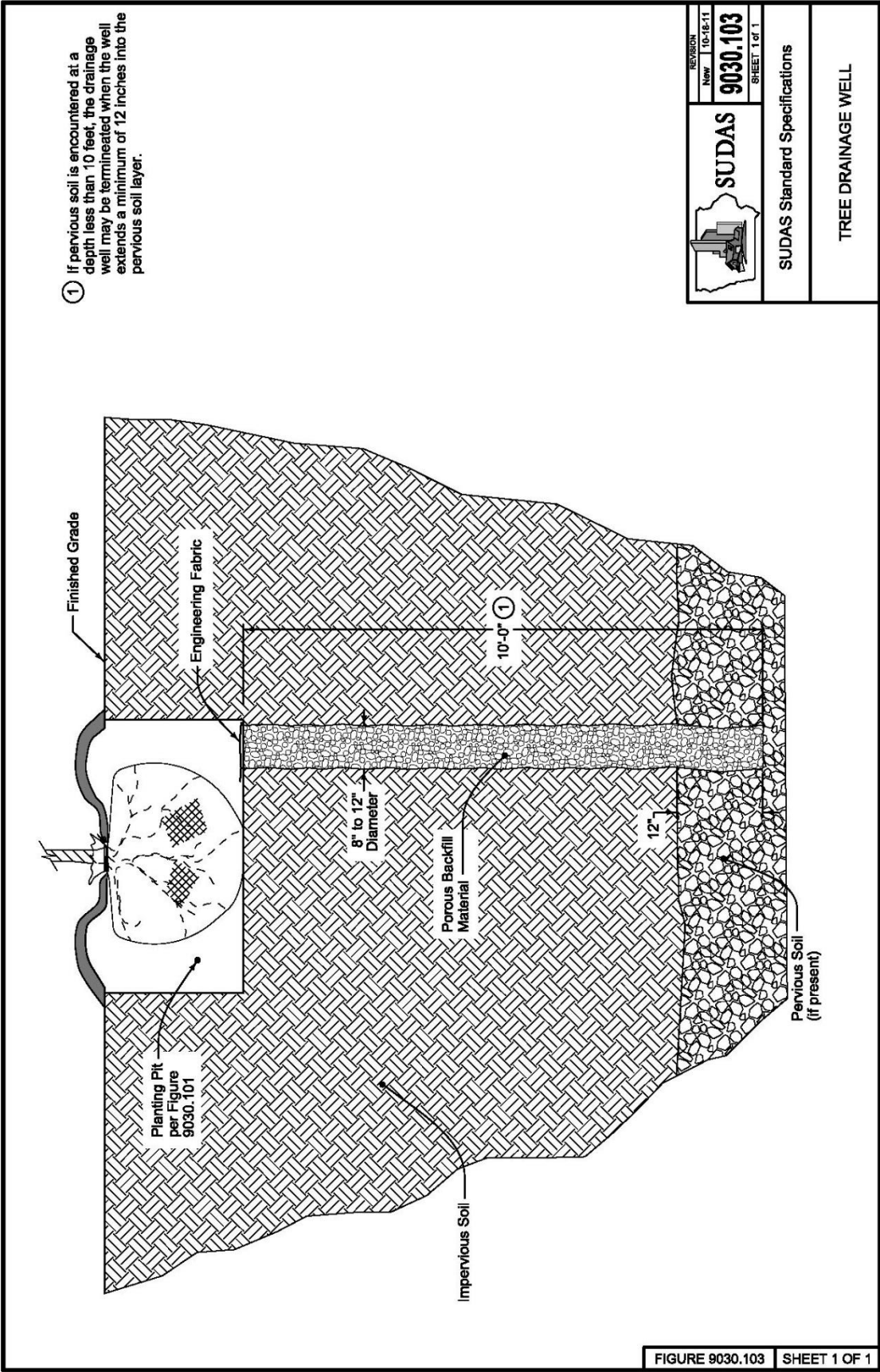
2. Remove weeds and grasses from planting beds and mulch areas. Apply herbicide to control weed growth when directed by the Engineer.
 3. Water as required to enhance early root growth and maintain a moist soil.
 4. Adjust stakes and ties to maintain plant in an upright and plumb condition.
 5. Re-set 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.
1. 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.
 2. 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 9040 - 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 Division 1 - General Provisions and Covenants, 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 Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants, 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.

1.08 MEASUREMENT AND PAYMENT

A. Stormwater Pollution Prevention Plan (SWPPP):

1. Preparation:

- a. **Measurement:** Lump sum item; no measurement will be made.
- b. **Payment:** Payment will be at the lump sum price for SWPPP preparation.
- c. **Includes:** Lump sum price includes, but is not limited to, development of a SWPPP by the Contractor meeting local and state agency requirements, filing the required public notices, filing a Notice of Intent for coverage of the project under the Iowa DNR NPDES General Permit No. 2, and payment of associated NPDES permit fees.
- d. **Other:** Item will be paid for upon approval of the SWPPP by the Engineer, and after the Notice of Intent has been filed by the Contractor.

2. Management:

- a. **Measurement:** Lump sum item; no measurement will be made.
- b. **Payment:** Payment will be at the lump sum price for SWPPP management.
- c. **Includes:** Lump sum price includes 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. Item also includes weekly inspections

required to satisfy the provisions of General Permit No. 2, unless otherwise specified in the contract documents.

- d. **Does Not Include:** Unit price does not include installation or maintenance of erosion and sediment control practices.
- e. **Other:** The Engineer may make partial payments based on estimates of the project completion. Final payment will be made when the site reaches final stabilization and the Notice of Discontinuation is filed.

B. Compost Blankets:

- 1. **Measurement:** Measurement will be in square feet for each thickness of compost blanket.
- 2. **Payment:** Payment will be at the unit price per square foot for each thickness of compost blanket.

C. Filter Berms:

- 1. **Measurement:** Measurement will be in linear feet for each size of filter berm, measured longitudinally along the top of the berm.
- 2. **Payment:** Payment will be at the unit price per linear foot for each size of berm.

D. Filter Socks:

- 1. **Installation:**
 - a. **Measurement:** Measurement will be in linear feet for each size of filter sock.
 - b. **Payment:** Payment will be at the unit price per linear foot for each size of filter sock.
 - c. **Includes:** Unit price includes, but is not limited to, anchoring stakes.
- 2. **Removal:**
 - a. **Measurement:** Measurement will be in linear feet of filter sock removed.
 - b. **Payment:** Payment will be at the unit price per linear foot of filter sock removed.
 - c. **Includes:** Unit price includes, but is not limited to, restoration of the area to finished grade and off-site disposal of filter socks and accumulated sediment.

E. Temporary Rolled Erosion Control Products (RECP):

- 1. **Measurement:** Measurement will be in square yards, based on the width specified in the contract documents and actual measured length, for each type of temporary RECP.
- 2. **Payment:** Payment will be at the unit price per square yard for each type of temporary RECP.

3. **Includes:** Unit price includes, but is not limited to, excavation, staples, anchoring devices, and material for anchoring slots.

F. Wattles:

1. Installation:

- a. **Measurement:** Measurement will be in linear feet for each type and size of wattle.
- b. **Payment:** Payment will be at the unit price per linear foot for each type and size of wattle.
- c. **Includes:** Unit price includes, but is not limited to, anchoring stakes.

2. Removal:

- a. **Measurement:** Measurement will be in linear feet of wattle removed.
- b. **Payment:** Payment will be at the unit price per linear foot of wattle removed.
- c. **Includes:** Unit price includes, but is not limited to, restoration of the area to finished grade and off-site disposal of wattle and accumulated sediment.

G. Check Dams:

1. Rock Check Dams:

- a. **Measurement:** Measurement will be in ton of stone installed.
- b. **Payment:** Payment will be at the unit price per ton of stone installed.
- c. **Includes:** Unit price includes, but is not limited to, engineering fabric.

2. Manufactured Check Dams:

a. Installation:

- 1) **Measurement:** Measurement will be in linear feet for each type and size of manufactured check dam.
- 2) **Payment:** Payment will be at the unit price per linear foot for each type and size of manufactured check dam.
- 3) **Includes:** Unit price includes, but is not limited to, anchoring stakes.

b. Removal:

- 1) **Measurement:** Measurement will be in linear feet for each type of manufactured check dam removed.
- 2) **Payment:** Payment will be at the unit price per linear foot for each type of manufactured check dam removed.
- 3) **Includes:** Unit price includes, but is not limited to, restoration of the area to finished grade and off-site disposal of manufactured check dam and accumulated sediment.

H. Temporary Earth Diversion Structures:

1. **Measurement:** Measurement will be in linear feet for each type and size of temporary earth diversion structure.
2. **Payment:** Payment will be at the unit price per linear foot of temporary earth diversion structure.
3. **Includes:** Unit price includes, but is not limited to, removal of the structure upon completion of the project.

I. Level Spreaders:

1. **Measurement:** Measurement will be in linear feet of level spreaders.
2. **Payment:** Payment will be at the unit price per linear foot of level spreader.
3. **Includes:** Unit price includes, but is not limited to, maintaining the spreader during the period of construction and removal upon completion of the project, unless otherwise specified in the contract documents.

J. Rip Rap:

1. **Measurement:** Measurement will be in tons for each type of rip rap.
2. **Payment:** Payment will be at the unit price per ton of rip rap.
3. **Includes:** Unit price includes, but is not limited to, engineering fabric.

K. Temporary Pipe Slope Drains:

1. **Measurement:** Measurement will be in linear feet for each type and size of temporary pipe slope drain, measured from end of apron to end of apron.
2. **Payment:** Payment will be at the unit price per linear foot for each type and size of pipe.
3. **Includes:** Unit price includes, but is not limited to, excavation, furnishing and installing pipe and pipe aprons, grading, and removal of the slope drain upon completion of the project.

L. Sediment Basin:

1. Outlet Structure:

- a. **Measurement:** Each size of sediment basin outlet structure will be counted.
- b. **Payment:** Payment will be at the unit price for each sediment basin outlet structure.
- c. **Includes:** Unit price includes, but is not limited to, concrete base, dewatering device, anti-vortex device, outlet pipe, and anti-seep collars (if specified).
- d. **Does Not Include:** Unit price does not include earthwork required for construction of the sediment basin.

2. Removal of Sediment:

- a. **Measurement:** Each occurrence of sediment removal will be counted.

- b. **Payment:** Payment will be at the unit price for each occurrence of sediment removal.
 - c. **Includes:** Unit price includes, but is not limited to, dewatering and removal and off- site disposal of accumulated sediment.
3. **Removal of Outlet Structure:**
- a. **Measurement:** Each sediment basin outlet structure removed will be counted.
 - b. **Payment:** Payment will be at the unit price for each sediment basin outlet structure removed.
 - c. **Includes:** Unit price includes, but is not limited to, dewatering and off-site disposal of the outlet structure, concrete base, emergency spillway, and accumulated sediment.
 - d. **Does Not Include:** Unit price does not include earthwork required to remove the sediment basin and restoration of the area to finished grade.
- M. **Sediment Trap Outlet:**
1. **Installation:**
- a. **Measurement:** Measurement will be in tons of crushed stone placed.
 - b. **Payment:** Payment will be at the unit price per ton of crushed stone.
 - c. **Includes:** Unit price includes, but is not limited to, engineering fabric.
 - d. **Does Not Include:** Unit price does not include earthwork required for construction of the sediment trap.
2. **Removal of Sediment:**
- a. **Measurement:** Each occurrence of sediment removal will be counted.
 - b. **Payment:** Payment will be at the unit price for each occurrence of sediment removal.
 - c. **Includes:** Unit price includes, but is not limited to, dewatering and removal and off- site disposal of accumulated sediment.
3. **Removal of Device:**
- a. **Measurement:** Each sediment trap outlet removed will be counted.
 - b. **Payment:** Payment will be at the unit price for each sediment trap outlet removed.
 - c. **Includes:** Unit price includes, but is not limited to, dewatering and off-site disposal of sediment trap outlet and accumulated sediment.
 - d. **Does Not Include:** Unit price does not include earthwork required to remove the sediment trap outlet and restoration of the area to finished grade.
- N. **Silt Fence or Silt Fence Ditch Check:**

1. Installation:

- a. **Measurement:** Measurement will be in linear feet of silt fence or silt fence ditch check.
- b. **Payment:** Payment will be at the unit price per linear foot of silt fence or silt fence ditch check.
- c. **Includes:** Unit price includes, but is not limited to, anchoring posts.

2. Removal of Sediment:

- a. **Measurement:** Measurement will be in linear feet of silt fence or silt fence ditch check.
- b. **Payment:** Payment will be at the unit price per linear foot of silt fence or silt fence ditch check.
- c. **Includes:** Unit price includes, but is not limited to, anchoring posts.

3. Removal of Device:

- a. **Measurement:** Measurement will be in linear feet of silt fence removed.
- b. **Payment:** Payment will be at the unit price per linear foot of silt fence removed.
- c. **Includes:** Unit price includes, but is not limited to, restoration of the area to finished grade and off-site disposal of fence, posts, and accumulated sediment.

O. Stabilized Construction Entrance:**1. Stabilized Construction Entrance by Square Yard:**

- a. **Measurement:** Measurement will be in square yards of material placed.
- b. **Payment:** Payment will be at the unit price per square yard of material placed.
- c. **Includes:** Unit price includes, but is not limited to, subgrade stabilization fabric.

2. Stabilized Construction Entrance by Ton:

- a. **Measurement:** Measurement will be in tons of material placed.
- b. **Payment:** Payment will be at the unit price per ton of material placed.
- c. **Includes:** Unit price includes, but is not limited to, subgrade stabilization fabric.

P. Dust Control:**1. Water for Dust Control:**

- a. **Measurement:** Measurement will be by metering of water applied to haul roads and other areas to control dust. If metering is not available, measurement will be by counting the loads from a transporting tank of

known volume and gauging the contents of the transporting truck for partial loads.

- b. **Payment:** Payment will be at the unit price per 1,000 gallons of water used.
- c. **Includes:** Unit price includes, but is not limited to, furnishing, transporting, and distributing water to the haul road.

2. **Dust Control Product:**

- a. **Measurement:** Measurement will be in square yards of the treated area.
- b. **Payment:** Payment will be at the unit price per square yard of product applied.

Q. **Erosion Control Mulching:**

1. **Conventional Mulching:**

- a. **Measurement:** Measurement will be in acres of conventional mulch.
- b. **Payment:** Payment will be at the unit price per acre of conventional mulch.

2. **Hydromulching:**

- a. **Measurement:** Measurement will be in acres for each type of hydromulch.
- b. **Payment:** Payment will be at the unit price per acre for each type of hydromulch.

R. **Turf Reinforcement Mats (TRM):**

- 1. **Measurement:** Measurement will be in squares for each type of turf reinforcement mat, each square containing 100 square feet.
- 2. **Payment:** Payment will be at the unit price per square for each type of turf reinforcement mat.
- 3. **Includes:** Unit price includes, but is not limited to, excavation, staples, anchoring devices, and material for anchoring slots.

S. **Surface Roughening:**

- 1. **Measurement:** Measurement will be in square feet of surface roughening, including directional tracking or grooving/furrowing.
- 2. **Payment:** Payment will be at the unit price per square foot of surface roughening.

T. **Inlet Protection Device:**

1. **Installation:**

- a. **Measurement:** Each type of inlet protection device will be counted.
- b. **Payment:** Payment will be at the unit price for each inlet protection device.

- c. **Includes:** Unit price includes, but is not limited to, removal of the device upon completion of the project.
- 2. **Maintenance:**
 - a. **Measurement:** Each inlet protection device maintenance occurrence will be counted.
 - b. **Payment:** Payment will be at the unit price for each inlet protection device maintenance occurrence.
 - c. **Includes:** Unit price includes, but is not limited to, removal and off-site disposal of accumulated sediment.

U. Flow Transition Mat:

- 1. **Measurement:** Measurement will be in square feet of flow transition mat.
- 2. **Payment:** Payment will be at the unit price per square foot of flow transition mat.
- 3. **Includes:** Unit price includes, but is not limited to, anchoring devices.

PART 2 - PRODUCTS

2.01 COMPOST BLANKETS

Comply with Section 9010, 2.07, C 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

- A. Material for use in filter socks, filter berms, and other areas, as specified in the contract documents.
- B. Use material derived from wood, bark, or other, non-toxic vegetative feed stocks.
- C. Use material with no visible admixture of refuse or other physical contaminants, nor any material toxic to plant growth.

D. Use material meeting the following particle sizes:

Sieve Size	Percent Passing ¹
2"	100
1"	90-100
3/8"	0-30

¹The 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 to 10 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.
4. **Aggregate:** Erosion stone complying with Iowa DOT Article 4130.04.
5. **Engineering Fabric:** Comply with Section 9040, 2.18.

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 RIPRAP

- 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 4020, 2.01.
- 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 4020; 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 4020; diameter as specified in the contract documents.
- E. **Anti-Vortex Device:** CMP complying with Section 4020; diameter according to 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 Figure 9040.117.

2.12 SEDIMENT TRAPS

- A. **Erosion Stone:** Comply with Section 9040, 2.09.
- B. **Engineering Fabric:** Comply with Section 9040, 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 9010, 2.07.
 2. Bonded Fiber Matrix (BFM): Comply with Section 9010, 2.07.

3. Mechanically Bonded Fiber Matrix (MBFM): See Section 9010, 2.07.**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	0.25 in	0.25 in
		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
		Maximum Slope Gradient (Slope Applications)	N/A	1:1 (H:V) or flatter	1:1 (H:V) or flatter	1:1 (H:V) or greater	1:1 (H:V) or greater

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.

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

- A. Coordinate and carry out all requirements of Iowa DNR NPDES General Permit No. 2 and any local ordinance requirements, including:
- B. Update the SWPPP according to the requirements of the NPDES General Permit No. 2.
- C. Revise the SWPPP and implement changes, as necessary, to prevent sediment or hazardous materials from being transported off the site.
- D. Submit all SWPPP revisions to the Engineer for review and approval.
- E. Perform and maintain records of weekly erosion and sediment control site inspections, unless otherwise specified in the contract documents.
- F. Maintain records of transfer of responsibility under the NPDES General Permit No. 2.
- G. Retain all records on-site, or as required by the NPDES General Permit No. 2.
- H. After final stabilization, file a Notice of Discontinuation, according to the NPDES General Permit No. 2.
- I. 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.

- J. 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 (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 (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 (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) (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 9010 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 9010, 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 (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.
- C. Completely remove the wattle netting, filler material, and stakes.
- D. Spread the accumulated sediment to match finished grade and to ensure proper drainage.
- E. 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.
- F. **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 (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 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 (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 9010.

3.12 LEVEL SPREADERS (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 (Figures 9040.110 and 9040.111)

Install rip rap (revetment stone or erosion stone) as shown on Figures 9040.110 and 9040.111.

3.14 TEMPORARY PIPE SLOPE DRAINS (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 (Figures 9040.113 and 9040.114)

- A. **Concrete Base:** Construct the concrete base and anchor riser section, as shown on 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 Figure 9040.116.

3.16 ANTI-SEEP COLLAR (Figure 9040.117)

- A. **General:** Place backfill material and compact over-excavation areas to a minimum of 95% Standard Proctor Density per Section 3010.
- B. **Concrete Collar:**
1. Place collars a minimum of 2 feet from pipe joints.
 2. Provide Class C concrete per Section 6010.
- 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 (Figure 9040.118)

Construct the storage area to the size and elevations specified in the contract documents.

3.18 SILT FENCES (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 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 (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/yd², 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/yd².
 - 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:

1. May be used on all slopes.
2. 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.
3. Operate equipment along the contour of the slope to create grooves that are perpendicular to the slope.
4. 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.

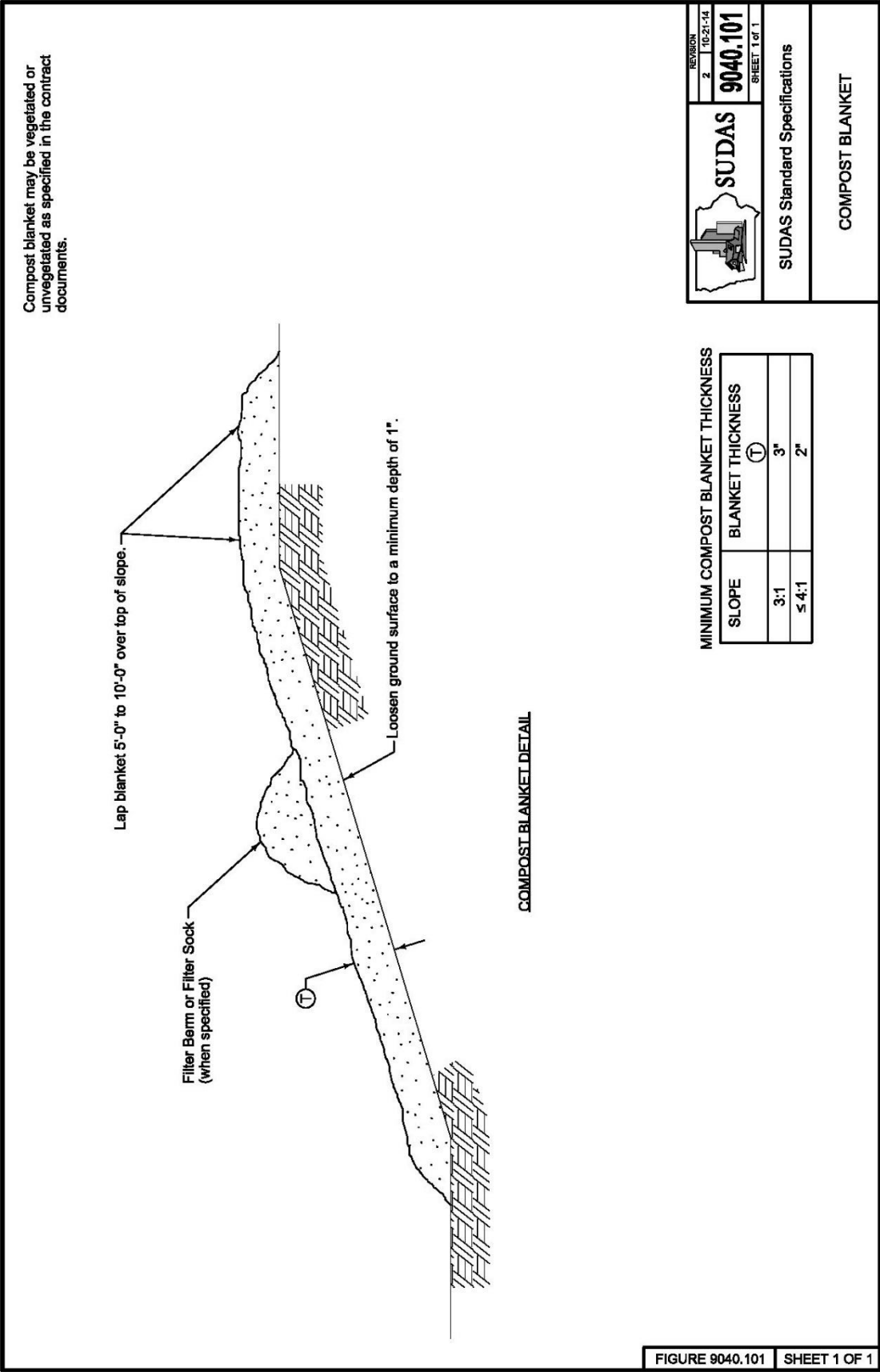
3.25 FLOW TRANSITION MATS

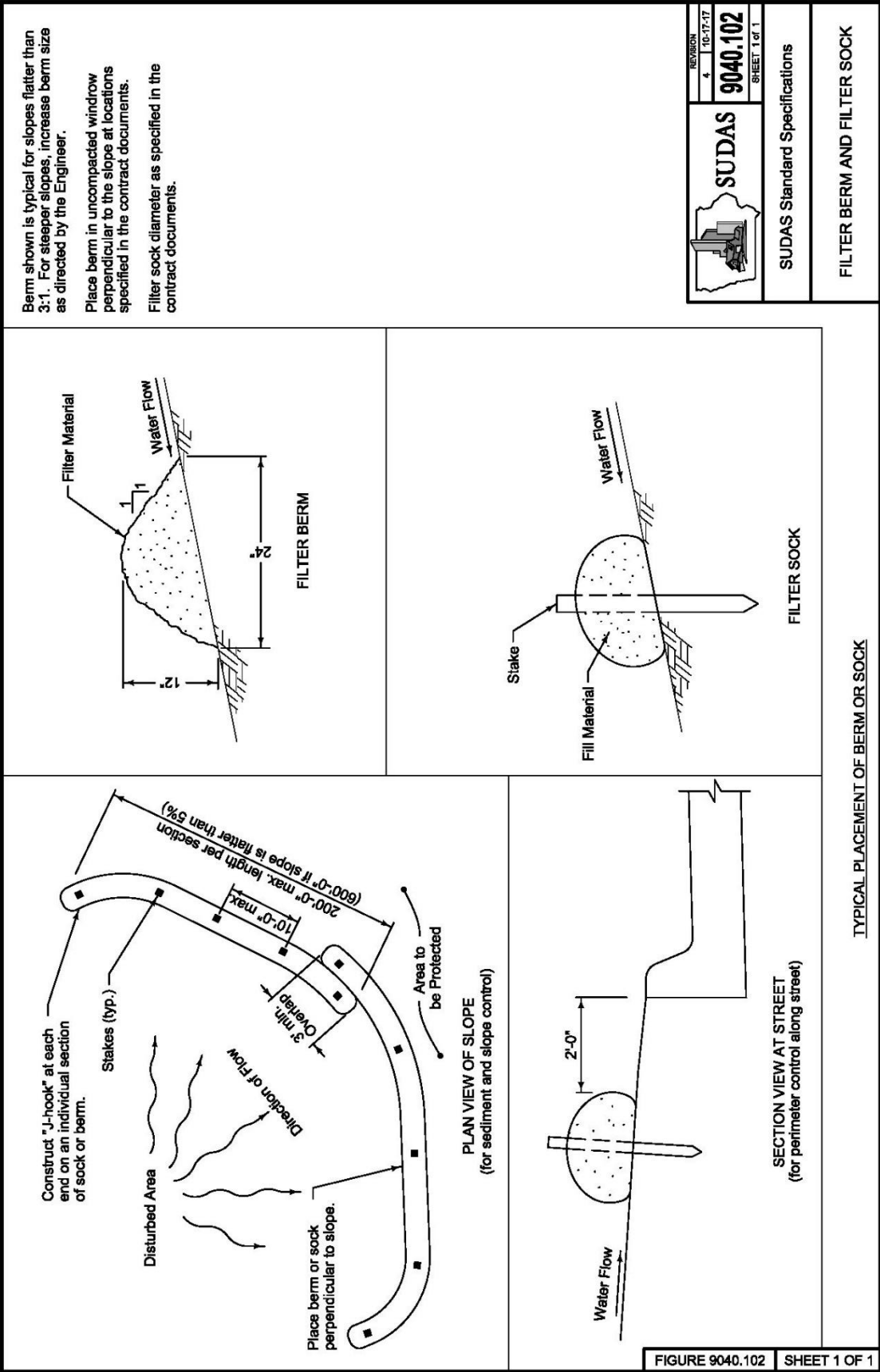
Install according to the manufacturer's published recommendations.

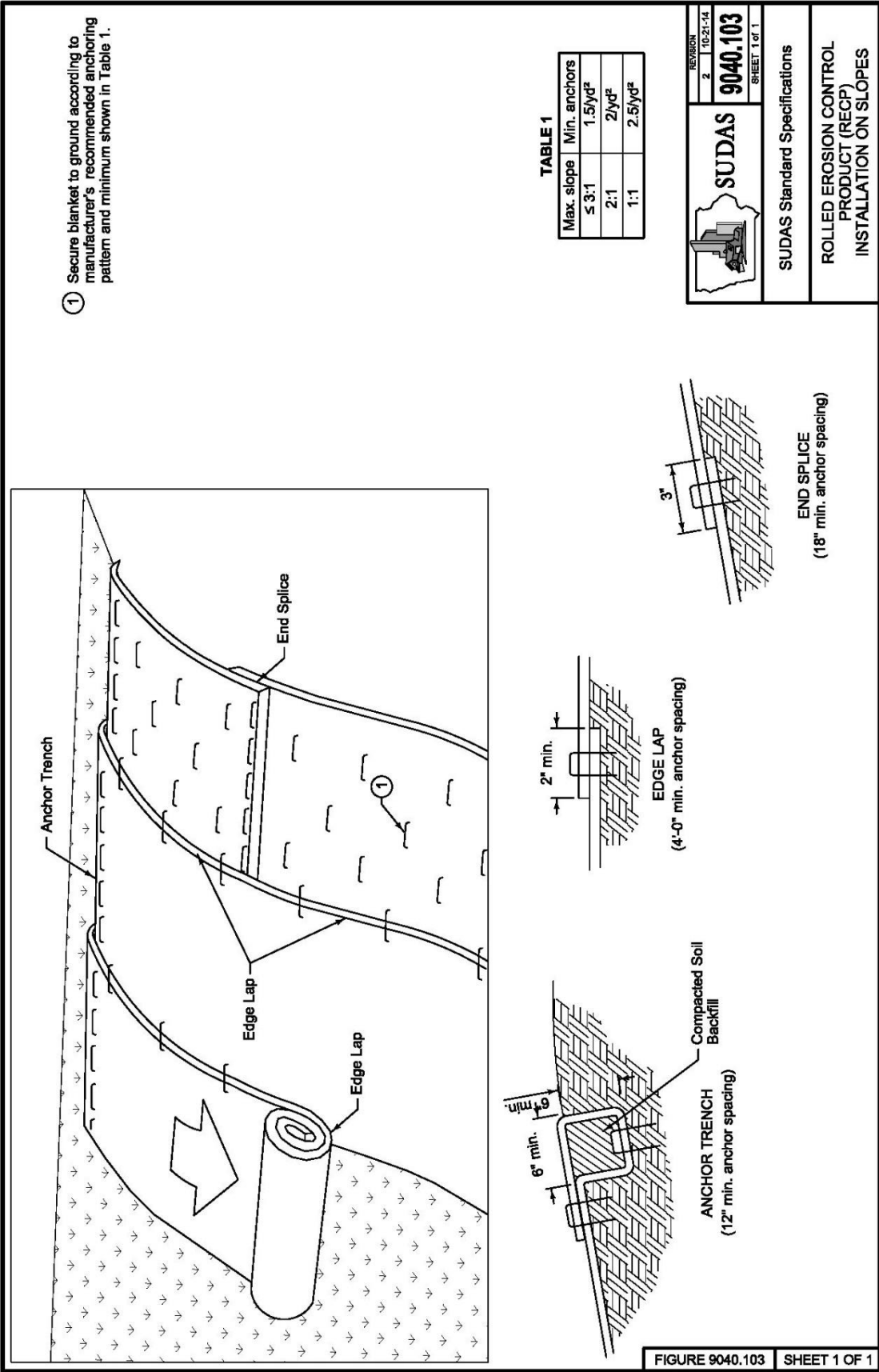
3.26 TEMPORARY EROSION CONTROL SEEDING

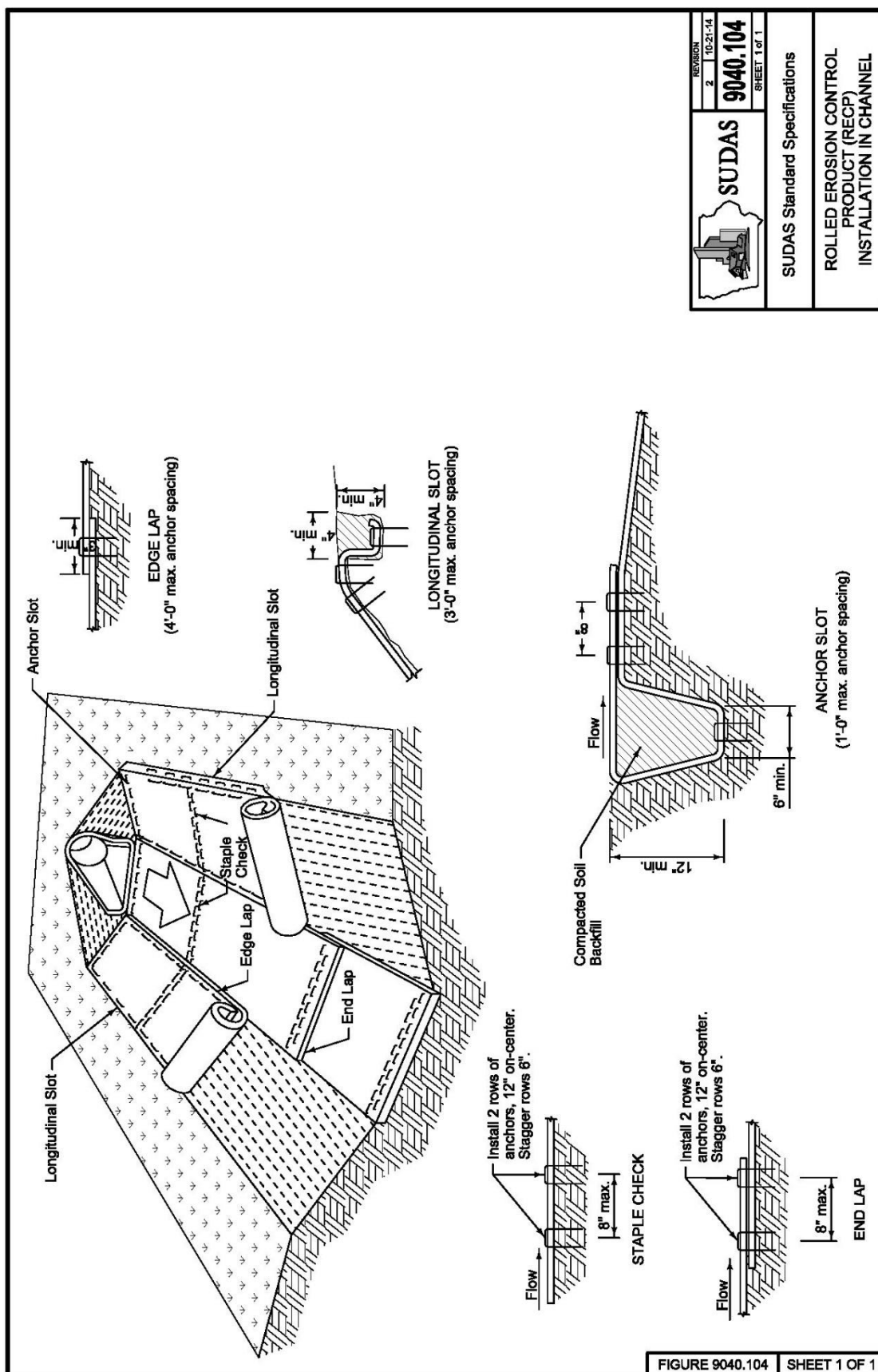
Comply with Section 9010.

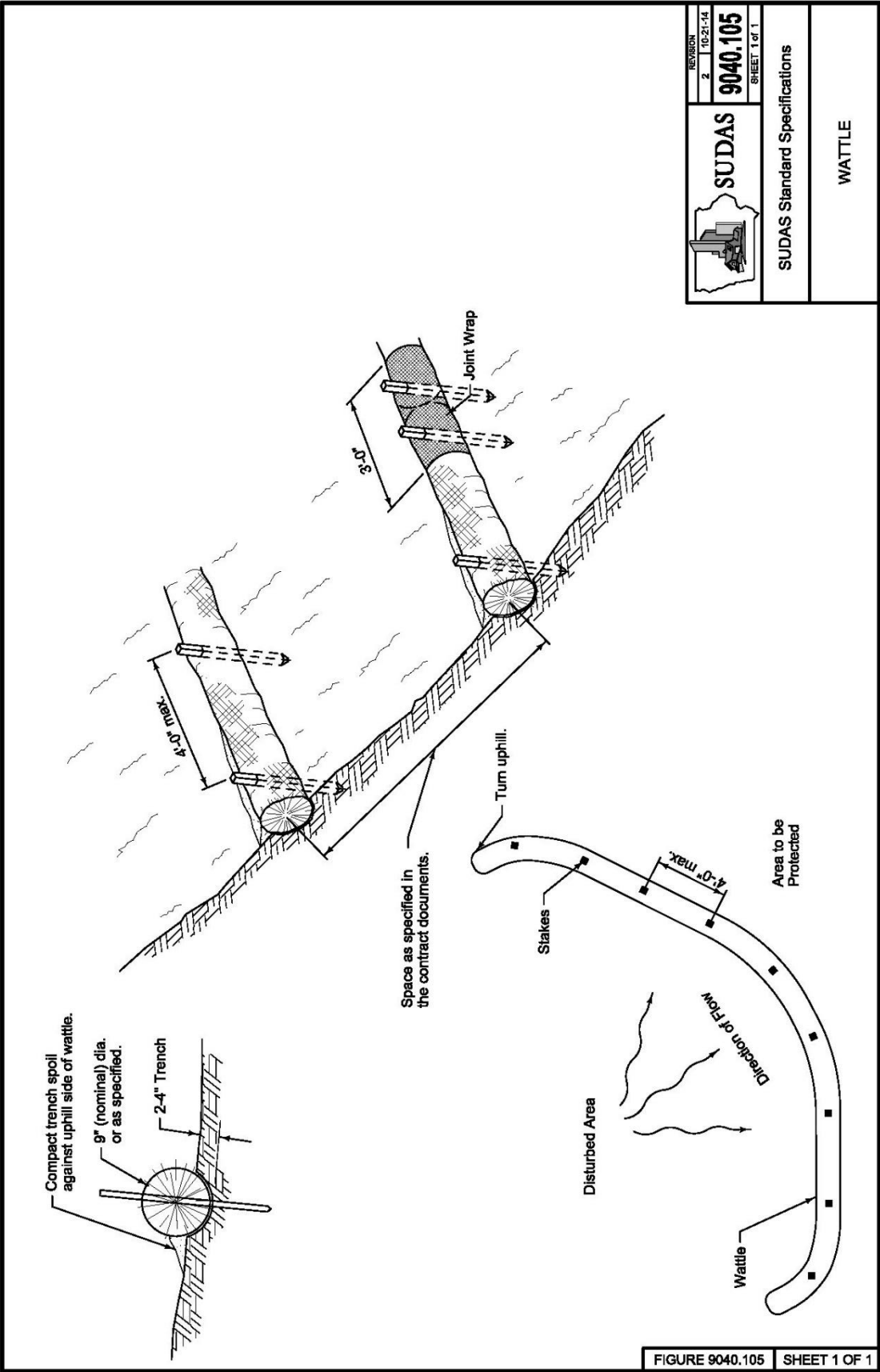
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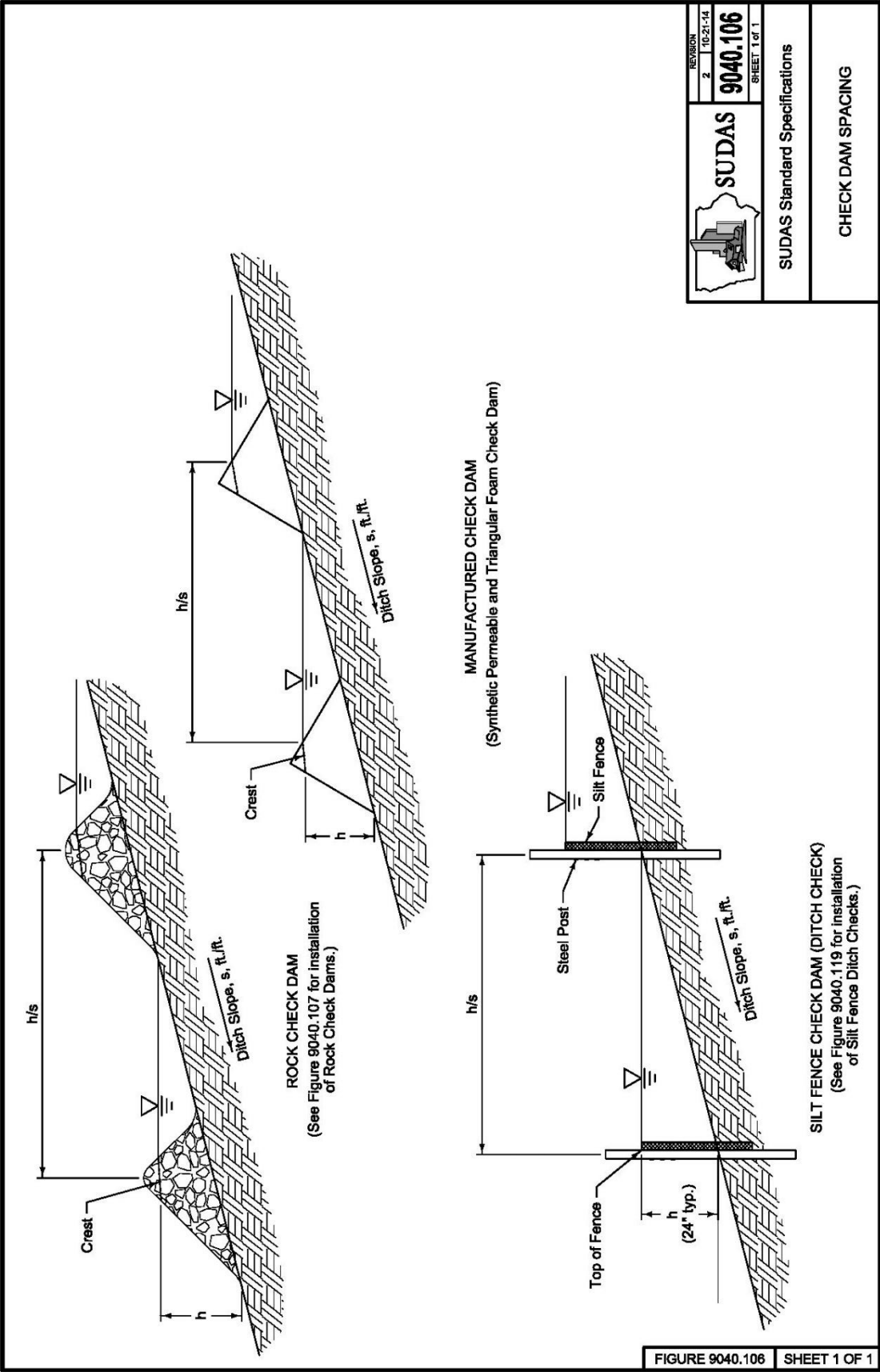




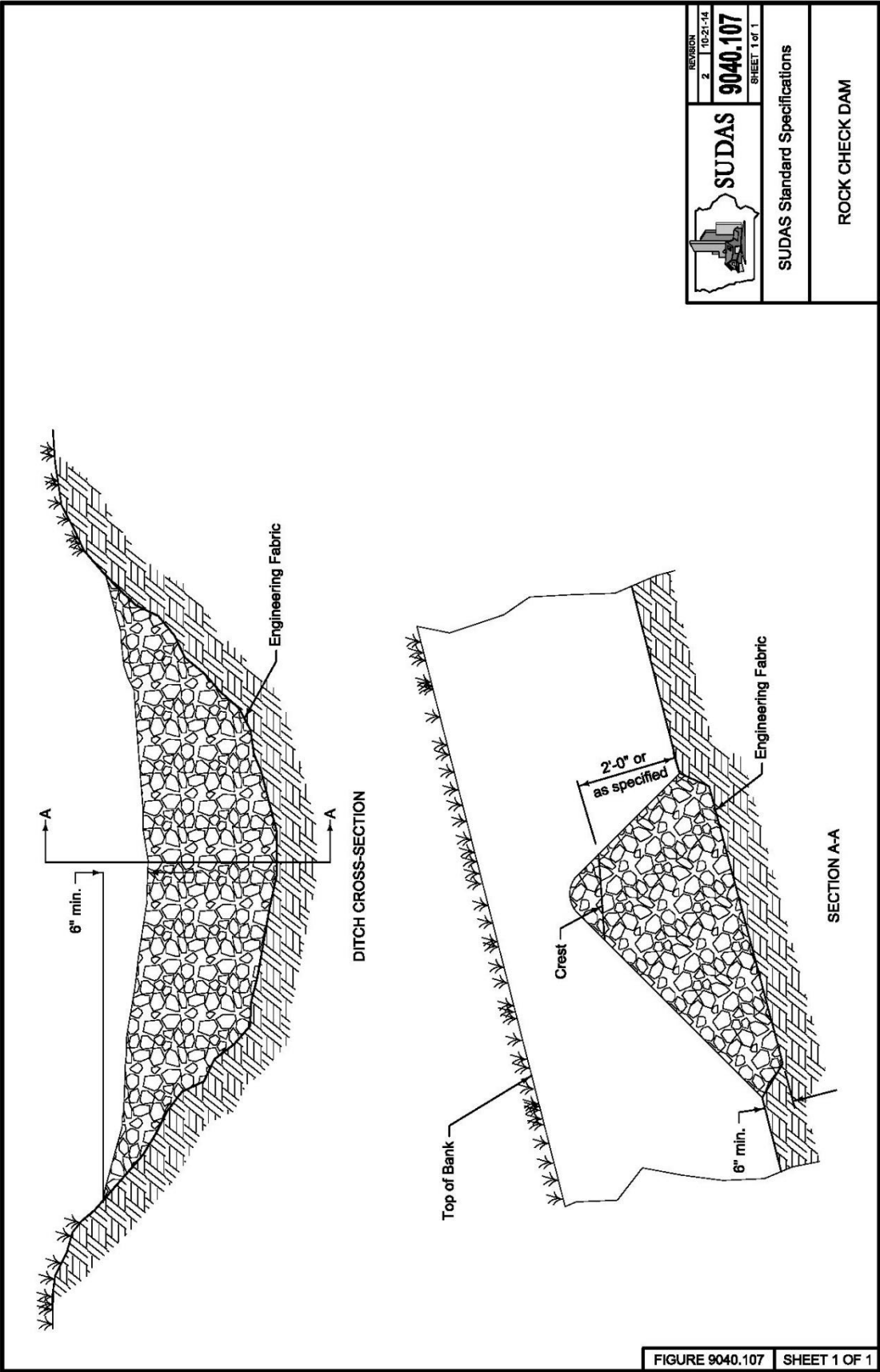


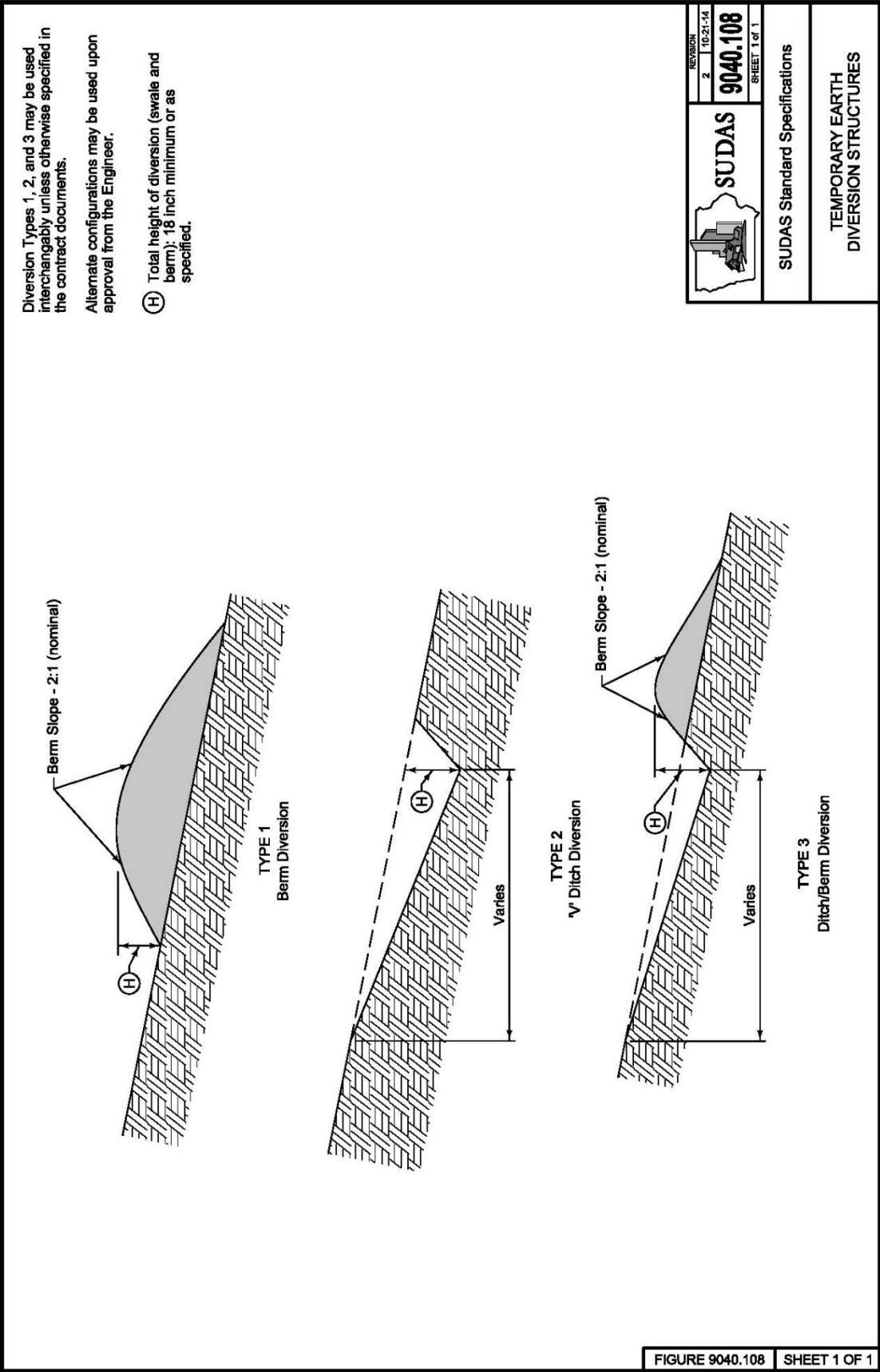


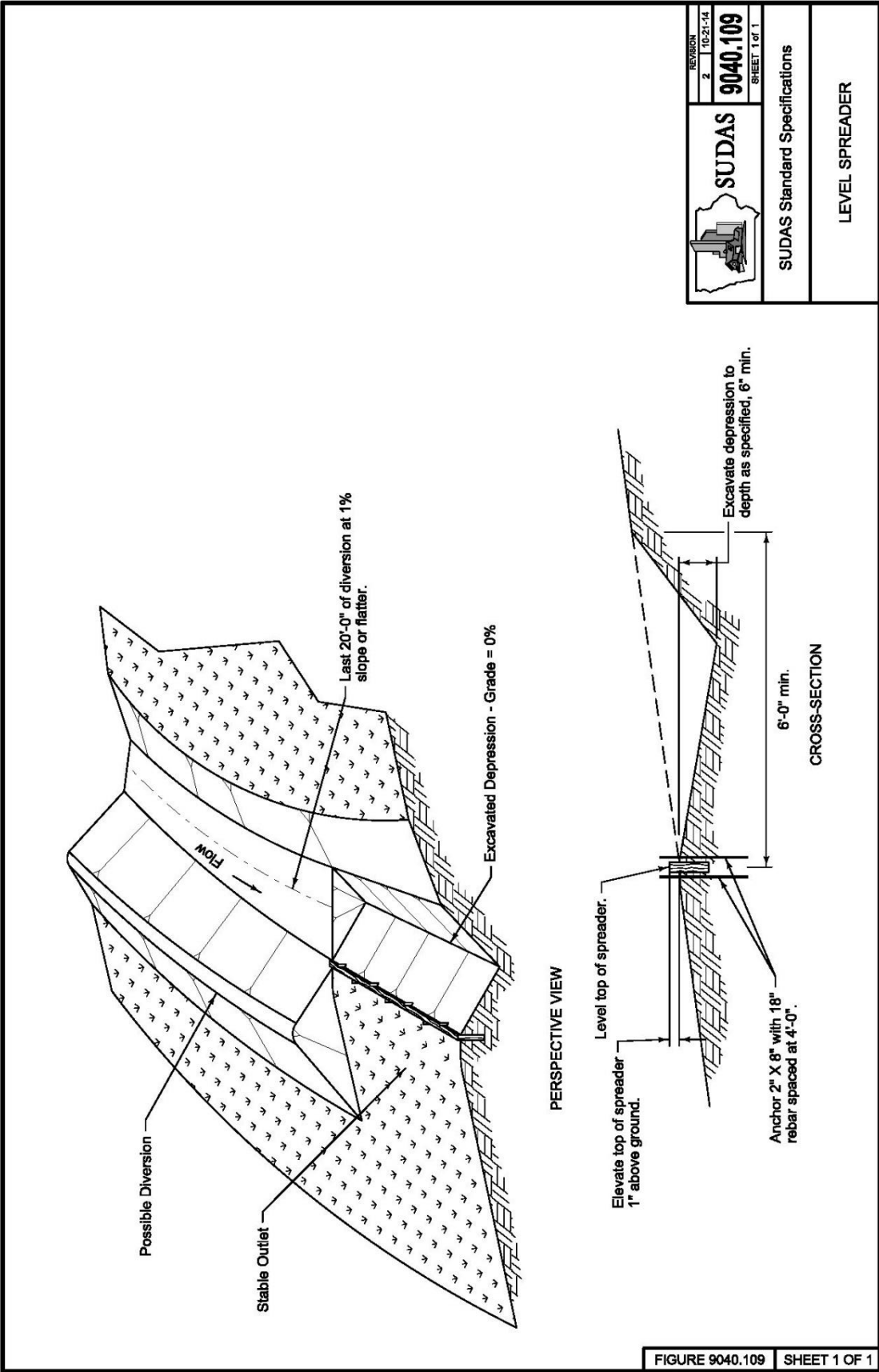


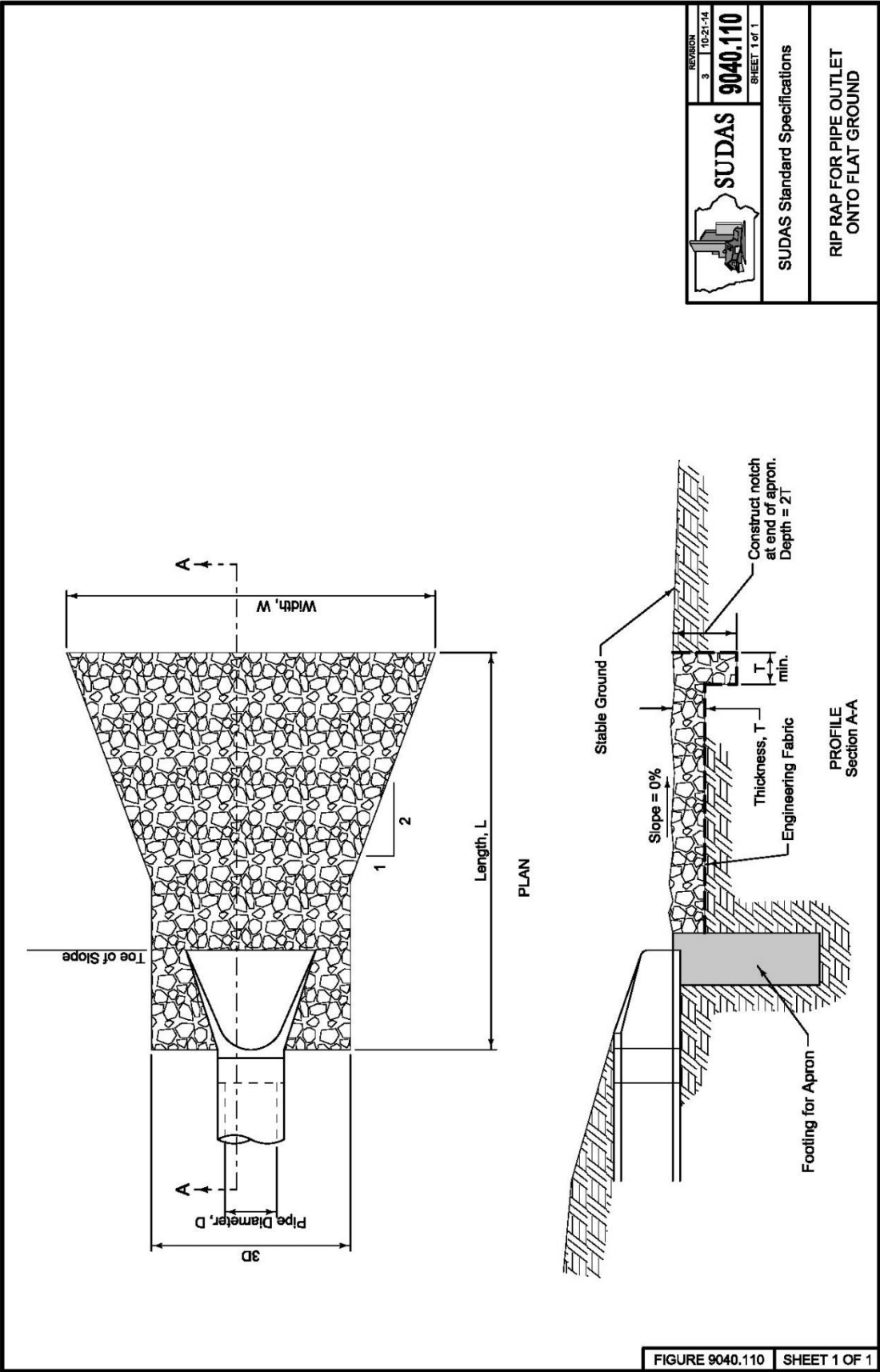


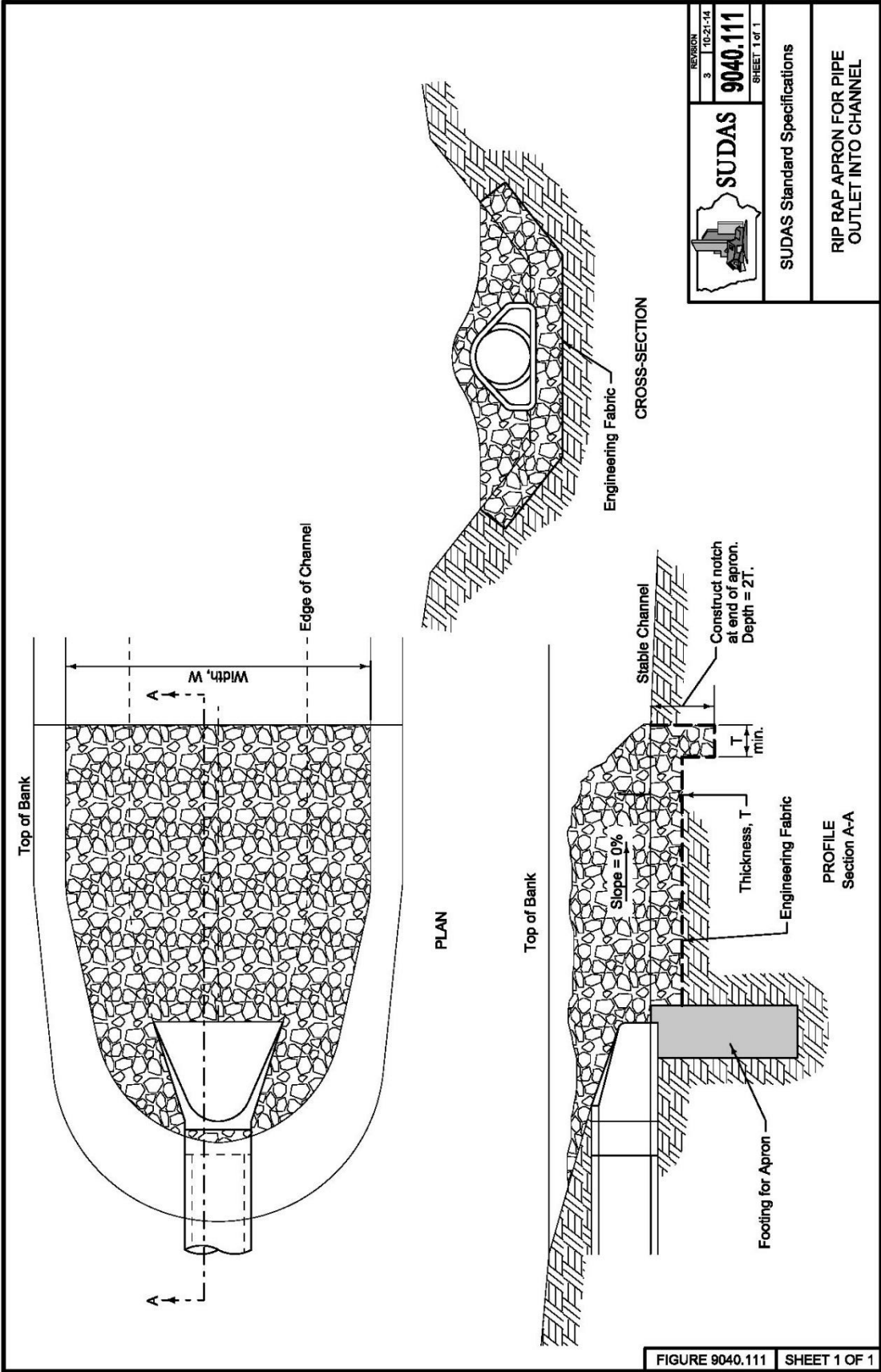
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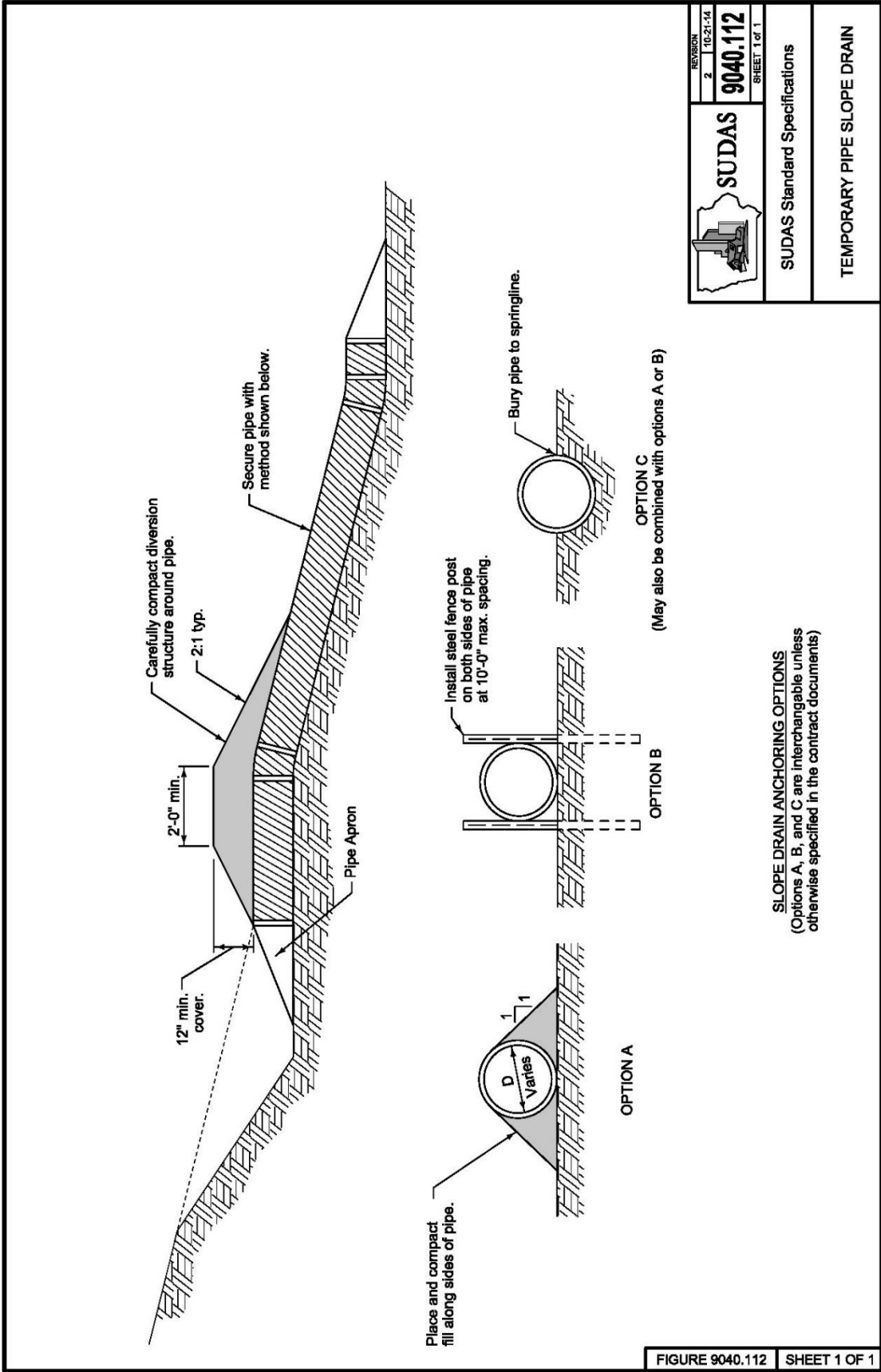


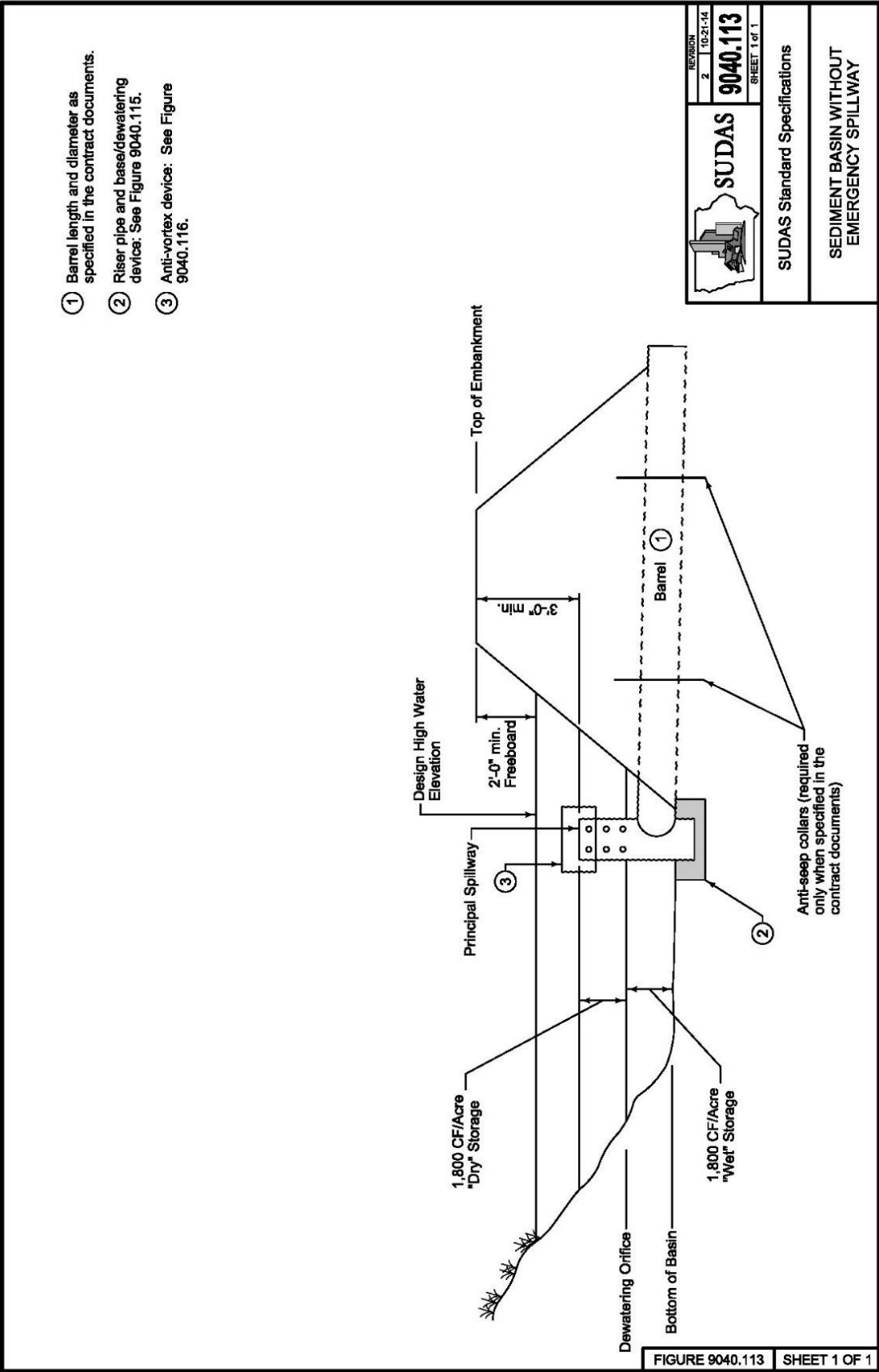


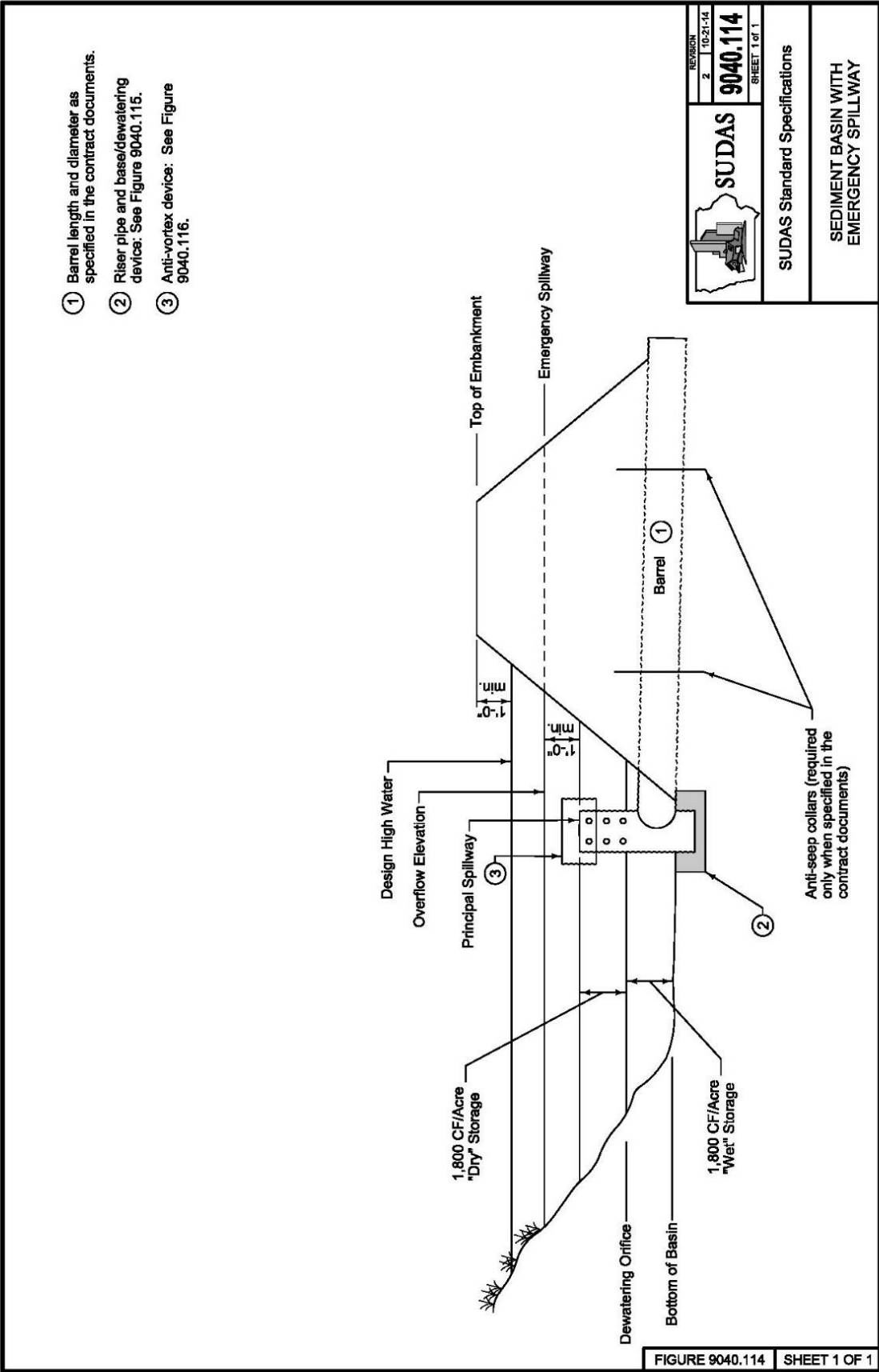


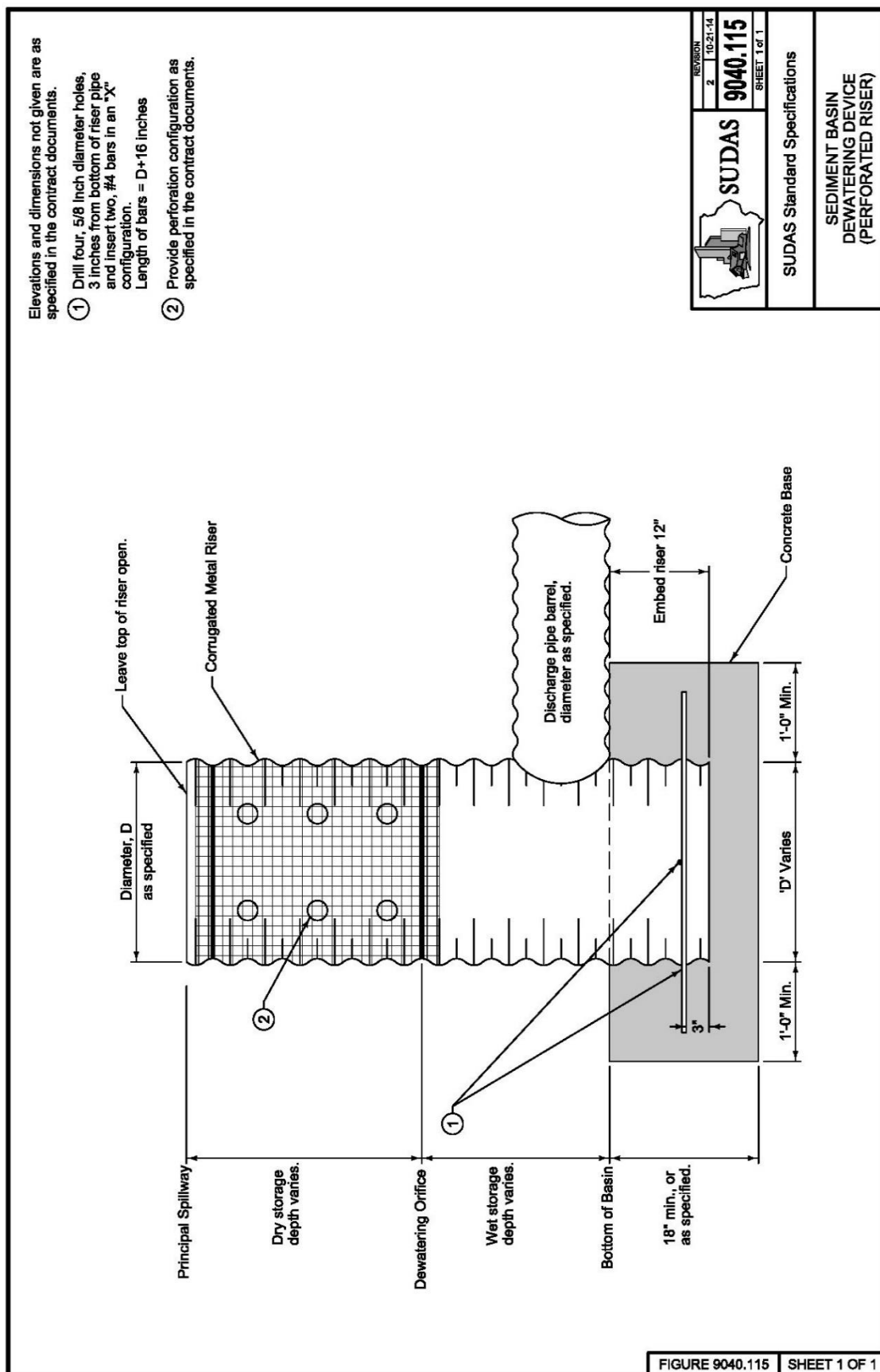


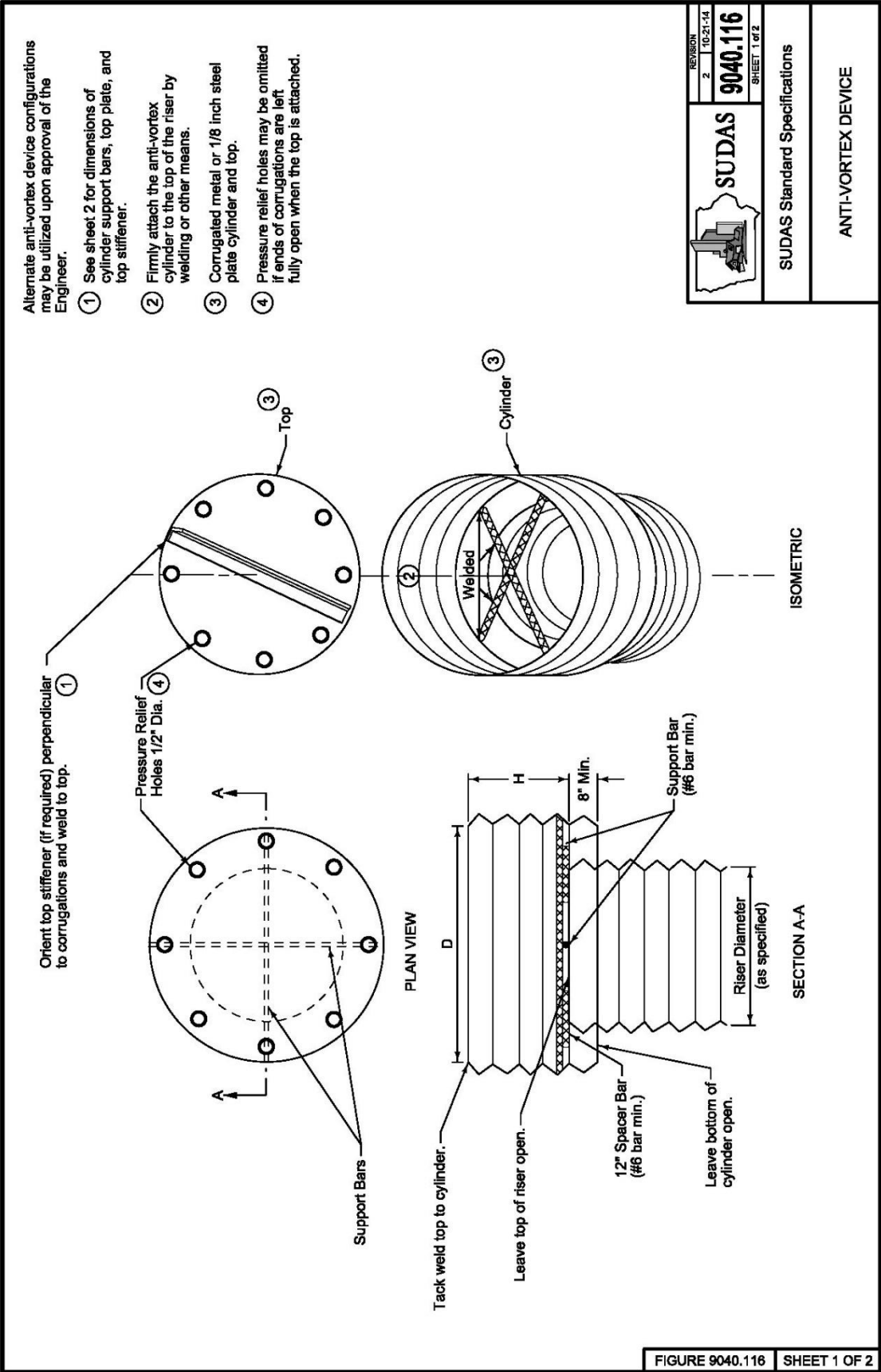












RISER		CYLINDER			MINIMUM TOP	
Diameter (in.)	Diameter (in.)	Thickness (gage)	Height (H) (in.)	Minimum Size Support Bar	Thickness	Stiffener
12	18	16	6	#6 rebar or 1 1/2" X 3/16" angle	16 ga F & C	—
15	21	16	7	#6 rebar or 1 1/2" X 3/16" angle	16 ga F & C	—
18	27	16	8	#6 rebar or 1 1/2" X 3/16" angle	16 ga F & C	—
21	30	16	11	#6 rebar or 1 1/2" X 3/16" angle	16 ga (C), 14 ga (F)	—
24	36	16	13	#6 rebar or 1 1/2" X 3/16" angle	16 ga (C), 14 ga (F)	—
27	42	16	15	#6 rebar or 1 1/2" X 3/16" angle	16 ga (C), 14 ga (F)	—
36	54	16	17	#8 rebar	14 ga (C), 12 ga (F)	—
42	60	16	19	#8 rebar	14 ga (C), 12 ga (F)	—
48	72	16	21	1 1/4" pipe or 1 1/4" X 1 1/4" X 1/4" angle	14 ga (C), 10 ga (F)	—
54	78	16	25	1 1/4" pipe or 1 1/4" X 1 1/4" X 1/4" angle	14 ga (C), 10 ga (F)	—
60	90	14	29	1 1/2" pipe or 1 1/2" X 1 1/2" X 1/4" angle	12 ga (C), 8 ga (F)	—
66	96	14	33	2" pipe or 2" X 2" X 1/4" angle	12 ga (C), 8 ga (F)	2" X 2" X 1/4" angle
72	102	14	36	2" pipe or 2" X 2" X 1/4" angle	12 ga (C), 8 ga (F)	2 1/2" X 2 1/2" X 1/4" angle
78	114	14	39	2 1/2" pipe or 2" X 2" X 1/4" angle	12 ga (C), 8 ga (F)	2 1/2" X 2 1/2" X 1/4" angle
84	120	12	42	2 1/2" pipe or 2" X 2" X 1/4" angle	12 ga (C), 8 ga (F)	2 1/2" X 2 1/2" X 5/16" angle

Notes:

- The criterion for sizing the cylinder is that the area between the inside of the cylinder and the outside of the riser is equal to or greater than the area inside the riser. Therefore, the above table is invalid for use with concrete pipe risers.
- C - Corrugated F - Flat.

FIGURE 9040.116

SHEET 2 OF 2

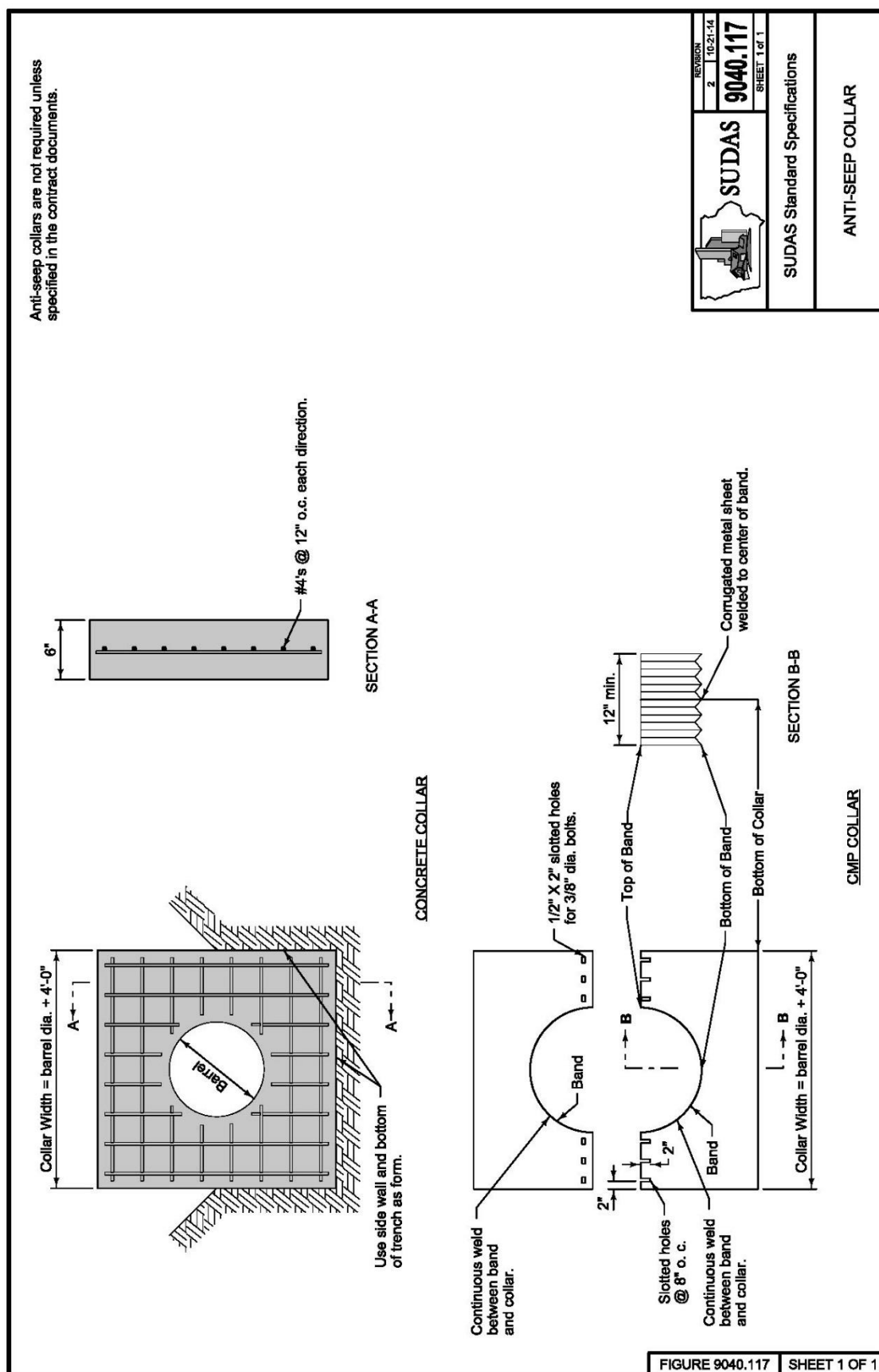
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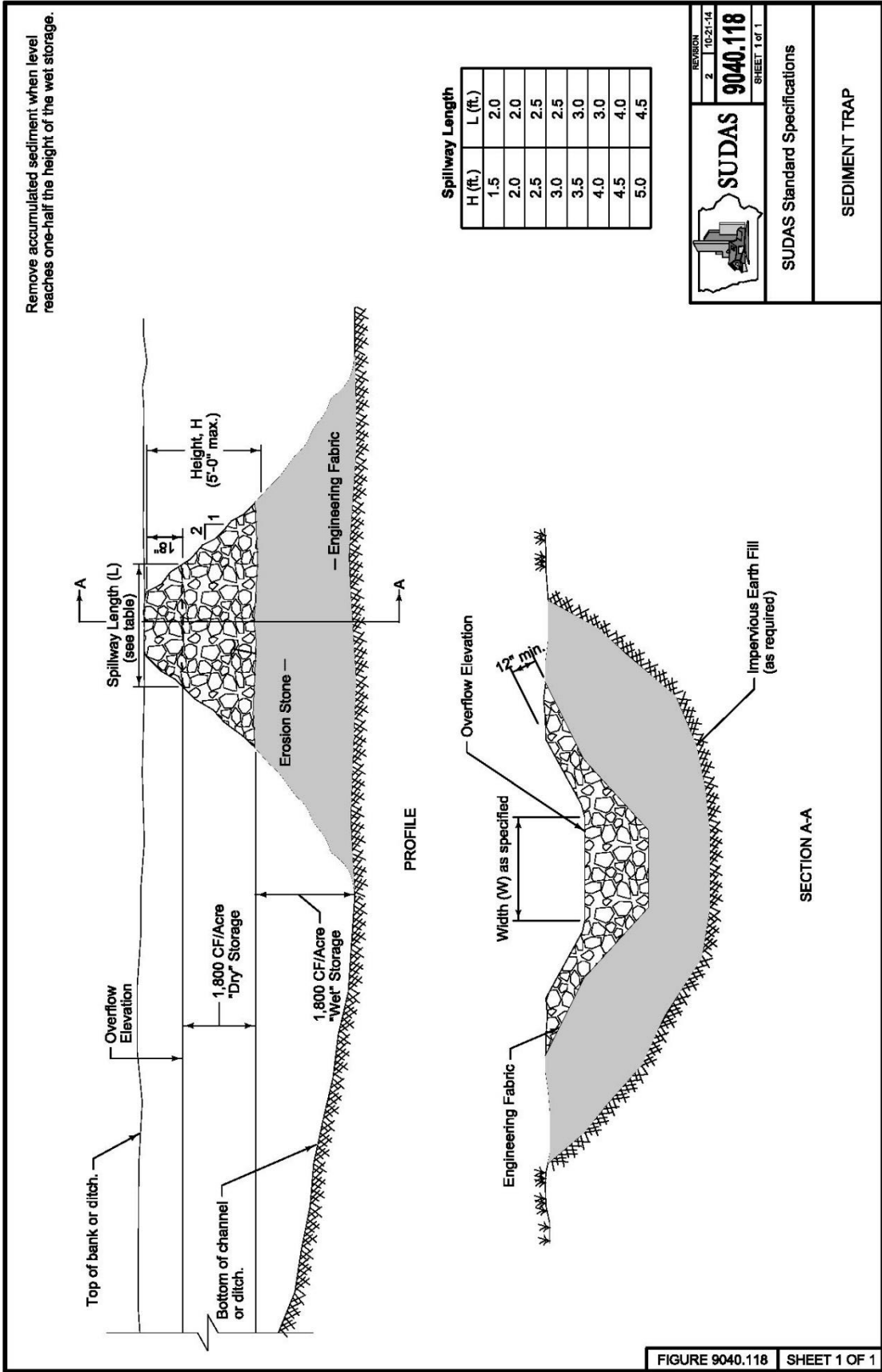
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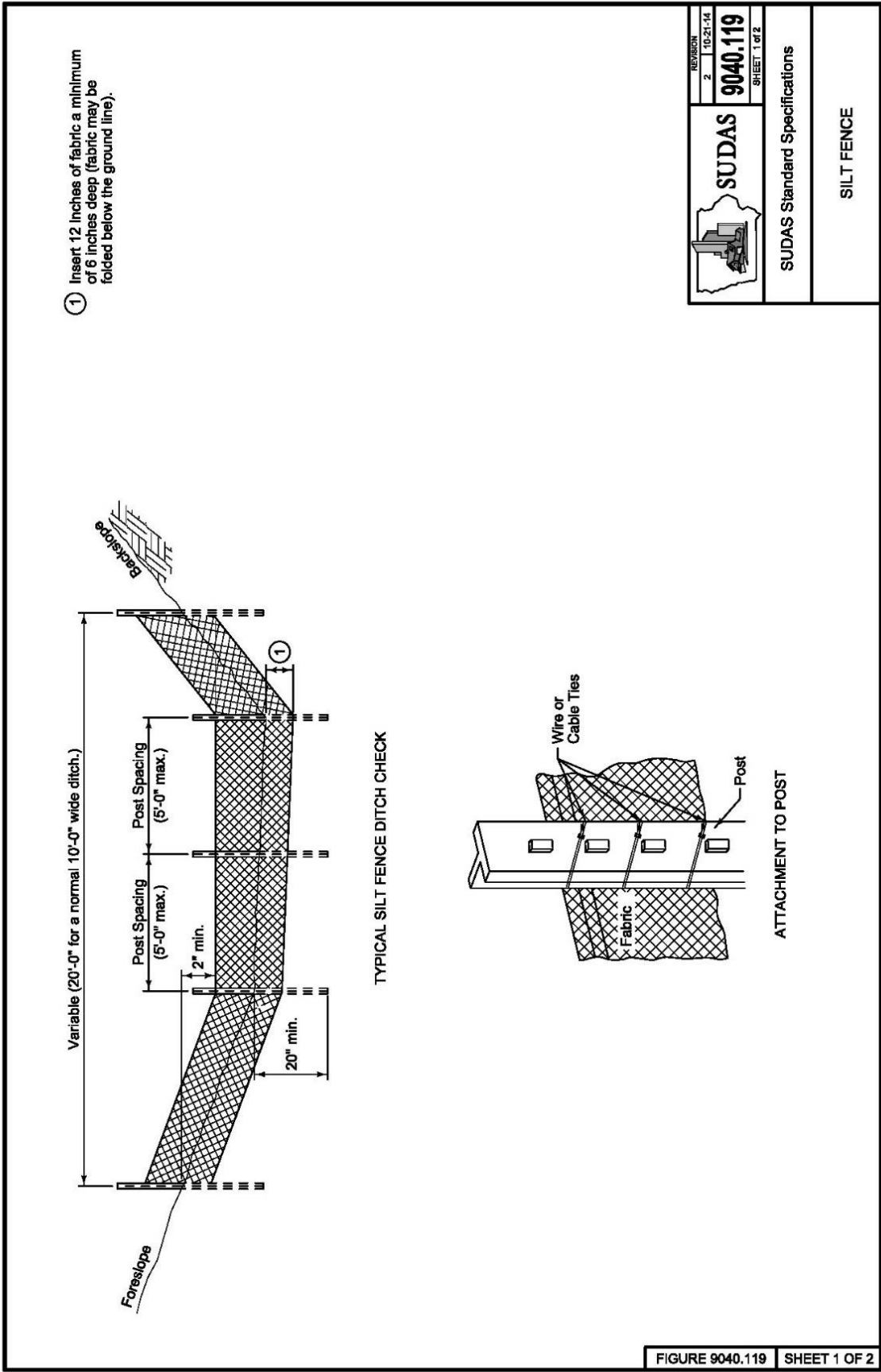
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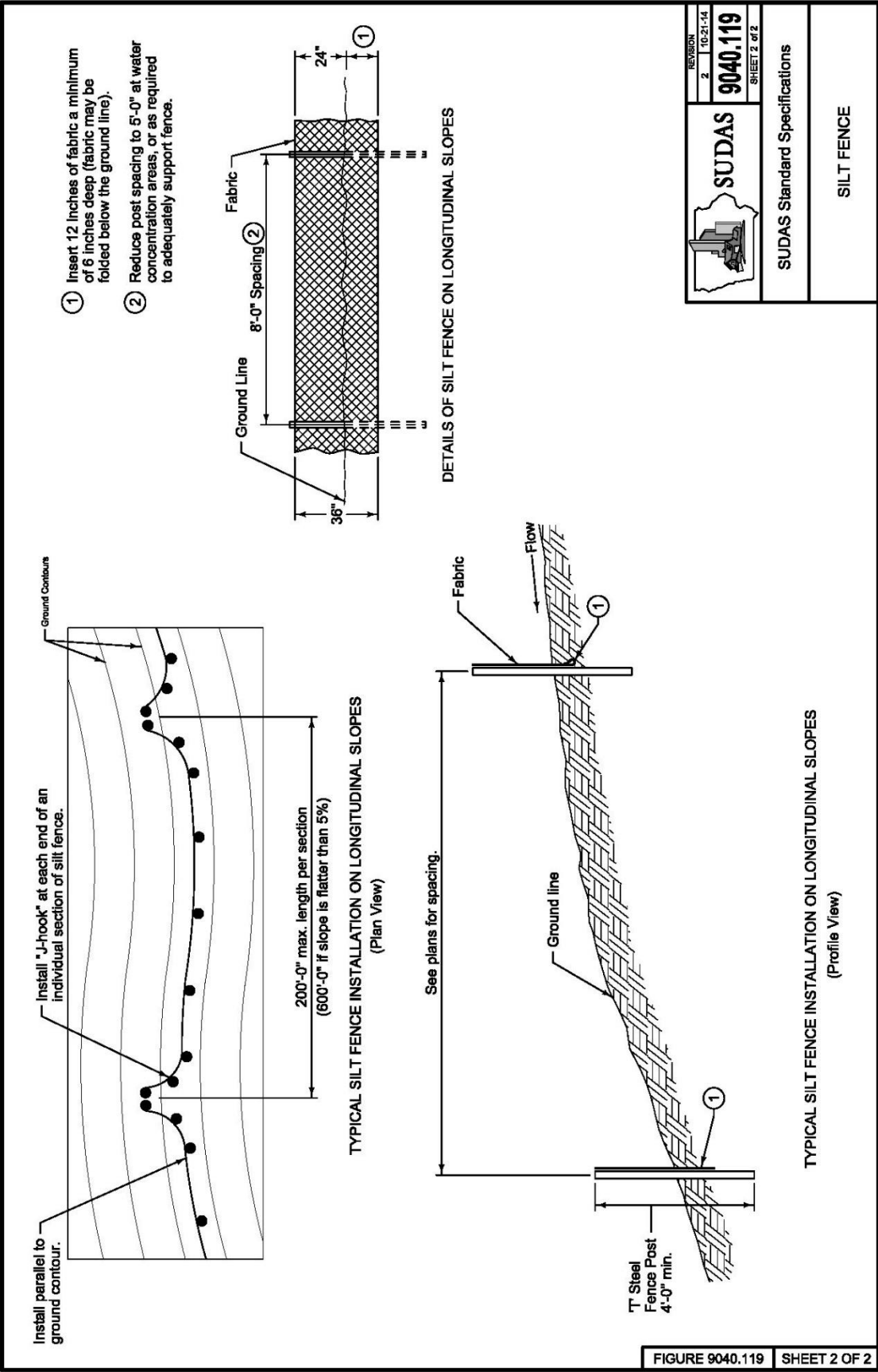
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ANTI-VORTEX DEVICE

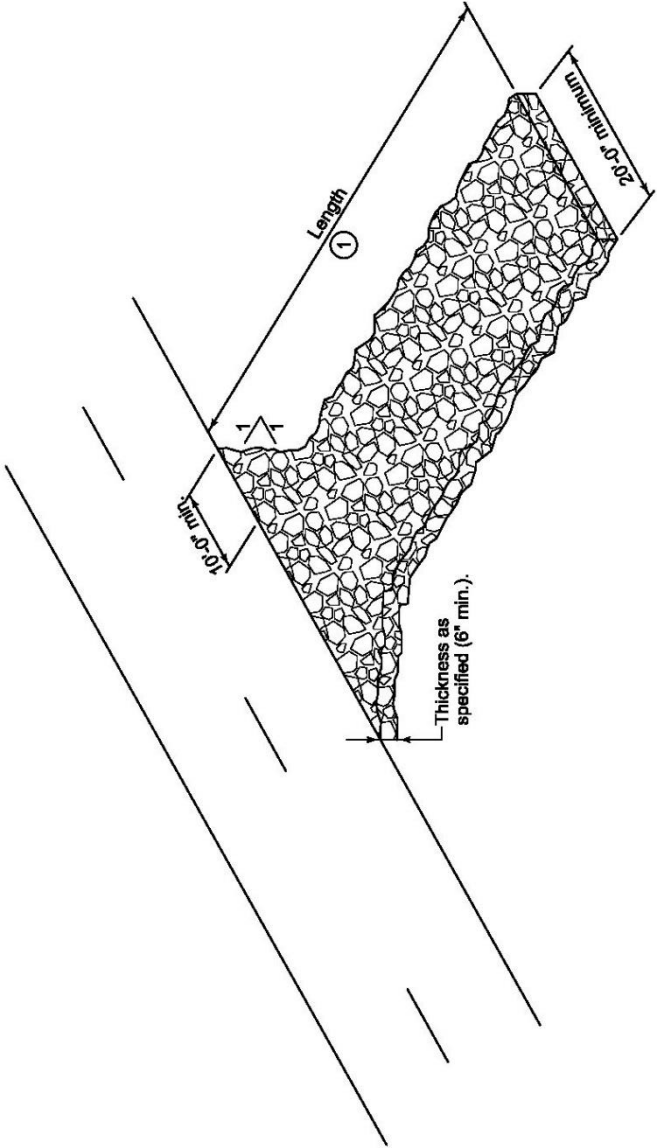








- ① Entrance length: 50 foot minimum (30 foot for single family residential), or as specified in the contract documents. Length of entrance may be increased if sediment track-out occurs.



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SUDAS Standard Specifications

STABILIZED
CONSTRUCTION ENTRANCE

FIGURE 9040.120 SHEET 1 OF 1

SECTION 9050 - GABIONS AND REVET MATTRESSES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Gabions
- B. Revet Mattresses (Gabion Mattresses)

1.02 DESCRIPTION OF WORK

- A. Assembly and installation of gabions.
- B. Assembly and installation of revet mattresses.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants, as well as the following:

Upon request, submit certification that products supplied comply with identified specifications.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT

A. Gabions:

1. **Measurement:** Measurement will be the plan quantity in cubic yards for the total volume of each type of gabion installed.
2. **Payment:** Payment will be at the unit price per cubic yard for each type of gabion installed.
3. **Includes:** Unit price includes, but is not limited to, furnishing and assembling wire mesh baskets, PVC coating (if specified in the contract documents), fasteners, furnishing and placing gabion stone, engineering fabric, and anchor stakes.

B. Revet Mattresses:

1. **Measurement:** Measurement will be the plan quantity in cubic yards for the total volume of each type of revet mattress installed.

2. **Payment:** Payment will be at the unit price per cubic yard for each type of revet mattress installed.
3. **Includes:** Unit price includes, but is not limited to, furnishing and assembling wire mesh baskets, PVC coating (if specified in the contract documents), fasteners, furnishing and placing mattress stone, engineering fabric, and anchor stakes.

C. **Excavation:** Comply with Section 2010, 1.08, E.

PART 2 - PRODUCTS

2.01 DOUBLE TWISTED WIRE BASKETS

Utilize double twisted wire baskets unless otherwise specified in the contract documents.

A. **General:** Fabricate baskets according to ASTM A 975.

B. **Wire:**

1. **Galvanized:** Comply with ASTM A 975, Style 1 for mesh, selvedge, and lacing wire.
2. **PVC Coated:** Comply with ASTM A 975, Style 3 for mesh, selvedge, and lacing wire.
3. **Tensile Strength:** Minimum tensile strength of 60,000 psi. Maximum tensile strength as specified in ASTM A 975.

C. **Connections:**

1. **Galvanized Gabion and Revet Mattresses:** Provide metallic coated steel lacing wire or ring fasteners complying with ASTM A 975.
2. **PVC Coated Gabions and Revet Mattresses:** Provide only stainless steel ring fasteners complying with ASTM A 975.

2.02 WELDED WIRE BASKETS

Utilize welded wire baskets only when specified in the contract documents.

A. **General:** Fabricate baskets according to ASTM A 974.

B. **Welded Wire:**

1. **Galvanized:** Comply with ASTM A 974, Style 2 for wire, selvedge, and lacing wire.
2. **PVC Coated:**
 - a. Provide Style 2, galvanized wire fabric with a minimum nominal wire diameter of 0.120 inches for gabion baskets and 0.087 inches for revet mattresses.
 - b. Coat wire with PVC. Comply with ASTM A 974, Style 5.

3. **Tensile Strength:** Minimum tensile strength of 80,000 psi. Maximum tensile strength as specified in ASTM A 974.

C. Connections:

1. **Galvanized Gabions and Revet Mattresses:** Provide metallic-coated lacing wire with a nominal diameter of 0.120 inches. Comply with the requirements of ASTM A 764 as follows:
 - a. Tensile Strength: Class I (Finish 1 or 2).
 - b. Coating: Class 3, Type B or C.
2. **PVC Coated Gabions and Revet Mattresses:** Provide stainless steel lacing wire with a nominal diameter of 0.120 inches complying with ASTM A 313, Type 302, Class 1.

2.03 GABION AND MATTRESS STONE

Comply with Iowa DOT Section 4130.

2.04 ENGINEERING FABRIC

Comply with Iowa DOT Article 4196.01, B for embankment erosion control.

2.05 ANCHOR STAKES

When anchor stakes are specified in the contract documents provide 2 inch galvanized standard weight pipe complying with ASTM A 53. Provide stakes with length as specified in the contract documents.

2.06 GRANULAR SUBBASE

Comply with Iowa DOT Section 4123 for modified subbase.

PART 3 - EXECUTION

3.01 SUBGRADE PREPARATION AND BEDDING

- A. When applicable, cut and reshape the area behind a proposed gabion wall as specified in the contract documents to allow for placement of the wall.
- B. Excavate the subgrade area to the required elevation and smooth as necessary for proper placement of the gabions or mattresses.
- C. Prepare a firm unyielding subgrade foundation. In fill areas, construct and compact subgrade to no less than 95% of maximum Standard Proctor Density according to ASTM D 698.
- D. If unsuitable foundation materials exist, remove and replace with suitable materials and compact to no less than 95% of maximum Standard Proctor Density according to ASTM D 698.
- E. If specified in the contract documents, place and compact granular subbase materials to the dimensions specified in the contract documents.

3.02 ENGINEERING FABRIC

- A. Install engineering fabric under the proposed gabion or mattress installation.
- B. Extend fabric behind gabion walls to the top of the wall.
- C. Overlap adjacent sections of engineering fabric a minimum of 3 inches, with the upstream strip on top.

3.03 CONNECTIONS

Make all connections with lacing wire or approved fasteners.

A. Lacing Wire:

- 1. Loop or twist lacing wire to secure it to the wire mesh or fabric.
- 2. Proceed to lace with alternating double and single loops through every mesh or fabric opening, approximately every 3 to 4 inches, pulling each loop tight.
- 3. Secure end of lacing wire to the wire mesh or fabric by twisting or looping.

B. Fasteners: Install fasteners according to manufacturer's specified spacing.

3.04 GABION ASSEMBLY AND INSTALLATION

- A. Refer to the contract documents for special details of gabion wall installation including height, slope of wall, gabion setback, special backfill materials, and tieback requirements. Construct these features as specified in the contract documents.
- B. Unfold baskets and flatten all kinks and bends. Erect the sides, ends, and diaphragms, ensuring all panels are in the correct position and the tops of all sides are aligned.
- C. Connect the four corners of the gabion first, followed by connecting the diaphragms to the outside walls.
- D. Install and secure gabion baskets together.
 - 1. After initial assembly, move baskets into their final position.
 - 2. Join empty baskets together along the vertical and top edges.
- E. Fill gabion baskets with gabion stone.
 - 1. When PVC coated baskets are specified, take care not to damage PVC coating during stone placement.
 - 2. Fill baskets in lifts not exceeding 1 foot each.
 - 3. Manually orient stones after placement of each lift.
 - 4. Machine placement of stone will be allowed. However, considerable handwork is required to provide maximum density without bulges, a compact and dense exposed face, and maximum aggregate contact with the lid and other baskets to be placed in the structure.

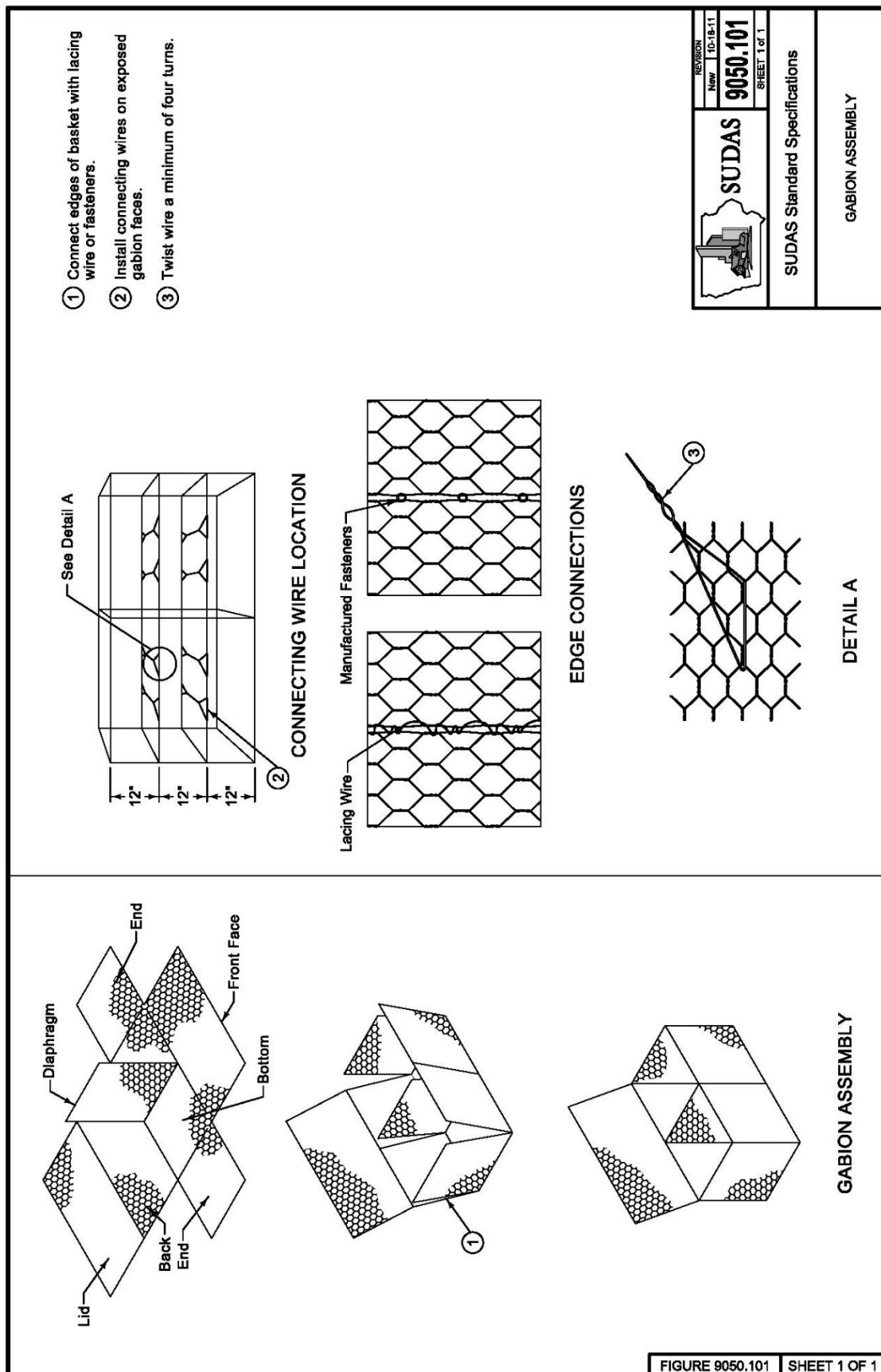
5. For gabions 3 feet high, install internal connecting wires after placement of each lift. Internal connecting wires are not required on gabions with a height of 18 inches or less.
 - a. Connect each exposed cell face to the opposite face or diaphragm with internal connecting wires.
 - b. Install two connecting wires on each exposed face, in each cell, in between each lift.
 - c. Locate wires with equal horizontal spacing approximately 1 foot apart.
 - d. Install wires by looping each end around two mesh or fabric openings, then wrapping wire tightly around itself for at least four full turns, locking the end of the wire in place by lacing it under the previous lap.
 - e. A 3 foot high cell with one exposed face requires four connecting wires. A 3 foot high end cell with two exposed faces requires eight connecting wires.
6. Fill adjacent cells consecutively. Do not allow stone fill in one cell to be more than 1 foot higher than an adjacent cell.
7. Overfill gabions 1 to 2 inches to allow for settlement.
- F. Attach gabion lids.
 1. Pull edges of lids tight until lid meets the perimeter edge of the gabion.
 2. Install lacing wire or fasteners at edges and diaphragms to connect lid.
- G. Place and compact backfill behind gabion walls to the same level as the filled gabions as gabions are installed.
- H. If structure requires more than one layer, connect the upper empty baskets to the top of the completed lower gabions along the front and back edges of the baskets.

3.05 REVET MATTRESS ASSEMBLY AND INSTALLATION

- A. Assemble revet mattresses in their final location. Unroll mattress and flatten all kinks and bends.
- B. Erect the sides, ends, and diaphragms, ensuring that all panels are in the correct position and the tops of all sides are aligned.
- C. Connect the four corners of the mattress first followed by connecting the diaphragms to the outside walls.
- D. Join adjacent empty mattresses together along the vertical and top edges.
- E. If anchor stakes are specified in the contract documents, install stakes at required spacing. Drive stakes into ground so the top of the stake is flush with the top of the mattress. Tie anchor stakes to baskets at the top and base of the mattress.
- F. Fill revet mattresses with mattress stone.

1. When PVC coated baskets are specified, take care not to damage PVC coating during stone placement.
 2. Machine placement of stone will be allowed. However, handwork is required to provide maximum density without bulges or voids.
 3. Fill mattresses in stages as required to prevent bulges between adjacent cells.
 4. Overfill mattresses 1 to 2 inches to allow for natural settlement of stone.
- G. Attach mattress lids.
1. Pull edges of lids tight until lid meets the perimeter edge of the mattress.
 2. Install lacing wire or fasteners at edges and diaphragms to connect lid.

END OF SECTION



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SECTION 9060 - CHAIN LINK FENCE

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Chain Link Fence
- B. Removal and Reinstallation of Existing Fence
- C. Temporary Fence

1.02 DESCRIPTION OF WORK

- A. Installation of chain link fence.
- B. Removal and reinstallation of existing fences.
- C. Installation and removal of temporary fence.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants, as well as the following:

- A. Materials and color samples for vinyl-coated fence fabric.
- B. Upon request, submit certification that products supplied comply with identified specifications.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

Provide chain link fencing and gates as completed units, constructed by a single source, including necessary erection accessories, fittings, and fastenings.

1.08 MEASUREMENT AND PAYMENT

A. Chain Link Fence:

1. **Measurement:** Measurement will be in linear feet for each type and height of fence, measured along the bottom of the fence fabric, excluding the length of gates.
2. **Payment:** Payment will be at the unit price per linear foot for each type and height of fence installed.
3. **Includes:** Unit price includes, but is not limited to, posts, fabric, rails, braces, truss rods, ties, tension wire, tension bands, tension bars, grounds, fittings,

PVC coating (if specified in the contract documents), excavation of post holes, and concrete encasement of posts.

B. Gates:

1. **Measurement:** Each type, height, and span of gate will be counted.
2. **Payment:** Payment will be at the unit price for each type, height, and span of gate.
3. **Includes:** Unit price includes, but is not limited to, gate rails, fabric, stretcher bars, braces, vertical stay, hinges, latches, keepers, drop bar lock, center gate stop, and barbed wire (if specified in the contract documents).

C. Barbed Wire:

1. **Measurement:** Measurement will be in linear feet for the length of fence to which barbed wire is applied, measured along the top of fence.
2. **Payment:** Payment will be at the unit price per linear foot of barbed wire.
3. **Includes:** Unit price includes, but is not limited to, furnishing and installing all necessary strands of barbed wire, anchors, and barbed wire supporting arms.

D. Removal and Reinstallation of Existing Fence:

1. **Measurement:** Measurement will be in linear feet for each type and size of fence removed and reinstalled, measured along the bottom of the fence fabric, including length of gates.
2. **Payment:** Payment will be at the unit price per linear foot for each size and type of fence removed and reinstalled.
3. **Includes:** Unit price includes, but is not limited to, removing vegetation; removing all fence fabric, appurtenances, posts, and gates; removal of concrete encasement from posts; storage of the removed fencing materials to prevent damage; reinstallation of the posts, gates, and fabric, including all appurtenances; and replacement of any fence parts that are not able to be salvaged and reinstalled. Replace items damaged from Contractor's operations with new materials, at no additional cost to the Contracting Authority.

E. Removal of Fence:

1. **Measurement:** Measurement will be in linear feet of fence removed, measured along the bottom of fence fabric, including length of gates.
2. **Payment:** Payment will be at the unit price per linear foot of fence removed.
3. **Includes:** Unit price includes, but is not limited to, off-site disposal of fence (including posts, concrete encasement of posts, gates, grounds, and barbed wire) and placing and compacting backfill material in post holes.

F. Temporary Fence:

1. **Measurement:** Measurement will be in linear feet for each type and height of temporary fence, measured along the bottom of the fence fabric, excluding the length of gates.
2. **Payment:** Payment will be at the unit price per linear foot for each type and height of temporary fence.
3. **Includes:** Unit price includes, but is not limited to, furnishing, installing, and removing posts, fabric, ties, and fittings.

PART 2 - PRODUCTS**2.01 FABRIC**

- A. **General:** Provide fence fabric manufactured from wire meeting the requirements of ASTM A 817. Use No. 9 gauge wire woven in a 2 inch mesh. Construct knuckled selvedge at the top and bottom of the fabric.
- B. **Zinc-coated Fabric:** Comply with ASTM A 392.
 1. Wire Coated Prior to Weaving: Use Type II, Class 5 zinc coating per ASTM A 817.
 2. Fabric Coated After Weaving: Use Class 2 coating per ASTM A 392.
- C. **Aluminum-coated Fabric:** Meet the requirements of ASTM A 491. Coat wire prior to weaving fabric per ASTM A 817, Type I coating.
- D. **PVC-coated Fabric:** Comply with ASTM F 668, Class 2b.
 1. Apply PVC coating to zinc or aluminum-coated wire prior to weaving fabric.
 2. PVC coating color as specified in the contract documents, complying with ASTM F 934.

2.02 POSTS, RAILS, AND BRACES

- A. Standard weight (Schedule 40) pipe complying with ASTM F 1083.
 1. Galvanize pipe inside and out.
 2. Unless otherwise specified in the contract documents, provide the following nominal sizes for the respective uses:

Post Use	Fence Height		
	48" and under (nominal diameter)	48" to 96" (nominal diameter)	Greater than 96" (nominal diameter)
Line Post	2"	2 1/2"	3"
Terminal Post*	2 1/2"	3"	4"
Top/intermediate Rail Braces	1 1/4"	1 1/4"	1 1/4"
Gate Post	Refer to contract documents and ASTM F 900		

*Includes corner, angle, end, and pull posts.

- B. Pipe meeting the requirements of ASTM F 1043, Group 1A (Type A coating) or Group 1C (Type B coating). Use nominal sizes specified in ASTM F 1043.
- C. When PVC-coated fence is specified in the contract documents, coat all posts, rails, and braces with a PVC-coated finish according to ASTM F 1043.
 - 1. Zinc-coated post per ASTM F 1083 prior to application of PVC coating.
 - 2. Color as specified in the contract documents, complying with ASTM F 934.
- D. Ensure all posts, rails, and braces provided for a given section of fence have similar coatings and shapes.
- E. Provide caps for all posts. Comply with ASTM F 626.

2.03 FITTINGS

- A. Comply with ASTM F 626.
- B. Provide attachments to connect braces to posts by fittings that will hold both post and brace rigidly.
- C. Provide 3/8 inch diameter round steel diagonal tension rods with an appropriate commercial means for tightening. Provide a locknut or other device to hold the tightening device in place.
- D. Provide a suitable sleeve or coupling device, recommended by the manufacturer, to connect sections of top rail and provide for expansion and contraction.
- E. Use stretcher (tension) bars of the size specified in ASTM F 626 with suitable bands for attaching fabric to corner, end, or gate posts.

2.04 TIE WIRE AND TENSION WIRE

- A. **Tie Wire:** Provide tie wires for chain link fence that are the size and type the manufacturer recommends, but no smaller than No. 9 diameter for post ties or No. 12 diameter for rail and brace ties. Comply with ASTM F 626.
- B. **Tension Wire:** Comply with ASTM A 824, with Type I or Type II (Class 3) coating per ASTM A 817.

2.05 BARBED WIRE SUPPORTING ARMS

- A. Comply with ASTM F 626 for type of arm configuration specified in the contract documents, as listed below:
 - 1. Type I: Single slanted arm for three barbed wire strands.
 - 2. Type II: Single vertical arm for three barbed wire strands.
 - 3. Type III: V-shaped arm for six barbed wire strands.
 - 4. Type IV: A-shaped arm for five barbed wire strands.
- B. Anchor arms to line, end, corner, and pull posts

2.06 BARBED WIRE

Comply with ASTM A 121, design number 12-4-5-14R, Type A or Type Z (Class 3) coating.

2.07 GATES

- A. Provide the type, height, and width of gates as specified in the contract documents.
- B. Comply with ASTM F 900.
- C. Provide coating on gate, gate posts, and fabric as required for adjacent fence.

2.08 CONCRETE

Provide concrete materials complying with Section 6010.

2.09 ELECTRICAL GROUND

- A. **Ground Rod:** 5/8 inch diameter, 8 foot long copper-clad rod.
- B. **Ground Wire:** No. 6 AWG bare copper wire.

PART 3 - EXECUTION

3.01 CHAIN LINK FENCE INSTALLATION

- A. **General:** Comply with ASTM F 567. Construct fence at the location and height specified in the contract documents.
- B. **Posts:**
 - 1. **Post Location:**
 - a. Place posts in the line of the fence with equal spacing not to exceed 10 feet on center.
 - b. Set terminal (end, corner, and gate) posts at the beginning and end of each continuous length of fence and at abrupt changes in vertical and horizontal alignments. Place pull posts so that no more than 300 linear feet of fence is constructed with only line posts.
 - 2. **Post Setting:**
 - a. Dig or drill post holes to the dimensions specified in the contract documents.
 - b. Set posts in concrete. Ensure all posts are set plumb in a vertical position.
 - c. Form top of concrete footing so it extends 1 inch above grade and is sloped to direct water away from the post. To prevent frost heave, ensure footing is a uniform size to full depth without flare at the top of grade.
 - d. Install posts no less than 24 hours prior to installation of fabric.
 - e. Set terminal, corner, angle, pull, and gate posts with the required brace-post assembly as specified in the contract documents.

C. Rails:

1. **Top Rail:** Pass the top rail through the base of the line post caps to form a continuous brace from end to end of each stretch of fence. Join rail sections with sleeve or coupling device to allow for expansion and contraction. Securely fasten the top rail to the terminal posts with pressed steel connectors.
2. **Intermediate Rail:** Securely fasten the intermediate rail between all line posts and terminal posts with pressed steel fasteners. Intermediate rail is required only on fences 8 feet tall and taller.

D. Braces:

1. Securely fasten braces to the post by means of malleable iron or pressed steel connections; then truss from the line post back to the end, gate, or corner post.
2. Tighten the diagonal tension rod (truss rod) to produce proper tension.

E. Fabric:

1. Install fabric on the outside of the posts from the area being fenced or on the roadway side of the posts.
2. Secure one end of the fabric by a stretcher bar inserted in the final link of the fabric. Pull fabric taut with bottom selvedge, 2 inches above grade, before making attachment elsewhere.
3. Tighten and secure each end of each run of chain link fabric by a stretcher bar inserted in the final link of the fabric. Secure stretcher bar to the end post by tension bands equally spaced no more than 15 inches apart.
4. Attach fence fabric securely to the braces, top rail, tension wire, and all intermediate posts with wire ties or bands at intervals of no more than 12 inches.

F. Bottom Tension Wire:

1. Install bottom tension wire on fence 5 feet high and taller.
2. Stretch bottom tension wire taut from terminal post to terminal post and securely fasten to each intermediate post within the bottom 6 inches of fabric.

G. Barbed Wire (When Specified):

1. Install 3 parallel wires on each barbed wire supporting arm on the outside of the area being secured, unless otherwise specified in the contract documents.
2. Pull wires taut, without kinks or twists, for tension.

H. Gates: Install gates as specified in the contract documents.**I. Electrical Grounds:**

1. Install electrical grounds as specified in the contract documents at the following locations:

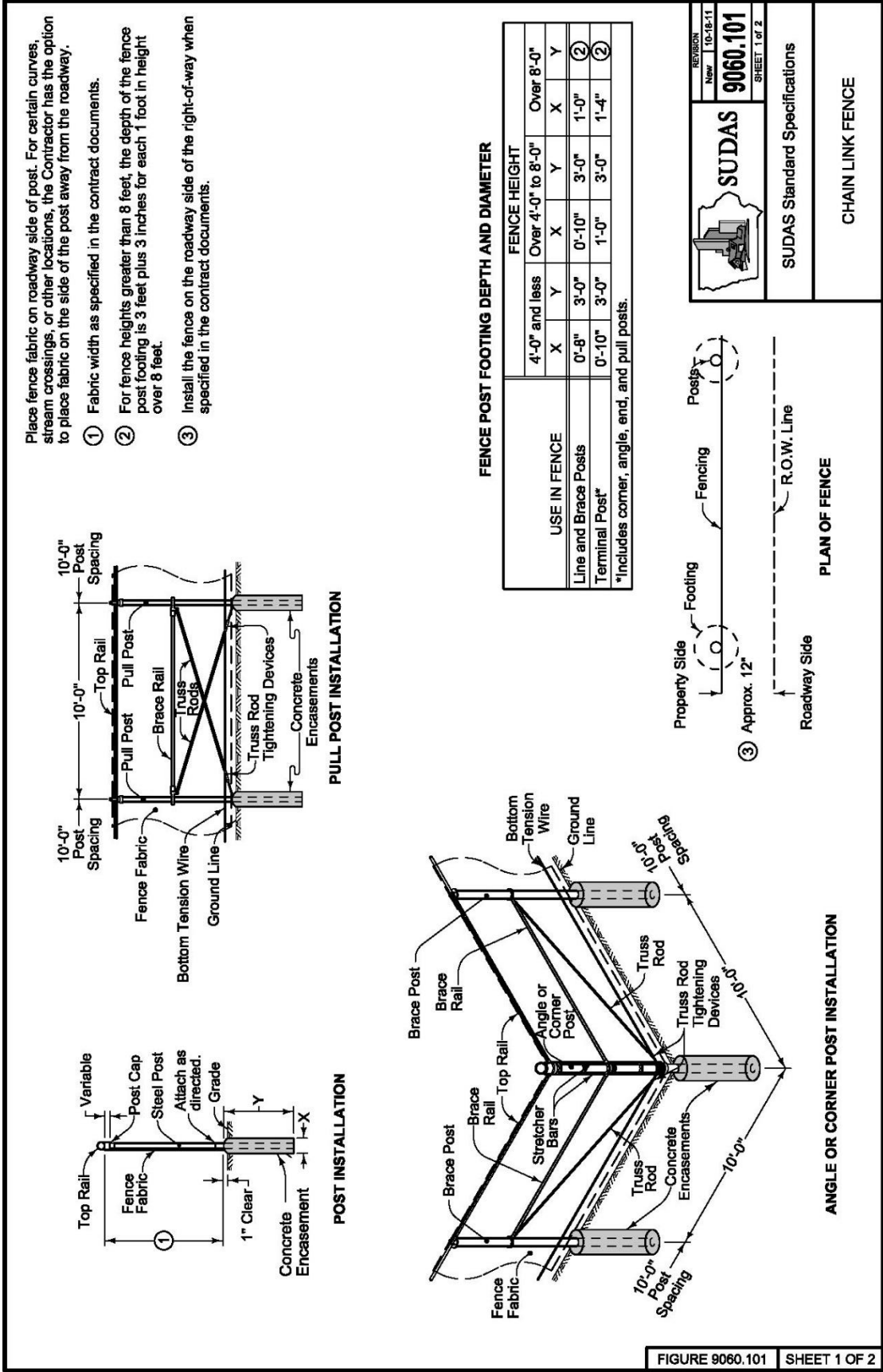
- a. Where a primary electrical transmission line (not a secondary feeder line for individual service) passes over the fence. Also install the ground on the fence at a distance of 25 to 50 feet in each direction from the crossing.
 - b. Where the fence is adjacent to and within 50 feet of a primary electrical transmission line, install the ground at 500 foot maximum intervals.
 - c. In at least one location on each applicable straight section of fence.
2. Drive ground rod vertically until the top is 6 inches below the ground surface.
 3. Clamp ground wire to the rod and to the fence in such a manner that each element of the fence is grounded.

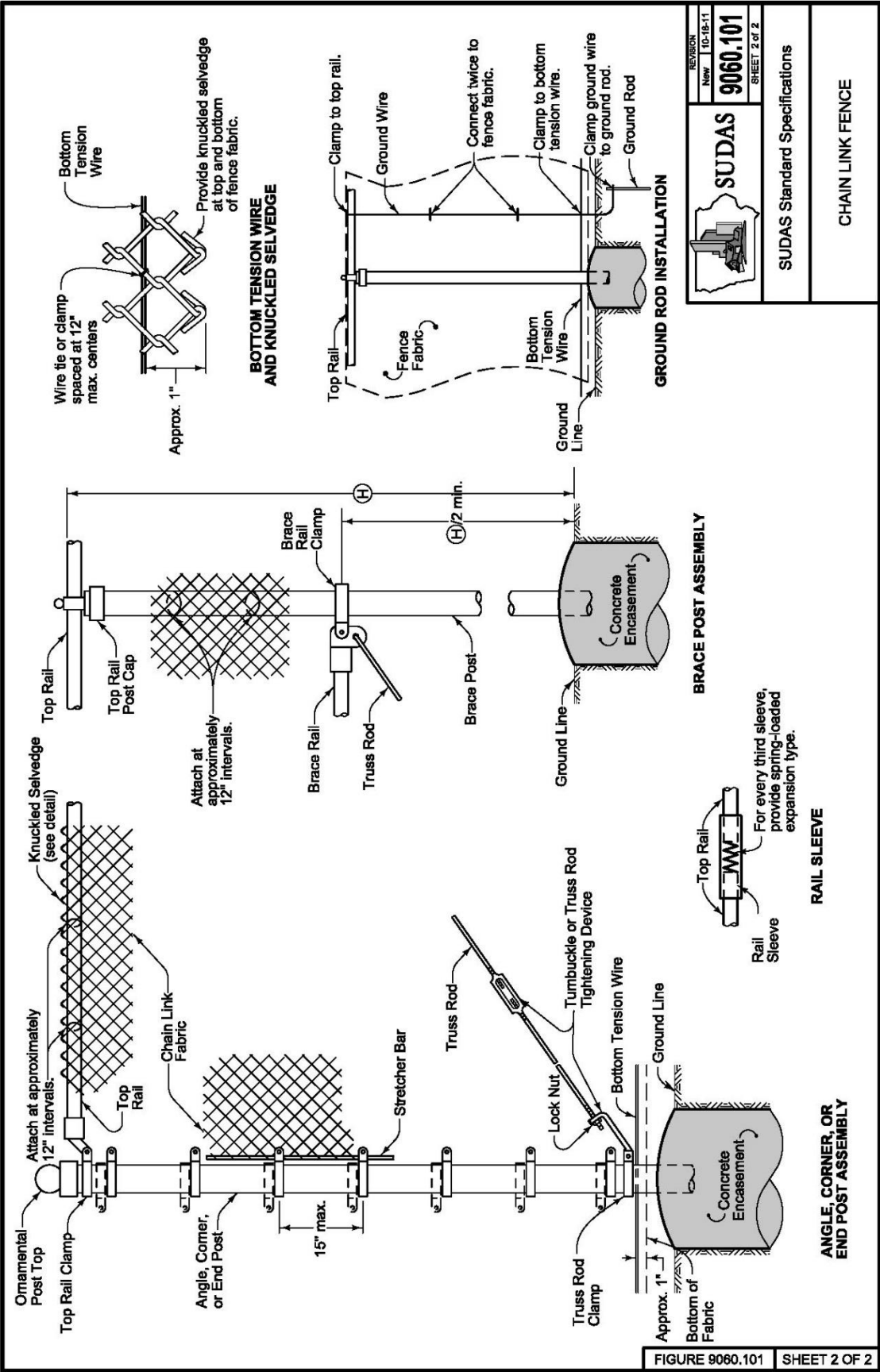
3.02 REMOVAL OF EXISTING FENCE

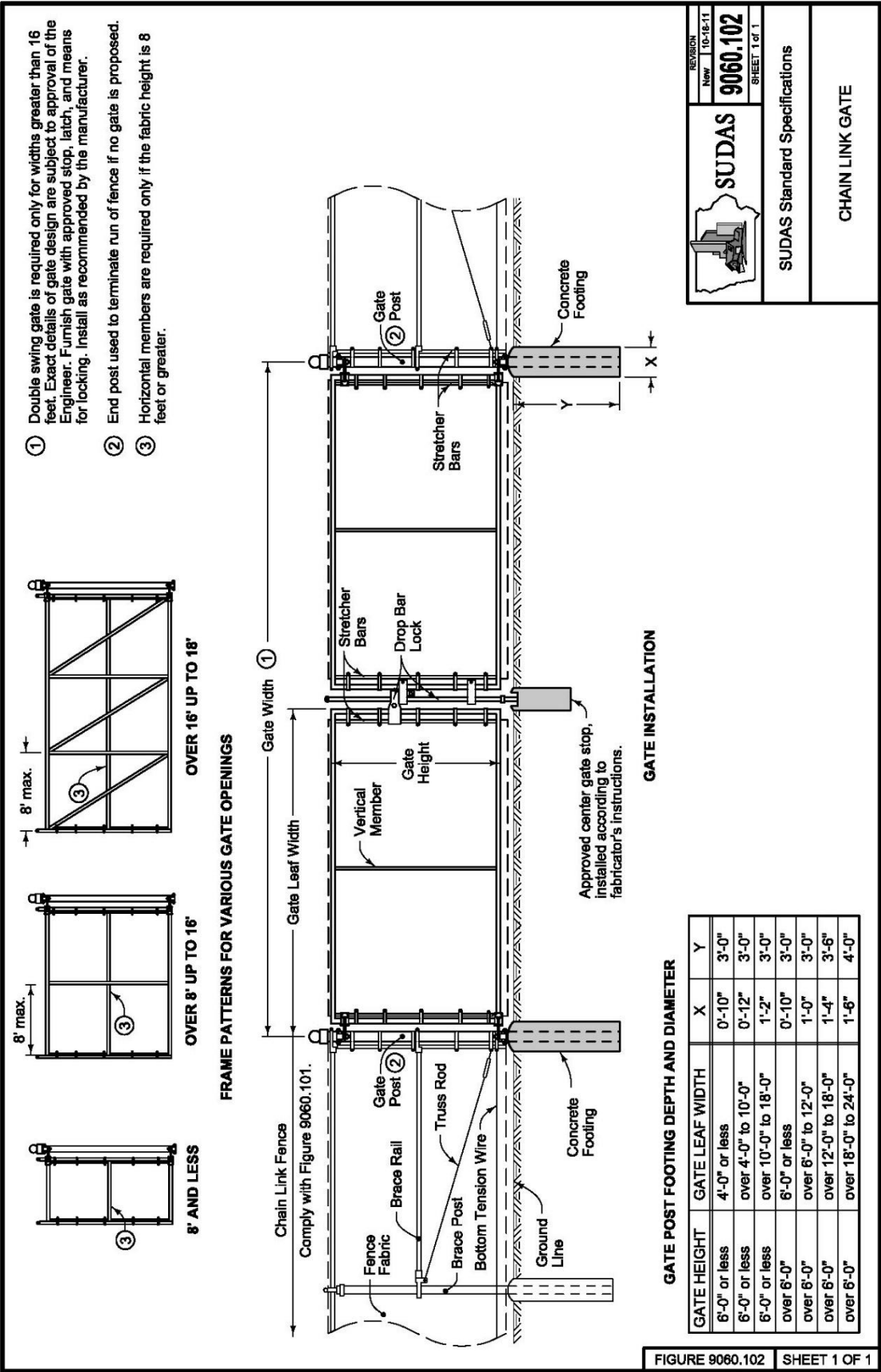
Remove all fences, including posts and footings, within work areas unless otherwise specified in the contract documents. Remove fence to first line post beyond construction limits. Replace items damaged from Contractor's operations with new materials, at no additional cost to the Contracting Authority.

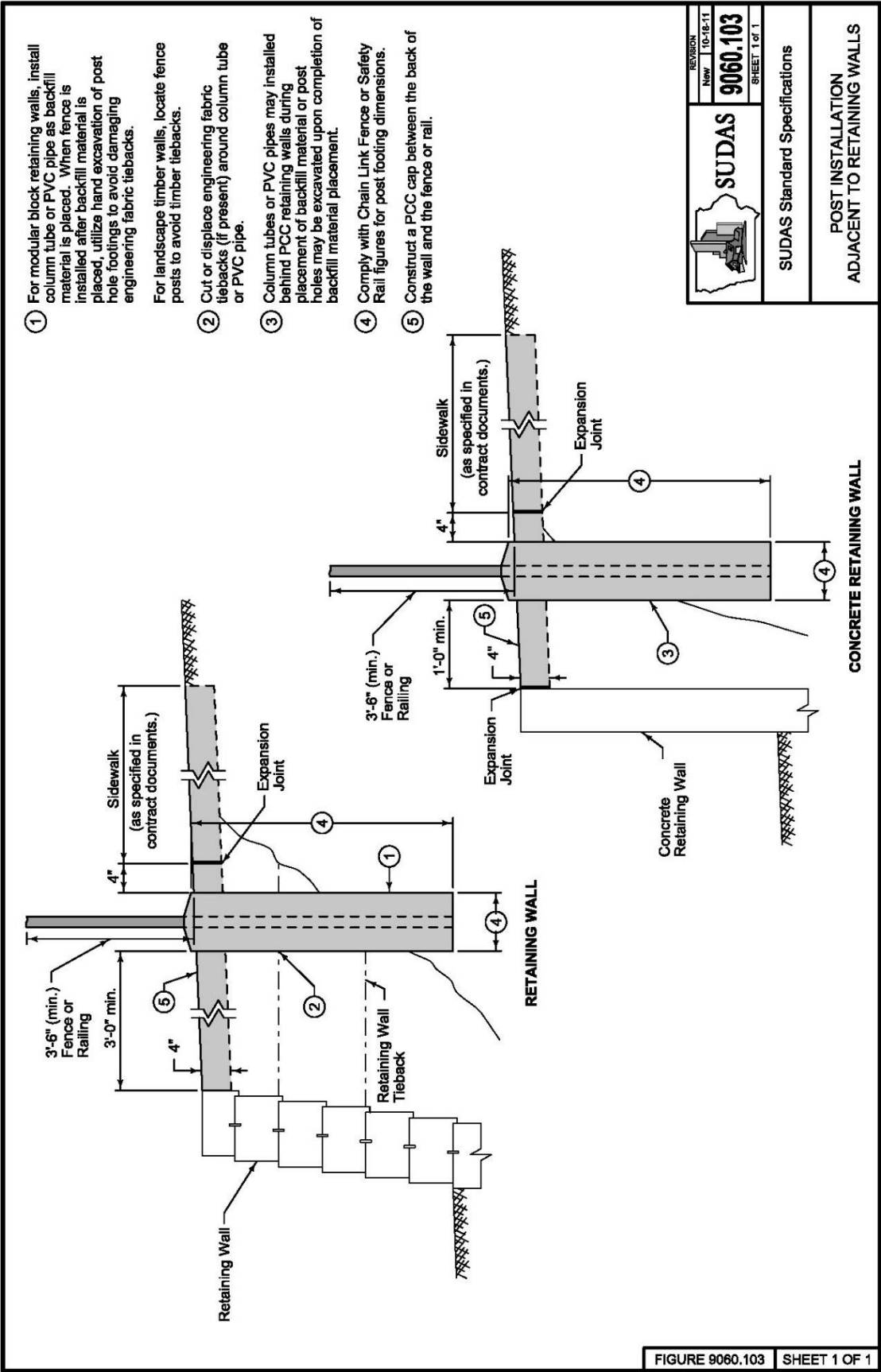
3.03 TEMPORARY FENCE

- A. Furnish and install chain link fence fabric, posts, ties, and other materials for the height specified in the contract documents.
- B. Install according to permanent fence installation specifications, with the following exceptions:
 1. Drive posts into the ground. Do not set posts in concrete except at corner or temporary gate posts.
 2. Top rail, tension wire, and bracing will not be required.
- C. Remove temporary fence and materials when no longer necessary. Place suitable backfill material in post holes. Fence materials will remain the property of the Contractor and removed from the site.









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SECTION 9070 - LANDSCAPE RETAINING WALLS

PART 1 -GENERAL

1.01 SECTION INCLUDES

- A. Modular Block Retaining Walls
- B. Limestone Retaining Walls
- C. Landscape Timber Retaining Walls

1.02 DESCRIPTION OF WORK

- A. Construction of modular block retaining walls.
- B. Construction of limestone retaining walls.
- C. Construction of landscape timber retaining walls.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants, as well as the following:

- A. Upon request, submit certification that products supplied comply with identified specifications.
- B. Test results on modular blocks, if required.
- C. Catalog cuts for modular retaining wall blocks and cap stones indicating the size, type, and color proposed for installation.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT

A. Modular Block Retaining Wall:

1. **Measurement:** Measurement will be in square feet for the area of the face of retaining wall, measured from the top of the leveling pad to the top of the wall, including coping or cap stones.
2. **Payment:** Payment will be at the unit price per square foot of retaining wall.
3. **Includes:** Unit price includes, but is not limited to, excavation, foundation preparation, furnishing and placing wall units, geogrid (if necessary), leveling

pad, subdrain, porous backfill material for subdrain, engineering fabric for subdrain, granular backfill material, suitable backfill material, and shoring as necessary.

B. Limestone Retaining Wall:

1. **Measurement:** Measurement will be in square feet for the area of the face of retaining wall.
2. **Payment:** Payment will be at the unit price per square foot of retaining wall.
3. **Includes:** Unit price includes, but is not limited to, excavation, foundation preparation, furnishing and placing leveling pad, limestone, subdrain, porous backfill material for subdrain, engineering fabric for subdrain, suitable backfill material, and shoring as necessary.

C. Landscape Timbers:

1. **Measurement:** Measurement will be in square feet for the area of the face of retaining wall, measured from the top of the leveling pad to the top of the wall.
2. **Payment:** Payment will be at the unit price per square foot of retaining wall.
3. **Includes:** Unit price includes, but is not limited to, excavation, foundation preparation, furnishing and placing leveling pad, landscape timbers, spikes, reinforcing bar, subdrain, porous backfill material for subdrain, engineering fabric for subdrain, suitable backfill material, and shoring as necessary.

D. Excavation and Suitable Backfill Material: If bid separately, excavation for wall construction and placement of suitable backfill material will be measured and paid according to Section 2010, 1.08.

E. Fence: Comply with Section 9060, 1.08, A.

F. Safety Rail: Comply with Section 9080, 1.08, C.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Modular Block Walls:

1. Dry-cast Concrete Wall Units:

- a. Comply with ASTM C 1372. Test units and provide samples according to ASTM C 140.
- b. Provide certification that the blocks comply with the freeze-thaw durability requirements of ASTM C 1262 and Iowa DOT Materials I.M. 445.04.
- c. Furnish from an approved supplier listed in Iowa DOT Materials I.M. 445.04, Appendix A.
- d. In lieu of furnishing blocks from an approved supplier, provide blocks from an approved system.
 - 1) Iowa DOT Materials I.M. 445.04, Appendix B lists approved systems.

- 2) Test the required number of blocks from the lot to be installed according to Iowa DOT Materials I.M. 445.04.
 - 3) Submit results of test data to the Engineer.
2. **Wet-cast Concrete Wall Units:** Comply with Iowa DOT Materials I.M. 445.05.
 - a. Furnish from an approved supplier listed in Iowa DOT Materials I.M. 445.05, Appendix A.
 - b. In lieu of furnishing blocks from an approved supplier, provide blocks from an approved system.
 - 1) Iowa DOT Materials I.M. 445.05, Appendix B lists approved systems.
 - 2) Test the required number of blocks from the lot to be installed according to Iowa DOT Materials I.M. 445.05.
 - 3) Submit results of test data to the Engineer.
- B. **Limestone:** Furnish limestone slabs with a flat bottom and top and a clean face. Provide slabs with a minimum depth of 8 inches, or as specified in the contract documents, to ensure stability of the wall.
- C. **Landscape Timbers:**
 1. Minimum 6 inch by 6 inch (nominal) pressure-treated landscape timbers rated for ground contact. Ensure timbers are straight, solid, have at least three good sides, and are free of visible dry rot, with only a minor amount of splitting or cracking. Ensure all timbers used in a wall have the same cross-sectional area.
 2. Provide 3/8 inch diameter galvanized spikes, 10 to 12 inches long.
- D. **Leveling Pad:** Provide material recommended by the wall manufacturer or supplier.
 1. Granular Material: Comply with Iowa DOT Section 4132.
 2. Concrete: Comply with Section 6010. Provide Class C Concrete.
- E. **Subdrain:** Comply with Section 4040, 2.02. Minimum 4 inch diameter pipe.
- F. **Porous Backfill Material (for Subdrain):** Comply with Section 4040, 2.04.
- G. **Engineering Fabric:** Provide fabric complying with Iowa DOT Article 4196.01 for subsurface drainage.
- H. **Unit Fill Material:** Comply with Iowa DOT Section 4131.
- I. **Backfill Material:**
 1. Granular Backfill Material: Comply with Iowa DOT Section 4133 when granular backfill material is necessary according to the manufacturer's requirements.
 2. Suitable Backfill Material: Comply with Section 2010.

- J. **Fence:** If the contract documents require a fence, comply with Section 9060.
- K. **Safety Rail:** If the contract documents require a safety rail, comply with Section 9080.

PART 3 - EXECUTION

3.01 EXCAVATION AND EMBANKMENT

- A. Prior to beginning wall construction, compact proposed embankment behind the wall according to the field quality control requirements of Section 2010 with the following exception: compact to a minimum of 90% of maximum Standard Proctor Density.
- B. Excavate to the line and grade specified in the contract documents. Minimize over- excavation. Install sheeting, shoring, or other retention systems as required to ensure the stability of the excavation.

3.02 INSTALLATION

A. General:

- 1. **Height:** Overall wall height is limited to 4 feet.
- 2. **Foundation Soil Preparation:** Excavate and compact 12 inches of native soil beneath the leveling pad to 95% of maximum Standard Proctor Density.
- 3. **Leveling Pad:**
 - a. Construct a minimum 6 inch thick leveling pad of granular material, at a depth such that the entire first course will be completely below the finished grade at the base of the wall.
 - b. Compact granular material with a minimum of three passes of a vibratory plate compactor.
- 4. **Subdrain:**
 - a. Install subdrain behind the first course of retaining wall. Place porous backfill material around the subdrain to a minimum cover of 3 inches, and ensure a trench width of at least 8 inches.
 - b. Wrap porous backfill material with engineering fabric.
 - c. Ensure positive drainage on subdrain, and outlet subdrains into a storm sewer or along a slope at an elevation lower than the lowest point in the pipe behind the wall.
- 5. **Fence:** If the contract documents require a fence, comply with Section 9060.
- 6. **Safety Rail:** If the contract documents require a safety rail, comply with Section 9080.

B. Modular Block Retaining Wall:**1. Unit Installation:**

- a. Place units side by side for the full length of wall alignment. Establish alignment by means of a string line or offset from the base line.
- b. Ensure units are in full contact with the leveling pad.
- c. Install connecting pins. Fill open cells of blocks with unit fill material; tamp the fill.
- d. Sweep all excess material from top of units and install the next course. Ensure each course is completely filled prior to proceeding to the successive course.
- e. Place each course so that pins protrude into adjoining courses a minimum of 1 inch or to tolerances recommended by the supplier/manufacturer. Two pins are required per unit. Repeat the above procedure for each course to the top of wall height.
- f. At the end of each course, where the wall changes elevation, turn the units into the backfill material. Place units to create the minimum radius possible. Install a minimum of three units into the grade. Ensure only the front face of the units is visible from the side of the wall.
- g. Install manufacturer approved geogrid reinforcement for every 2 feet of vertical wall elevation constructed.

2. Backfill Material Placement:

- a. Place each lift of granular backfill material following the erection of each lift of wall. Where reinforcement material is present, roughly level the backfill material before placing and connecting the reinforcement. If necessary, decrease the lift thickness to obtain the specified density.
- b. At the end of each day's operations, shape the last level of backfill material to allow runoff of rain water away from the wall face.
- c. Compact granular backfill material according to the field quality control requirements of Section 2010 with the following exception: ensure the moisture content falls within a range from 3% under optimum moisture to no more than the optimum moisture content.
- d. Place and compact backfill material without disturbing or distorting the tieback reinforcement (if present) or the wall. Do not use tamping type rollers or other rollers that may damage the reinforcing. Use light mechanical tampers to achieve the required compaction in a strip 3 feet wide adjacent to the backside of the wall; compaction density testing will not be required within 3 feet of the back of the wall.

3. **Tieback Reinforcement Installation:** Install tieback reinforcement according to the manufacturer's requirements.

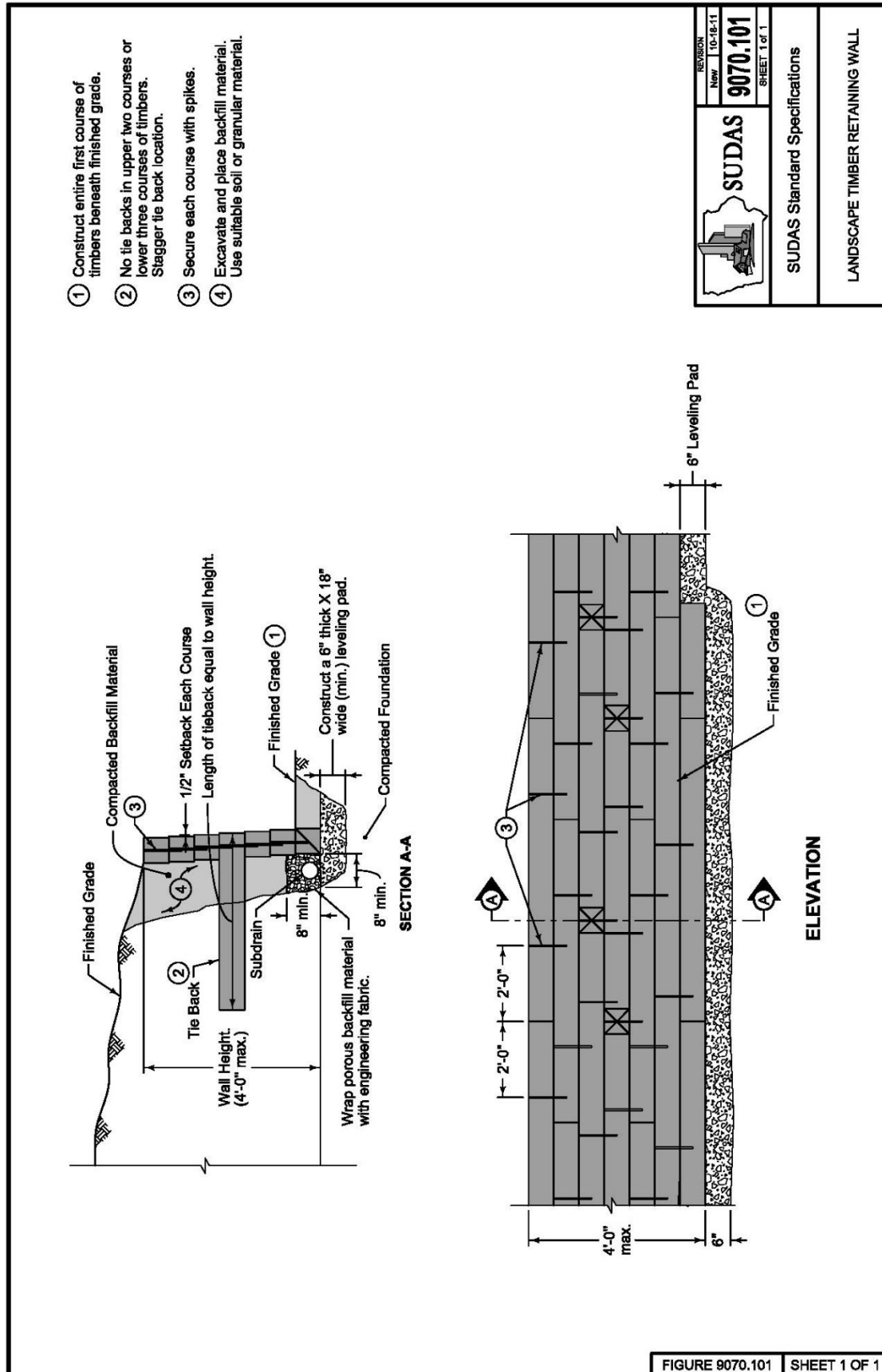
C. Limestone Retaining Wall:

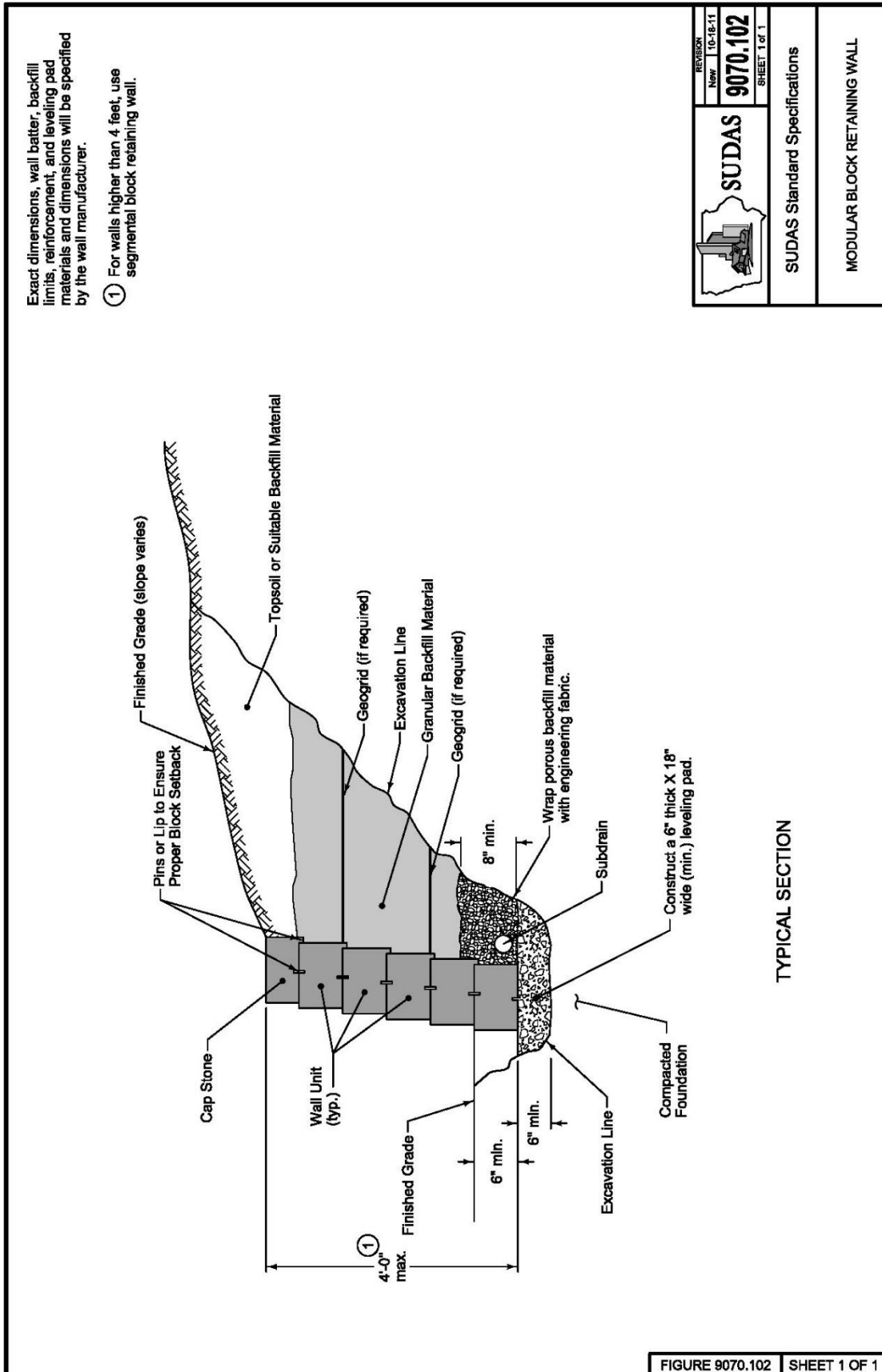
1. Place limestone slabs. Ensure adjacent slabs are in full contact without gaps.
2. Stagger vertical joints so no joint is located closer than 2 feet to a joint in the course below it.
3. After each course is laid, place backfill material behind the wall and compact with hand tools to a density equal to or greater than the existing soil behind the wall.

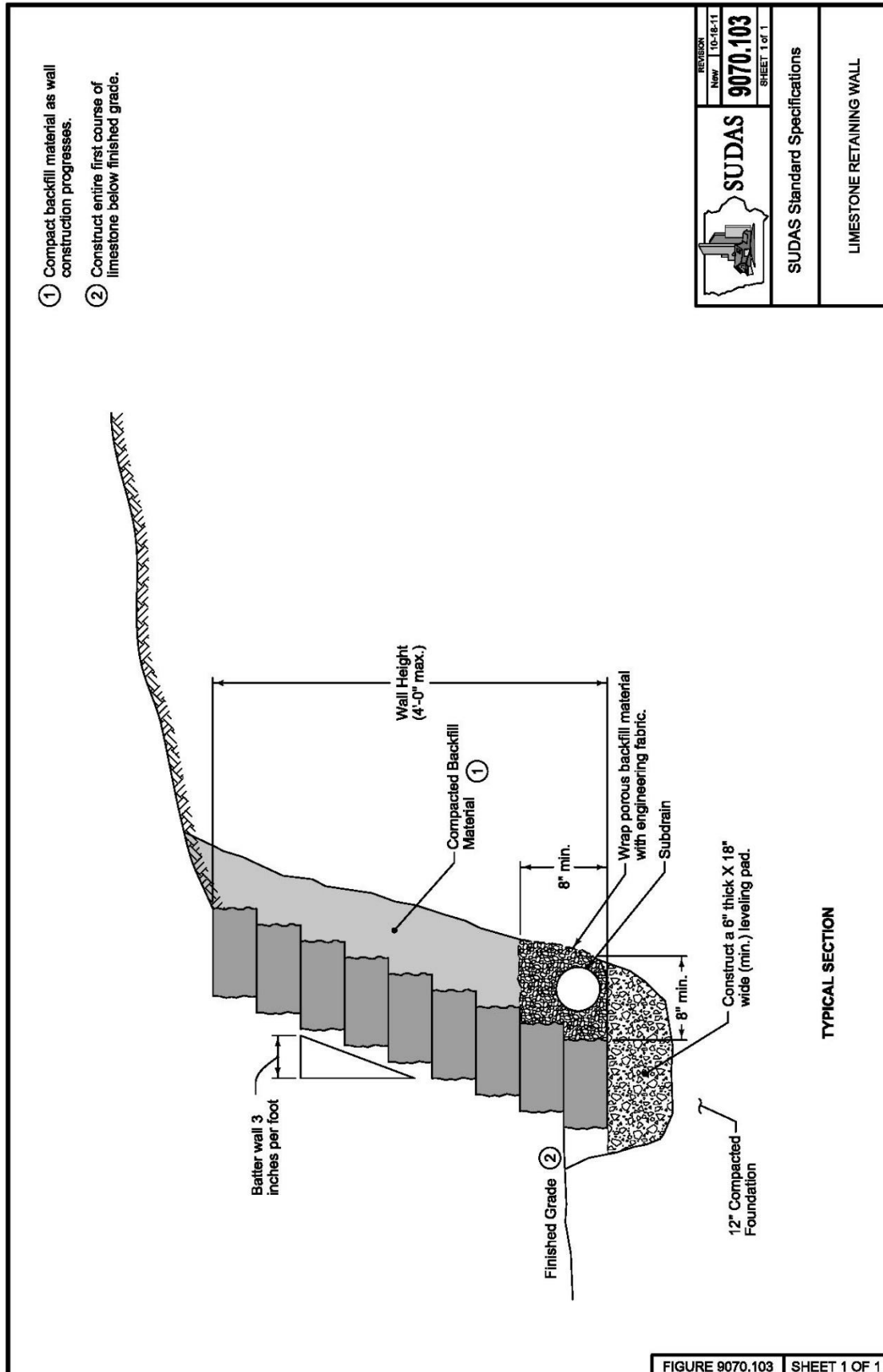
D. Landscape Timbers:

1. Lay first course of timbers horizontally, ensuring timbers are level. Set back each succeeding course 1/2 inch.
2. Secure each course to the course below it using spikes placed 2 feet from each joint and spaced at no more than 4 feet. Drill pilot holes in timbers to facilitate installation of spikes.
3. Stagger vertical joints so no joint is located closer than 2 feet to a joint in the course below it.
4. Install tiebacks with length equal to the wall height, perpendicular to the wall face, spaced at 8 feet. Stagger location of tieback on each course. Do not install tiebacks in bottom three courses or upper two courses of timbers. Ensure the end of the tieback is flush with the front of the retaining wall. Attach tieback to course below it using a spike.
5. After each course is laid, place backfill material behind the wall and compact with hand tools to a density equal to or greater than the existing soil behind the wall.

END OF SECTION







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SECTION 9071 - SEGMENTAL BLOCK RETAINING WALLS

PART 1 -GENERAL

1.01 SECTION INCLUDES

Segmental Block Retaining Walls

1.02 DESCRIPTION OF WORK

Constructing segmental block retaining walls.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants, as well as the following:

- A. Upon request, submit certification that products supplied comply with identified specifications.
- B. Detailed design calculations (including soil bearing pressure), construction drawings, and shop drawings for all segmental block retaining walls, prepared by a licensed Professional Engineer in the State of Iowa.
- C. A detailed explanation of the design properties of geogrid reinforcement and quality control tests limits.
- D. Test results on segmental blocks, if required.
- E. Catalog cuts of segmental retaining wall blocks and cap stones indicating the size, type, and color specified for installation.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

- A. A licensed Professional Engineer in the State of Iowa must prepare, sign, and seal detailed design calculations, construction drawings, and shop drawings for all segmental block retaining walls.
- B. Ensure design complies with the National Concrete Masonry Association (NCMA) "Design Manual for Segmental Retaining Walls."

1.08 MEASUREMENT AND PAYMENT

- A. **Segmental Block Retaining Wall:**

1. **Measurement:** Measurement will be in square feet for the area of the face of retaining wall, measured from the top of the leveling pad to the top of the wall, including coping or cap stones.
 2. **Payment:** Payment will be at the unit price per square foot of retaining wall.
 3. **Includes:** Unit price includes, but is not limited to, design by a Licensed Professional Engineer in the State of Iowa, excavation, foundation preparation, furnishing and placing wall units, geogrid, leveling pad, subdrain, porous backfill material for subdrain, engineering fabric for subdrain, suitable backfill material, and shoring as necessary.
- B. **Excavation and Suitable Backfill Material:** If bid separately, excavation for wall construction and placement of suitable backfill material will be measured and paid according to Section 2010, 1.08.
- C. **Granular Backfill Material:**
1. **Measurement:** Measurement will be in tons for material used in connection with segmental block retaining walls.
 2. **Payment:** Payment will be at the unit price per ton of granular backfill material.
 3. **Includes:** Unit price includes, but is not limited to, furnishing, transporting, placing, and compacting material.
- D. **Fence:** Comply with Section 9060, 1.08, A.
- E. **Safety Rail:** Comply with Section 9080, 1.08, C.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. **Segmental Block Walls:**
1. **Dry-cast Concrete Wall Units:**
 - a. Comply with ASTM C 1372. Test and provide samples according to ASTM C 140.
 - b. Provide certification that the blocks comply with the freeze-thaw durability requirements of ASTM C 1262 and the additional requirements for concrete units of Iowa DOT Materials I.M. 445.04.
 - c. Furnish from an approved supplier.
 - 1) Iowa DOT Materials I.M. 445.04, Appendix A lists approved suppliers.
 - 2) Provide written certification that blocks comply with ASTM C 1372 and the additional materials requirements of Iowa DOT Materials I.M. 445.04, Appendix A.
 - d. In lieu of furnishing blocks from an approved supplier, provide blocks from an approved system.

- 1) Iowa DOT Materials I.M. 445.04, Appendix B lists approved systems.
 - 2) Test the required number of blocks from the lot to be installed according to Iowa DOT Materials I.M. 445.04.
 - 3) Submit results of test data to the Engineer.
2. **Wet-cast Concrete Wall Units:** Comply with the materials and compressive strength requirements of Iowa DOT Materials I.M. 445.05.
- a. Furnish from an approved supplier.
 - 1) Iowa DOT Materials I.M. 445.05, Appendix A lists approved suppliers.
 - 2) Provide written certification that blocks comply with Iowa DOT Materials I.M. 445.05.
 - b. In lieu of furnishing blocks from an approved supplier, provide blocks from an approved system.
 - 1) Iowa DOT Materials I.M. 445.05, Appendix B lists approved systems.
 - 2) Test the required number of blocks from the lot to be installed according to Iowa DOT Materials I.M. 445.05.
 - 3) Submit results of test data to the Engineer.
3. **Geogrid:** Provide geogrid as specified in the retaining wall design.
- B. **Leveling Pad:** Provide material recommended by the wall manufacturer or supplier.
1. **Granular Material:** Comply with Iowa DOT Section 4132.
 2. **Concrete:** Comply with Section 6010. Use Class C Concrete.
- C. **Subdrain:** Comply with Section 4040, 2.02. Minimum 4 inch diameter pipe.
- D. **Porous Backfill Material (for Subdrain):** Comply with Section 4040, 2.04.
- E. **Engineering Fabric:** Provide fabric complying with Iowa DOT Article 4196.01 for subsurface drainage.
- F. **Unit Fill Material:** Comply with Iowa DOT Section 4131.
- G. **Backfill Material:**
1. **Granular Backfill Material:** Comply with Iowa DOT Section 4133 within the reinforced earth zone of segmental block retaining walls.
 2. **Suitable Backfill Material:** Comply with Section 2010.
- H. **Fence:** If the contract documents require a fence, comply with Section 9060.
- I. **Safety Rail:** If the contract documents require a safety rail, comply with Section 9080.

PART 3 - EXECUTION**3.01 EXCAVATION AND EMBANKMENT**

- A. Prior to beginning wall construction, compact proposed embankment behind the wall according to the field quality control requirements of Section 2010 with the following exception: compact to a minimum of 90% of maximum Standard Proctor Density.
- B. Excavate to the line and grade specified in the contract documents. Minimize over- excavation. Install sheeting, shoring, or other retention systems as required to ensure the stability of the excavation.

3.02 INSTALLATION

- A. **Foundation Soil Preparation:** Excavate and compact 12 inches of native soil beneath the leveling pad to 95% of maximum Standard Proctor Density.
- B. **Leveling Pad:** Construct a minimum 6 inch thick leveling pad of material as specified in the contract documents.
- C. **Unit Installation:** Install materials at the proper elevation and orientation specified in the contract documents. Install the concrete segmental units and geogrid reinforcement according to the approved submittals.
- D. **Subdrains:**
 - 1. Install subdrains as specified in the contract documents to maintain gravity flow of water to the outside of the reinforced earth zone. Outlet subdrains into a storm sewer or along a slope at an elevation lower than the lowest point of the pipe within the reinforced earth zone.
 - 2. Place porous backfill material around the subdrain to a minimum cover of 3 inches.
 - 3. Wrap porous backfill material with engineering fabric.
- E. **Backfill Material Placement:**
 - 1. Place the backfill material in maximum 8 inch lifts, spread, and compact in such a manner that eliminates the development of wrinkles and/or movement of the geogrid reinforcement.
 - 2. Compact granular backfill material according to the field quality control requirements of Section 2010 with the following exception: ensure the moisture content falls within a range from 3% under optimum moisture to no more than the optimum moisture content.
 - 3. Use only hand-operated compaction equipment within 3 feet of the front of the wall face.
 - 4. Do not operate tracked construction equipment directly on the geogrid reinforcement. A minimum thickness of 6 inches of backfill material is required over the geogrid reinforcement prior to operation of tracked vehicles.

Minimize turning of tracked vehicles to prevent tracks from displacing the fill and damaging the geogrid reinforcement.

5. Rubber-tired equipment may pass over the geogrid reinforcement, if done according to the manufacturer's recommendations. Avoid sudden braking and sharp turning.

F. Geogrid Installation:

1. Do not overlap the geogrid in the design strength direction; use one continuous piece of material. The design strength direction is perpendicular to the wall face. Butt adjacent sections of geogrid in a manner to ensure 100% coverage after placement.
2. Install the geogrid reinforcement under tension. Apply a nominal tension to the reinforcement and maintain it by staples, stakes, or hand tensioning. The tension applied may be released after the geogrid reinforcement has been covered and held in place with soil fill.
3. Install manufacturer approved geogrid reinforcement for every 2 feet of vertical wall elevation constructed.

G. **Fence:** If the contract documents require a fence, comply with Section 9060.

H. **Safety Rail:** If the contract documents require a safety rail, comply with Section 9080.

END OF SECTION

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SECTION 9072 - COMBINED CONCRETE SIDEWALK AND RETAINING WALL

PART 1 - GENERAL

1.01 SECTION INCLUDES

Combined Concrete Sidewalk and Retaining Wall

1.02 DESCRIPTION OF WORK

Constructing combined concrete sidewalk and retaining wall.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants, as well as the following:

Upon request, submit certification that products supplied comply with identified specifications.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT

A. Combined Concrete Sidewalk and Retaining Wall:

1. **Measurement:** Measurement will be in cubic yards for the volume of combined sidewalk and retaining wall.
2. **Payment:** Payment will be at the unit price per cubic yard of combined sidewalk and retaining wall.
3. **Includes:** Unit price includes, but is not limited to, excavation; foundation preparation; furnishing and placing concrete and reinforcing steel; joint material; subdrain; porous backfill material; suitable backfill material; finishing disturbed areas; and shoring as necessary.

B. **Fence:** Comply with Section 9060, 1.08, A.

C. **Safety Rail:** Comply with Section 9080, 1.08, C.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Combined Concrete Sidewalk and Retaining Wall:

1. **Portland Cement Concrete:** Comply with Section 6010, 2.03.
2. **Reinforcing Steel:** Comply with Iowa DOT Section 4151.
3. **Expansion Joint:** Comply with Iowa DOT Article 4136.02. Use resilient filler when the type is not specified.

B. Subdrain: Comply with Section 4040, 2.02. Minimum 4 inch diameter.

C. Porous Backfill Material (for Subdrain): Comply with Section 4040, 2.04.

D. Suitable Backfill Material: Comply with Section 2010.

E. Rodent-proof Hardware Cloth: Comply with Iowa DOT Materials I.M. 443.01.

F. Fence: If the contract documents require a fence, comply with Section 9060.

G. Safety Rail: If the contract documents require a safety rail, comply with Section 9080.

PART 3 - EXECUTION

3.01 EXCAVATION AND EMBANKMENT

- A. Prior to beginning wall construction, compact proposed embankment behind the wall according to the field quality control requirements of Section 2010 with the following exception: compact to a minimum of 90% of maximum Standard Proctor Density.
- B. Excavate to the line and grade specified in the contract documents. Minimize over- excavation. Install sheeting, shoring, or other retention systems as required to ensure the stability of the excavation.

3.02 INSTALLATION

A. General:

1. Comply with Section 6010.
2. Forming the back of the wall is not required. Where the back of the walls is not formed and sloughing occurs, remove the loose material, and replace with concrete at no additional cost to the Contracting Authority.
3. Install 3 inch diameter weep holes at 8 foot intervals. Form weep holes with an approved rustproof device backed with rodent-proof hardware cloth.
4. Install 8 inch wide trench of porous backfill behind the wall. Install subdrain within porous backfill trench. Ensure positive drainage on subdrain.

B. Backfill Material Placement:

1. Place the backfill material in maximum 8 inch lifts, spread, and compact.

2. Compact granular backfill material according to the field quality control requirements of Section 2010 with the following exception: ensure the moisture content falls within a range from 3% under optimum moisture to no more than the optimum moisture content.
 3. Use only hand-operated compaction equipment within 3 feet of the front of the wall face.
- C. **Fence:** If the contract documents require a fence, comply with Section 9060.
- D. **Safety Rail:** If the contract documents require a safety rail, comply with Section 9080.

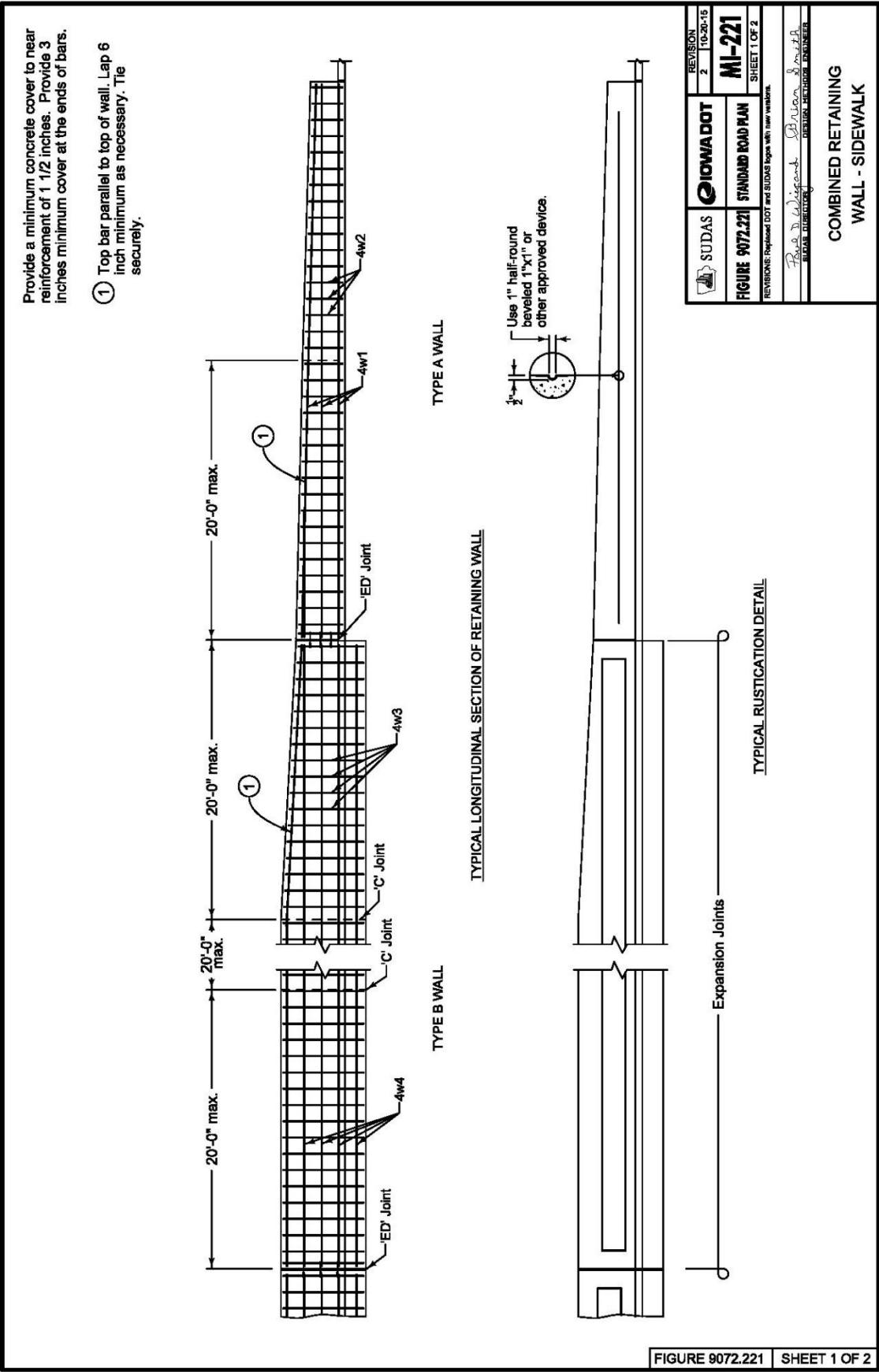
3.03 JOINTS

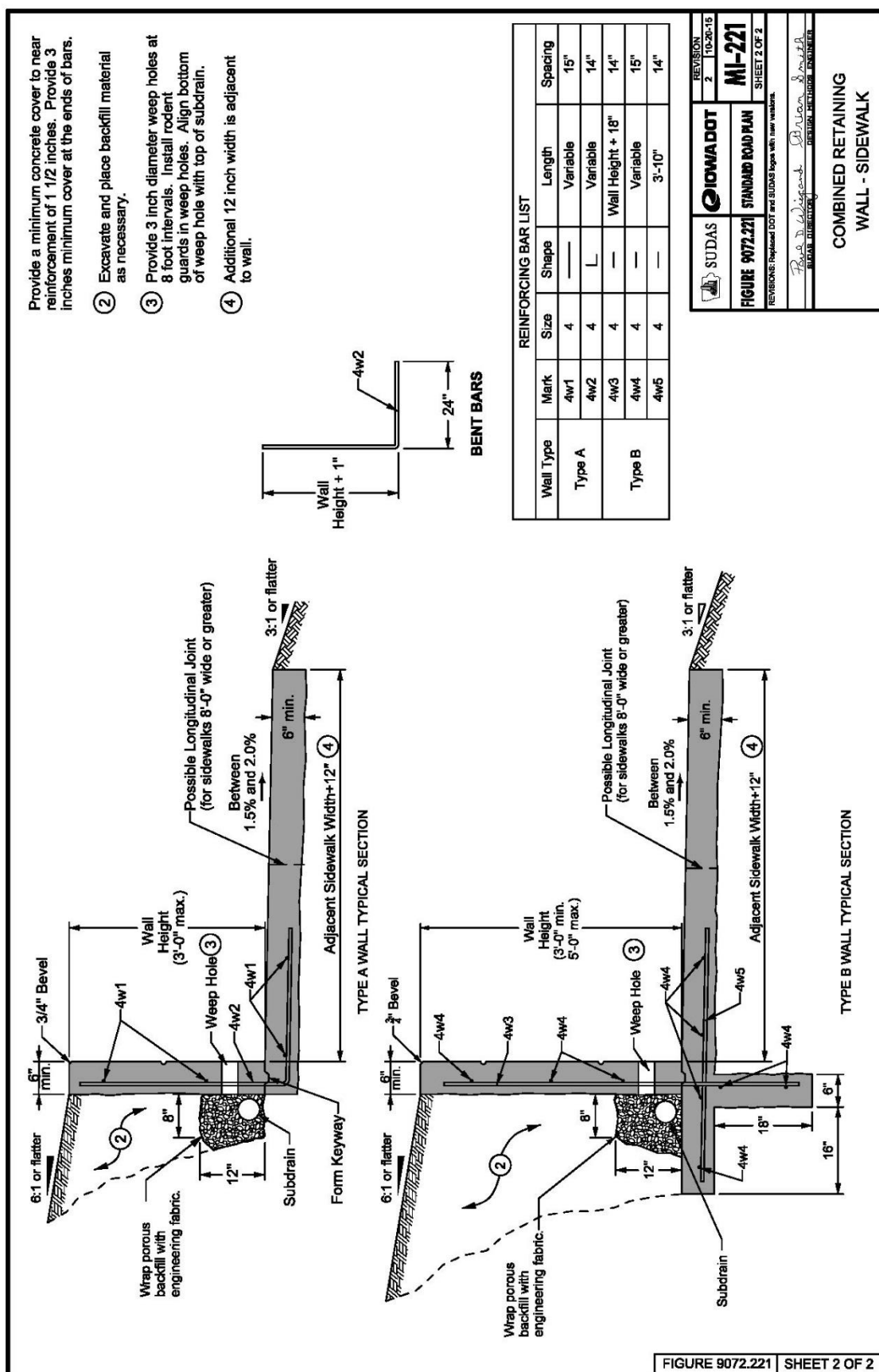
- A. Form ED joints in the wall at no more than 60 foot spacing. Affix expansion material to retaining wall.
- B. Form C joints in the wall at no more than 20 foot spacing.
- C. Form E joints in the sidewalk to coincide with ED joints in the wall. Form C joints in the sidewalk at spacing equal to the sidewalk width.
- D. Form a longitudinal joint in the sidewalk when the sidewalk width is greater than 8 feet.

3.04 RUSTICATION

Decorative form liners or inserts may be used when forming the face of the wall with the approval of the Engineer. Form rustications as specified in the contract documents.

END OF SECTION





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SECTION 9080 - CONCRETE STEPS, HANDRAILS, AND SAFETY RAIL

PART 1 -GENERAL

1.01 SECTION INCLUDES

- A. Concrete Steps
- B. Handrails
- C. Safety Rail

1.02 DESCRIPTION OF WORK

- A. Construction of concrete steps.
- B. Furnishing and installation of handrails.
- C. Furnishing and installation of safety rail.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants, as well as the following:

- A. Submit color samples and product literature for primer, paint, and powder coating to be used on handrails and safety rail.
- B. Submit shop drawings for handrails and safety rail.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

- A. Provide 1 gallon of color matched exterior grade polyurethane paint for each color specified, for the Contracting Authority's maintenance use.
- B. Label each container with the manufacturer's name, product number, and color number.

1.08 MEASUREMENT AND PAYMENT

A. Concrete Steps:

1. **Measurement:** Measurement will be the area of concrete steps in square feet for each type of concrete step. The length will be the horizontal length between expansion joints, and the width will include curbs.
2. **Payment:** Payment will be at the unit price per square foot of concrete steps.

3. **Includes:** Unit price includes, but is not limited to, reinforcement, expansion joint material, and preparation of subgrade.

B. Handrail:

1. **Measurement:** Measurement will be in linear feet for each type of handrail, measured along the top of the handrail from end of rail to end of rail.
2. **Payment:** Payment will be at the unit price per linear foot for each type of handrail.
3. **Includes:** Unit price includes, but is not limited to, posts, mounting hardware or concrete grout, and finishing (painted, galvanized, or powder coated).

C. Safety Rail:

1. **Measurement:** Measurement will be in linear feet for safety rail, measured along the top of the safety rail from end post to end post.
2. **Payment:** Payment will be at the unit price per linear foot of safety rail.
3. **Includes:** Unit price includes, but is not limited to, posts, pickets, mounting hardware, epoxy grout, and finishing (painted, galvanized, or powder coated).

PART 2 - PRODUCTS

2.01 STEPS

- A. **Concrete:** Class C concrete complying with Section 6010, 2.03.
- B. **Reinforcing Steel:** Comply with Iowa DOT Section 4151 for epoxy coated reinforcement.
- C. **Expansion Joint:** Comply with Iowa DOT Section 4136.03, A.
- D. **Forms:** Comply with Iowa DOT Section 2403.

2.02 HANDRAIL

- 1 ¼ to 2 inches in diameter; ensure post diameter matches handrail diameter.
- A. **Steel:** Welded or seamless black steel pipe and posts complying with ASTM A 53, Grade A or B.
 - B. **Aluminum:** Aluminum-alloy extruded structural pipe complying with ASTM B 429, alloy 6061-T6 or 6063-T6, schedule 40 (if specified; for use with grouted connection only).
 - C. **Bends:** Provide manufactured pipe bends and connections for handrail. Do not field bend pipe.

2.03 SAFETY RAIL

- A. **Rails and Posts:** Provide 2 1/2 inch by 2 1/2 inch tubular high strength steel with 1/4 inch minimum wall thickness. Comply with ASTM A 500, Grade B.
- B. **Pickets:** Provide 1 inch by 1 inch tubular high strength steel with 1/8 inch minimum wall thickness. Comply with ASTM A 500, Grade B.

2.04 FINISH

- A. **Painted:** Provide factory-mixed paint / primer.
 - 1. **Primer:** Provide single component, water-based rust and corrosion resistant primer specifically designed for use on steel surfaces.
 - 2. **Paint:** Provide water-based, abrasion-resistant paint specifically designed for use on steel surfaces.
- B. **Galvanized:** When specified in the contract documents, galvanize handrail and safety rail.
 - 1. Provide zinc coating complying with ASTM A 123.
 - 2. Hot-dip galvanize components after fabrication.
 - 3. For hot-dip galvanized components that will be powder coated, utilize the dry-kettle (pre- fluxing) process. Air cool galvanized components. Do not quench in water or chromate.
- C. **Powder Coated:** Apply powder coat to steel, galvanized steel, or aluminum handrail and safety rail when specified in the contract documents. Comply with the manufacturer's recommendations for surface preparation, application of primer, and application of the powder coating, in addition to the following minimum requirements.
 - 1. **Surface Preparation:**
 - a. **Steel Substrate:**
 - 1) Remove oils and surface contamination by solvent cleaning. Comply with the requirements of SSPC-SP 1. Rinse thoroughly with hot water or water pressure and dry completely.
 - 2) Remove loose rust, loose mill scale, and other foreign substances by hand or power tool cleaning. Comply with SSPC-SP 2 or 3.
 - 3) Remove all dirt, grease, rust scale, mill scale, paint, slag, and other foreign substances by blast cleaning. Comply with SSPC-SP 6.
 - 4) Remove all blast cleaning products by means of vacuuming or compressed air.
 - 5) Chemically clean surface to remove residual contamination, apply conversion coating, and apply sealing agent to prepare the surface for powder coating.
 - 6) Begin powder coating as soon as possible after surface preparation to prevent the development of iron oxide on the surface of the steel.
 - b. **Galvanized Steel Substrate:**
 - 1) Remove all tears, spikes, high spots, or other surface defects caused by the galvanizing process using hand or power tools.

- 2) Apply an alkaline solution, with a pH between 11 and 12, to remove traces of oil, grease, and dirt.
- 3) Remove residual zinc oxide by spraying surface with a mild acidic solution (pH of 3.5 to 4.5).
- 4) Apply conversion coating to the surface and apply sealing agent to prepare the surface for powder coating.

c. Aluminum Substrate:

- 1) Clean surface by power washing to remove contaminants.
 - 2) Clean surface with an aqueous alkaline solution by immersion or scrubbing with a soft brush. Do not scrub with a steel bristle brush. Dry completely after cleaning.
 - 3) Remove oils and surface contamination by solvent cleaning. Comply with the requirements of SSPC-SP 1.
 - 4) Remove light deposits of aluminum reaction by-products by hand or power tool cleaning. Comply with SSPC-SP 2 or 3.
 - 5) Remove aluminum oxide by sweep blasting or chemical treatment:
 - a) Sweep Blasting:
 - i. Utilize oil-free compressed air to prevent contamination of cleaned surface.
 - ii. Utilize blast media with a MOH hardness of 5 or less, or utilize organic media such as corn cobs or walnut shells. Do not roughen surface.
 - iii. Powder coat surface within 60 minutes of sweep blasting to prevent re-formation of aluminum oxide.
 - b) Chemical Treatment: Comply with ASTM D 1730 for Type B treatment.
 - 6) Chemically clean surface to remove residual contamination, apply conversion coating, and apply sealing agent to prepare the surface for powder coating.
2. **Priming:** Apply as recommended by coating manufacturer for specific substrate to all surfaces, unless specifically not required by coating manufacturer.
3. **Coating:**
- a. **General:**
 - 1) Provide complete multi-coat systems formulated and recommended by the manufacturer for the application indicated.

- 2) Provide urethane, TGIC polyester, polyester wrinkle, or non-TGIC polyester based powder coatings as recommended by the powder coating manufacturer to provide long term exterior durability.
- b. Application:
 - 1) Apply coating to the thickness specified by the coating manufacturer. Comply with coating manufacturer's recommendations for application of powder coating.
 - 2) Apply coating in uniform thickness coats without runs, drips, pinholes, brush marks, or variations in color, texture, or finish. Finish edges, crevices, corners, and other changes in dimension with full coating thickness.
4. **Curing:** Cure the powder coating at the temperature and for the time recommended by the powder coating manufacturer.

2.05 ATTACHMENT

A. Bolted Connection:

1. **Anchor plate:** 1/4 inch thick, 6 inch by 6 inch steel anchor plate with a 46,000 psi yield strength. Paint or galvanize anchor plate to match handrail or safety rail.
2. **Bolts:** Provide 3/8 inch galvanized anchor bolts or threaded rod with length as required to provide a 3 inch embedment. Comply with ASTM A 36.
3. **Adhesive Anchoring Material:**
 - a. Epoxy complying with ASTM C 881, Type IV. Provide appropriate epoxy class based upon concrete temperature at time of installation.
 - b. Grout on approved products list in Iowa DOT Materials I.M. 491.11, Appendix C.

B. Grouted Connection:

1. **Polymer Grout:** Comply with Iowa DOT Materials I.M. 491.11.
2. **Non-shrink Grout:** Comply with Iowa DOT Materials I.M. 491.13.

PART 3 - EXECUTION

3.01 INSTALLATION OF STEPS

- A. Prepare Subgrade: In fill areas, construct and compact subgrade to 95% of maximum Standard Proctor Density.
- B. Forming: Comply with Iowa DOT Article 2403.03, B.
- C. Concrete: Comply with Section 6010, 3.02. Deposit concrete for the full depth of the steps in one operation.
- D. Reinforcing Steel: Comply with Iowa DOT Section 2404. Provide a minimum 2 inches of cover on all reinforcing steel.

3.02 INSTALLATION OF RAIL

A. General:

1. Install rail continuously with no gaps or breaks along the length specified in the contract documents.
2. Use welded connections between rail components. Grind connections to remove sharp or abrasive edges and to remove other irregularities.

B. **Handrail:** Install the top rail between 34 inches and 38 inches above the nose of the step tread. Maintain a consistent height above the step treads. Install the bottom rail midway between the nose of the step and the top rail.

C. Safety Rail:

1. Rails: Install the top rail a minimum of 42 inches above the finished grade. Install the bottom rail a maximum of 4 inches above finished grade.
2. Pickets: Locate pickets in the center of the top and bottom rails and space evenly between posts. Provide a maximum clear opening between pickets of 4 inches.

D. **Posts:** Install posts at a maximum spacing of 8 feet. Attach handrail posts in one of following two ways.

1. Bolted Connection:

- a. Weld anchor plate to the bottom of the handrail posts.
- b. Layout location and drill four 7/16 inch holes for anchor bolts at each post attachment point. Drill holes with a carbide drill bit; do not core drill anchor bolt holes.
- c. Apply adhesive anchoring material according to manufacturer's published recommendations and install threaded rod or anchor bolts.

2. Grouted Connection:

- a. Form a 6 inch deep hole in the concrete curb 1 inch larger than the outside diameter of the post. Alternatively, hole may be core drilled in hardened concrete.
- b. After the concrete hardens, set handrail posts into holes and temporarily secure.
- c. Fill the void between the post and holes with non-shrink or polymer grout.

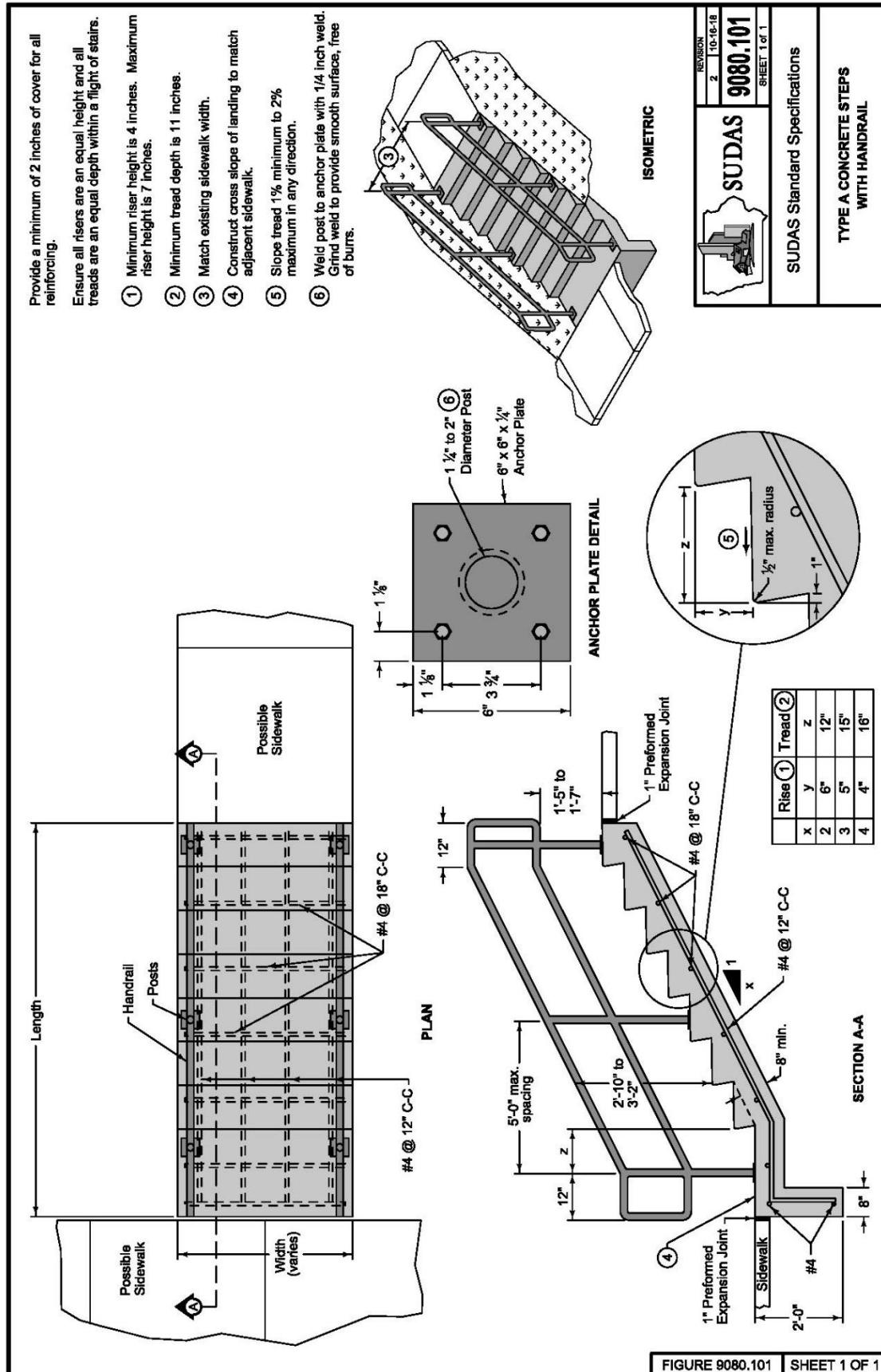
3.03 PAINTING

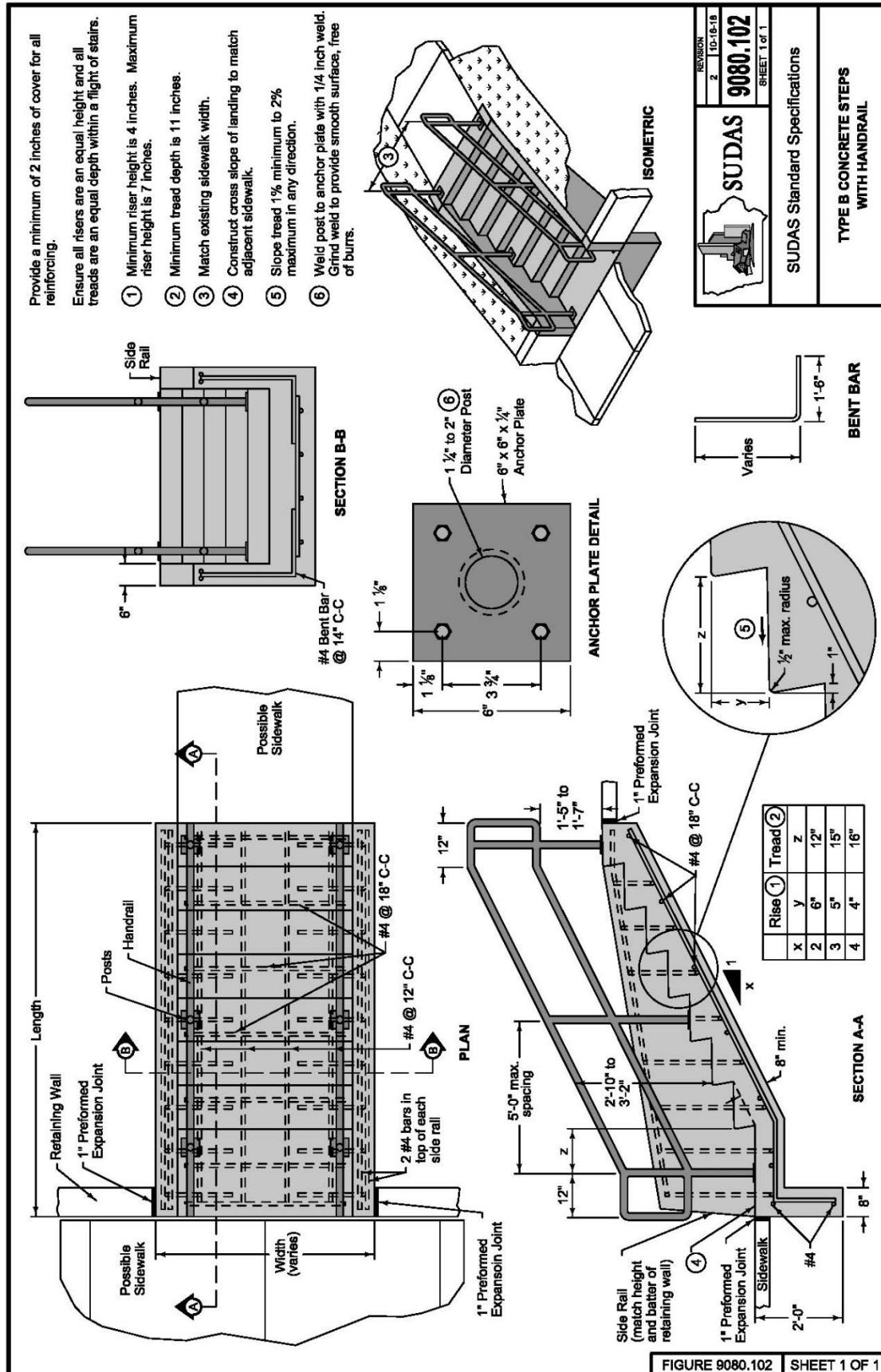
Do not paint hot dipped galvanized or aluminum handrail or safety rail.

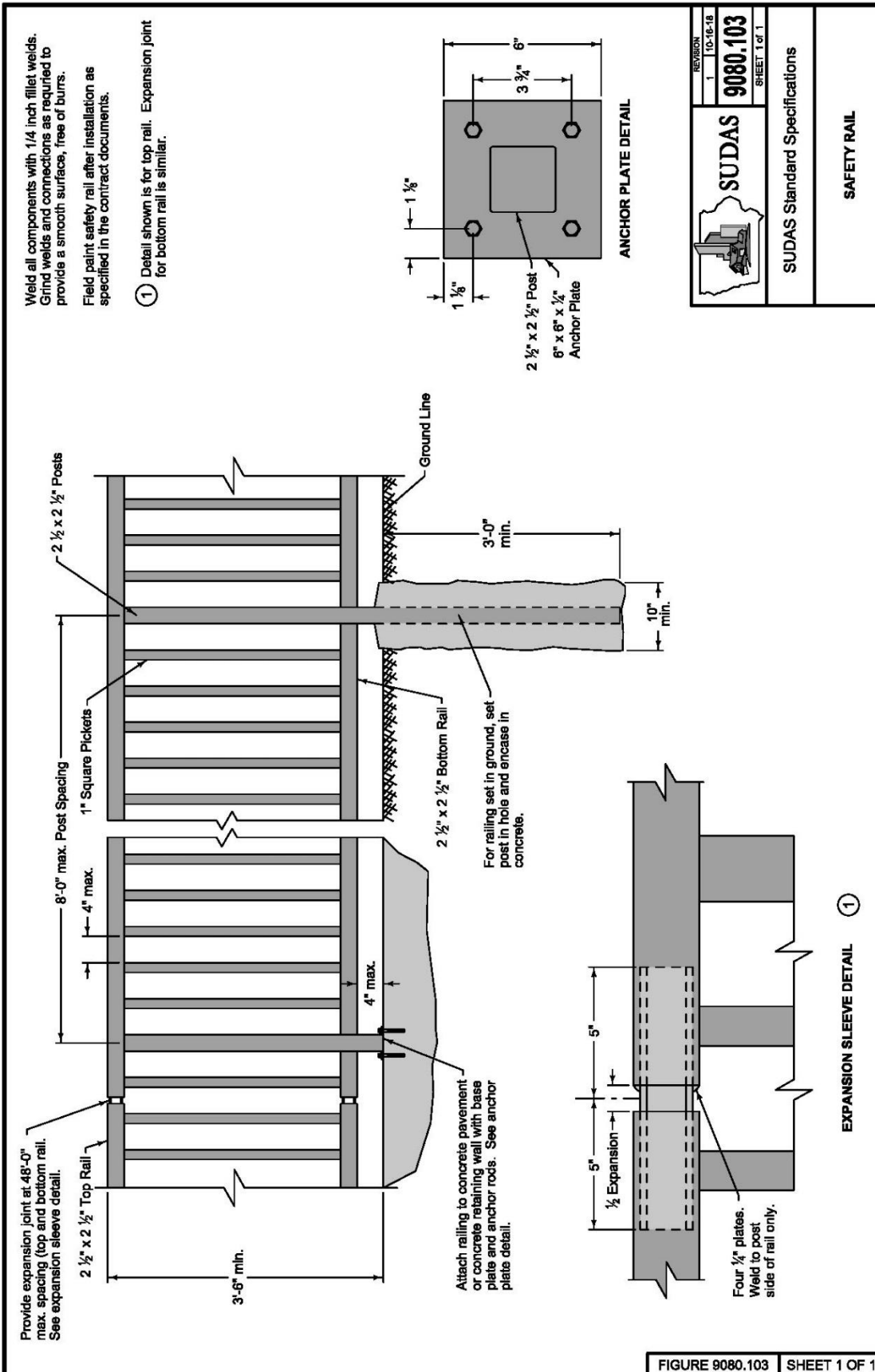
- A. Mix paint and/or primer to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials to paint unless such procedure is specifically described in manufacturer's product instructions.

- B. Shop coat handrail, safety rail, posts, pickets, and anchor plates with primer following fabrication.
- C. Apply two field coats of paint upon completion of installation.

END OF SECTION







DIVISION 10 – DEMOLITION

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SECTION 10,010 - DEMOLITION OF BUILDING STRUCTURES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Protection of Public and Private Facilities
- B. Demolition of Building Structures
- C. Removal and Disposal of all Site Elements
- D. Site Backfill, Grading, Soil Restoration, and Clean Up
- E. Establishment of Ground Cover

1.02 DESCRIPTION OF WORK

- A. Properly disconnect all public and private utilities.
- B. Comply with local, state, and federal regulations to remove and properly dispose of sidewalks, steps, driveways, and structures (including both above ground and below ground elements).
- C. Comply with local, state, and federal regulations to remove fuel tanks, septic tanks, cisterns, and any other underground facilities; and to properly dispose of any liquids or products contained within these items.
- D. Properly plug or abandon wells.
- E. Place backfill material in holes and depressions, grade the site, and establish ground cover.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants, as well as the following:
Seventy-two hours prior to initiating demolition at each site, submit a plan to control erosion and sediment from each site covered by the contract.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants, as well as the following:
Ensure access to fire hydrants is maintained at all times.

1.06 SCHEDULING AND CONFLICTS

- Comply with Division 1 - General Provisions and Covenants, as well as the following:
- A. Submit a schedule of work to the Engineer a minimum of 72 hours prior to commencing activities.
 - B. Coordinate with public and private utilities for timely disconnection of service prior to initiating demolition.

- C. Submit a traffic control plan to the Engineer 48 hours in advance of any lane or road closures indicating the area of closure and the signs and traffic control devices to be used to set up the closure.

1.07 SPECIAL REQUIREMENTS

- A. The use of explosives is not allowed unless specified in the contract documents.
- B. Use of fire is prohibited.
- C. Obtain all local, state, and federal permits required for execution of the work, including notification to the Iowa DNR according to 40 CFR 61.145. Pay all permit fees.
- D. Property Ownership:
 - 1. Title: The property address, legal description, and ownership will be included in the contract documents. Upon execution of the contract for the work of demolition and site clearance on all or any part of the demolition area, all rights, title, and interest of the Jurisdiction in and to buildings, structures, and other property to be demolished and/or removed by the Contractor on part or all of said project area as described in the contract documents and contract addenda thereto, is vested with the Contractor.
 - 2. Land: No property rights, title, or interest of any kind whatsoever, in or to the land or premises upon which such buildings or structures stand, is created, assigned, conveyed, granted, or transferred to the Contractor or any other person or persons, except only the license and right of entry to remove such buildings and according to the contract documents. Do not use the land or premises, or allow any other party to use the land or premises, for any purpose other than activities in direct support of the demolition of the building.

1.08 MEASUREMENT AND PAYMENT

A. Demolition Work:

- 1. **Measurement:** Lump sum item; no measurement will be made.
- 2. **Payment:** Payment will be at the lump sum price.
- 3. **Includes:** Unit price includes, but is not limited to, removal of trees, brush, vegetation, buildings, building materials, contents of buildings, appliances, trash, rubbish, basement walls, foundations, sidewalks, steps, and driveways from the site; disconnection of utilities; furnishing and compaction of backfill material; furnishing and placing topsoil; finish grading of disturbed areas; placing and removing safety fencing; removal of fuel and septic tanks and cisterns; seeding; and payment of any permit or disposal fees.

B. Plug or Abandon Well:

- 1. **Measurement:** Each abandoned or plugged well will be counted.
- 2. **Payment:** Payment will be at the unit price for each plugged or abandoned well.

3. **Includes:** Unit price includes, but is not limited to, obtaining all permits; plug or abandon private wells according to local, state, and federal regulations.

PART 2 - PRODUCTS

2.01 BACKFILL MATERIAL

Meet the requirements of Section 3010, 2.03.

2.02 TOPSOIL

Meet the requirements of Section 2010, 2.01.

2.03 SEEDING

Meet the requirements of Section 9010.

2.04 WELL PLUGGING

A. Sealing Materials:

1. Neat Cement: Provide at a ratio of 14 pounds of cement per 1 gallon of water.
2. Bentonite: Graded bentonite, bentonite pellets, or bentonite grout.
3. Sand Cement Grout: Provide at a ratio of 1 sack of cement, equal volume of masonry sand, and not more than 6 gallons of water.
4. Concrete: Provide a Class A, Class B, or Class C mix meeting the requirements of Iowa DOT Materials I.M. 529.

B. Filling Materials: Provide filling materials free of foreign matter and any toxic residue.

1. Sand
2. Pea gravel
3. Class A, B, or C granular surfacing material
4. Agricultural lime

PART 3 - EXECUTION

3.01 GENERAL

- A. Protect existing fire hydrants, street lights, traffic signals, utility poles, fire alarm boxes, wire cables, underground utilities, and other appurtenances in the vicinity of the demolition site.
- B. Provide correct type and class of fire extinguishers on site and in equipment. Provide fire extinguishers adjacent to any areas where cutting torches are used.
- C. Comply with noise pollution requirements and any working hour restrictions of the Jurisdiction.

- D. Prior to starting demolition, remove and properly dispose of all volatile or flammable materials such as gasoline, kerosene, benzene, cleaning fluids, paints or paint thinners, household hazardous wastes, or similar products.
- E. Inspect the site for its character and the type of structures to be demolished. The Jurisdiction assumes no responsibility for the condition of existing buildings, structures, and other property within the demolition area, or the condition of the property before or after the solicitation for proposals. No adjustment of proposal price or allowance for any change in conditions that occur after the acceptance of the lowest responsible, responsive proposal will be made.
- F. Pay all disposal costs, including costs related to disposal of specialty items such as household hazardous wastes, appliances, yard wastes, or electronics.

3.02 UTILITY DISCONNECTIONS

Disconnect all utilities prior to initiating demolition.

- A. **Sanitary Sewer:** Disconnect and plug all sanitary sewer service lines according to Section 4010, 3.08 and the Jurisdiction's Plumbing Code. Notify engineer for inspection of the disconnection prior to placing backfill material.
- B. **Water Service:** Disconnect all water services by a licensed plumber according to the Jurisdiction's Plumbing Code requirements. Notify engineer for inspection prior to placing backfill material.
- C. **Storm Sewer:** Disconnect all sump pump and area drain connections to the storm sewer system according to the requirements of the Jurisdiction. Notify engineer for inspection prior to placing backfill material.
- D. **Private Utility Services:** Disconnect all natural gas or propane lines, electric services, communication services, and any other services according to the requirements of the specific utility involved.
- E. **Backfill:** Place backfill material for all service disconnects according to Section 3010, 3.05.
- F. **Surface Restoration:**
 - 1. Within the Street: Restore the street surface according to Section 7040.
 - 2. Public Right-of-way: Grade and seed according to Section 9010. Provide a 1 year warranty for all seeded areas. If dates do not allow for seeding, complete fine grading and apply mulch until seeding can be completed.

3.03 PROTECTION OF THE PUBLIC

- A. **Temporary Fencing:** Erect temporary fencing prior to any work around all excavations, buildings, or other dangerous elements to prevent unauthorized access. Provide a fence 4 feet high minimum. Ensure the fence is consistently restrictive from top to grade and without horizontal openings greater than 2 inches. Maintain fencing until all hazards are eliminated.
- B. **Adjacent Property:** Protect structures, parking lots, driveways, sidewalks, utilities, lawns, and other property elements from damage from the demolition activities.

Provide sheeting or shoring as necessary to protect adjacent property. Prevent the accumulation of debris and litter on adjacent properties.

- C. **Sidewalks:** If sidewalks are to be closed during demolition, submit a sidewalk closure plan that meets the ADA requirements to the Engineer 48 hours prior to the scheduled closure. Install necessary signing and barricades according to the approved closure plan. Sidewalks designated to remain and damaged during the work will be replaced by the Contractor at no cost to the Contracting Authority.
- D. **Streets:** Promptly remove any demolition debris, litter, or mud from streets and rights-of-way caused by the demolition work. Repair damage to the street and right-of-way caused by the demolition at no additional cost to the Contracting Authority.
- E. **Vehicle Covering:** Cover all open-bodied vehicles transporting demolition debris and trash.
- F. **Drainage Facilities:** Maintain or re-establish all tiles, roadway subdrains, culverts, or other drainage facilities not identified in the contract documents for removal.

3.04 ENVIRONMENTAL REQUIREMENTS

- A. **Erosion and Sediment Control:** Implement the approved erosion and sediment control plan for each site prior to initiating demolition by placing all required devices; include measures to prevent tracking of mud onto adjacent streets or alleys.
- B. **Dust Control:** Comply with all applicable air pollution requirements of the Jurisdiction. Use water or appropriate chemicals for control of dust in the demolition area, on hauling equipment, on adjacent roadways, and when grading the site.
- C. **Litter:** Take steps to prevent the generation of litter during demolition and collect all litter from the demolition area at the end of each working day. Load trucks to prevent leakage or blowing of debris.
- D. **Septic Tanks and Outdoor Toilets:** Pump out all septic tanks and outdoor toilets using a licensed company. Remove septic tanks and dispose of properly. Demolish outdoor toilet building and remove from site.
- E. **Cisterns and Meter Pits:** Pump out and remove all cisterns and meter pits.
- F. **Freon:** Identify, handle, and dispose of all Freon containing appliances according to applicable state and federal regulations.
- G. **Mercury and PCB:** Handle and dispose of any fluorescent light fixtures and ballasts or thermostats containing polychlorinated biphenyl (PCB) or mercury according to state and federal regulations.
- H. **Electronic Wastes:** Comply with local regulations to dispose of all electronic wastes, including TVs, VCRs, DVD players, stereo equipment, cell phones, and computers.

3.05 FUEL TANK REMOVAL

- A. Remove and dispose of all fuel tanks containing gasoline, benzene, kerosene oils, or similar volatile materials, either above or below ground, according to the State Fire Marshal and Iowa DNR regulations.
- B. Pump out or empty all other tanks in a safe manner. Flush immediately with water, carbon dioxide, or nitrogen until gas-free. Prior to tank removal, use appropriate metering equipment to verify the tank is free of all volatile gases. Conduct the test by a competent individual in the presence of the Engineer.

3.06 WELL PLUGGING AND ABANDONMENT

Plug and abandon all wells according to the Iowa Administrative Code, Section 567, Chapter 39. File an Iowa DNR Abandoned Water Well Pugging Record upon completion of the well abandonment.

A. Plugging Procedures, All Wells:

- 1. Remove all obstructions from the well.
- 3. Note: Some high horsepower submersible pumps contain mercury. Contact the Iowa DNR Private Well Program office if the pump motor is separated from the pump head assembly, the motor is positioned horizontally in the well, or if mercury contamination is observed.
- 2. Remove casing pipe, any curbing, frost pit, or pump house structure to a depth of 4 feet below the ground surface.
- 3. Introduce sealing or filling material from the bottom of the well, or interval to be filled or sealed, and place progressively upward to the top of the well or interval to be filled or sealed.
- 4. For placement of neat cement, sand cement grout, or concrete, utilize grout pipe, tremie pipe, cement bucket, or dump bailer to avoid segregation or dilution of the sealing materials during placement.
- 5. Place bentonite pellets or graded bentonite for sealing by pouring in place and agitating to avoid bridging.
- 6. Sealing materials may be substituted for filling materials to fill the entire well up to the well cap. This procedure is preferred but not required.

B. Plugging Procedures, Class 1 Wells:

- 1. Place filling or sealing materials from the bottom of the well to 1 foot below the static water level.
- 2. Place sealing materials on top of the filling materials up to the static water level to act as a cap.
- 3. Place filling or sealing materials up to top of 4 feet below the ground surface.
- 4. Place 1 foot of sealing material on top of filling materials, extending 6 inches beyond the diameter of the well casing.

C. Plugging Procedures, Class 2 Wells:

1. Bedrock Well in Single Confined Aquifer (Artesian Well):

- a. Place filling material from the bottom of the well up to 10 feet below the bottom of the casing string being plugged or the confining layer.
- b. If well flow cannot be overcome by sealing materials, install a bridge plug or packer in the bottom of the casing.
- c. Place sealing material from a level of 10 feet below the casing string being plugged, or the confining layer if open borehole, to a depth of 10 feet below ground surface.
- d. Place a 6 foot thick cap of neat cement, grout, or concrete to a depth of 4 feet below the ground surface.

2. Bedrock Well in Single Unconfined Aquifer:

- a. Place filling material from the bottom of the well up to 10 feet below the bottom of the casing or confining layer, whichever is less.
- b. Place sealing materials to 10 feet below the ground surface.
- c. Place a 6 foot thick cap of neat cement, grout, or concrete to a depth of 4 feet below the ground surface.

3. Bedrock Well in Multiple Aquifers:

- a. Place filling material in the lowest aquifer from the bottom of the well up to 10 feet below the bottom of the casing or confining layer of the lowest aquifer, whichever is less.
- b. Place 20 feet of neat cement on top of filling material. Allow neat cement to develop initial set before performing subsequent filling and sealing work. High early strength cement may be used to reduce work stoppage time.
- c. Place sealing materials in at least the top 10 feet of each subsequent aquifer, extending at least 10 feet into the confining layer or casing above. Allow sufficient time for initial set before performing subsequent filling or sealing work.
- d. Place filling materials between subsequent aquifer seals.
- e. Place fill or sealing material from the top of the uppermost aquifer seal to the static water level of the well.
- f. Place sealing materials to 10 feet below the ground surface.
- g. Place a 6 foot thick cap of neat cement, grout, or concrete to a depth of 4 feet below the ground surface.

3.07 SALVAGE

- A. **Restrictions:** Salvage is allowed only on property owned by the Jurisdiction. The ownership of each site is included in the contract documents. Remove all salvaged materials from the site by the end of each day's work.

- B. **Authorized Workers:** Only the Contractor's authorized workers are allowed to salvage or demolish the structure or its contents.

3.08 DEMOLITION AND REMOVAL

A. **Structures:**

1. Except for wood frame or non-rigid masonry buildings, start on the top floor and maintain structural parts of buildings, such as columns, beams, and joists, supporting the floor of any building story until the walls, flooring, and partitions of that story are removed.
2. No wall or part of a wall will be allowed to fall outward from any building except through chutes or other controlled method that will ensure safety and minimize dust, noise, and other nuisance.
3. Remove chimneys or outside portions of chimneys in advance of general demolition. Remove inside chimneys as soon as they become unsupported by reason of removal of other parts of the building.
4. Remove all unstable, free-standing, or inadequately supported building elements prior to the end of each work day.

- B. **Basements and Foundations:** Completely remove and dispose of all basement floors, footings, foundations, and walls unless specifically stated in the contract documents. Notify engineer for inspection prior to filling the basement excavation.

- C. **Surface Slabs:** Remove all concrete, asphalt, or masonry slabs and appurtenances.

D. **Vegetation:**

1. Remove and dispose of all brush, shrubs, trees, logs, downed timber, and other yard waste on the site unless otherwise specified in the contract documents. Do not mix with demolition material. Remove stumps to a minimum of 2 feet below finish grade.
2. Protect any trees or other vegetation not designated for removal by placing a fence at the drip line encompassing the entire tree and keeping all operations outside of the fenced in area, including storage of equipment or materials. At no additional cost to the Contracting Authority, replace any trees that are designated for protection but are damaged beyond treatment. The Engineer will determine size and species of the replacement tree.

- E. **Retaining Walls:** Remove all retaining walls unless otherwise specified in the contract documents. Complete work without damage to adjacent public or private property. Following removal, grade the adjacent slope to a 3:1 (horizontal to vertical) slope or flatter.

- F. **Fences:** Remove all fences, guardrails, posts, and other appurtenances unless on a property line with adjacent private property and designated for retention in the contract documents. Fill and compact soil in all post holes.

- G. **Miscellaneous Objects:** Remove all clotheslines, signs, piping, posts, or any other objects protruding from the ground and fill any resulting hole.

3.09 DISPOSAL

- A. **Appliances, Electronics, Tires, Trash, Household Hazardous Waste, and Rubbish:** Remove all appliances, electronics, tires, trash, household hazardous wastes, and rubbish from the site leaving the site free of debris. Dispose of appliances, electronics, tires, rubbish, household hazardous wastes, and trash according to local and state regulations and not with the demolition material.
- B. **Demolition Material:** Deliver all demolition material to the disposal facility designated in the contract documents according to the rules for that facility. Cover all vehicles used to transport demolition material. The Contractor may submit an alternate disposal facility, fully licensed by the state, for consideration by the Engineer. Submit all disposal tickets received from the disposal facility clearly indicating the specific address of the origin of the demolition debris. Pay all fees associated with disposal of the demolition material.

3.10 ASBESTOS ABATEMENT

All asbestos or asbestos containing materials will be removed prior to the demolition by a licensed asbestos contractor through a separate contract. Notify the Engineer if asbestos is discovered in the demolition process. No further work will be allowed until the asbestos has been removed by a licensed contractor.

3.11 RECYCLING

If specified in the contract documents, certain materials may be required to be recycled from the demolition site. These include bricks, concrete, and recoverable metals. All costs related to recycling and the value received from recycled materials are the Contractor's.

3.12 BACKFILL AND GRADING

- A. **Backfill:** Place backfill material in all excavation areas and holes with material meeting Section 2010, 2.03. Unless otherwise specified in the contract documents, compact using Type A compaction as indicated in Section 2010, 3.04. If compaction with moisture and density control is specified, use Section 2010, 3.09. Notify the Engineer 24 hours in advance of compaction testing so a soil density sample can be obtained and analyzed. Provide density testing as specified in the contract documents.
- B. **Topsoil:** Strip and stockpile the top 12 inches of topsoil for use as a final topsoil and grading material. If topsoil quality does not meet Section 2010, 2.01, supply additional material to place a minimum of 8 inches over the site. The Engineer will approve the borrowed topsoil material. No payment will be made for supplying additional topsoil material.
- C. **Borrow:** If sufficient fill material is not available, supply additional material of equal quality to the soil on the site. Supply suitable material meeting Section 2010. No payment will be made for supplying additional fill material.

- D. **Grading:** Grade site to conform with all surrounding areas with a uniform surface that will not allow ponding and does not change drainage patterns that existed prior to demolition. Remove excess excavation material from the site.

3.13 CLEAN UP AND SEEDING

- A. **Clean Up:** Remove all unused material and rubbish from the site. Remove all salvaged materials and any materials recycled. Restore all areas occupied during the course of the work, including the public right-of-way and any private property.
- B. **Seeding:** Complete seedbed preparation, seeding, fertilizing, and mulching of the site according to the requirements for permanent urban seeding in Section 9010, 2.02, A. If unable to comply with permanent seeding dates, apply the urban temporary erosion control mixture in Section 9010, 2.02, D.

END OF SECTION

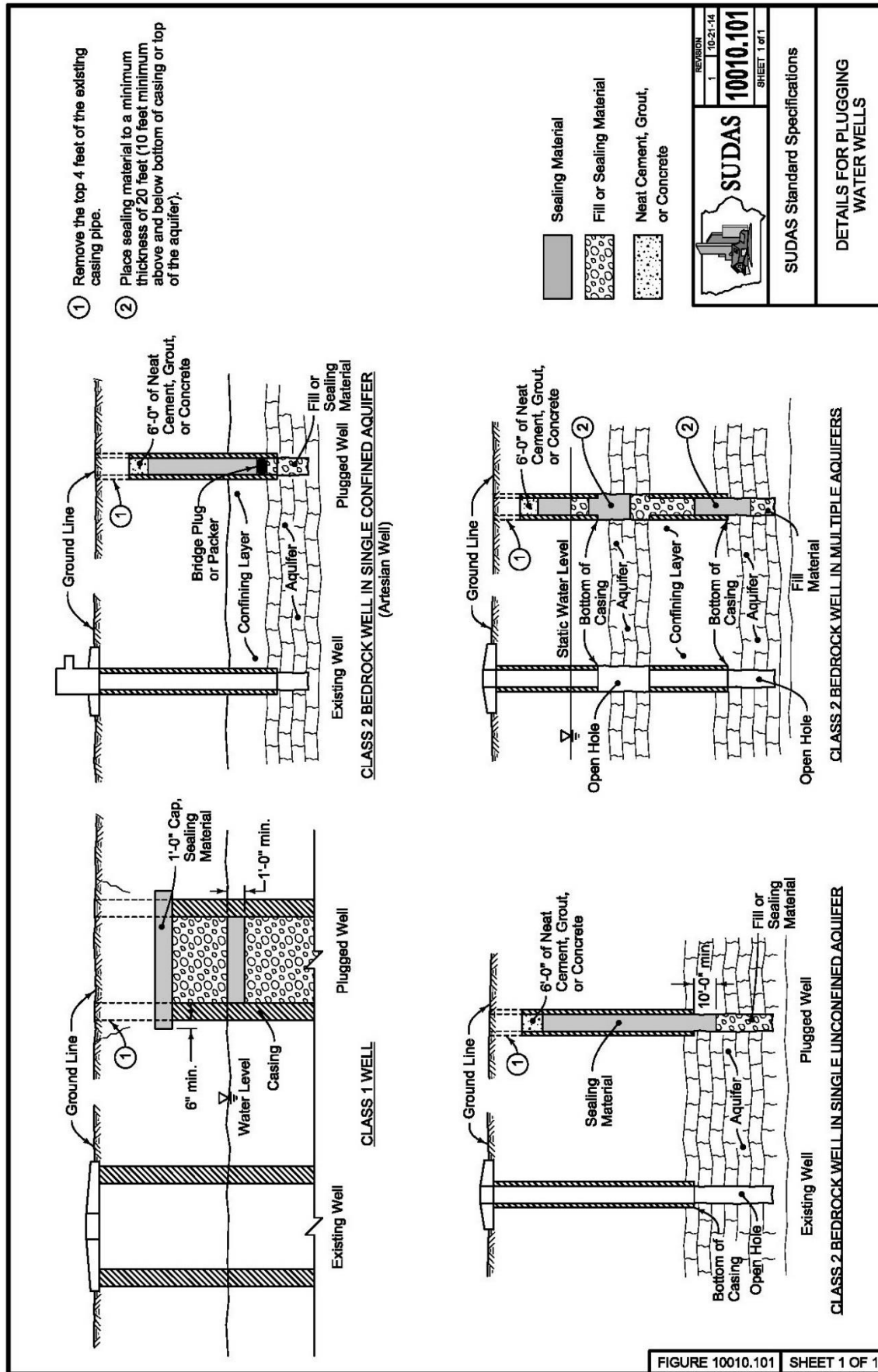


FIGURE 10010.101 SHEET 1 OF 1

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SECTION 11,010 - CONSTRUCTION SURVEY

PART 1 -GENERAL

1.01 SECTION INCLUDES

Construction survey includes personnel, equipment, and supplies required for, but not limited to, the following:

A. Construction Survey:

1. Project Control
2. Grading
3. Bridges, Structural Walls, and Reinforced Box Culverts
4. Pipe Culverts
5. Sanitary and Storm Sewers
6. Water Mains
7. Paving
8. Replacement of Disturbed Monuments
9. Additional Items Included in the Contract Documents

B. Monument Preservation and Replacement

1.02 DESCRIPTION OF WORK

Construction survey and staking necessary for construction of the project as shown in the contract documents.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants, as well as the following:

- A. **Documentation:** Format the survey work documentation in a manner acceptable to the Engineer. Ensure documentation is sufficient to prove means and methods used to transfer design intent to construction stakes. Check tie-ins with existing roadways, structures, and utilities prior to staking; notify the Engineer if discrepancies are found.
1. **Benchmarks:** Submit descriptions and elevations of new permanent benchmarks. Establish benchmarks on existing durable fixtures not subject to frost action or disturbance.
 2. **Staking Records:** Upon request, submit all field books, computer-aided design and drafting (CADD) files, digital log files, etc.
 3. **Monument Preservation and Replacement:** If the contract documents include a bid item for monument preservation and replacement, submit copies of all documents developed for compliance with the requirements of Iowa Code Section 355 and Iowa Administrative Code 193C to the Engineer.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

A. Qualifications:

1. Perform construction survey directly by or under responsible charge of a Professional Engineer or Professional Land Surveyor licensed in the State of Iowa.
2. Reset disturbed monuments with new monuments under the responsible charge of a Professional Land Surveyor licensed in the state of Iowa.

B. Obtain Engineer's approval when interpolating grades or using cross-sections to obtain alignments and elevations.

C. The Jurisdiction will provide benchmarks, right-of-way corners, and primary control points from the original survey in the contract documents. Roadway alignment data will be provided as required for construction.

D. If the contract documents do not include a bid item for monument preservation and replacement, the Contracting Authority will be responsible for replacing disturbed monuments located within the project area and not noted for protection.

1.08 MEASUREMENT AND PAYMENT

A. **Construction Survey:** If the contract documents specify that the Contractor is responsible for construction survey, measurement and payment will be as follows.

1. **Measurement:** Lump sum item; no measurement will be made.
2. **Payment:** Payment will be at the lump sum price for construction survey.
3. **Includes:** Lump sum price includes, but is not limited to, the costs of resetting project control points, re-staking, and any additional staking requested beyond the requirements of this section.

B. **Monument Preservation and Replacement:** If the contract documents specify the Contractor is responsible for replacing monuments, measurement and payment will be as follows.

1. **Measurement:** Lump sum item; no measurement will be made.
2. **Payment:** Payment will be at the lump sum price for replacement of disturbed monuments.
3. **Includes:** Lump sum price includes, but is not limited to, property research and documentation, locating monuments prior to construction, replacement of

disturbed monuments, and preparation and filing of the monument preservation certificate.

PART 2 - PRODUCTS

2.01 HUBS

Provide hardwood, metal, or plastic stakes of sufficient size and length to prevent stake movement due to adjacent construction activity.

2.02 LATH

Provide wood lath that is approximately 3/8 inch thick by 1 1/2 inches wide by 48 inches long.

PART 3 - EXECUTION

3.01 EQUIPMENT

- A. Utilize survey equipment with a level of accuracy appropriate for the type of work being staked.
- B. Do not use GPS equipment for staking the vertical elements of paving hubs, bridges, structural walls, or reinforced box culverts.

3.02 PROJECT CONTROL

Provide all horizontal and vertical control data to the Jurisdiction at the completion of each phase of the construction survey work activity.

- A. **Primary Monuments:** Primary survey monuments are established by the Jurisdiction prior to project construction.
 - 1. Replace primary monuments disturbed by construction.
 - 2. Reference a minimum of three ties to durable objects (trees, fence posts, station marks, etc.) in the description of the new monument.
- B. **Secondary Monuments:** Secondary control points are established by the Contractor or Contractor's Surveyor during construction to facilitate staking or instrument calibration.
 - 1. Place in locations likely to survive construction.
 - 2. Reference to the primary monuments with a resulting error radius not to exceed 0.10 feet.
 - 3. Replace any points disturbed during construction. Points do not need to be replaced after construction.
- C. **Benchmarks:** Utilize the benchmarks shown in the contract documents to establish all other vertical control on the project site.
 - 1. Establish new permanent vertical control benchmarks on new structures (bridges, reinforced box culverts), fire hydrants, or power poles located in the project limits.

2. Identify permanent benchmarks.
 3. Transfer elevations from construction plan benchmarks to new permanent benchmarks using a digital level or a three-wire leveling method.
 4. Record descriptions and elevations of new permanent benchmarks.
- D. **Property Limits:** If specified, mark all construction easements, permanent easements, and rights-of-way with flagged lath at 100 feet intervals on tangents; at the PC and PT of curves; at 25 feet intervals on curves; and at all angle points.

3.03 CONSTRUCTION STAKING

For each construction operation specified in the contract documents, provide stakes as follows. If approved by the Engineer, staking frequency may be modified as long as the level of accuracy appropriate for the type of work is achieved.

A. Grading:

1. Conventional Grading:

- a. Set slope stakes left and right (nails or wood hubs) at 100 foot intervals, or less if needed, for all embankment or roadway excavation. Mark slope stakes with wooden lath depicting station, offset, and elevation reference (cut or fill) to all pertinent breaks in the slope.
- b. In lieu of slope stakes, set a 100 foot grid with lath over project limits for mass grading with cut or fill marked for finished grade elevation. Finished grade refers to the finished surface of construction (top of paving for paved areas, top of black dirt for unpaved areas).
- c. For paved areas, in addition to the 100 foot grid, set lath at appropriate offsets around the perimeter at 50 foot intervals, high and low points, and points of inflection. Mark lath with cut or fill to finished grade (top of paving).
- d. For building pads, set lath at appropriate offsets for building corners or gridlines. Provide a semi-permanent benchmark, consisting of a 2 foot wooden hub or rebar, set to the same elevation as the proposed finished floor elevation.
- e. Set finished grade stakes (blue tops) at 100 foot intervals at both edges of paving and along centerline for roadways, and in a 100 foot grid in parking areas. Mark blue tops with a stake chaser or similar method.

2. GPS Machine-Controlled Grading:

- a. Establish GPS control points consisting of a minimum of 5 semi-permanent points located around the perimeter of the site. Points may be established horizontally using GPS, but transfer elevations of said points from an original benchmark located in the construction documents using a total station or level.
- b. Provide grade check stakes at an approximate spacing of 300 feet on roadways.

- c. Provide approximately 20 grade control check stakes for building pad and parking areas.

B. Bridges, Structural Walls, and Reinforced Concrete Box Culverts:

1. Provide appropriate offsets for centerline of abutments, piers, back of parapets, face of walls, etc.
2. Provide stakes consisting of a tacked wooden hub with a lath. Clearly mark offset distance and referenced line identification: centerline roadway, abutment, pier, etc.
3. Clearly mark height of cut or fill to a pre-determined elevation reference: flowline, top of wall, top of footing, etc. For structural walls, provide elevation reference to either top of wall or top of footing. Do not reference off of bottom of wall.
4. Set a minimum of two semi-permanent benchmarks, consisting of a 2 foot wooden hub or rebar, for each structure. Transfer elevation to benchmarks from construction plan benchmarks using a total station or level.
5. Perform an independent check of all the above stakes. Independent check can be performed by an independent survey crew or by arbitrary verification of the location of the stakes as placed in the field.
 - a. For an arbitrary verification, survey stakes and control points in an arbitrary coordinate system and then rotate digitally into the design file to verify accuracy with the contract documents.
 - b. Notify Contractor of any discrepancies within 24 hours of placing the stakes for each structure.

C. Pipe Culverts:

1. Place stakes for offsets to ends of pipe, labeled with offset distance, and cut or fill to proposed flowline of the new culvert.
2. Place stakes for all bends in the pipe alignment. Provide two offset stakes, one along each pipe segment bearing, at bends to accurately place bend location.
 - a. For culverts over 100 feet in length, set offset stakes 50 feet and 100 feet from end of pipe and every 100 feet thereafter. Label stakes with offset distance and elevation reference to the flowline of the proposed pipe.

D. Sanitary and Storm Sewers:

1. Place stakes for all manholes, intakes, cleanouts, and other structures associated with new sewer.
2. Provide offset stake for each structure set at 10 to 15 feet. Offset may be increased for deep sewers.
3. For back of curb intakes, set two offset stakes along the curb alignment to properly align the new grate. Stakes may also be offset perpendicular to the curb alignment as required to avoid conflicts with the proposed storm sewer.

4. Place stakes for all bends in the pipe alignment. Provide two offset stakes, one along each pipe segment bearing, at bends to accurately place bend location.
5. For pipe sections over 100 feet in length, set offset stakes 50 feet and 100 feet from end of pipe and every 100 feet thereafter. Label stakes with offset distance and elevation reference to the flowline of the proposed pipe.

E. Water Mains:

1. Place stakes for proposed water main on line (no offset) at 100 foot intervals. Label stakes as centerline of water main with elevation reference to the top of the proposed pipe to ensure sufficient depth is achieved.
2. Place stakes for all hydrants, valves, bends, tees, and other appurtenances with appropriate offsets. Label stakes with offset distance and elevation reference to proposed finished grade adjacent to the hydrant, valve, bend, tee, or other appurtenance.
3. Place stakes at all crossings of storm sewers and sanitary sewers. Label stakes with top of pipe elevations at the crossing for water mains and sewer mains to ensure proper depth and vertical separation.

F. Paving:

1. Conventional Paving:

- a. Set paving hubs at appropriate offsets around perimeter of paved areas. Place hubs at grade breaks (high and low points), points of horizontal deflection (bends), and 25 foot intervals in between. Label stakes with offset distance and elevation reference to the top of paving.
- b. For paving areas wider than 60 feet, set paving hubs at appropriate offsets on 25 foot intervals along interior bays or drive lanes. Label stakes with offset distance and elevation reference to the top of paving.
- c. Place stakes for curb drop locations for sidewalk ramps and driveways. Set hubs on both sides of the drop curb at the bottom of the drop to ensure the appropriate width of curb opening is achieved. Label stakes with offset distance and elevation reference to top of paving.
- d. Place stakes for sidewalks and trails on one side only at appropriate offsets. Place stakes at 50 foot intervals in straight and level sections and 25 foot intervals for horizontal or vertical curves. Label stakes with offset distance and elevation reference to the top of paving.

2. Stringless Paving:

- a. When stringless paving is used, set additional control points on each side of the pavement, as necessary, to meet the manufacturer's requirements for the equipment used. Furnish x, y, and z coordinates and station offset information for each point. Points may be established horizontally using GPS, but transfer elevations of said points from an original benchmark located in the construction documents using a total station or level.

- b. Provide grade check paving hubs at appropriate offsets around the perimeter of the paved areas. 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. Place stakes for curb drop locations for sidewalk ramps and driveways. Set hubs on both sides of the drop curb at the bottom of the drop to ensure the appropriate width of curb opening is achieved. Label stakes with offset distance and elevation reference to top of paving.
- d. Provide grade check stakes for sidewalks and shared use paths at appropriate offset on one side only. Provide grade check stakes for sidewalks and shared use paths at a maximum interval spacing of 100 feet.

3.04 MONUMENT PRESERVATION AND REPLACEMENT

Comply with the requirements of Iowa Code Section 355 and the Iowa Administrative Code Section 193C for the replacement of all disturbed monuments within the project area.

END OF SECTION

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SECTION 11,020 – MOBILIZATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

Project Mobilization

1.02 DESCRIPTION OF WORK

Mobilization includes preparatory work, operations performed, or costs incurred prior to beginning work on the various items on the project site.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

- A. When a bid item for mobilization is included on the proposal form, comply with this section for measurement and payment.
- B. When the proposal form does not include a bid item for mobilization, all costs incurred by the contractor for mobilization are incidental to other work and no separate payment will be made.

1.08 MEASUREMENT AND PAYMENT

A. Mobilization:

- 1. **Measurement:** Lump sum item; no measurement will be made.
- 2. **Payment:**
 - a. When 5% of the original contract amount has been completed, 25% of the contract price for mobilization will be paid.
 - b. When 10% of the original contract amount has been completed, 50% of the contract price for mobilization will be paid.
 - c. When 50% of the original contract amount has been completed, 100% of the contract price for mobilization will be paid.
- 3. **Includes:** The unit price for mobilization may include the following.
 - a. The movement of personnel, equipment, and supplies to the project site.

- b. The establishment of offices, buildings, and other facilities necessary for the project.
- c. Bonding, permits, or other expenses incurred prior to construction.

PART 2 - PRODUCTS

None.

PART 3 - EXECUTION

None.

END OF SECTION

SECTION 11,030 - TEMPORARY SERVICES DURING CONSTRUCTION

PART 1 -GENERAL

1.01 SECTION INCLUDES

- A. Maintenance of Postal Service
- B. Coordination of Solid Waste Collection

1.02 DESCRIPTION OF WORK

- A. Maintain postal service to all properties within the project area.
- B. Maintain solid waste collection to all properties within the project area. Solid waste includes garbage, recycling, and yard waste.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT

A. Maintenance of Postal Service:

- 1. **Measurement:** Lump sum item; no measurement will be made.
- 2. **Payment:** Payment will be at the lump sum price for maintenance of postal service.

B. Maintenance of Solid Waste Collection:

- 1. **Measurement:** Lump sum item; no measurement will be made.
- 2. **Payment:** Payment will be at the lump sum price for maintenance of solid waste collection.

PART 2 - PRODUCTS**2.01 MAILBOXES**

- A. **Curbside Mailboxes:** Provide standard curbside mailboxes complying with US Postal Service (USPS) STD-7B.
- B. **Cluster Mailboxes:** Provide cluster box units complying with USPS-B-1118.

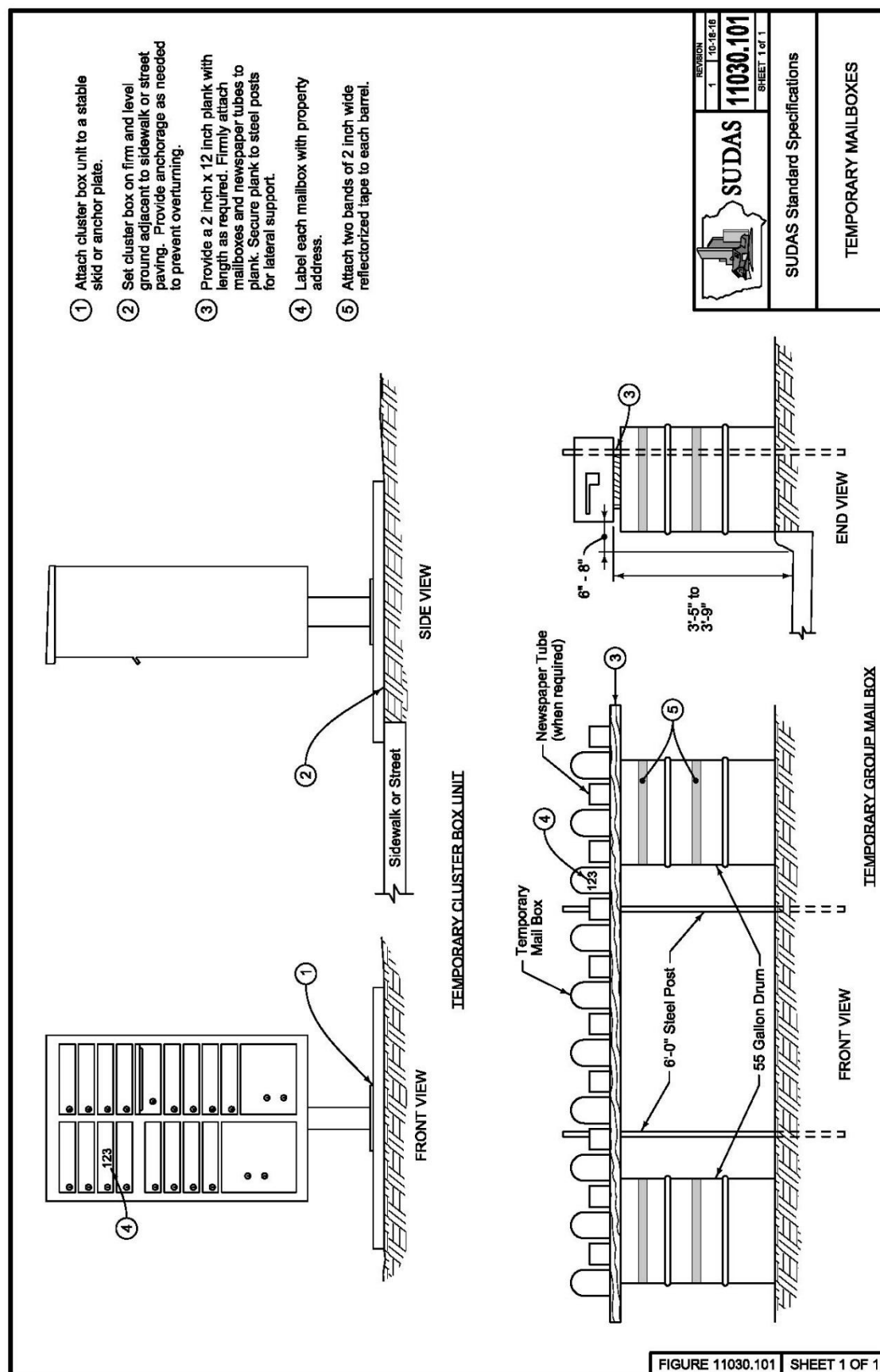
PART 3 - EXECUTION**3.01 POSTAL SERVICE**

- A. Coordinate delivery of mail with the USPS.
- B. Maintain postal service to all properties within the project area. Meet the needs of physically challenged individuals within the project area.
- C. When construction staging prohibits access to normal mailbox locations by the USPS, establish temporary mail service as follows:
 - 1. Coordinate with the USPS to establish an acceptable location for a temporary group mailbox.
 - 2. Verify proposed location with the Engineer prior to installation.
 - 3. Erect and maintain a temporary group mailbox or provide a temporary USPS approved cluster box unit complying with Figure 11,030.101.

3.02 SOLID WASTE COLLECTION

- A. Coordinate collection of solid waste with property owners and the solid waste collection agencies operating in the project area.
- B. Maintain access for solid waste collection vehicles during construction.
- C. When construction staging prohibits access to normal collection locations by solid waste collection vehicles, comply with the following:
 - 1. Coordinate with solid waste collection agencies to establish a common location for collection outside the inaccessible area.
 - 2. Coordinate with residents/businesses within the project area for the alternate solid waste collection procedures.
 - 3. Affix a temporary label to solid waste containers identifying the property owner's or renter's name or address.
 - 4. Prior to the normal collection time, gather containers from properties within the inaccessible area, and transport to the common location accessible by solid waste collection vehicles.
 - 5. Return solid waste containers to each property within 24 hours after collection.

END OF SECTION



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SECTION 11,040 - TEMPORARY SIDEWALK ACCESS

PART 1 -GENERAL

1.01 SECTION INCLUDES

- A. Temporary Residential Access
- B. Temporary Granular Sidewalk
- C. Temporary Longitudinal Channelizing Device

1.02 DESCRIPTION OF WORK

- A. Construct a temporary access to residential properties impacted by construction.
- B. Construct a granular surfaced, temporary, public sidewalk.
- C. Construct temporary longitudinal channelizing device along a public sidewalk to delineate the pedestrian access route.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT

A. Temporary Pedestrian Residential Access:

1. **Measurement:** Granular surfacing for temporary pedestrian residential access will be measured in square yards.
2. **Payment:** Payment for temporary pedestrian residential access will be made at the unit price per square yard.
3. **Includes:** The unit price for temporary pedestrian residential access includes, but is not limited to, supplying and placing granular material, continuous maintenance of granular surface, removal of temporary granular sidewalk, and restoring disturbed surfaces to a condition equal to that which existed prior to construction.

B. Temporary Granular Sidewalk:

1. **Measurement:** Temporary granular sidewalk will be measured in square yards.
2. **Payment:** Payment for temporary granular sidewalk will be made at the unit price per square yard.
3. **Includes:** The unit price for temporary granular sidewalk includes, but is not limited to, excavation, grading, timber edging, supplying and placing granular material, continuous maintenance of granular surface, removal of temporary granular sidewalk, and restoring disturbed surfaces to a condition equal to that which existed prior to construction.

C. Temporary Longitudinal Channelizing Device:

1. **Measurement:** Temporary longitudinal channelizing device will be measured in linear feet along the top rail support.
2. **Payment:** Payment for longitudinal channelizing device will be made at the unit price per linear foot.
3. **Includes:** The unit price for temporary longitudinal channelizing device includes, but is not limited to, construction, placement, maintenance, and removal of the device.

PART 2 - PRODUCTS**2.01 GRANULAR SURFACING**

Provide Class V fine limestone complying with Iowa DOT Article 4109.02, Gradation No. 8 in the Aggregate Gradation Table and the quality requirements of Iowa DOT Article 4117.03 for temporary residential access or a temporary granular sidewalk.

2.02 TEMPORARY LONGITUDINAL CHANNELIZING DEVICE

- A. Construct channelizing device from common dimensional lumber and construction fasteners. Comply with Figure 11040.102.
- B. Provide a manufactured pedestrian guidance system complying with the requirements of the *American's with Disabilities Act Accessibility Guidelines for Buildings and Facilities* (ADAAG) and the MUTCD.
- C. Other alternatives that comply with the ADAAG and MUTCD requirements may be allowed upon approval of the Engineer.

PART 3 - EXECUTION**3.01 TEMPORARY PEDESTRIAN RESIDENTIAL ACCESS**

This item is for the construction of a temporary granular path through the project area for pedestrian access to residential properties when street and sidewalk access area is impacted by construction. This access is not intended to provide access to the general public.

- A. Construct a 4 foot wide granular path through the project area as required to maintain access to residential properties.
- B. Place granular material directly on the existing surface to a nominal depth of 3 inches.
- C. Grade the granular surface smooth and compact.
- D. Maintain the surface of the path in a firm, stable, and slip resistant condition.
- E. Relocate or replace path as required by construction staging.
- F. Place additional granular material as directed by the Engineer.

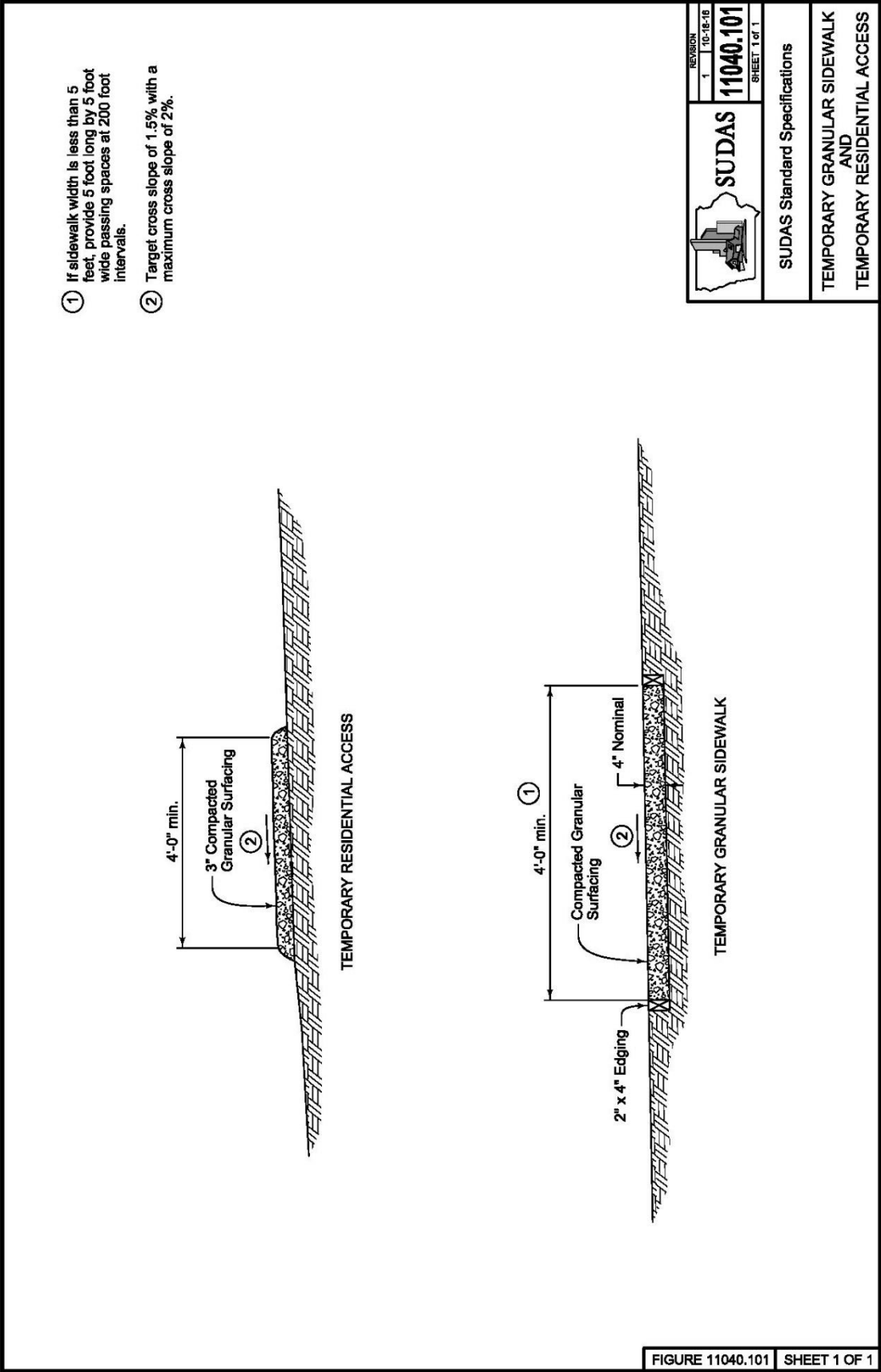
3.02 TEMPORARY GRANULAR SIDEWALK

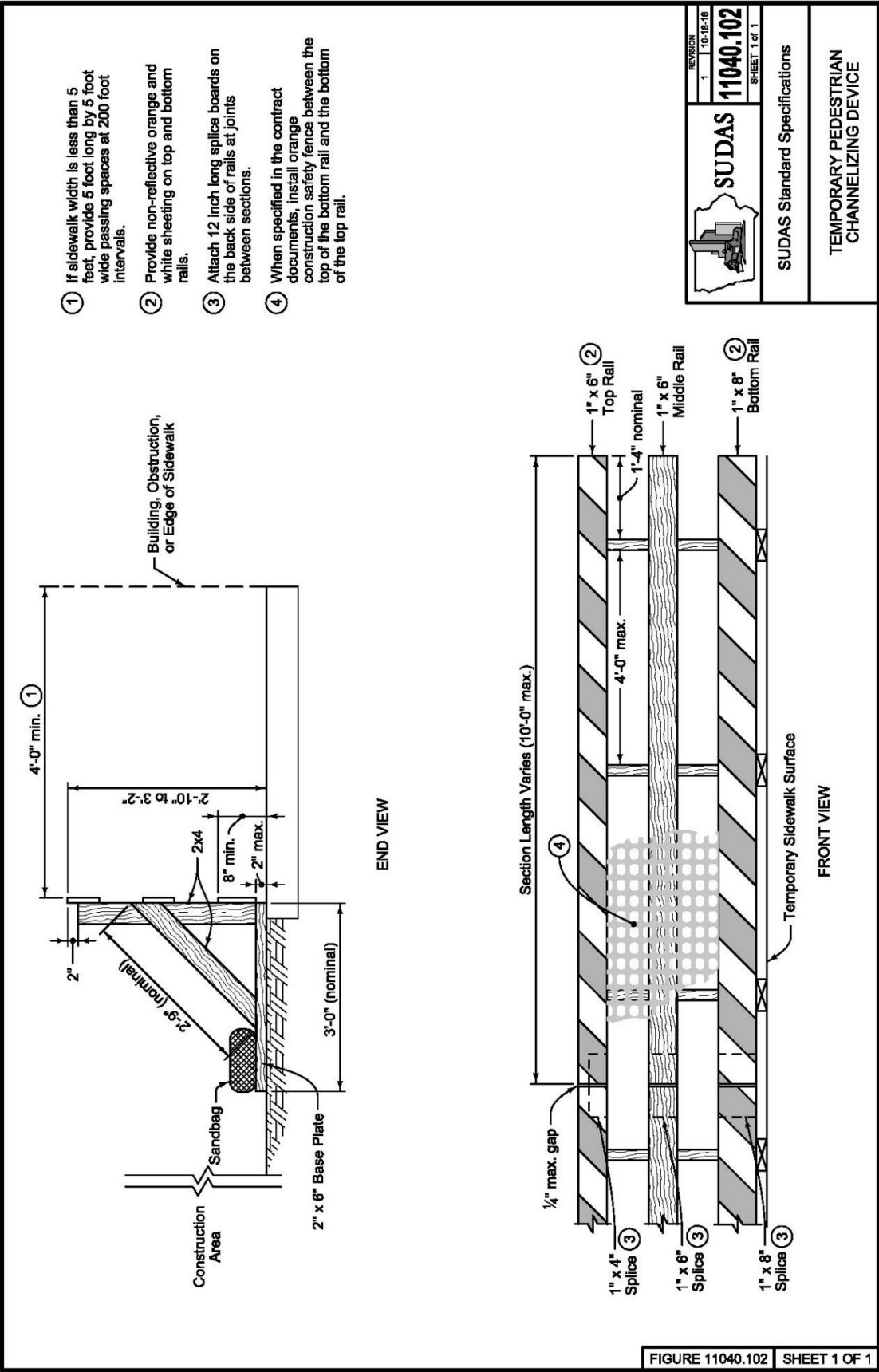
- A. Construct temporary granular sidewalk at locations specified in the contract documents.
- B. Excavate existing ground surface to a nominal depth of 4 inches. Install 2 by 4 edging along both sides of the excavation.
- C. Place granular surfacing between edging and compact.
- D. Maintain the surface of the granular sidewalk in a firm, stable, and slip resistant condition.
- E. Place additional granular material as directed by the Engineer.

3.03 TEMPORARY LONGITUDINAL CHANNELIZING DEVICE

- A. Construct temporary longitudinal channelizing device according to Figure 11040.102, or erect manufactured or other approved pedestrian railing system.
- B. Locate device as specified in the contract documents.
- C. Add additional posts, braces, base plates, screws, nails, sandbags, or other appurtenances as required to maintain device in a stable condition at no additional cost to the Contracting Authority.

END OF SECTION





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SECTION 11,050 - CONCRETE WASHOUT

PART 1 -GENERAL

1.01 SECTION INCLUDES

Concrete Washout

1.02 DESCRIPTION OF WORK

Provide and maintain concrete washout system.

1.03 SUBMITTALS

Comply with Division 1 - General Provisions and Covenants.

1.04 SUBSTITUTIONS

Comply with Division 1 - General Provisions and Covenants.

1.05 DELIVERY, STORAGE, AND HANDLING

Comply with Division 1 - General Provisions and Covenants.

1.06 SCHEDULING AND CONFLICTS

Comply with Division 1 - General Provisions and Covenants.

1.07 SPECIAL REQUIREMENTS

None.

1.08 MEASUREMENT AND PAYMENT

A. Concrete Washout:

1. **Measurement:** Lump sum item; no measurement will be made.
2. **Payment:** Payment will be at the lump sum price for concrete washout.
3. **Includes:** Lump sum price includes, but is not limited to, providing concrete wash water containment, collection, and disposal.

PART 2 - PRODUCTS

2.01 CONCRETE WASHOUT

Provide a concrete washout system that retains all concrete wash water and complies with one of the following:

A. Manufactured Washout Containment:

1. **Concrete Washout Containers:** Provide roll-off type metal container that is leak-proof and designed specifically for collection of concrete and concrete wash water. When concrete pumper trucks are utilized, provide a ramp or other means to allow access for pumper trucks.
2. **Concrete Washout Collection Bags:** Provide leak-proof collection bags designed specifically for collection of concrete and concrete wash water.

3. **Chute Washout Box:** Provide ready mixed trucks with on-vehicle chute washout system to collect concrete wash water for return to the ready mixed plant.

B. Non-Manufactured Containment:

1. **Below-grade System:** For excavated pits, provide an impermeable plastic liner with a minimum thickness of 10 mils.
2. **Above-grade Containment:** For containment areas constructed from earthen berms, provide a double thickness of impermeable plastic liner with a minimum thickness of 10 mil per sheet.

- C. **Prohibited Products:** Silt fence, unlined hay bales, unlined earthen embankments, and other practices that may allow concrete wash water to leak out of the containment area or to come in direct contact with the ground are not allowed.

PART 3 - EXECUTION

3.01 CONCRETE WASHOUT

- A. Provide concrete wash water containment on all projects where concrete wash water will be generated. Clearly mark the location of the washout area and provide directions to truck drivers.
- B. Locate concrete washout containment systems a minimum of 50 feet from proposed or existing storm sewer intakes, open ditches, or waterbodies.
- C. Collect all concrete wash water from ready mixed trucks, pumper trucks, and cleaning of tools and other equipment.
- D. Retain concrete wash water within the containment system until the water evaporates or is collected and disposed.
- E. Prior to rain events, lower the liquid level or cover the concrete washout containment area to prevent overflow.
- F. Clean out the concrete wash water containment area when it reaches 75% of the total capacity.
- G. Hardened solids may be removed from the containment area and disposed of as other non- hazardous wastes or may be broken up and used on the site for other appropriate uses.

3.02 CLEANUP AND REMOVAL

- A. Remove all manufactured washout containment facilities from the project area.
- B. For excavated pits, pump out and properly dispose of all remaining water, remove any hardened solids, and remove all plastic liner materials and fill pit area flush with surrounding ground.

- C. For above-grade containment facilities, pump out and properly dispose of all remaining water, remove any hardened solids, and remove all plastic liner materials and spread out earthen berms.

END OF SECTION

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**RESOLUTION APPROVING IOWA DOT AGREEMENT 2020-R-005 FOR A RISE GRANT IN
THE AMOUNT OF \$1,640,342**

WHEREAS the City of Marshalltown applied for a RISE Grant from the Iowa Department of Transportation to support the development of the extension of Edgewood Street and North 8th Avenue to provide a truck diversion route from Highway 14 to industries on the eastern side of the City; and

WHEREAS, the Iowa DOT Commission approved a grant of \$1,640,342 to the City of Marshalltown at their October 2019 meeting; and

WHEREAS, the City has continued to pursue additional funding for the project and required stormwater infrastructure through the United States Economic Development Administration, which changed some aspects of the City's original scope of work with the Iowa DOT; and

WHEREAS, the Iowa DOT has presented an Agreement 2020-R-005 to the City of Marshalltown for the acceptance of the RISE Grant for \$1,640,342, which matches the new developable acreage;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF MARSHALLTOWN, IOWA, Iowa DOT Agreement 2020-R-005 is hereby approved and the Mayor is directed to execute the Agreement.

Passed this 26th day of May, 2020, and signed this _____ day of May, 2020.

CITY OF MARSHALLTOWN, IOWA

Joel T.S. Greer, Mayor

ATTEST:

Shari L. Coughenour, CMC, City Clerk

**Iowa Department of Transportation
Agreement for a
Revitalize Iowa's Sound Economy Program (RISE) Project**

RECIPIENT: Marshalltown

PROJECT NO: RM-4797(626)--9D-64

IOWA DOT AGREEMENT NO.: 2020-R-005

This is an agreement between Marshalltown (hereinafter referred to as Recipient) and the Iowa Department of Transportation (hereinafter referred to as the DOT). The Recipient submitted an application to the DOT for funding through the Revitalize Iowa's Sound Economy (RISE) fund under Iowa Code Chapter 315, and the application was approved by Transportation Commission Order No. PPM-2020-20 on October 8, 2019.

Pursuant to the terms of this agreement, and applicable statutes and administrative rules the DOT agrees to provide funding to the Recipient for the authorized and approved costs for eligible items associated with the construction of approximately 1,720 feet of Edgewood Street and 1,540 feet of North 8th Avenue located on the northeast side of town.

In consideration of the foregoing and the mutual promises contained in this agreement, the parties agree as follows:

1. The Recipient shall be the lead organization for carrying out the provisions of this agreement.
2. All notices required under this agreement shall be made in writing to the DOT's and/or the Recipient's contact person. The DOT's contact person shall be Jennifer Kolacia, Systems Planning Bureau, 800 Lincoln Way, Ames, Iowa 50010, 515-239-1738, email Jennifer.Kolacia@iowadot.us. The Recipient's contact person shall be Jessica Kinser, City Administrator, Marshalltown, 24 N Center St, Marshalltown, IA 50158, jkinser@marshalltown-ia.org, 641-754-5799.
3. The Recipient shall be responsible for the development and completion of the following described project:

Construction of approximately 1,720 feet of Edgewood Street and 1,540 feet of North 8th Avenue located on the northeast side of town.

This project is necessary to provide access to eight lots totaling more than 44 acres for industrial purposes. The associated economic development is the majority of the designated development area (44 acres in total and shown on Exhibit A) will be developed with RISE eligible land uses.

See Exhibit A.

4. Eligible project costs for the project described in Section 3 of this agreement, listed above, date of project approval (funding commitment) by the Transportation Commission shall be paid as follows:

City RISE Funds:	\$1,640,342
City of Marshalltown Local Contribution:	\$1,640,342
Project Total:	\$3,280,684

5. The local contribution stated above may include cash or non-cash contributions to the project. The Recipient shall certify to the DOT the value of any non-cash contribution to the project prior to it being incurred. For right of way contributions, the recipient shall submit an appraisal from a qualified independent appraiser. The DOT reserves the right to review the Recipient's certificate of value and has sole authority to determine the value of the Recipient's non-cash contribution for the purposes of this agreement. If, as a result of the DOT's determination, the Recipient's total cash and non-cash contribution is below that stated in the terms of this agreement, the Recipient shall increase its cash contribution in order to complete the Recipient's local contribution, or the grant and/or loan amount associated with this project shall be reduced accordingly.
6. The portion of total project costs paid by RISE grant shall not exceed the amount stated above \$1,640,342 or 50 percent of the total cost of the eligible items, whichever is the smaller amount. Any cost overruns shall be paid solely by the applicant.
7. Project activities or costs eligible for funding include only those items set out in Exhibit B which is attached hereto and by this reference incorporated into this agreement, and which are necessary to complete the project as described in Section 3.
8. Activities or costs ineligible for funding include but are not limited to those items set out in Exhibit C which is attached hereto and by this reference incorporated into this agreement.
9. Notwithstanding any other provisions of this contract, if funds anticipated for the continued fulfillment of this contract are at any time not forthcoming or insufficient, either through the failure of the State of Iowa to appropriate funds or discontinuance or material alteration of the program for which funds were provided, the DOT shall have the right to terminate this contract without penalty by giving not less than ninety (90) days written notice.
10. The DOT reserves the right to delay reimbursement of funds to the Recipient if necessary to maintain a positive cash flow. If such a delay is necessary and lasts more than five working days, the DOT shall so notify the Recipient in writing and shall give the Recipient an estimate of when reimbursement might be expected. The DOT shall establish a system to equitably make reimbursements to all Recipients so affected.
11. The attached project implementation schedule, Exhibit D, shall be used unless the Recipient submits to the DOT, no later than 30 days subsequent to the Recipient's signature date on this agreement, a revised implementation schedule.

12. The Recipient must have let the contract or construction started within three years of the date this project is approved by DOT. If the Recipient does not do this, they will be in default for which the DOT can revoke funding commitments. This agreement may be extended for periods up to six months upon receipt of a written request from the Recipient at least sixty (60) days prior to the deadline.
13. If any part of this agreement is found to be void and unenforceable, the remaining provisions of this agreement shall remain in effect.
14. It is the intent of both parties that no third party beneficiaries be created by this agreement.
15. This agreement shall be executed and delivered in two or more copies, each of which so executed and delivered shall be deemed to be an original and shall constitute but one and the same instrument.
16. This agreement is not assignable without the prior written consent of the DOT.
17. If the project described in Section 3 of this agreement crosses a DOT primary road, then:
 - A. The Recipient shall convey title to the State of Iowa, by quit claim deed, to any right of way necessary for the primary road crossing, all at no cost to the DOT. However, the DOT shall prepare detailed legal descriptions and plats. The general configuration of the right of way to be conveyed shall be agreed to by the Recipient and the DOT prior to the survey.
 - B. The Recipient shall submit six copies of plans for all primary road system crossings to the DOT contact person for review and approval by the District Offices for necessary permits, Road Design and Maintenance Bureau with regard to crossing design and location, signing, fencing, safety, maintenance, compliance with access control policy, etc. Said approval shall be obtained before the Recipient proceeds with the construction of any primary road system crossing.
 - C. The use of primary highway right of way for this projects' purpose shall be subject to any rights enjoyed by any existing utility lines presently within the right of way. If excavation of a utility line over which this project has been placed is necessary for any reason, the utility shall be responsible for proper backfilling of said excavation to ground level. The Recipient shall be responsible for any necessary resurfacing or restoration.
 - D. The use of primary highway right of way for this projects' purposes shall be subject to any future plans for reconstruction, improvement, maintenance, and/or relocation of the highway by the DOT. Any relocation of this project necessary because of said plans shall be at the expense of the Recipient, all at no cost to the DOT.
18. The Recipient shall acquire the project right of way, whether by lease, easement or fee title and shall provide relocation assistance benefits and payments in accordance with the

procedures set forth in the DOT's Right of Way manual. The Recipient shall contact the DOT for assistance, as necessary, to ensure compliance with the required procedures, even if no federal funds in the right of way purchase are involved. The Recipient will need to get environmental concurrence before acquiring any needed right of way. With prior approval, hardship and protective buying is possible. If the Recipient requests Federal-aid participation for right of way acquisition, the Recipient will need to get environmental concurrence and Federal Highway Administration (FHWA) authorization before purchasing any needed right of way.

19. The Recipient shall comply with the Policy for Accommodating Utilities on City and County Federal-aid Highways Right of Way and the Policy for Accommodating Utilities on Primary Road system when on the DOT's right of way. Certain utility relocation, alteration, adjustment, or removal costs to the Recipient for the project may be eligible for Federal-aid reimbursement in accordance with the FHWA rules applicable to the type of utility involved and Iowa Code Chapter 306A.
20. The Recipient shall be responsible for obtaining any permits, such as the Right to Occupy and/or Perform Work Within the Right of Way, Permit of Access, Utility Accommodation, Right to Install and Maintain Traffic Control Devices, and/or other construction permits required for the project prior to the start of construction.

The Recipient shall complete all known required environmental permits before the project is advertised for letting. In addition, the Recipient shall fully comply with all applicable environmental requirements before funds are reimbursed or credited.

The approval of the project application for funding nor the signing of this agreement nor the concurrence to advertise shall be construed as approval of any required permit from DOT.

21. Traffic control devices, signing, or pavement markings installed within the limits of this project shall conform to the "Manual on Uniform Traffic Control Devices for Streets and Highways" per 761 Iowa Administrative Code Chapter (IAC) 130. The safety of the general public shall be assured through the use of proper protective measures and devices such as fences, barricades, signs, flood lighting, and warning lights as necessary.
22. In the event that right of way is required for the project, said right of way will be acquired in accordance with 761 IAC Chapter 111, Real Property Acquisition and Relocation Assistance, and the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.
23. The project plans, specifications and cost estimate shall be prepared and certified by a professional engineer, architect and or landscape architect (whichever applies), licensed to practice in the State of Iowa. The Recipient shall submit the plans, specifications and other agreement documents to the DOT for review. This submittal may be in divisions and in the order of preference as determined by the Recipient. However, the plans, specifications and other agreement documents for each division must be submitted at least thirty (30) days prior to the project advertising of each division. Project cannot be advertised until DOT concurrence has been acquired. The DOT shall review said

submittal(s) recognizing the Recipient's development schedule and shall, after satisfactory review, authorize in writing the Recipient to proceed with implementation of the project letting. The work on this project shall be in accordance with the survey, plans, and specifications on file. Any modification of these plans and specifications must be approved by the DOT prior to the modification being put into effect.

24. The Recipient shall be responsible for the daily inspection of the project. For projects let to contract, the Recipient shall compile a daily log of materials and quantities. For projects constructed with local forces, the Recipient shall compile a daily log of materials, equipment and labor on the project. The DOT reserves the right to inspect project activities and to audit claims for funding reimbursement. The purpose of the inspection or audit is to determine substantial compliance with the terms of this agreement.
25. The Recipient shall maintain all books, documents, papers, accounting records, reports and other evidence pertaining to costs incurred for the project. The Recipient shall also make such materials available at all reasonable times during the construction period and for three years from the date of final reimbursement, for inspection by the DOT, FHWA, or any authorized representatives of the Federal government. Copies of said materials shall be furnished by the Recipient if requested.
26. The Recipient may submit to the DOT periodic itemized claims for reimbursement for eligible project costs. Reimbursement claims shall include certification that all eligible project costs, for which reimbursement is requested, have been completed in substantial compliance with the terms of this agreement.
27. The DOT shall reimburse the Recipient for properly documented and certified claims for eligible project activity costs less a retainage of not more than five percent, either by state warrant, or by crediting other accounts from which payment may have been made initially. If, upon audits of contracts, the DOT determines the Recipient is overpaid, the Recipient shall reimburse the overpaid amount to the DOT.
28. Upon completion of the project described in this agreement, a professional engineer, architect and or landscape architect (whichever applies), licensed to practice in the State of Iowa, shall certify in writing to the DOT that the project activities were completed in substantial compliance with the plans and specifications set out in this agreement.

In addition, prior to final reimbursement for the project the Recipient shall furnish a set of "as-built" plans of the project to the DOT.

Final reimbursement of funds, including retainage, shall be made only after the DOT accepts the project as complete.

29. If, in the opinion of the Recipient, the specific provisions of this agreement requiring the services of a professional engineer, architect and or landscape architect (whichever applies), licensed to practice in the State of Iowa, prove to be burdensome to the Recipient or otherwise not in the public interest, and if the Recipient decides that the provisions of this agreement can be otherwise complied with without endangering public

safety, the Recipient may request that said provisions be waived on all or specific parts of the project identified by the Recipient. Such request shall be made in writing to the DOT's contact person who shall, after consultation with other DOT staff, as necessary, make the final determination concerning said waiver. If said waiver is granted, all provisions of this agreement requiring the services of a professional engineer, architect and or landscape architect (whichever applies), licensed to practice in the State of Iowa, shall be performed by the Recipient's contact person or designee.

30. The Recipient agrees to indemnify, defend and hold the DOT harmless from any action or liability arising out of the design, construction, maintenance, placement of traffic control devices, inspection or use of this project. This agreement to indemnify, defend and hold harmless applies to all aspects of the DOT's application review and approval process, plan and construction reviews and funding participation.
31. This agreement may be declared to be in default by the DOT if the DOT determines that the Recipient's application for funding contained inaccuracies, omissions, errors or misrepresentations; or if the DOT determines that the project is not developed as described in the application.
32. If the Recipient fails to perform any obligation under this agreement, the DOT shall have the right, after first giving thirty (30) days written notice to the Recipient by certified mail return receipt requested, to declare any part or all of this agreement in default. The Recipient shall have thirty (30) days from date of mailing of the notice to cure the default. If the Recipient cures the default, the Recipient shall notify DOT no later than five (5) days after cure or before the end of said thirty (30) day period given to cure the default. Within ten (10) working days of receipt of Recipient's notice of cure, the DOT shall issue either a notice of acceptance of cure or a notice of continued default.
33. In the event a default is not cured the DOT may revoke funding commitments and/or seek repayment of funds loaned or granted by this agreement. By signing this agreement, the Recipient agrees to repay said funding if they are found to be in default. Repayment methods must be approved by the DOT Commission and may include cash repayment, installment repayments with negotiable interest rates, charges against the Recipient's share of road use tax funds, or other methods as approved by the Commission.
34. In case of dispute concerning the terms of this agreement, the parties shall submit the matter to arbitration pursuant to Iowa Code Chapter 679A. Either party has the right to submit the matter to arbitration after ten (10) days notice to the other party of their intent to seek arbitration. The written notice must include a precise statement of the disputed question. DOT and the Recipient agree to be bound by the decision of the appointed arbitrator. Neither party may seek any remedy with the state or federal courts absent exhaustion of the provisions of this section for arbitration.
35. The Recipient shall maintain, or cause to be maintained for the intended public use, the improvement for twenty (20) years from the completion date in a manner acceptable to the DOT. Failure to comply with this provision may be considered a default of this agreement.

36. In accordance with Iowa Code Chapter 216, the Recipient shall not discriminate against any person on the basis of race, color, creed, age, sex, sexual orientation, gender identity, national origin, religion, pregnancy, or disability.
37. The Recipient shall use positive efforts to solicit bids from and to utilize Targeted Small Business (TSB) enterprises as contractors and ensure that the contractors make positive efforts to utilize these enterprises as subcontractors, suppliers or participants in the work covered by this agreement. Efforts shall be made and documented in accordance with Exhibit E which is attached hereto and by this reference incorporated into this agreement.
38. The Recipient shall conduct the project development and implementation in compliance with applicable laws, ordinances and administrative rules. For portions of the project let to bid, the Recipient shall advertise for bidders, make a good faith effort to get at least three bidders and hold a public letting for the project work. Prior to awarding the contract, the Recipient shall provide the DOT file copies of project letting documents within five (5) working days after the letting. The Recipient must wait for DOT concurrence before making the final award.
39. The Recipient shall include in their Notice to Bidders that Sales Tax Exemption Certificates will be issued, as provided for by Iowa Code section 423.3, subsection 80. The Recipient shall be responsible for obtaining the sales tax exemption certificates through the Iowa Department of Revenue and Finance. The Recipient shall issue these certificates to the successful bidder and any subcontractors to enable them to purchase qualifying materials for the project free of sales tax.
40. Local Development: The Recipient shall notify the DOT's contact person within 30 days of the date the RISE project was constructed and open to traffic. The Recipient shall certify to the DOT's contact person within three years of the date the RISE project is constructed and open to traffic any associated economic development which has resulted from the project, including infrastructure improvements, capital investment, and/or job creation. This certification by the Recipient is subject to review by the DOT.

Land: The Recipient shall also provide certification documentation to the DOT's contact person within three years of the date the RISE project is constructed and open to traffic that the majority of the area that was developed is RISE eligible. The Recipient will certify that the developed area has been maintained as a RISE eligible development and that the said development meets RISE eligibility requirements. This certification by the Recipient is subject to audit by the DOT and the DOT has sole authority to determine whether the associated economic development has been accomplished. If the majority of the developed area is not RISE eligible then the Recipient shall pay back an amount determined by the DOT up to the full repayment of the RISE award.

The DOT shall monitor the progress of the associated economic development following the construction of the RISE project. Failure to certify the associated economic development shall be considered a default under this agreement.

41. This agreement as set forth in sections 1 through 41 herein, including referenced exhibits, constitutes the entire agreement between the DOT and the Recipient concerning this project. Representations made before the signing of this agreement are not binding, and

neither party has relied upon conflicting representations in entering into this agreement. Any change or alteration to the terms of this agreement must be made in the form of an addendum to this agreement. Said addendum shall become effective only upon written approval of the DOT and Recipient.

IN WITNESS WHEREOF, each of the parties hereto has executed Agreement No. 2020-R-005
as of the date shown opposite its signature below.

RECIPIENT: Marshalltown

By: _____ Date _____, _____

Title: Mayor

CERTIFICATION:

I, _____, certify that I am the Clerk of the city, and that
(Name of City Clerk)

_____, who signed said Agreement for and on behalf of
(Name of Mayor/Signer Above)

the city was duly authorized to execute the same by virtue of a formal resolution duly passed
and adopted by the city, on the ____ day of _____, _____.

Signed: _____

City Clerk of Marshalltown, Iowa.

IOWA DEPARTMENT OF TRANSPORTATION
Planning, Programming and Modal Division
800 Lincoln Way, Ames, Iowa 50010

By: _____ Date _____, 20__

Craig Markley
Director
Systems Planning Bureau

Exhibit A

Project Site Map:

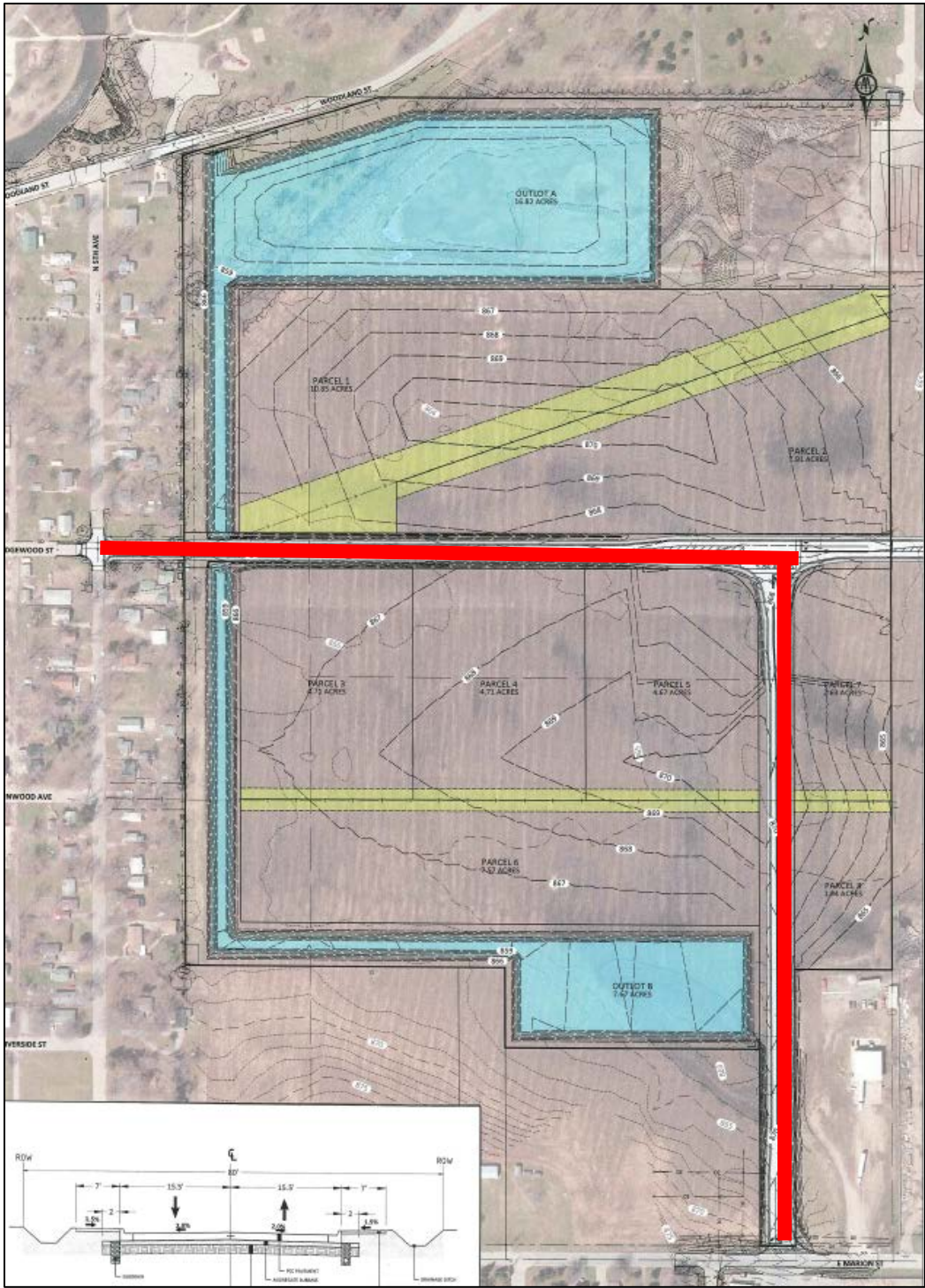


Exhibit B

Project activities or costs eligible for RISE funding, and which may be counted as part of the non-RISE participation in immediate opportunity and local development roadway projects, include only the following:

- a. Roadway resurfacing, rehabilitation, modernization, upgrading, reconstruction or initial construction, including grading and drainage, paving, erosion control, pavement overlays and shoulder widening and stabilization.
- b. Bridge and culvert repair, modernization, replacement or initial construction.
- c. Roadway intersection and interchange improvements including warranted traffic signalization when it is integral to the improvement.
- d. Public transportation system improvements, including but not limited to bus shelters, bus turnouts, and passenger information signage, when they are integral to the roadway improvement and were approved for inclusion in the project by the Department prior to the funding commitment.
- e. Bicycle and pedestrian infrastructure improvements, including but not limited to sidewalks, at-grade pedestrian crossings, bike lanes, and separated bike lanes, when they are integral to the roadway improvement and were approved for inclusion in the project by the Department prior to the funding commitment.
- f. Right-of-way acquisition costs, including but not limited to appraisals, negotiation, compensation, and cultural resources surveys necessary to comply with applicable local, state and federal laws, rules and regulations.
- g. Construction or improvement of motorist rest areas, welcome centers and information centers.
- h. Design engineering costs leading to construction plan development and construction inspection costs associated with RISE-financed projects.
- i. County and City bond principal and interest payments associated with RISE projects. No financing expenses incurred prior to funding commitment shall be eligible.
- j. Storm drainage and storm sewer costs to the extent needed for draining the roadway.
- k. Reconstruction or adjustment of utilities, including but not limited to water, sanitary sewer, electric, telephone, and natural gas, when utilities are located on private property and require replacement or relocation due to project construction; or said utilities are located in the public right-of-way and the utility is not required to relocate at its own expense.
- l. Costs associated with the acquisition of local, state and federal permits required for roadway construction.

Exhibit C

Activities or costs ineligible for RISE funding, and which may not be counted as part of the non-RISE participation in immediate opportunity or local development roadway projects, include but are not limited to the following:

- a. Any and all costs incurred prior to a funding commitment by the Transportation Commission unless granted advance eligibility to incur costs according to Administrative Rule 761-163.9(315)-
- b. Routine roadway, bridge and culvert maintenance, including but not limited to pothole filling, crack sealing, seal coating, patching, shoulder maintenance, gravel or earth roadway maintenance, and bridge painting.
- c. Winter roadway and bridge maintenance, including but not limited to snow plowing, sanding and salting.
- d. Overhead and operating costs associated with eligible project activities, including auditing.
- e. Expenses associated with the preparation and submission of applications for RISE funding.
- f. Pre-design engineering, feasibility or alignment studies, and other planning expenses.
- g. Traffic signalization, except as an integral part of a roadway project.
- h. Pavement marking and traffic signs, except as an integral part of a roadway project.
- i. Utility construction, reconstruction or adjustment except for those activities or costs described in Exhibit B, Item k.
- j. Safety appurtenances, except as an integral part of a roadway project.
- k. Lighting, except as an integral part of a roadway project.
- l. Lighting energy and maintenance costs.
- m. Sidewalks, bicycle paths and railroad-highway crossings, except when replacing those facilities in service and affected by the project, or as an integral part of a roadway project.
- n. Parking expenditures, including those for structure, lots, meters, paving, and marking whether on-street or off-street parking.
- o. Non-roadway transportation expenditures, including those for railway, aviation, public transportation and inland waterway facilities and equipment.
- p. Purchase of furnishings, construction equipment and personal property.

- q. General government expenses and expenses associated with the provision of any public service which are not eligible for RISE program assistance.
- r. Donated right of way.

Exhibit D

Project Implementation Schedule:

Commission Approval Date: October 8, 2019

Construction: November 2020

Project Closeout: September 2021

Exhibit E

CONTRACT PROVISION

**Targeted Small Business (TSB)
Affirmative Action Responsibilities
on
Non-Federal Aid Projects (Third-Party State-Assisted Projects)**

March 2019

CONTRACT PROVISION

Targeted Small Business (TSB) Affirmative Action Responsibilities on Non-Federal-aid Projects (Third-party State-Assisted Projects)

1. TSB DEFINITION

A TSB is a small business, as defined by Iowa Code Section 15.102(10), which is 51% or more owned, operated and actively managed by one or more women, minority persons, service-disabled veterans or persons with a disability provided the business meets all of the following requirements: is located in this state, is operated for profit and has an annual gross income of less than 4 million dollars computed as an average of the three preceding fiscal years.

2. TSB REQUIREMENTS

In all State-assisted projects made available through the Iowa Department of Transportation, local governments have certain affirmative action requirements to encourage and increase participation of disadvantaged individuals in business enterprises. These requirements are based on Iowa Code Section 19B.7. These requirements supersede all existing TSB regulations, orders, circulars and administrative requirements.

3. TSB DIRECTORY INFORMATION

Available from: Iowa Economic Development Authority
Targeted Small Business Certification Program
200 East Grand Avenue
Des Moines, IA 50309
Phone: (515-348-6159)
Website: <https://iowaeconomicdevelopment.com/tsb>

4. THE CONTRACTOR'S TSB POLICY

The contractor is expected to promote participation of disadvantaged business enterprises as suppliers, manufactures and subcontractors through a continuous, positive, result-oriented program. Therefore, the contractor's TSB policy shall be:

It is the policy of this firm that Targeted Small Business (TSB) concerns shall have the maximum practical opportunity to participate in contracts funded with State-assisted funds which are administered by this firm (e.g. suppliers, manufactures and subcontractors). The purpose of our policy is to encourage and increase the TSB participation in contracting opportunities made available by State-assisted programs.

5. CONTRACTOR SHALL APPOINT AN EQUAL EMPLOYMENT OPPORTUNITY (EEO) OFFICER

The contractor shall designate a responsible person to serve as TSB officer to fulfill the contractors affirmative action responsibilities. This person shall have the necessary statistics, funding, authority and responsibility to carry out and enforce the firm's EEO policy. The EEO officer shall be responsible for developing, managing and implementing the program on a day-to-day basis. The officer shall also:

- A. For current TSB information, contact the Iowa Economic Development Authority (515-348-6159) to identify potential material suppliers, manufactures and contractors.
- B. Make every reasonable effort to involve TSBs by soliciting quotations from them and incorporating them into the firm's bid.
- C. Make every reasonable effort to establish systematic written and verbal contact with those TSBs having the materials or expertise to perform the work to be subcontracted, at least two weeks prior to the time quotations are to be submitted. Maintain complete records of negotiation efforts.
- D. Provide or arrange for assistance to TSBs in seeking bonding, analyzing plans/specifications or other actions that can be viewed as technical assistance.

TSB Affirmative Action Responsibilities

- E. Ensure the scheduled progress payments are made to TSBs as agreed in subcontract agreements.
- F. Require all subcontractors and material suppliers to comply with all contract equal opportunity and affirmative action provisions.

6. COUNTING TSBs PARTICIPATION ON A PROJECT

TSBs are to assume actual and contractual responsibilities for provision of materials/supplies, subcontracted work or other commercially useful function.

A. The bidder may count:

- (1) Planned expenditures for materials/supplies to be obtained from TSB suppliers and manufacturers; or
- (2) Work to be subcontracted to a TSB; or
- (3) Any other commercially useful function.

B. The contractor may count:

- (1) 100% of an expenditure to a TSB manufacturer that produces/supplies goods manufactured from raw materials.
- (2) 60% of an expenditure to TSB suppliers that are not manufacturers; provided the suppliers perform a commercially useful function in the supply process.
- (3) Only those expenditures to TSBs that perform a commercially useful function in the work of a contract, including those as a subcontractor.
- (4) Work the Contracting Authority has determined that it involves a commercially useful function. The TSB must have a necessary and useful role in the transaction of a kind for which there is a market outside the context of the TSB program. For example, leasing equipment or purchasing materials from the prime contractor would not count.

7. REQUIRED DATA, DOCUMENTS AND CONTRACT AWARD PROCEDURES FROM BIDDERS/CONTRACTORS FOR PROJECTS WITH ASSIGNED GOALS

A. Bidders

Bidders who fail to demonstrate reasonable positive efforts may be declared ineligible to be awarded the contract. Bidders shall complete the bidding documents plus a separate form called "TSB Pre-Bid Contact Information". This form includes:

- (1) Name(s) of the TSB(s) contacted regarding subcontractable items.
- (2) Date of the contract.
- (3) Whether or not a TSB bid/quotation was received.
- (4) Whether or not the TSB's bid/quotation was used.
- (5) The dollar amount proposed to be subcontracted.

B. Contractors Using Quotes From TSBs

Use those TSBs whose quotes are listed in the "Quotation Used in Bid" column along with a "yes" indicated on the Pre-bid Contact Information form.

TSB Affirmative Action Responsibilities

C. Contractors NOT Using Quotes From TSBs

If there are no TSBs listed on the Pre-bid Contract Information form, then the contractor shall document all efforts made to include TSB participation in this project by documenting the following:

- (1) What pre-solicitation or pre-bid meetings scheduled by the contracting authority were attended?
- (2) Which general news circulation, trade associations and/or minority-focused media were advertised concerning the subcontracting opportunities?
- (3) Were written notices sent to TSBs that TSBs were being solicited and was sufficient time allowed for the TSBs to participate effectively?
- (4) Were initial solicitations of interested TSBs followed up?
- (5) Were TSBs provided with adequate information about the plans, specifications and requirements of the contract?
- (6) Were interested TSBs negotiated with in good faith? If a TSB was rejected as unqualified, was the decision based on an investigation of their capabilities?
- (7) Were interested TSBs assisted in obtaining bonding, lines of credit or insurance required by the contractor?
- (8) Were services used of minority community organization, minority contractors' groups; local, State and Federal minority business assistance offices or any other organization providing such assistance.

The above documentation shall remain in the contractor's files for a period of three (3) years after the completion of the project and be available for examination by the Iowa Economic Development Authority.

8. POSITIVE EFFORT DOCUMENTATION WHEN NO GOALS ARE ASSIGNED

Contractors are also required to make positive efforts in utilizing TSBs on all State-assisted projects which are not assigned goals. Form "TSB Pre-bid Contact Information" is required to be submitted with bids on all projects. If there is no TSB participation, then the contractor shall comply with section 7C. of this document prior to the contract award.

Contractor _____

Page# _____

Project# _____

County _____

City _____

TARGETED SMALL BUSINESS (TSB)
PRE-BID CONTACT INFORMATION

(To Be Completed By All Bidders Per The Current Contract Provision)

In order for your bid to be considered responsive, you are required to provide information on this form showing your Targeted Small Business contacts made with your bid submission. This information is subject to verification and confirmation.

In the event it is determined that the Targeted Small Business goals are not met, then before awarding the contract, the Contracting Authority will make a determination as to whether or not the apparent successful low bidder made good faith efforts to meet the goals.

NOTE: Every effort shall be made to solicit quotes or bids on as many subcontractable items as necessary to achieve the established goals. If a TSB's quote is used in the bid, it is assumed that the firm listed will be used as a subcontractor.

TABLE OF INFORMATION SHOWING BIDDERS PRE-BID
TARGETED SMALL BUSINESS (TSB) CONTACTS

SUBCONTRACTOR	TSB	DATES CONTACTED	QUOTES RECEIVED		QUOTATION USED IN BID	
			YES/ NO	DATES CONTACTED	YES/ NO	DOLLAR AMT. PROPOSED TO BE SUBCONTRACTED

Total dollar amount proposed to be subcontracted to TSB on this project \$ _____

List items by name to be subcontracted:

**UTILIZATION OF TARGETED SMALL BUSINESS (TSB) ENTERPRISES
ON NON-FEDERAL AID PROJECTS
(THIRD-PARTY STATE-ASSISTED PROJECTS)**

In accordance with Iowa Code Section 19B.7, it is the policy of the Iowa Department of Transportation (Iowa DOT) that Targeted Small Business (TSB) enterprises shall have the maximum practicable opportunity to participate in the performance of contracts financed in whole or part with State funds.

Under this policy the Recipient shall be responsible to make a positive effort to solicit bids or proposals from TSB firms and to utilize TSB firms as contractors or consultants. The Recipient shall also ensure that the contractors or consultants make positive efforts to utilize TSB firms as subcontractors, subconsultants, suppliers, or participants in the work covered by this agreement.

The Recipient's "positive efforts" shall include, but not be limited to:

1. Obtaining the names of qualified TSB firms from the Iowa Economic Development Authority (515-348-6159) or from its website at: <https://iowaeconomicdevelopment.com/tsb>.
2. Notifying qualified TSB firms of proposed projects involving State funding. Notification should be made in sufficient time to allow the TSB firms to participate effectively in the bidding or request for proposal (RFP) process.
3. Soliciting bids or proposals from qualified TSB firms on each project, and identifying for TSB firms the availability of subcontract work.
4. Considering establishment of a percentage goal for TSB participation in each contract that is a part of this project and for which State funds will be used. Contract goals may vary depending on the type of project, the subcontracting opportunities available, the type of service or supplies needed for the project, and the availability of qualified TSB firms in the area.
5. For construction contracts:
 - a) Including in the bid proposals a contract provision titled "TSB Affirmative Action Responsibilities on Non-Federal Aid Projects (Third-Party State-Assisted Projects)" or a similar document developed by the Recipient. This contract provision is available from the Administering Office.
 - b) Ensuring that the awarded contractor has and shall follow the contract provisions.
6. For consultant contracts:
 - a) Identifying the TSB goal in the Request for Proposal (RFP), if one has been set.
 - b) Ensuring that the selected consultant made a positive effort to meet the established TSB goal, if any. This should include obtaining documentation from the consultant that includes a list of TSB firms contacted; a list of TSB firms that responded with a subcontract proposal; and, if the consultant does not propose to use a TSB firm that submitted a subcontract proposal, an explanation why such a TSB firm will not be used.

The Recipient shall provide the Iowa DOT the following documentation:

1. Copies of correspondence and replies, and written notes of personal and/or telephone contacts with any TSB firms. Such documentation can be used to demonstrate the Recipient's positive efforts and it should be placed in the general project file.
2. Bidding proposals or RFPs noting established TSB goals, if any.
3. The attached "Checklist and Certification." This form shall be filled out upon completion of each project and forwarded to: Iowa Department of Transportation, Civil Rights Coordinator, Office of Employee Services, 800 Lincoln Way, Ames, IA 50010.

CHECKLIST AND CERTIFICATION
For the Utilization of Targeted Small Businesses (TSB)
On Non-Federal-aid Projects (Third-Party State-Assisted Projects)

Recipient: _____ Project Number: _____

County: _____ Agreement Number: _____

1. Were the names of qualified TSB firms obtained from the Iowa Economic Development Authority? ☐ YES ☐ NO

If no, explain _____

2. Were qualified TSB firms notified of project? ☐ YES ☐ NO

If yes, by ☐ letter, ☐ telephone, ☐ personal contact, or ☐ other (specify) _____

If no, explain _____

3. Were bids or proposals solicited from qualified TSB firms? ☐ YES ☐ NO

If no, explain _____

4. Was a goal or percentage established for TSB participation? ☐ YES ☐ NO

If yes, what was the goal or percentage? _____

If no, explain why not: _____

5. Did the prime contractor or consultant use positive efforts to utilize TSB firms on subcontracts? ☐ YES ☐ NO

If no, what action was taken by Recipient? _____

Is documentation in files? ☐ YES ☐ NO

6. What was the dollar amount reimbursed to the Recipient
from the Iowa Department of Transportation?

\$ _____

What was the final project cost?

\$ _____

What was the dollar amount performed by TSB firms?

\$ _____

Name(s) and address(es) of the TSB firm(s) _____

(Use additional sheets if necessary)

Was the goal or percentage achieved? ☐ YES ☐ NO

If no, explain _____

As the duly authorized representative of the Recipient, I hereby certify that the Recipient used positive efforts to utilize TSB firms as participants in the State-assisted contracts associated with this project.

Title

Signature

Date

MARSHALLTOWN

I O W A

City Administrator's Office

Joel Greer, Mayor
Jessica Kinser, Administrator
Shari L. Coughenour, Clerk
24 North Center Street
Marshalltown, IA 50158-4911
Tel - (641) 754-5799
Fax - (641) 754-5717

To: Mayor Greer and the City Council
From: Jessica Kinser, City Administrator
Date: May 15, 2020
RE: RISE Grant Agreement

Policy Issue: Council is required to authorize grant agreements committing City resources

Recommendation: To approve the resolution as proposed

Background: The City applied for a RISE grant for creating a truck diversion route off of Highway 14 at Edgewood Street. Edgewood would be extended from its current dead end through the City's ag land and make a south turn and connect with 8th Avenue. The DOT approved this grant in October 2019, but we could not sign the agreement when it was presented in January due to a change in scope.

The City has also been working on a grant from the EDA to cover the costs of required stormwater improvements that must occur if the roadway is to be built. This changed the scope of the project financially, but also created less land available for development as required by RISE. The City is now being required to show a commitment of the RISE funds for the EDA grant, and we can move forward with executing the agreement with the DOT. The City will have 3 years to complete the project from the date of award.

Until we have an agreement for the EDA grant, it is possible this project might not occur. We are currently providing them with a significant amount of requested information to hopefully get to the point where an award is possible. The City also obtained appraisals of all the properties along Edgewood Street, which is still on hold, pending there being a project. However, this piece would be funded locally and not with any federal or state funds, should the Council will want to purchase property.

Budget Impact: City cost of larger project is now estimated between \$1.2-\$1.6 million which is budgeted from LOST-Capital and Road Use Tax in FY21.

Attachment: RISE Grant Agreement

City Council
Susan Cahill, Michael Gowdy, Al Hoop,
Gabriel Isom, Leon Lamer, Bill Martin, Bethany Wirin



**RESOLUTION APPROVING AN AGREEMENT WITH THE MARSHALLTOWN AREA
CHAMBER OF COMMERCE FOR TOURISM AND PROMOTIONAL SERVICES**

WHEREAS, the City of Marshalltown has previously entered into agreements with the Marshalltown Area Chamber of Commerce and/or Marshalltown Regional Partnership concerning the creation and operation of the Convention and Visitor's Bureau, dating back to July 1, 1999; and

WHEREAS, the current year agreement expires on June 30, 2020; and

WHEREAS, the existing agreement is proposed to be extended for another one-year period with no changes to funding formula or to the scope of work;

NOW THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF MARSHALLTOWN, IOWA, that the attached agreement for funding Promotional and Tourism Services for the period of July 1, 2020, through June 30, 2021, is hereby approved.

Passed this 26th day of May, 2020, and signed this _____ day of May, 2020.

CITY OF MARSHALLTOWN, IOWA

Joel T.S. Greer, Mayor
ATTEST:

Shari L. Coughenour, CMC, City Clerk

AGREEMENT FOR TOURISM AND PROMOTIONAL SERVICES WITH THE MARSHALLTOWN AREA CHAMBER OF COMMERCE

WHEREAS, the City of Marshalltown (hereinafter referred to as “City”) desires to enter into a contract to provide tourism and promotional services which effectively promote and develop the visitor experience to Marshalltown as well as services that encourage residents to attend and support community events; and

WHEREAS, the Marshalltown Area Chamber of Commerce (hereinafter referred to as “Chamber”) is capable of providing the services desired;

NOW THEREFORE BE IT RESOLVED, the parties agree to the following:

1. Scope of Work

The following scope of services are necessary and appropriate to promote and develop the visitor experience to Marshalltown:

- a. Community Calendar and Electronic Message Board
The Chamber will provide a Community Calendar in an online and mobile format and serve as the entity collecting and managing event data. The Chamber will also continue to maintain and operate the electronic message board.
- b. Marketing plan/campaign which enhances Marshalltown’s public image
The Chamber will coordinate a regional marketing campaign that focuses on the assets of the community as a whole. This should involve multiple forms of media, including television and social media. The Chamber will present a plan to the City Council and will report to the Council on any items that could be considered cost-prohibitive with the funding specified in item 2 below.
- c. Hospitality materials
The Chamber will create and distribute materials that provide information for visitors to the community.
- d. Convention and meeting services
The Chamber will work with local and out-of-town groups to provide information about the facilities available to host conventions and meetings and Marshalltown and coordinate with events occurring to ensure a positive visitor experience.
- e. Community event planning/coordination
The Chamber will work with community groups and with organizations outside of the community to assist the with coordination and planning of events that serve the broader community and benefit Marshalltown through increased visitors, hotel room stays, and general economic contributions to the community.

2. Fee for Scope of Work

For the services detailed above, the City of Marshalltown shall dedicate 67% of all hotel/motel tax received. The payments shall be made quarterly in the month following the City's receipt of the hotel/motel tax dollars from the Iowa Department of Revenue.

3. Reporting

The Chamber shall provide an annual report to the City Council no later than December 31 on its previous year's activities. The report should include:

1. A summary and analysis of the specific steps taken to perform the tasks in this contract;
2. Performance Measures. The Chamber and the City shall work together to develop performance measures which include data that measures the Chamber's success towards the scope of work. The City will assist in providing this data to the Chamber.
3. A report on the variety of specific promotion activities executed for the purpose of attracting visitors to Marshalltown. Include samples of advertising, which include family, quality of life and educational opportunities. The report should include a description of the specific promotion activities targeted at attracting visitors to Marshalltown during the fall, winter and spring. Include samples of advertising, which include family, quality of life and educational opportunities.
4. A report and analysis of the viability of new festivals and events for supporting additional tourism, including efforts the Chamber made to coordinate with other community groups on existing events.
5. A summary report of outreach efforts made by the Chamber to other organizations, businesses, and people to support the work of this contract.

4. Duration of Agreement

This agreement shall be for a one-year period beginning July 1, 2020 and end on June 30, 2021.

5. Amendment and Termination

Agreement may be terminated by either party by giving written notice only upon a finding of gross mismanagement or misappropriation of funds. In the event the hotel/motel tax is terminated by vote of the residents of the City of Marshalltown, Iowa, or by action of the Iowa Legislature, this agreement shall terminate ninety (90) days after receipt of the last tax revenues, or sooner if State law so provides.

6. Assignability

The Chamber shall not assign any interest in this Agreement and shall not transfer any interest in the Agreement without prior written approval of the City.

7. Hold Harmless

By execution of this Agreement, the Chamber agrees to indemnify and hold harmless the City from any liability whatsoever arising under the terms of this Agreement and shall defend the City from any such claims, including payment of attorney fees and related costs.

8. Insurance

The Chamber shall maintain all necessary insurance coverage for Workers' Compensation, liability, errors and omissions and any other coverages necessary to provide the Scope of Work.

Approved and signed this ____ day of _____, 2020.

MARSHALLTOWN AREA CHAMBER OF
COMMERCE

CITY OF MARSHALLTOWN, IOWA

John Dawley
Board Chair

Joel T.S. Greer
Mayor

ATTEST:

Lynn Olberding
President/CEO

Shari L. Coughenour, CMC
City Clerk

THIS WEEK IN MARSHALLTOWN



Austin Chadderdon at Tannin
on Friday, March 6



Bon Jecci at Old Timer on
Saturday, March 7

Event and Conference Promotion

- Took over weekly email newsletter “This Week in Marshalltown” and it grew from 200 to 450-plus recipients in first three months in 2020
- Assisted with several conventions and special events in Marshalltown, pre-COVID-19
- Working with meeting planners and local venues for future conventions/conferences
- In regular contact with local event planners to assist in their efforts
- Provided Tourism grants for bigger local events

Video Series

- Started with videos on local attractions such as Grimes Farm, Orpheum Theater, etc. After COVID-19 hit, we have moved to more inspirational, community building and community marketing videos such as “Spreading Love”
- Other videos included a “Thank You” to local essential workers and a dog exploring Marshalltown trails ⇒
- Videos were published on Chamber YouTube Channel and on Facebook
- Total views of videos are more than 20,000
- Have received statewide attention for videos - One example is Channel 5 of Des Moines news ran portion of the dog on trails video in May



Social Media

- Publishing more photos on local amenities on Facebook and Twitter - especially focused on nature and trails photos during the pandemic with the lack of events. We will focus more on events as they return.

Future

- Larger scale community marketing efforts
- Continued work to draw more conference/conventions
- More promotion on trails in area
- Continued video projects designed to bring more people to Marshalltown
- More promotion of area events and partnering with local event organizers

Update provided to Marshalltown City Council for May 26, 2020 meeting

**RESOLUTION SUPPORTING AN ARTS PROJECT GRANT APPLICATION TO THE IOWA
ARTS COUNCIL FOR PUBLIC ART FOR A DOWNTOWN POCKET PARK**

WHEREAS the City of Marshalltown has included the creation of a pocket park between the Veterans Memorial Coliseum and City Hall as part of the Fiscal Year 2021 Capital Improvement Plan; and

WHEREAS, an initial concept created for the project has identified an opportunity to incorporate public art as part of the project; and

WHEREAS, the specific art project proposed is to have quotes regarding the tornado and its impact stamped into areas of colored concrete; and

WHEREAS, the total estimated cost of the project, which includes an artist fee and production of the concrete stamps, is \$6,000, of which half can be requested as an Arts Project Grant through the Iowa Arts Council;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF MARSHALLTOWN, IOWA, an application a \$3,000 Arts Project Grant is hereby approved to be submitted.

Passed this 26th day of May, 2020, and signed this _____ day of May, 2020.

CITY OF MARSHALLTOWN, IOWA

Joel T.S. Greer, Mayor

ATTEST:

Shari L. Coughenour, CMC, City Clerk

MARSHALLTOWN

I O W A

City Administrator's Office

Joel Greer, Mayor
Jessica Kinser, Administrator
Shari L. Coughenour, Clerk
24 North Center Street
Marshalltown, IA 50158-4911
Tel - (641) 754-5799
Fax - (641) 754-5717

To: Mayor Greer and the City Council
From: Jessica Kinser, City Administrator
Date: May 18, 2020
RE: Arts Project Grant

Policy Issue: Council is required to approve grant requests committing City resources

Recommendation: To approve the resolution as proposed

Background: The FY21 CIP includes a project for the creation of a pocket park in between the Coliseum and City Hall, which would feature a pickleball court and greenery and create an inviting and usable space. As this project was being conceptualized, the inclusion of some sort of art related to the tornado was always on the table.

With July 1st getting closer, staff has been working with CGA on an initial concept, which is attached. The proposed art project would be to hire an artist/storyteller to interview multiple residents who were impacted by the tornado and identify 10 quotes including multiple languages. The artist would then design custom concrete stamps which the City would then pay to have fabricated and placed into the colored concrete.

Overall the pocket park budget is estimated at \$220,000 which includes stormwater and pavement replacement for the length of the alley, which will become the second pedestrian alley in Downtown. Other sources of funds include CIP tax funds, Road Use Tax, and Stormwater fees. The City will also be submitting a Letter of Interest to the Rebuild Marshalltown Fund by July 1st to support the project with a grant.

Budget Impact: The Art Grant is \$3,000 as part of an overall budget of ~\$220,000.

Attachment: Initial Conceptual Drawing

City Council

Susan Cahill, Michael Gowdy, Al Hoop,
Gabriel Isom, Leon Lamer, Bill Martin, Bethany Wirin

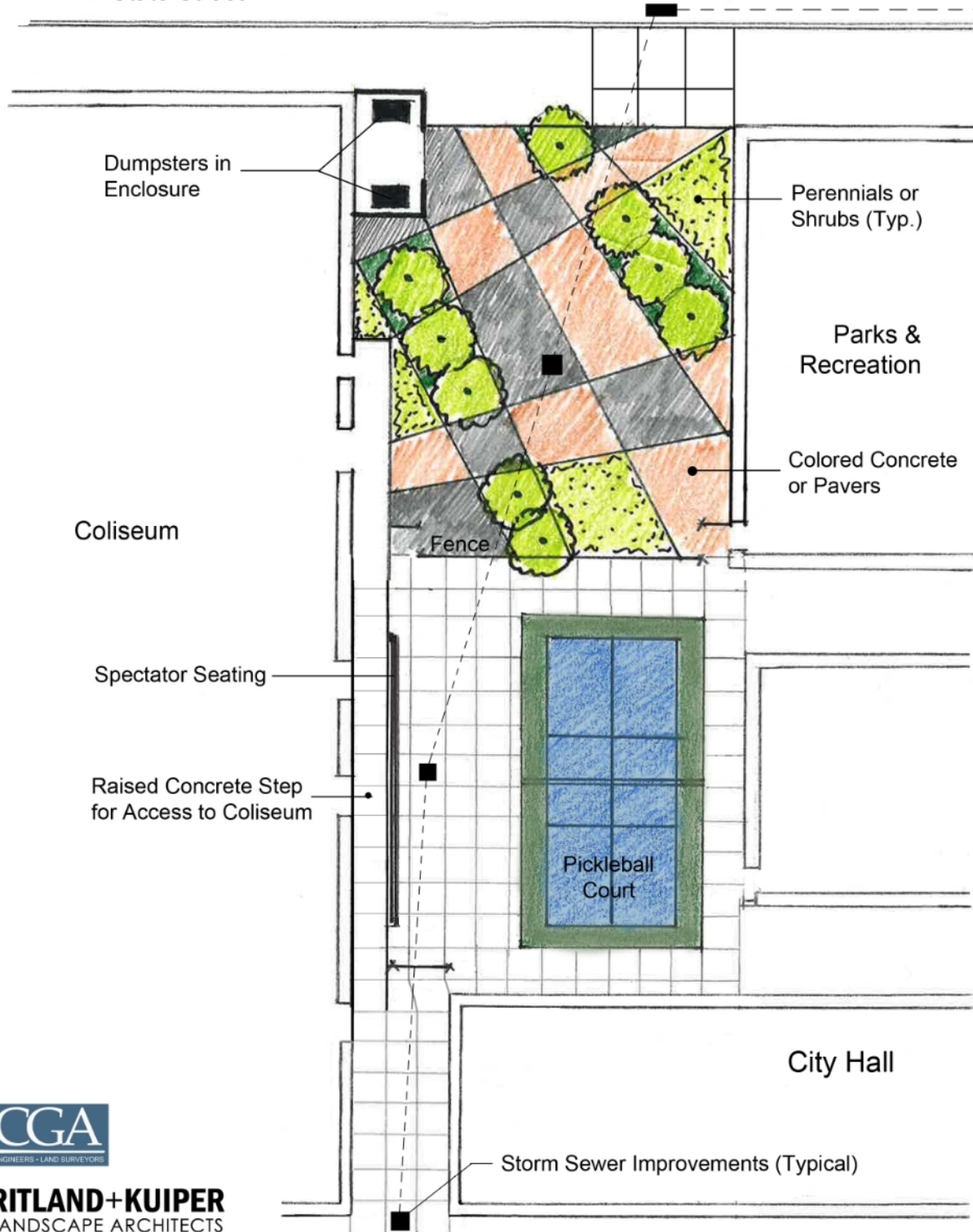




City Hall Courtyard Park

Marshalltown, Iowa

W. State Street



RITLAND+KUIPER
LANDSCAPE ARCHITECTS

Susan Cahill, Michael Gowdy, Al Hoop,
Gabriel Isom, Leon Lamer, Bill Martin, Bethany Wirin



RESOLUTION APPROVING PERSONALLY IDENTIFIABLE INFORMATION AND
PROTECTED PERSONALLY IDENTIFIABLE INFORMATION POLICY FOR THE CITY
OF MARSHALLTOWN

WHEREAS the City of Marshalltown, Iowa wishes to create a Personally Identifiable Information (PII) and Protected Personally Identifiable Information (PPII) policy in order to protect employees, customers, vendors, contractors, volunteers, etc.; and

WHEREAS, the City wishes to comply with the Uniform Grant Guidance in Title 2 Code of Federal Regulations (CFR) Grants and Agreements and Part 200 Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards,

WHEREAS, City elected officials, City employees, and sub-recipients that have access to PII or PPII will acknowledge that they have received the policy and will be required to report violations to the City Administrator and City Finance Director; and

WHEREAS, the City Administrator or Finance Director is responsible for reporting violations to the federal agency affected if there is a violation; and

WHEREAS the council finds that adopting this policy is in the best interest of the City of Marshalltown, Iowa.

THEREFORE, IT IS HEREBY RESOLVED BY THE CITY COUNCIL OF THE CITY OF MARSHALLTOWN, IOWA: to adopt the Personally Identifiable Information and Protected Personally Identifiable Information policy.

Passed this 26th day of May, 2020, and signed this ____ day of May, 2020.

CITY OF MARSHALLTOWN, IOWA

Joel Greer, Mayor
ATTEST:

Shari L. Coughenour, CMC, City Clerk



Joel Greer, Mayor
Jessica Kinser, Administrator
Diana Steiner, Finance Director
24 North Center Street
Marshalltown, IA 50158-4911
Tel - (641) 754-5760
Fax - (641) 754-5781

FINANCE DEPARTMENT

May 19, 2020

To: Mayor Joel Greer
Members of the City Council

From: Diana Steiner, Finance Director

Re: **Personally Identifiable Information (PII) and Protected Personally Identifiable Information (PPII) Policy**

Policy Issue: Council must approve City policies

Recommendation: Staff recommends approving the Personally Identifiable Information and Protected Personally Identifiable Information policy.

Background: Upon review of our new FEMA grant request for COVID-19, we were asked for our City policy regarding Protected Personally Identifiable Information. There was not an existing one, so staff utilized a template provided by FEMA. This policy indicates what is considered personally identifiable information vs. protected personally identifiable information. Staff that have access to protected personally identifiable information for grant recipients, customers, employees, vendors, etc. will be required to acknowledge that they have read the policy and report any breach of information.

Budget Impact: N/A

Attachment: Personally Identifiable Information and Protected Identifiable Information Policy

cc: Jessica Kinser, City Administrator

City Council
Susan Cahill, Leon Lamer, Mike Gowdy,
Al Hoop, Gabriel Isom, Bill Martin, Bethany Wirin



CITY OF MARSHALLTOWN, IOWA

POLICY AND PROCEDURES FOR PERSONALLY IDENTIFIABLE INFORMATION AND PROTECTED PERSONALLY IDENTIFIABLE INFORMATION

Original Publication: May 26, 2020

Council Resolution: 2020-_____

In compliance with Uniform Grant Guidance in Title 2 Code of Federal Regulation (C.F.R.) Grants and Agreements, Part 200 Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards, it is the policy of the City of Marshalltown, Iowa to protect Personally Identifiable Information (PII) of employees, customers, vendors, contractors, volunteers, etc. The electronic restrictions and safeguards outlined in 2 C.F.R. 200.79 Personally Identifiable Information, and 200.82 Protected Personally Identifiable Information (PPII), along with 2 C.F.R 200.303 Internal Controls, this policy provides guidance for employees, volunteers, agents, etc. with access to PII and PPII.

Personally Identifiable Information (2 C.F.R. 200.79) is any information pertaining to an individual that can be used to distinguish or trace a person's identity. Some information that is considered PII is available in public sources such as telephone books, public websites, etc. This type of information is considered to be Public PII and includes:

1. First and Last name
2. Address
3. Work telephone number
4. Work e-mail address
5. Home telephone number
6. General educational credentials
7. Photos and video

The definition of PII is not anchored to any single category of information or technology. Rather, it requires a case-by-case assessment of the specific risk that an individual can be identified. Non-PII can become PII whenever additional information is made publicly available, in any medium and from any source, that, when combined with other available information, could be used to identify an individual.

Protected PII (2 C.F.R. 200.82) means an individual's first name or first initial and last name in combination with any one or more of types of information, including, but not limited to:

1. Social security number
2. Username and password
3. Passport number
4. Credit card number
5. Clearances
6. Banking information
7. Biometrics
8. Data and place of birth
9. Mother's maiden name
10. Criminal, medical and financial records
11. Educational transcripts
12. Photos and video including any of the above

This does not include PII that is required by law, statute, or regulation to be disclosed, such as a law enforcement or court order right to know.

Internal controls (2 C.F.R. 200.303)

The non-Federal entity must:

(e) Take reasonable measures to safeguard protected personally identifiable information and other information the Federal awarding agency or pass-through entity designates as sensitive or the non-Federal entity considers sensitive consistent with applicable Federal, state, local, and tribal laws regarding privacy and obligations of confidentiality.

[78 FR 78608, Dec. 26, 2013, as amended at 79 FR 75883, Dec. 19, 2014]

Procedures

Guidelines on how to maintain and discard PII. All electronic files that contain Protected PII will reside within a protected information system location. All physical files that contain Protected PII will reside within a locked/secured/monitored location when not being actively viewed or modified. Protected PII is not to be downloaded to personally owned employee workstations or mobile devices (such as laptops, personal digital assistants, mobile phones, tablets or removable media). PII will also not be sent through any form of insecure electronic communication e.g. e-mail or instant messaging systems. Significant security risks emerge when PII is transferred from a secure location to a less secure location or is disposed of improperly. When disposing of PII the physical or electronic file should be shredded or securely deleted.

Incident Reporting

The City Administrator and City Finance Director must be informed of a real or suspected disclosure or breach of Protected PII data within 24 hours after discovery. Examples: misplacing a paper report containing PII, loss of a laptop, mobile device, or removable media containing PII, accidental email of PII, possible virus, or malware infection or a computer containing PII.

Audits

Periodic audits of organization owned equipment and physical locations may be performed to ensure that protected PII is stored in approved information systems or locations. The purpose of the audit is to ensure compliance with this policy and to provide information necessary to continuously improve practices.

Enforcement

Anyone found to be in violation of this policy may be subject to disciplinary action as deemed appropriate based on the facts and circumstances giving rise to the violation.

Records Disposal

Records containing personal data are to be disposed of so as to prevent inadvertent compromise of data and will use a disposal method that will render all personal data unrecognizable and beyond reconstruction.

Acknowledgement:

I acknowledge that I have received a copy of the Personally Identifiable Information and Protected Personally Identifiable Information. I understand that I am responsible for reading and abiding by this policy. I also understand that the purpose of this policy is to inform me of the City's policy and procedure, and it is not a contract of employment. I understand that the City of Marshalltown has the right to change any provision of this policy at any time through a Council resolution and that I will be bound by such changes.

Signature

Full Name (please print)

Date

RESOLUTION APPROVING THE TITLE VI PROGRAM
FOR MARSHALLTOWN MUNICIPAL TRANSIT

WHEREAS, there is herewith submitted to the City Council of Marshalltown, Iowa, a proposed Title VI program for Marshalltown Municipal Transit to implement beginning June 1, 2020.

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

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

Section 1. That the proposed Title VI program for Marshalltown Municipal Transit is hereby fully approved in all respects and particulars and the Mayor and City Clerk are hereby authorized and directed to execute same for and on behalf of said City.

Passed this ____ day of May, 2020 and signed this ____ day of May, 2020

CITY OF MARSHALLTOWN.

Joel Greer, Mayor

ATTEST:

Shari L. Coughenour, CMC, City Clerk



Joel Greer, Mayor
Jessica Kinser, Administrator
Justin Nickel, Public Works Director
24 North Center Street
Marshalltown, IA. 50158-4911
Tel - (641) 754-5760
Fax - (641) 754-5781

TRANSIT DIVISION

May 26, 2020

To: Mayor Joel Greer
Members of the City Council

From: Kevin Pigors
Transit Director

Re: Title VI Policy Update

Policy Issue: FTA requires the Transit Division to review and approve the Title VI policy every three years.

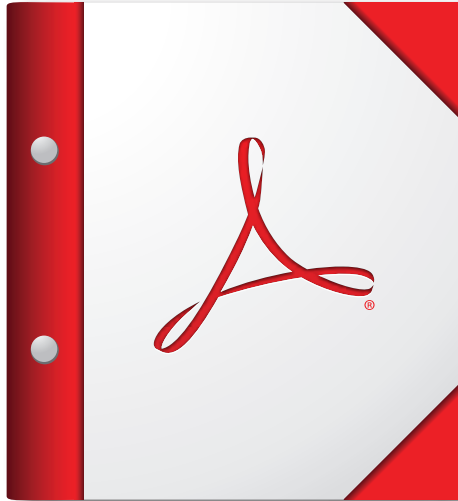
Recommendation: Staff recommends approving the attached Title VI updated policy.

Attachment: Policy

cc: Jessica Kinser, City Administrator

City Council
Susan Cahill, Leon Lamer, Mike Gowdy,
Al Hoop, Gabriel Isom, Bill Martin, Bethany Wirin





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Acrobat X or Adobe Reader X, or later.**

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MARSHALLTOWN

I O W A

May 21, 2020

To: Mayor, Members of the City Council and City Administrator

From: Michelle Spohnheimer, Housing & Community Development Director

Re: Contract for professional environmental review services with Impact7G, Inc. related to the Edgewood Street extension project

Policy Issue: The City has received a Letter of Further Consideration related to the grant request from the U.S. Department of Commerce Economic Development Administration related to the Edgewood Street extension project. As a part of the required information the City must complete the environmental review process which includes a Phase I Cultural Resource Investigation and archeological study of the project area. The cost of completion is not to exceed \$55,000.

Recommendation: Staff is recommending approval of the contract with Impact7G, Inc. to perform the necessary requirements in order to continue the pursuit of the \$2.9 million dollar grant request.

Background: The City had the initial Phase 1A completed and it identified the next step to include the Phase I Cultural Resource Investigation. This project also received a DOT RISE grant.

Budget Impact: Contract amount not to exceed \$55,000. This portion of the project is paid with LOST-capital funds.

Attachment: Resolution and proposed contract.

RESOLUTION APPROVING CONTRACT FOR ENVIRONMENTAL INVESTIGATION
SERVICES WITH IMPACT7G, INC. RELATED TO THE EDGEWOOD STREET
EXTENSION PROJECT

WHEREAS the City of Marshalltown, Iowa, is being considered for funding from the United States Department of Commerce Economic Development Administration for the Edgewood Street extension project, and;

WHEREAS the funding requires a full environmental review including a Phase I Cultural Resource Investigation in order to be considered, and;

WHEREAS a contract has been prepared with Impact7G, Inc. to complete said work for an amount not to exceed \$55,000.00 and that the said contract is now before this Council for final approval.

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

That the contract between Impact7G, Inc., duly executed by said company, be hereby accepted and approved with an amount not to exceed \$55,000.00.

BE IT FURTHER RESOLVED that the Mayor, City Clerk and City Administrator be authorized and directed to execute the contract for and on behalf of the City of Marshalltown, Iowa.

Passed this _____ day of May 2020, and signed this _____ day of May 2020.

CITY OF MARSHALLTOWN, IOWA

Joel T.S. Greer, Mayor

ATTEST:

Shari L. Coughenour, CMC, City Clerk



Professional Services Agreement

Project:	City of Marshalltown, EDA Grant Application, Phase I for Edgewood Street Development Area		
Property:	Edgewood Street Development Area, Marshalltown, IA	Date:	5/21/2020

Client:	City of Marshalltown		
Contact:	Michelle Spohnheimer		
Address:	36 N. Center Street		
City/State/Zip:	Marshalltown, Iowa 50158		
Phone:	641-754-5756		
Email:	mspohnheimer@marshalltown-ia.gov		

AGREEMENT made this twenty-first day of May 2020, by and between the service provider, Impact7G, Inc. ("Impact7G") and City of Marshalltown ("Client").

WHEREAS, the Client intends to engage the services of Impact7G to: Assist with environmental planning tasks, specifically a Phase 1 cultural resource survey associated with proposed Edgewood Street roadway corridor and development area in Marshalltown, Iowa.

WHEREAS, Impact7G agrees to provide said services pursuant to the terms of this Agreement.

NOW THEREFORE, the parties agree as follows:

1. **Project**

Impact7G agrees to assist with environmental planning tasks related to cultural resource investigations in the proposed project development corridor.

2. **Scope of Services**

Phase I Cultural Resource Investigation

The review area encompasses approximately 30.6 ha (75.5 ac) in Sections 25 and 26, T84N, R18W, Taylor Township, Marshall County, Iowa (see Aerial Figure attached). The Phase 1A archaeological desktop review completed by Impact7G recommended an intensive Phase I archaeological investigation of the entire area. The review area occurs primarily on alluvial landforms within the Southern Iowa Drift Plain physiographic region. From an archaeological investigation perspective what this means is that investigators will need to investigate deeper sediments to rule out sites as there does exist a high potential for archaeological sites throughout the area. In order to meet expected Economic Development Agency (EDA) cultural resource expectations and potentially SHPO expectations (presuming federal EDA grant funds are awarded

to the City), the number of Phase I investigation areas sampled throughout this project area will be based on geomorphologic conditions. Intensive archaeological investigations should generally be catered to geomorphological conditions to determine where archaeological potential exists within the review area and to determine potential for deeply buried archaeological sites.

This Scope of Services does not include Memorandum of Agreement preparation associated with the outcome of Iowa EDA consultation with the SHPO. This proposal does not include any advance testing (Phase II) that might be necessary if potentially significant archaeological sites are encountered. Impact7G will promptly notify the Client of any potentially significant resources if they are encountered.

3. **Impact7G Responsibilities** Impact7G hereby agrees to:

- (i) Provide the professional services as set forth in this Agreement; and
- (ii) Perform said services in a manner consistent with that degree of care and skill ordinarily exercised by members of the same profession currently practicing at the same time and in the same or similar locality.

4. **Client Responsibilities** Client hereby agrees to:

- (i) Provide a knowledgeable representative of the Property, who will be available to coordinate all on-site work;
- (ii) Provide unrestricted access to the Property for Impact7G to perform the services; and
- (iii) Provide copies of any previously-completed reports that may be pertinent to this Project.

5. **Schedule**

The Project will commence immediately upon receipt of the executed Professional Services Agreement (PSA) from the Client. Impact7G anticipates being able to initiate the Phase I Cultural Resource Investigation field work within approximately 3 weeks of receiving the PSA. The Phase I Cultural Resource Investigation will be complete within approximately 10 business days following completion of the field work.

6. **Project Cost, Payment and Termination**

The Client shall pay Impact7G on a cost-plus basis based on Impact7G 2020 Rate Schedule (attached) in the amount not to exceed fifty-five thousand dollars (\$55,000.00) for the performance of this Agreement. Note that if discovered geomorphological conditions indicate large areas not suitable for past human habitation costs would be significantly less than the not to exceed amount. Direct costs such as communications, postage, routine printing, and copying are not invoiced separately, but are included with the individual rates to streamline the accounting process and reduce overhead costs.

Invoices for Impact7G's services will be submitted upon project completion. Invoices shall be due and payable upon receipt. If any invoice is not paid within 30 days, Impact7G may, without waiving any claim or right against the Client, and without liability whatsoever to the Client, suspend or terminate the performance of services.

7. **Work Product** All reports, plans, specifications, field data, field notes, laboratory test data, calculations, estimates and other documents including all documents on electronic media prepared by Impact7G as instruments of service shall remain the property of Impact7G.

All project documents including, but not limited to, plans and specifications furnished by Impact7G under this project are intended for use on this project only. Any reuse, without specific written verification or adoption by Impact7G, shall be at the Client's sole risk, and Client shall defend, indemnify and hold harmless Impact7G from all claims, damages and expenses including attorney's fees arising out of or resulting therefrom.

Under no circumstances shall delivery of electronic files for use by the Client be deemed a sale by Impact7G, and Impact7G makes no warranties, either express or implied, of merchantability and fitness for any particular purpose. In no event shall Impact7G be liable for indirect or consequential damages as a result of the Client's use or reuse of the electronic files.

Because electronic file information can be easily altered, corrupted, or modified by other parties, either intentionally or inadvertently, without notice or indication, Impact7G reserves the right to remove itself from its ownership and/or involvement in the material from each electronic medium not held in its possession. Client shall retain copies of the work performed by Impact7G in electronic form only for information and use by Client for the specific purpose for which Impact7G was engaged. Said material shall not be used by Client or transferred to any other party, for use in other projects, additions to this project, or any other purpose for which the material was not strictly intended by Impact7G without Impact7G's expressed written permission. Any unauthorized use or reuse or modifications of this material shall be at Client's sole risk. Furthermore, the Client agrees to defend, indemnify, and hold Impact7G harmless from all claims, injuries, damages, losses, expenses, and attorney's fees arising out of the modification or reuse of these materials.

8. **Project Site** The Client agrees that it shall be solely responsible for job site safety and warrants that this intent shall be made evident in the Client's agreements with any third parties. The Client also agrees that Impact7G and Impact7G's consultants shall be indemnified and shall be made additional insureds on the Client's general liability policies on a primary and non-contributory basis.

9. **Claims and Disputes** Nothing contained in this Agreement shall create a contractual relationship with or a cause of action in favor of a third party against either the Client or Impact7G. Impact7G's services under this Agreement are being performed solely for the Client's benefit, and no other party or entity shall have any claim against Impact7G because of this Agreement or the performance or nonperformance of services hereunder. The Client and Impact7G agree to require a similar provision in all contracts with contractors, subcontractors, subconsultants, vendors and other entities involved in this Project to carry out the intent of this provision.

The Client shall make no claim for professional negligence, either directly or in a third party claim, against Impact7G unless the Client has first provided Impact7G with a written certification executed by an independent professional currently practicing in the same discipline as Impact7G and licensed in the State in which the claim arises.

10. **Limited Liability** The Client agrees, to the fullest extent permitted by law, to limit the liability of Impact7G and Impact7G's officers, directors, partners, employees, shareholders, owners and subconsultants to the Client for any and all claims, losses, costs, damages of any nature whatsoever or claims expenses from any cause or causes, including attorneys' fees and costs and expert witness fees and costs, so that the total aggregate liability of Impact7G and its officers, directors, partners, employees, shareholders, owners and subconsultants to all those named shall not exceed \$50,000. It is intended that this limitation apply to any and all liability or cause of action however alleged or arising, unless otherwise prohibited by law.

11. **Mediation** In an effort to resolve any conflicts that arise during the project or following the completion of the project, the Client and Impact7G agree that all disputes between them arising out of or relating to this Agreement shall be submitted to non-binding mediation unless the parties

mutually agree otherwise. The Client and Impact7G further agree to include a similar mediation provision in all agreements with independent contractors and consultants retained for the Project and to require all independent contractors and consultants also to include a similar mediation provision in all agreements with subcontractors, sub-consultants, suppliers or fabricators so retained, thereby providing for mediation as the primary method for dispute resolution between the parties to those agreements.

12. **Attorney's Fees** If litigation arises for purposes of collecting fees or expenses due under this Agreement, the Court in such litigation shall award reasonable costs and expenses, including attorney fees, to the prevailing party. In awarding attorney fees, the Court shall not be bound by any Court fee schedule, but shall, in the interest of justice, award the full amount of costs, expenses, and attorney fees paid or incurred in good faith.

13. **Controlling Law** This Agreement shall be construed and enforced in accordance with the laws of the state of Iowa.

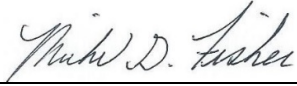
14. **Assignment** Neither the Agreement nor any of the rights or obligations arising under the Agreement may be assigned without prior written consent.

This agreement is approved and accepted by the Client and Impact7G upon both parties signing and dating the agreement. The effective date of the agreement shall be the last date entered below.

City of Marshalltown

Impact7G, Inc.

Accepted by: _____

Project Manager: 

Printed/
Typed Name: Jessica Kinser

Printed/
Typed Name: Michael Fisher

Title: City Administrator

Date: 5/21/2020

Date: _____

Proposed Edgewood Extension Project Area, Marshalltown, IA

Legend

 Edgewood Extension Area



Impact7G 2020 Rate Schedule

Professional Title	Rate
Principal	\$150
Certified Industrial Hygienist	\$150
Senior Project Manager	\$135
Project Manager	\$120
Drilling Services Manager	\$110
Sr. Environmental Specialist	\$100
Environmental Specialist II	\$90
Environmental Specialist I	\$80
Drilling Technician	\$70
Field Technician	\$60
Intern	\$50
Training Coordinator	\$85
Office Manager	\$90
Administrative Professional I	\$55
Administrative Professional II	\$65
Reimbursable Expenses	
1. All materials and supplies used in the performance of work will be billed at cost plus 10%.	
2. Auto mileage will be reimbursed per the standard IRS mileage reimbursement rate.	
3. Charges for sub-consultants will be billed at their invoice cost plus 15%.	
4. All other direct expenses will be invoiced at cost plus 15%.	

MARSHALLTOWN

— I O W A —

City Administrator's Office

Joel Greer, Mayor
Jessica Kinser, Administrator
Shari L. Coughenour, Clerk
24 North Center Street
Marshalltown, IA 50158-4911
Tel - (641) 754-5799
Fax - (641) 754-5717

To: Mayor Greer and the City Council
From: Geoff Hubbard, Parks & Recreation Director
Date: May 21, 2020
RE: Accept and Award Bid for the Anson Park Shelter Project

Policy Issue: City policy requires Governing Body approval of projects and expenditures over \$25,000

Recommendation: Staff recommends rejecting all of the bids for the Anson Park Shelter Project as they are all significantly higher than the engineer's estimates.

Background: In to 2019, Council approved GO Bond funding for several Parks & Recreation projects including the renovation of the Anson Shelter, PRK20001. The shelter is being renovated so it can be used year round for rentals and the project includes a new roof, exterior façade, restrooms, and heating and cooling system.

Bids were opened on Wednesday, May 20 at 10:00am for the Anson Park Shelter, PRK20001. The Engineer's Estimate for the base bid of the project was \$319,230.70. Four bids were received, all bidders were responsive, and bids for the base bid are summarized as follows:

Bidder	City	Amount
Hay Construction	Marshalltown, IA	\$452,000
Woodruff Construction	Ames, IA	\$370,104
Garling Construction	Belle Plaine, IA	\$425,000
Happe Construction	Ankeny, IA	\$475,000

Budget Impact: This project was to be funded with 2019 GO Bonds.

Attachment: None

cc: Jessica Kinser, City Administrator

City Council
Susan Cahill, Michael Gowdy, Al Hoop,
Gabriel Isom, Leon Lamer, Bill Martin, Bethany Wirin



RESOLUTION REJECTING ALL BIDS FOR THE ANSON PARK SHELTER PROJECT IN THE CITY OF
MARSHALLTOWN, IOWA BEING PROJECT PRK20001

WHEREAS notice to bidders was duly given as required by law with publication in the Marshalltown Times Republican for the Anson Park Shelter Project, Project PRK20001, in the City of Marshalltown, as described in the plans and specifications; and

WHEREAS on May 20, 2020 there was filed with the City Clerk in response to the published notice to the bidders referred to above, proposals for the construction of the above designated improvements.

WHEREAS after consideration of all bids filed, it was determined that all bids should be rejected..

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

Section 1. That all bids received and opened on May 20, 2020, for the Anson Park Shelter Project, Project PRK20001 shall be rejected, as all four bids were substantially greater than the engineers estimate.

Passed this 11th day of May 2020, and signed this _____day of May 2020.

CITY OF MARSHALLTOWN, IOWA

Joel Greer, Mayor

ATTEST:

Shari L. Coughenour, CMC, City Clerk



PROJECT: **City of Marshalltown**
Anson Park Sheler Renovation
PRK#20001

ARCHITECT'S PROJECT NO: 01190805

Prime Contractors	Time Received	Addenda	10% Bid Bond	Completion Dates	BASE BID	ORDER OF BIDDERS (Low - High)	ALTERNATES		BASE BID + Selected Alternates	ORDER OF BIDDERS (Low - High)
		#1 - 05/07/20 #2 -05/12/20					Alt -#01 (Add) Fiberglass Windows	ALT-#02 (Add) Sidewalk Replacement		
Hay Construction		x x	x	x	\$452,000.00	3	\$5,325.00	\$4,650.00	\$461,975.00	3
Woodruff Construction		x x	x	x	\$370,104.00	1	\$6,783.00	\$4,944.00	\$381,831.00	1
garling Construction		x x	x	x	\$425,000.00	2	\$8,500.00	\$6,500.00	\$440,000.00	2
happe Commercial		x x	x	x	\$475,800.00	4	\$5,340.00	\$5,080.00	\$486,220.00	4

Bid Tabulation
Hangar Improvements and Terminal Building and Site Improvements
Marshalltown Municipal Airport - Marshalltown, IA ~ Bid Date: 5/14/2020 10:00 am

Bidder Address Check or Bid Bond				Engineer's Opinion of Probable Construction Cost		Garling Construction, Inc. Belle Plaine, IA 5% Bid Bond		Jensen Builders LTD Des Moines, IA 5% Bid Bond		Hansen Company, Inc. Johnston, IA 5% Bid Bond	
Item #	Bid Package No. 1 - Hangar Improvements - Base Bid	Quantity	Unit	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
BP1-1	Mobilization	1	LS	\$91,310.00	\$91,310.00	\$6,000.00	\$6,000.00	\$103,017.00	\$103,017.00	\$9,240.00	\$9,240.00
BP1-2	Traffic Control	1	LS	\$10,000.00	\$10,000.00	\$11,900.00	\$11,900.00	\$13,165.00	\$13,165.00	\$13,800.00	\$13,800.00
BP1-3	Engineers Field Office	12	Months	\$2,000.00	\$24,000.00	\$350.00	\$4,200.00	\$844.63	\$10,135.56	\$900.00	\$10,800.00
BP1-4	Subgrade Prep, 12" - Hangar	1,350	SY	\$7.00	\$9,450.00	\$4.50	\$6,075.00	\$6.76	\$9,126.00	\$7.20	\$9,720.00
BP1-5	Modified Subbase, 8" - Hangar	1,350	SY	\$15.00	\$20,250.00	\$20.00	\$27,000.00	\$13.51	\$18,238.50	\$14.40	\$19,440.00
BP1-6	PCC Paving, 9" Hangar Floor	1,350	SY	\$80.00	\$108,000.00	\$88.00	\$118,800.00	\$126.76	\$171,126.00	\$105.60	\$142,560.00
BP1-7	100' x 120' Hangar Building - Complete	1	LS	\$820,000.00	\$820,000.00	\$985,000.00	\$985,000.00	\$934,100.00	\$934,100.00	\$1,151,500.00	\$1,151,500.00
BP1-8	Concrete Stoop	1	EA	\$2,000.00	\$2,000.00	\$1,500.00	\$1,500.00	\$993.26	\$993.26	\$1,800.00	\$1,800.00
BP1-9	400A Fused Disconnect	1	LS	\$3,000.00	\$3,000.00	\$950.00	\$950.00	\$1,069.86	\$1,069.86	\$1,140.00	\$1,140.00
Total BP#1 Base Bid				\$1,088,010.00		\$1,161,425.00		\$1,260,971.18		\$1,360,000.00	
Item #	Bid Package No. 1 - Hangar Improvements - Alternate Bid 1 (Additional Flood Lighting for Apron)	Quantity	Unit	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
BP1-A1-10	Provide Additional Flood Lighting for Hangar Approach	1	LS	\$8,000.00	\$8,000.00	\$5,000.00	\$5,000.00	\$3,135.00	\$3,135.00	\$3,342.00	\$3,342.00
Total BP#1 Alternate 1 Bid				\$8,000.00		\$5,000.00		\$3,135.00		\$3,342.00	
Item #	Bid Package No. 1 - Hangar Improvements - Alternate Bid 2 (Paint Exposed Structural Steel in Hangar)	Quantity	Unit	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
BP1-A2-11	Paint Exposed Structural Steel	1	LS	\$20,000.00	\$20,000.00	\$18,000.00	\$18,000.00	\$19,340.00	\$19,340.00	\$21,000.00	\$21,000.00
Total BP#1 Alternate 2 Bid				\$20,000.00		\$18,000.00		\$19,340.00		\$21,000.00	
Item #	Bid Package No. 1 - Hangar Improvements - Alternate Bid 3 (Full Height Liner Panel on Sidewalls)	Quantity	Unit	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
BP1-A3-12	Full Height Liner Panel	1	LS	\$28,000.00	\$28,000.00	\$22,000.00	\$22,000.00	\$32,975.00	\$32,975.00	\$36,000.00	\$36,000.00
Total BP#1 Alternate 3 Bid				\$28,000.00		\$22,000.00		\$32,975.00		\$36,000.00	
Item #	Bid Package No. 1 - Hangar Improvements - Alternate Bid 4 (Subgrade Treatment)	Quantity	Unit	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
BP1-4	Deduct - Subgrade Prep, 12" - Hangar	-1,350	SY	\$7.00	(\$9,450.00)	\$4.50	(\$6,075.00)	\$6.76	(\$9,126.00)	\$6.00	(\$8,100.00)
BP1-A4-13	Cement Treated Subgrade Prep, 12" Hangar	1,350	SY	\$12.00	\$16,200.00	\$8.75	\$11,812.50	\$10.14	\$13,689.00	\$10.80	\$14,580.00
BP1-A4-14	Cement	50	Ton	\$180.00	\$9,000.00	\$185.00	\$9,250.00	\$253.39	\$12,669.50	\$270.00	\$13,500.00
Total BP#1 Alternate 4 Bid				\$15,750.00		\$14,987.50		\$17,232.50		\$19,980.00	
Item #	Bid Package No. 1 - Hangar Improvements - Alternate Bid 5 (Upgrade to 400A Transfer Switch with Generator Connections)	Quantity	Unit	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
BP1-9	Deduct - 400A Fused Disconnect	-1	LS	\$3,000.00	(\$3,000.00)	\$500.00	(\$500.00)	\$929.09 *	(\$929.09)	\$825.00	-\$825.00
BP1-A5-15	400A Transfer Switch with Generator Connections	1	LS	\$13,000.00	\$13,000.00	\$9,000.00	\$9,000.00	\$9,420.00	\$9,420.00	\$10,038.00	\$10,038.00
Total BP#1 Alternate 5 Bid				\$10,000.00		\$8,500.00		\$8,490.91		\$9,213.00	
Item #	Bid Package No. 1 - Hangar Improvements - Alternate Bid 6 (Provide 240V,125A,Receptacle at Ext. Junction Box to Power Aircraft Power Cart)	Quantity	Unit	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
BP1-A2-11	240V (125A) Power Cart Receptacle, Wiring and Conduit	1	LS	\$3,500.00	\$3,500.00	\$2,500.00	\$2,500.00	\$2,250.00	\$2,250.00	\$2,394.00	\$2,394.00
Total BP#1 Alternate 6 Bid				\$3,500.00		\$2,500.00		\$2,250.00		\$2,394.00	

Item #	Bid Package No. 2 - Terminal Building and Site Improvements - Base Bid	Quantity	Unit	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
BP2-1.01	Traffic Control, Mobilization and Safety Plan	1	LS	\$154,765.00	\$154,765.00	\$25,000.00	\$25,000.00	\$109,770.00	\$109,770.00	\$51,600.00	\$51,600.00
BP2-2.01	Unclassified Excavation, Class 13	1,050	CY	\$7.00	\$7,350.00	\$20.00	\$21,000.00	\$34.32	\$36,036.00	\$36.00	\$37,800.00
BP2-2.02	Topsoil, Offsite, Borrow	160	CY	\$20.00	\$3,200.00	\$70.00	\$11,200.00	\$57.21	\$9,153.60	\$60.00	\$9,600.00
BP2-2.03	Subgrade Prep, 12" – Parking	900	SY	\$7.00	\$6,300.00	\$6.50	\$5,850.00	\$6.87	\$6,183.00	\$7.20	\$6,480.00
BP2-2.04	Subgrade Prep, 12" – Sidewalk	250	SY	\$7.00	\$1,750.00	\$20.00	\$5,000.00	\$6.87	\$1,717.50	\$7.20	\$1,800.00
BP2-2.05	Subgrade Prep, 12" – Terminal	350	SY	\$7.00	\$2,450.00	\$16.50	\$5,775.00	\$6.87	\$2,404.50	\$7.20	\$2,520.00
BP2-2.06	Subgrade Prep, 12" – Approach	700	SY	\$7.00	\$4,900.00	\$11.00	\$7,700.00	\$6.01	\$4,207.00	\$7.20	\$5,040.00
BP2-2.07	Subbase, Modified 6" – Parking	900	SY	\$9.00	\$8,100.00	\$15.00	\$13,500.00	\$13.73	\$12,357.00	\$14.40	\$12,960.00
BP2-2.08	Subbase, Modified 6" – Sidewalk	250	SY	\$9.00	\$2,250.00	\$14.00	\$3,500.00	\$13.73	\$3,432.50	\$14.40	\$3,600.00
BP2-2.09	Subbase, Modified 6" – Terminal	350	SY	\$9.00	\$3,150.00	\$17.00	\$5,950.00	\$13.73	\$4,805.50	\$14.40	\$5,040.00
BP2-2.10	Subbase, Modified 8" – Approach	700	SY	\$15.00	\$10,500.00	\$14.00	\$9,800.00	\$16.02	\$11,214.00	\$16.80	\$11,760.00
BP2-2.11	Removal and Replacement of Unsuitable Material	500	CY	\$15.00	\$7,500.00	\$80.00	\$40,000.00	\$34.32	\$17,160.00	\$36.00	\$18,000.00
BP2-4.01	Sanitary Sewer Gravity Main, Trenched, 8" PVC, SDR-26	100	LF	\$60.00	\$6,000.00	\$65.00	\$6,500.00	\$114.41	\$11,441.00	\$120.00	\$12,000.00
BP2-4.02	6" PVC Sanitary Sewer Service, Trenched, Temporary	80	LF	\$60.00	\$4,800.00	\$75.00	\$6,000.00	\$120.14	\$9,611.20	\$96.00	\$7,680.00
BP2-4.03	Sanitary Sewer Abandonment, Fill and Plug	190	LF	\$25.00	\$4,750.00	\$25.00	\$4,750.00	\$45.77	\$8,696.30	\$48.00	\$9,120.00
BP2-4.04	Removal of Sanitary Sewer, 8" CIP	200	LF	\$10.00	\$2,000.00	\$25.00	\$5,000.00	\$34.32	\$6,864.00	\$36.00	\$7,200.00
BP2-4.05	Storm Sewer Trenched, 4" HDPE, Temporary	20	LF	\$15.00	\$300.00	\$47.50	\$950.00	\$114.41	\$2,288.20	\$120.00	\$2,400.00
BP2-4.06	Storm Sewer Trenched, 8" PVC	40	LF	\$30.00	\$1,200.00	\$92.00	\$3,680.00	\$85.81	\$3,432.40	\$90.00	\$3,600.00
BP2-4.07	Storm Sewer Trenched, 10" PVC	240	LF	\$40.00	\$9,600.00	\$47.00	\$11,280.00	\$57.21	\$13,730.40	\$60.00	\$14,400.00
BP2-4.08	Storm Sewer Trenched, 12" RCP	136	LF	\$70.00	\$9,520.00	\$95.00	\$12,920.00	\$80.09	\$10,892.24	\$84.00	\$11,424.00
BP2-4.09	Down Spout Connections	4	EA	\$400.00	\$1,600.00	\$500.00	\$2,000.00	\$572.07	\$2,288.28	\$600.00	\$2,400.00
BP2-4.10	Removal of Storm Sewer, 12" RCP	360	LF	\$10.00	\$3,600.00	\$35.00	\$12,600.00	\$45.77	\$16,477.20	\$48.00	\$17,280.00
BP2-4.11	Pipe Apron, 10" HDPE	1	EA	\$1,500.00	\$1,500.00	\$325.00	\$325.00	\$858.10	\$858.10	\$900.00	\$900.00
BP-4.12	Sanitary Sewer Service, Trenched, 4" PVC	40	LF	\$50.00	\$2,000.00	\$60.00	\$2,400.00	\$102.97	\$4,118.80	\$108.00	\$4,320.00
BP2-5.01	Water Main, Trenched, PVC, 6"	130	LF	\$50.00	\$6,500.00	\$75.00	\$9,750.00	\$74.37	\$9,668.10	\$78.00	\$10,140.00
BP2-5.02	Water Service, 1-1/2" Copper	20	LF	\$80.00	\$1,600.00	\$135.00	\$2,700.00	\$114.41	\$2,288.20	\$120.00	\$2,400.00
BP2-5.03	Water Service, 1-1/2" Copper - Temporary	80	LF	\$80.00	\$6,400.00	\$105.00	\$8,400.00	\$57.21	\$4,576.80	\$60.00	\$4,800.00
BP2-5.04	Removal of Pipe, Existing Water Main	450	LF	\$10.00	\$4,500.00	\$35.00	\$15,750.00	\$34.32	\$15,444.00	\$36.00	\$16,200.00
BP2-6.01	Manhole, SW-301, 48" Sanitary Sewer	2	EA	\$6,000.00	\$12,000.00	\$4,500.00	\$9,000.00	\$5,500.00	\$11,000.00	\$5,760.00	\$11,520.00
BP2-6.02	Intake, SW-502, Circular Single Grate	1	EA	\$5,500.00	\$5,500.00	\$4,000.00	\$4,000.00	\$4,235.00	\$4,235.00	\$4,440.00	\$4,440.00
BP2-6.03	Intake, SW-512, 18" Dia. Circular Area	1	EA	\$3,000.00	\$3,000.00	\$3,500.00	\$3,500.00	\$2,745.00	\$2,745.00	\$2,880.00	\$2,880.00
BP2-6.04	Intake, SW-512, 36" Dia. Circular Area	1	EA	\$4,000.00	\$4,000.00	\$5,000.00	\$5,000.00	\$6,300.00	\$6,300.00	\$6,600.00	\$6,600.00
BP2-6.05	Remove, Storm Sewer, Manhole or Intake	5	EA	\$2,500.00	\$12,500.00	\$650.00	\$3,250.00	\$1,145.00	\$5,725.00	\$1,200.00	\$6,000.00
BP2-6.06	Remove, Manhole, Sanitary Sewer	3	EA	\$2,500.00	\$7,500.00	\$2,000.00	\$6,000.00	\$1,145.00	\$3,435.00	\$1,200.00	\$3,600.00
BP2-7.01	PCC Paving, 7" Parking	750	SY	\$60.00	\$45,000.00	\$50.00	\$37,500.00	\$68.04	\$51,030.00	\$60.00	\$45,000.00
BP2-7.02	PCC Paving, 9" Approach	600	SY	\$70.00	\$42,000.00	\$60.00	\$36,000.00	\$66.94	\$40,164.00	\$72.00	\$43,200.00
BP2-7.03	Sidewalk, PCC, 4"	160	SY	\$60.00	\$9,600.00	\$56.00	\$8,960.00	\$52.31	\$8,369.60	\$67.20	\$10,752.00
BP2-7.04	Pavement Removal, HMA	1,550	SY	\$6.00	\$9,300.00	\$11.00	\$17,050.00	\$17.16	\$26,598.00	\$18.00	\$27,900.00
BP2-7.05	Pavement Removal, PCC	110	SY	\$6.00	\$660.00	\$28.00	\$3,080.00	\$22.88	\$2,516.80	\$24.00	\$2,640.00
BP2-7.06	Pavement Removal, Sidewalk	400	SY	\$6.00	\$2,400.00	\$16.00	\$6,400.00	\$22.88	\$9,152.00	\$18.00	\$7,200.00
BP2-8.01	Pavement Markings, Waterborne	1	LS	\$5,000.00	\$5,000.00	\$650.00	\$650.00	\$1,600.00	\$1,600.00	\$30,000.00	\$30,000.00
BP2-9.01	Hydraulic Seeding, Fertilizing And Mulching	1	LS	\$10,000.00	\$10,000.00	\$4,200.00	\$4,200.00	\$4,600.00	\$4,600.00	\$4,800.00	\$4,800.00
BP2-9.02	Silt Fence, Installation And Removal	500	LF	\$5.00	\$2,500.00	\$2.00	\$1,000.00	\$2.29	\$1,145.00	\$2.40	\$1,200.00
BP2-9.03	Silt Fence Cleanout	500	LF	\$3.00	\$1,500.00	\$1.00	\$500.00	\$1.14	\$570.00	\$1.20	\$600.00
BP2-9.04	Filter Sock, Installation, Cleanout And Removal	500	LF	\$5.00	\$2,500.00	\$2.00	\$1,000.00	\$2.29	\$1,145.00	\$2.40	\$1,200.00
BP2-9.05	Rolled Erosion Control Products	100	SQ	\$20.00	\$2,000.00	\$20.00	\$2,000.00	\$11.44	\$1,144.00	\$24.00	\$2,400.00
BP2-9.06	Inlet Protection Devices	5	EA	\$250.00	\$1,250.00	\$35.00	\$175.00	\$40.04	\$200.20	\$42.00	\$210.00
BP2-11.01	Terminal Building - Complete	1	LS	\$780,000.00	\$780,000.00	\$950,000.00	\$950,000.00	\$1,020,000.00	\$1,020,000.00	\$1,334,088.40	\$1,334,088.40
BP2-11.02	PCC Paving, 4" Terminal Floor	350	SY	\$55.00	\$19,250.00	\$54.00	\$18,900.00	\$64.91	\$22,718.50	\$64.80	\$22,680.00
BP2-11.03	Concrete Stoop	6	EA	\$1,500.00	\$9,000.00	\$1,500.00	\$9,000.00	\$1,152.00	\$6,912.00	\$1,800.00	\$10,800.00
BP2-11.04	Propane Service Line, Copper, Including Trenching And Backfill	250	LF	\$75.00	\$18,750.00	\$12.00	\$3,000.00	\$91.53	\$22,882.50	\$93.60	\$23,400.00
BP2-11.05	2" PVC Conduit, Telephone, Including Trenching And Backfill	400	LF	\$3.00	\$1,200.00	\$2.00	\$800.00	\$2.23	\$892.00	\$2.34	\$936.00
BP2-11.06	2" PVC Conduit, Internet, Including Trenching And Backfill	80	LF	\$3.00	\$240.00	\$5.00	\$400.00	\$2.23	\$178.40	\$2.34	\$187.20
BP2-11.07	2" PVC Conduit, Fuel Monitor, Including Trenching And Backfill	330	LF	\$3.00	\$990.00	\$2.00	\$660.00	\$2.23	\$735.90	\$2.34	\$772.20
BP2-11.08	Fuel Monitor Cable	390	LF	\$20.00	\$7,800.00	\$5.00	\$1,950.00	\$2.00	\$780.00	\$2.10	\$819.00
BP2-11.09	Relocate Fuel Monitor From Existing Terminal To FBO Building	1	LF	\$2,500.00	\$2,500.00	\$1,300.00	\$1,300.00	\$1,487.37	\$1,487.37	\$1,560.00	\$1,560.00
BP2-11.10	2" PVC Conduit, Av Gas Power, Including Trenching And Backfill	40	LF	\$2.50	\$100.00	\$2.00	\$80.00	\$2.23	\$89.20	\$2.34	\$93.60
BP2-11.11	Av Gas Power Cable	40	LF	\$50.00	\$2,000.00	\$3.00	\$120.00	\$2.86	\$114.40	\$3.00	\$120.00
BP2-11.12	2 Way 4" PVC Conduit For Electrical Service From Transformer, Including Trenching And Backfill	90	LF	\$10.00	\$900.00	\$8.00	\$720.00	\$9.15	\$823.50	\$9.60	\$864.00
BP2-11.13	Relocate Vault Controls To Hangar Electrical Room	1	LS	\$8,000.00	\$8,000.00	\$9,000.00	\$9,000.00	\$9,925.00	\$9,925.00	\$10,410.00	\$10,410.00
BP2-11.14	Relocate Vault Radio Control Antenna To 100' X 120' Hangar Building	1	LS	\$2,500.00	\$2,500.00	\$3,000.00	\$3,000.00	\$3,280.00	\$3,280.00	\$3,438.00	\$3,438.00
BP2-11.15	L-867 Electrical Handhole, Size D, 24" Deep	4	EA	\$800.00	\$3,200.00	\$550.00	\$2,200.00	\$625.00	\$2,500.00	\$656.40	\$2,625.60
BP2-11.16	Construct ASOS Room In FBO Hangar Building	1	LS	\$30,000.00	\$30,000.00	\$4,500.00	\$4,500.00	\$25,260.00	\$25,260.00	\$120,000.00	\$120,000.00
BP2-11.17	Electrical Improvements To Interior Of FBO Hangar	1	LS	\$7,500.00	\$7,500.00	\$7,500.00	\$7,500.00	\$8,580.00	\$8,580.00	\$9,000.00	\$9,000.00
BP2-11.18	Perimeter Landscaping	200	SY	\$75.00	\$15,000.00	\$15.00	\$3,000.00	\$17.16	\$3,432.00	\$18.00	

RESOLUTION ACCEPTING BID, CONTINGENT UPON THE RECEIPT AND EXECUTION
OF GRANT AGREEMENT WITH THE FEDERAL AVIATION ADMINISTRATION FOR
THE CONSTRUCTION AIRPORT TERMINAL AND HANGAR IMPROVEMENTS
PROJECT AT THE MARSHALLTOWN MUNICIPAL AIRPORT FOR THE CITY OF
MARSHALLTOWN, IOWA

WHEREAS notice to bidders has been duly given as required by law for Airport Terminal and Hangar Improvements, for the City of Marshalltown, as described in the plans and specifications; and

WHEREAS bids were received from Garling Construction, Inc. for Bid Package No.1 – Base Bid in the amount \$1,161,425.00, Jensen Builders LTD in the amount of \$1,260,971.18, and Hansen Company, Inc. in the amount of \$1,360,000.00;

WHEREAS bids were received from Garling Construction, Inc. for Bid Package No.2 – Base Bid in the amount \$1,424,675.00, Jensen Builders LTD in the amount of \$1,653,381.19, and Hansen Company, Inc. in the amount of \$2,050,000.00;

WHEREAS the bid from Garling Construction, Inc. of Belle Plaine, Iowa is determined to be the lowest responsive and responsible bid for the designated public improvement; and

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

Section 1. That the bid from Garling Construction, Inc. of Belle Plaine, Iowa is hereby accepted for the Base Bid to construct the Airport Terminal and Hangar Improvements as described in the plans and specifications, as previously ordered by the Council, and that the contract for the construction is now awarded subject to receipt and execution of a grant agreement with the Federal Aviation Administration, to said contractor in the amount of Two Million, Five Hundred Eighty Six Thousand One Hundred 100 and 0/100 dollars (\$2,586,100.00).

Section 2. The Mayor and City Clerk of the City of Marshalltown, Iowa are hereby authorized and directed to execute the contract with the contractor for the public improvement as is herein referred to subject to concurrence from Federal Aviation Administration and receipt of a grant agreement with the Federal Aviation Administration.

Passed this 26th day of May, 2020, and signed this 26th day of May, 2020.

By: _____
Mayor

Attest: _____
City Clerk

Marshalltown Terminal Building and Hangar Building

List of Alternatives

Hangar Building

Bid Package No.1 - Alternate No.1 - (Additional Flood Lighting for Apron): This alternate is to provide for the installation of two additional flood lights directed at the apron. Acceptance of this alternate would allow the airport personnel to turn on additional lighting to allow them more visibility when moving planes in and out of the hangar. Bid Price = \$5,000.00

Acceptance of this alternative would allow for additional lighting for airport personnel when handling large aircraft.

Bid Package No.1 - Alternate No. 2 (Paint Exposed Structural Steel in Hangar): This alternate is to provide for the painting of exposed structural steel in the hangar. Painting provides a brighter finish and a finished look to the hangar space. Bid Price = \$18,000.00

Given the cost of this alternative, additional painting of the structural steel is not recommended. The existing structural steel will be painted with a primer only.

Bid Package No.1 - Alternate No. 3 (Full Height Liner Panel on Sidewalls): This alternate is to provide for the extending the interior metal liner panel from floor to ceiling. This provides a finished look to the hangar space and protects the insulation along the sidewalls. Bid Price = \$22,000.00

Given the cost of this alternative, providing full height liner panel is not recommended. The base bid includes a partial height liner panel of approximately 12' which would help prevent most if not all damage to the insulation.

Bid Package No.1 - Alternate No. 4 (Subgrade Treatment): This alternate is to provide for cement treating the subgrade underneath the hangar paving. The existing soils are a loess material and could potentially increase the difficulty of construction. Bid Price = \$14,987.50

Cement treating the soil will provide for ease of construction and increase the life span of the pavement. It could also reduce the potential for a change order for unsuitable materials that could be encountered during construction.

Bid Package No.1 - Alternate No. 5 (Upgrade to 400A Transfer Switch with Generator Connections): This alternate is to provide for a means of hooking up an existing generator at the airport. If a generator connection was provided it would allow the airport the ability to power certain circuits, i.e... heaters, some lights and hangar door in the event that there is no power at the airport. This alternate also provides a cord for connecting to an existing generator. In addition, the equipment would allow for easy connection of any different generator brought to the airport. Bid Price = \$8,500.00

Providing the transfer switch would allow for connection of a generator at the airport to power select circuits such as heaters, lights and hangar door in the event of no power at the airport.

Bid Package No.1 - Alternate No. 6 (Provide 240V, 125A, Receptacle at Exterior Junction Box to Power Aircraft Power Cart): This alternate is to provide for a means of having a large amperage receptacle on the exterior of the hangar building to allow for larger aircraft to be connected to a power source on the ramp. Bid Price = \$2,500.00

The receptacle helps power larger planes and provide for the ability to charge and start planes that come and go from the airport.

Terminal Building and Site Improvements (Bid Package No.2)

Bid Package No.2 - Alternate No. 1 (Linear Wood Plank Acoustical Ceiling and Wall Panels in Lobby Area): This alternate is to provide wood looking acoustical panels on the ceiling and wall in lobby areas. Bid Price = \$22,000.00

The wood plank on the ceiling and walls would provide a better architectural feel inside of the lobby area of the terminal building. This accent would be on a wall in the waiting area and on the ceiling in the lobby area.



Bid Package No.2 - Alternate No. 2 (Additional Parking): This alternate is to provide additional parking closer to the proposed hangar and terminal building. Bid Price = \$66,380.00

The existing parking lot will be in need of removal and replacement soon but it could be accomplished as a future project. Users and visitors will be able to use the closer parking lot for shorter term parking and will be able to use the remaining parking lot as longer-term parking.



Bid Package No.2 - Alternate No. 3 (Area Light for Base Bid Parking): This alternate is to provide some additional lights to light up the proposed parking lot. Bid Price = \$2,000.00

Currently there is very little lighting at the airport. The existing airport parking lot is dark. This alternate would provide some additional light beyond the proposed buildings for lighting of the parking associated with the base bid. This provides a security benefit for the airport and its users.

Bid Package No.2 - Alternate No. 4 (Cement Treating Subgrade - Base Bid): This alternate is to provide for cement treating the subgrade underneath terminal and parking lot paving. The existing soils are a loess material and could potentially increase the difficulty of construction. Bid Price = \$19,600.00

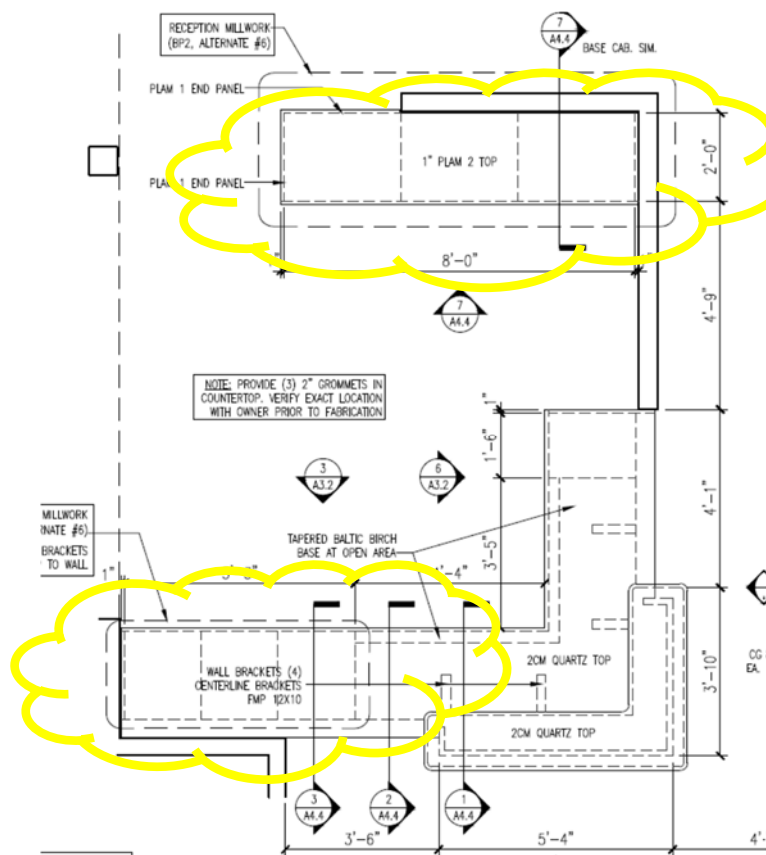
Cement treating the soil will provide for ease of construction and increase the life span of the pavement. It could also reduce the potential for a change order for unsuitable materials that could be encountered during construction.

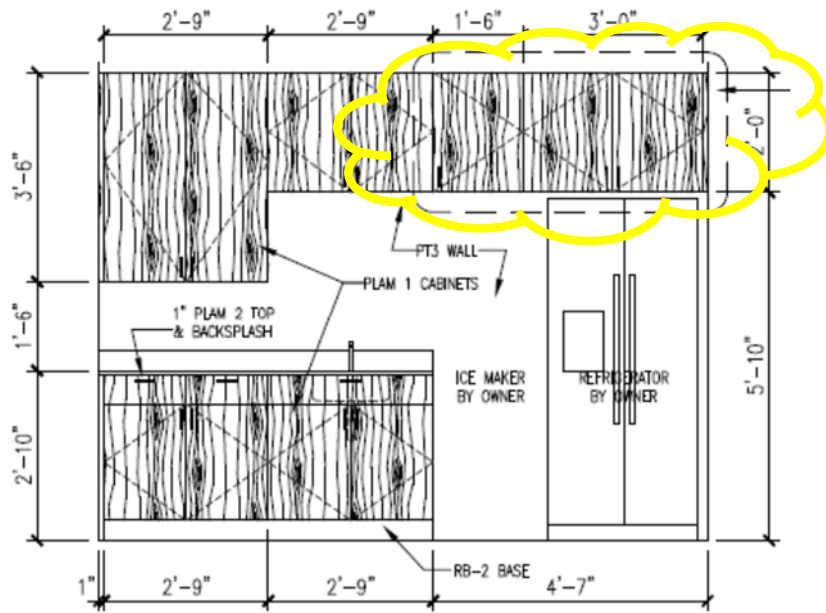
Bid Package No.2 - Alternate No. 5 (Cement Treating Subgrade - Alternate Bid 2): This alternate is to provide for cement treating the subgrade underneath the additional parking lot as part of Alternate Bid 2. The existing soils are a loess material and could potentially increase the difficulty of construction. Bid Price = \$6,600.00

This item should only be considered if Alternate No.2 of the Bid Package 2 is selected. Cement treating the soil will provide for ease of construction and increase the life span of the pavement. It could also reduce the potential for a change order for unsuitable materials that could be encountered during construction.

Bid Package No.2 - Alternate No. 6 (Additional P Lam Cabinets in Reception Area and Break Area): This alternate is to provide for additional built in cabinets underneath the counter of the reception desk, the wall behind the reception area and above the refrigerator of the terminal building. Bid Price = \$4,500.00

The additional cabinets provide for more places to store items needed for administration of the airport. In addition, the cabinets above the refrigerator allow for more storage in the breakroom area for airport staff and pilots use.





Bid Tabulation
Vault Improvements
Marshalltown Municipal Airport - Marshalltown, IA ~ Bid Date: 5-14-20 10:00am

Bidder Address Check or Bid Bond				Engineer's Opinion of Probable Construction Cost		Van Maanen Electric, Inc. Newton, IA 5% Bid Bond		Votmer, Inc. Decorah, IA 5% Bid Bond		K&W Electric Inc. Cedar Falls, IA 5% Bid Bond	
Item #	Description - BASE BID - VAULT IMPROVEMENTS	Quantity	Unit	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price	Unit Price	Total Price
1	Mobilization	1	LS	\$44,865.00	\$44,865.00	\$4,000.00	\$4,000.00	\$15,400.00	\$15,400.00	\$12,000.00	\$12,000.00
2	Traffic Control	1	LS	\$4,000.00	\$4,000.00	\$8,541.00	\$8,541.00	\$3,200.00	\$3,200.00	\$20,000.00	\$20,000.00
3	Pavement Removal	400	SY	\$12.50	\$5,000.00	\$15.00	\$6,000.00	\$20.00	\$8,000.00	\$25.00	\$10,000.00
4	Demolition of Existing Rotating Beacon	1	LS	\$3,000.00	\$3,000.00	\$2,500.00	\$2,500.00	\$3,600.00	\$3,600.00	\$3,350.00	\$3,350.00
5	Demolition of Existing Vault	1	LS	\$4,000.00	\$4,000.00	\$4,000.00	\$4,000.00	\$8,400.00	\$8,400.00	\$20,000.00	\$20,000.00
6	Clearing and Grubbing	1	LS	\$2,000.00	\$2,000.00	\$2,000.00	\$2,000.00	\$3,500.00	\$3,500.00	\$4,500.00	\$4,500.00
7	Seeding, Fertilizing and Mulching	1	LS	\$3,000.00	\$3,000.00	\$3,500.00	\$3,500.00	\$5,640.00	\$5,640.00	\$7,000.00	\$7,000.00
8	L-801A Class II Airport Rotating Beacon, In Place	1	EA	\$7,000.00	\$7,000.00	\$11,359.00	\$11,359.00	\$6,858.00	\$6,858.00	\$8,550.00	\$8,550.00
9	Tip Down Rotating Beacon Tower and Foundation, In Place	1	EA	\$30,000.00	\$30,000.00	\$31,325.00	\$31,325.00	\$29,608.00	\$29,608.00	\$35,250.00	\$35,250.00
10	No. 8 AWG, 5KV, L-824, Type C Cable, Installed in Trench, Duct or Conduit	1,400	LF	\$2.00	\$2,800.00	\$1.81	\$2,534.00	\$1.83	\$2,562.00	\$1.20	\$1,680.00
11	No. 6 AWG, Solid, Bare Counterpoise Wire, Installed in Trench, Including Ground Rods and Connectors	1,200	LF	\$2.00	\$2,400.00	\$1.32	\$1,584.00	\$1.91	\$2,292.00	\$1.10	\$1,320.00
12	No. 2 AWG, 600V, RHW-2 Equipment Ground Cable, Installed in Trench, Duct or Conduit	400	LF	\$3.00	\$1,200.00	\$2.01	\$804.00	\$4.41	\$1,764.00	\$2.00	\$800.00
13	No. 3/0 AWG, 600V, RHW-2, Installed in Trench, Duct or Conduit	1,200	LF	\$5.00	\$6,000.00	\$2.96	\$3,552.00	\$5.25	\$6,300.00	\$3.75	\$4,500.00
14	No. 4 AWG, 600V, L-824, Type C Cable (or TWHN-2), Installed in Trench, Duct or Conduit	2,700	LF	\$3.00	\$8,100.00	\$1.71	\$4,617.00	\$3.26	\$8,802.00	\$1.50	\$4,050.00
15	No. 4 AWG, 600V, L-824, Type C (or TWHN-2) Equipment Ground Cable, Installed in Trench, Duct or Conduit	1,200	LF	\$3.00	\$3,600.00	\$1.71	\$2,052.00	\$2.03	\$2,436.00	\$1.50	\$1,800.00
16	No. 10 AWG, 600V, L-824 Type C (or TWHN-2) Cable, Installed in Trench, Duct or Conduit	50	LF	\$2.00	\$100.00	\$0.97	\$48.50	\$18.30	\$915.00	\$1.20	\$60.00
17	No. 10 AWG, 600V, L-824, Type C (or TWHN-2) Equipment Ground Cable, Installed in Trench, Duct or Conduit	25	LF	\$2.00	\$50.00	\$0.97	\$24.25	\$24.60	\$615.00	\$1.20	\$30.00
18	Airfield Vault Enclosure - Complete Operational System	1	LS	\$80,000.00	\$80,000.00	\$68,793.00	\$68,793.00	\$85,090.00	\$85,090.00	\$120,000.00	\$120,000.00
19	L-828, Constant Current Regulator, 10.0KW, Class I, Style I, Ferroresonant	2	EA	\$12,500.00	\$25,000.00	\$10,248.00	\$20,496.00	\$11,160.00	\$22,320.00	\$12,000.00	\$24,000.00
20	Airfield Lighting Control Panel	1	LS	\$25,000.00	\$25,000.00	\$23,493.00	\$23,493.00	\$22,554.00	\$22,554.00	\$28,250.00	\$28,250.00
21	Vault Grounding for Lightning Protection	1	LS	\$3,000.00	\$3,000.00	\$4,716.00	\$4,716.00	\$7,758.00	\$7,758.00	\$2,750.00	\$2,750.00
22	Vault Building Controls	1	LS	\$5,000.00	\$5,000.00	\$8,300.00	\$8,300.00	\$1,156.00	\$1,156.00	\$1,200.00	\$1,200.00
23	L-854, Air to Ground Radio Control Equipment, Type I, Style A	1	EA	\$3,000.00	\$3,000.00	\$2,880.00	\$2,880.00	\$5,304.00	\$5,304.00	\$3,950.00	\$3,950.00
24	Remove and Relocate Existing 10KW Regulator	1	EA	\$2,500.00	\$2,500.00	\$2,100.00	\$2,100.00	\$3,600.00	\$3,600.00	\$750.00	\$750.00
25	2 Inch Schedule 40 PVC Conduit, Including Trenching and Backfill	3,200	LF	\$2.00	\$6,400.00	\$1.45	\$4,640.00	\$2.80	\$8,960.00	\$3.50	\$11,200.00
26	1 Way 3 Inch Schedule 40 PVC Conduit, Including Trenching and Backfill	80	LF	\$4.00	\$320.00	\$5.20	\$416.00	\$25.05	\$2,004.00	\$9.50	\$760.00
27	2 Way 4 Inch Schedule 40 PVC Conduit, Including Trenching and Backfill	460	LF	\$8.00	\$3,680.00	\$8.00	\$3,680.00	\$17.50	\$8,050.00	\$15.00	\$6,900.00
28	2 Inch HDPE Conduit, Directionally Bored	1,200	LF	\$15.00	\$18,000.00	\$7.50	\$9,000.00	\$7.10	\$8,520.00	\$13.00	\$15,600.00
29	L-867 Electrical Hand Hole, Size B, 24" Deep	4	EA	\$800.00	\$3,200.00	\$468.00	\$1,872.00	\$622.00	\$2,488.00	\$850.00	\$3,400.00
30	L-867 Electrical Hand Hole, Size D, 24" Deep	6	EA	\$800.00	\$4,800.00	\$550.00	\$3,300.00	\$692.00	\$4,152.00	\$900.00	\$5,400.00
31	Can Plaza with Three L-867, Size B, Electrical Hand Holes	2	EA	\$3,000.00	\$6,000.00	\$1,500.00	\$3,000.00	\$3,155.00	\$6,310.00	\$2,350.00	\$4,700.00
32	Can Plaza with Seven L-867, Size D, Electrical Hand Holes	2	EA	\$6,000.00	\$12,000.00	\$3,920.00	\$7,840.00	\$8,994.00	\$17,988.00	\$5,250.00	\$10,500.00
33	Remove and Relocate Existing ASOS Electrical Equipment on Rack	1	LS	\$2,000.00	\$2,000.00	\$4,600.00	\$4,600.00	\$4,506.00	\$4,506.00	\$3,250.00	\$3,250.00
34	Utility Reconfigurations for Existing FBO Hangar and Terminal Building	1	LS	\$25,000.00	\$25,000.00	\$47,650.00	\$47,650.00	\$24,009.00	\$24,009.00	\$45,750.00	\$45,750.00
35	Jet A 30A Combination Motor Starter Disconnect	1	LS	\$3,000.00	\$3,000.00	\$5,600.00	\$5,600.00	\$1,243.00	\$1,243.00	\$3,750.00	\$3,750.00
TOTAL BASE BID				\$355,015.00		\$310,816.75		\$345,904.00		\$427,000.00	

RESOLUTION ACCEPTING BID, CONTINGENT UPON THE RECEIPT AND EXECUTION
OF GRANT AGREEMENT WITH THE FEDERAL AVIATION ADMINISTRATION FOR
THE CONSTRUCTION OF THE AIRPORT VAULT IMPROVEMENTS PROJECT AT THE
MARSHALLTOWN MUNICIPAL AIRPORT FOR THE CITY OF MARSHALLTOWN,
IOWA

WHEREAS notice to bidders has been duly given as required by law for Airport Vault Improvements, for the City of Marshalltown, as described in the plans and specifications; and

WHEREAS bids were received from Van Maanen Electric, Inc. for the Base Bid in the amount \$310,816.75, Voltmer, Inc. in the amount of \$345,904.00, and K & W Electrical, Inc. in the amount of \$427,000.00;

WHEREAS the bid from Van Maanen Electric, Inc. of Newton, Iowa is determined to be the lowest responsive and responsible bid for the designated public improvement; and

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

Section 1. That the bid from Van Maanen Electric, Inc. of Newton, Iowa is hereby accepted for the Base Bid to construct the Airport Vault Improvements as described in the plans and specifications, as previously ordered by the Council, and that the contract for the construction is now awarded subject to receipt and execution of a grant agreement with the Federal Aviation Administration, to said contractor in the amount of Three Hundred Ten Thousand Eight Hundred Sixteen and 75/100 dollars (\$310,816.75).

Section 2. The Mayor and City Clerk of the City of Marshalltown, Iowa are hereby authorized and directed to execute the contract with the contractor for the public improvement as is herein referred to subject to concurrence from Federal Aviation Administration and receipt of a grant agreement with the Federal Aviation Administration.

Passed this 26th day of May, 2020, and signed this 26th day of May, 2020.

By: _____
Mayor

Attest: _____
City Clerk

RESOLUTION ACCEPTING BID AND AUTHORIZING THE AWARD OF CONTRACT
FOR THE S. 6th St & MERLE HIBBS CULVERT REPAIR PROJECT IN THE CITY OF
MARSHALLTOWN, IOWA BEING PROJECT NO. SMW19002
IN THE AMOUNT OF \$59,906.00

WHEREAS notice to bidders has been duly given as required by law publication in the Marshalltown Times-Republican for the s. 6TH St & Merle Hibbs Culvert Repair Project, being Project No. SMW19002, in the City of Marshalltown, as described in the plans and specifications therefore, and

WHEREAS, there has been filed with the City Clerk in response to the published notice to the bidders referred to above, certain proposals for the construction of the above designated improvement with the required certified checks or bid bond accompanying each proposal from the following bidders, to-wit:

<u>Name and Address of Bidders</u>	<u>Amount of Bid</u>
Con-Struct, Inc. Marshalltown, IA	\$117,605.00
Boulder Contracting, LLC. Grundy Center, IA	\$59,906.00

After consideration of all bids filed, there was determined by the Council that the bid of Boulder Contracting, LLC, Grundy Center, Iowa, is the best and lowest responsible bid for the public improvement as is herein outlined.

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

Section 1. That the bid of Boulder Contracting, LLC, Grundy Center , Iowa, and the same is hereby accepted for the construction of the improvement as described in the plans and specifications therefore, as previously ordered by the Council, and that the contract for the construction of same is now awarded to said contractor in the total amount Fifty-Nine Thousand Nine Hundred Six and .00/100 (\$59,906.00) Dollars.

Section 2. The Mayor and Clerk of the City of Marshalltown, Iowa are hereby authorized and directed to execute the contract with the contractor for the public improvement as is herein referred to, and that upon the contractor filing the required bond that the said bond and contract be then submitted to this Council for final approval as provided by law.

Section 3. The final settlement upon the contract, as referred to herein with said contractor, shall be upon the basis of the unit prices as are set forth in the bid of said contractor and for the actual quantities for each item of materials furnished or work performed in the construction of this public improvement. The said contract is subject to all of the conditions as are contained in the resolution ordering construction of this improvement, the notice to bidders as published, the terms of the bidders written proposal, the plans and specifications as are provided therefore, all of which are made a part of this resolution and the said bidders contract by reference as though the same were set out herein verbatim and in specific detail.

Section 4. This resolution as now adopted shall be in full force and binding effect upon the City of Marshalltown, Iowa, upon the final approval of the completed contract with the successful bidder and the approval of the contractor's surety bond by resolution of this Council.

Passed this 26th day of May, 2020, and signed this _____day of May, 2020.

CITY OF MARSHALLTOWN, IOWA

Joel Greer, Mayor

ATTEST:

Shari L. Coughenour, CMC, City Clerk

BID TABULATION

SMW19002 - S. 6TH ST. AND W. MERLE HIBBS BOX CULVERT REPAIR

CITY OF MARSHALLTOWN

Base Bid - Twin CMP Arch Culvert Repair			Bidder Location Bid Security		Engineer's Estimate Calhoun-Burns and Associates		Boulder Contracting, LLC Grundy Center, IA 10% Bid Bond		ConStruct, Inc. Marshalltown, IA 10% Bid Bond	
REF. NO.	CODE NO.	ITEM	QUANTITY	UNIT	PRICE	TOTAL	PRICE	TOTAL	PRICE	TOTAL
1	2102-2625000	EMBANKMENT-IN-PLACE	30	CY	\$50.00	\$1,500.00	\$42.00	\$1,260.00	\$100.00	\$3,000.00
2	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	65	CY	\$20.00	\$1,300.00	\$30.00	\$1,950.00	\$100.00	\$6,500.00
3	2401-6745635	REMOVAL OF EXISTING HANDRAIL	1	LS	\$3,000.00	\$3,000.00	\$750.00	\$750.00	\$1,500.00	\$1,500.00
4	2414-6444100	STEEL PIPE PEDESTRIAN HAND RAILING	65	LF	\$200.00	\$13,000.00	\$250.00	\$16,250.00	\$423.00	\$27,495.00
5	2511-6745900	REMOVAL OF SIDEWALK	43	SY	\$15.00	\$645.00	\$22.00	\$946.00	\$30.00	\$1,290.00
6	2511-7526106	SIDEWALK, REINFORCED P.C. CONCRETE, 6 IN.	60	SY	\$120.00	\$7,200.00	\$80.00	\$4,800.00	\$125.00	\$7,500.00
7	2528-8445110	TRAFFIC CONTROL	1	LS	\$10,000.00	\$10,000.00	\$5,100.00	\$5,100.00	\$6,000.00	\$6,000.00
8	2533-4980005	MOBILIZATION	1	LS	\$15,000.00	\$15,000.00	\$7,500.00	\$7,500.00	\$10,000.00	\$10,000.00
9	2539-6294000	PORTLAND CEMENT (FOR PRESSURE GROUTING)	2.0	TON	\$800.00	\$1,600.00	\$2600.00	\$5,200.00	\$13860.00	\$27,720.00
10	2546-1000100	GABIONS OR MATTRESSES	38	CY	\$700.00	\$26,600.00	\$425.00	\$16,150.00	\$700.00	\$26,600.00
TOTAL BASE BID						\$79,845.00		\$59,906.00		\$117,605.00

I HEREBY CERTIFY THAT THE FOREGOING IS AN ACCURATE REPRESENTATION AND TABULATION OF ALL BIDS RECEIVED AND THAT THE MATHEMATICS HAVE BEEN CHECKED AND IS TO THE BEST OF MY KNOWLEDGE CORRECT:


Civil Engineer II, Marshalltown Engineering Department

Date: 5/19/2020



Joel Greer, Mayor
Jessica Kinser, Administrator
Justin Nickel, Public Works Director
24 North Center Street
Marshalltown, IA 50158-4911
Tel - (641) 754-5760
Fax - (641) 754-5781

DEPARTMENT OF PUBLIC WORKS

May 19, 2020

To: Mayor Joel Greer
Members of the City Council

From: Jay C. Koch
Civil Engineer II

Re: Accept Bid and Award Construction Contract – Boulder Contracting, LLC. for the S. 6th St. and W. Merle Hibbs Culvert Repair, SMW19002, in the amount of \$59,906.000.

Policy Issue: City policy requires Governing Body approval of agreements when consideration exceeds \$36,000.

Recommendation: Staff recommends accepting the bid and awarding the construction contract to Boulder Contracting, LLC. for the S. 6th St. and W. Merle Hibbs Culvert Repair Project for an amount equal to \$59,906.00. The Engineers Estimate of probable cost was \$79,845.00.

Background: This project was brought to the Public Works Departments attention last summer by our street maintenance department. The east side of the overflow culverts crossing under S. 6th Street has a railing that is severely deteriorated and the embankments around the outlet are severely eroded and very steep. This results in a very unsafe condition for pedestrians and sidewalk snow cleaning crews. The City contracted with Calhoun-Burns and Associates to develop a plan to stabilize the embankments and provide a safety railing along the culvert outlet. This will provide a safe trail along the outlet for pedestrians and allow snow to be removed safely and effectively. The work will be completed by November 15, 2020.

Budget Impact: This project will be funded with Storm Water Revenues.

Attachment: Bid Tabulation

cc: Jessica Kinser, City Administrator

City Council
Susan Cahill, Gary Thompson, Mike Gowdy,
Al Hoop, Gabriel Isom, Bill Martin, Bethany Wirin



RESOLUTION AMENDING THE OFFER TO PURCHASE WITH LANDOVER CORPORATION AND FLINT HILLS HOLDINGS TO EXTEND THE CLOSING AND COMPLETION DATES

WHEREAS, the City Council approved an Offer to Buy Real Estate and Acceptance on Resolution 2018-242 with Landover Corporation and Flint Hills Holdings at the December 26, 2018, City Council meeting, following the required public hearing; and

WHEREAS, the City Council approved Resolution 2020-024 at the January 27, 2020, City Council meeting, moving the date for possession and closing to May 29, 2020; and

WHEREAS, the date for possession and closing in the amended Offer is not likely to occur per the Buyer; and

WHEREAS, it is the desire of Landover Corporation and Flint Hills Holdings to extend the date to August 31, 2020, with construction of the project to be completed by September 2021; and

WHEREAS, the proposed project to construct fifty residential rental units, of which ninety percent will be income-restricted addresses a public purpose of providing affordable housing options within the community;

NOW THEREFORE BE IT RESOLVED BY THE COUNCIL OF THE CITY OF MARSHALLTOWN, IOWA, that the request to extend the closing and possession and project completion dates as stated above is hereby approved, and the Mayor is authorized to execute the attached Amendment.

Passed this 26th day of May, 2020 and signed this ____ day of May, 2020.

CITY OF MARSHALLTOWN, IOWA

Joel T.S. Greer, Mayor

ATTEST:

Shari L. Coughenour, CMC, City Clerk

**RESOLUTION APPROVING A GRANT AGREEMENT WITH MCGREGOR'S FURNITURE FOR
EXTERIOR WALL REPAIRS AT 105 WEST MAIN STREET**

WHEREAS, the City of Marshalltown has secured a loan from the Nuisance Property and Abandoned Building Remediation Loan Program administered by the Iowa Economic Development Authority for the purpose of repairing exposed shared or party walls located in the Marshalltown Central Business District; and

WHEREAS, the building located at 105 West Main Street, owned by JARM Building Corporation, or McGregor's Furniture, has been exposed following the demolition of an adjoining building; and

WHEREAS, the scope of work has been reviewed by a structural engineer to ensure the proposed repairs are in the best interest of the City and the building owner;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF MARSHALLTOWN, IOWA, that the attached Grant Agreement with McGregor's Furniture for a grant not-to-exceed \$45,000 is hereby approved and the Mayor is directed to execute the agreement.

Passed this 26th day of May, 2020, and signed this _____ day of May, 2020.

CITY OF MARSHALLTOWN, IOWA

Joel T.S. Greer, Mayor

ATTEST:

Shari L. Coughenour, CMC, City Clerk

**CITY OF MARSHALLTOWN
GRANT AGREEMENT
FOR THE REPAIR OF A SHARED WALL**

This Grant Agreement ("Agreement") is made this _____ day of _____ 2020 by and between the CITY OF MARSHALLTOWN, IOWA ("City"), an Iowa municipal corporation, and MCGREGOR'S FURNITURE ("Grantee").

Recitals

WHEREAS, the City has secured a loan ("IEDA Loan") from the Nuisance Property and Abandoned Building Remediation Loan Program administered by the Iowa Economic Development Authority ("IEDA") for the purpose of repairing exposed shared or party walls located in the Marshalltown Central Business District; and

WHEREAS, the City is granting funds from the IEDA Loan to owners of eligible properties, including the property ("Property") located at 105 West Main Street, and legally described as follows:

The East one-third of Lot 11; the west 6 inches of the north 58 feet of Lot 12, all in Block 8, Town of Marshall, Marshall County, Iowa and right-of-way over 10 foot alley lying north of the South 90 feet of the East two-thirds of Lot 12 in said Block 8, Town of Marshall, Marshall County, Iowa, subject to the Party Wall Agreement recorded in Book 430, Page 145 of the Records of the Recorder's Office, Marshall County, Iowa; and

WHEREAS, Grantee, as owner of the Property, accepts this grant of funds ("Grant") upon the terms and conditions set out in this Agreement.

Agreement

NOW, THEREFORE, in consideration of the mutual promises contained in this Agreement and other good and valuable consideration, the parties agree as follows:

1. **PROJECT.** "Project" means the activities and other obligations to be performed or accomplished by Grantee to repair one or more exterior shared or party wall(s) upon the Property, as more fully described in the Scope of Work, attached hereto as "Exhibit A" and incorporated herein by this reference.

2. **PROJECT COMPLETION PERIOD.** The Project must be completed, and accepted as complete by the City, in its discretion, within one (1) year from the effective date of this Agreement, being the date of last signature below.

3. **GRANT AMOUNT.** The amount of the Grant shall not exceed Forty Five Thousand and 00/100 Dollars (\$45,000). The City's obligation to provide Grantee funds pursuant to this Agreement is contingent upon the availability of funds from the IEDA Loan. Grantee agrees to hold the City harmless from any damage Grantee may sustain as a result of funds for the Project being unavailable from the IEDA Loan.

4. **REIMBURSABLE COSTS.** Payment of Grant funds shall be made on a reimbursement basis. Reimbursable costs under this Agreement constitute those costs incurred by Grantee that are directly related to the Project. Costs incurred by the Grantee for work on the Project completed prior to City Council approval of this Agreement may be included as reimbursable Project costs if otherwise eligible pursuant to the provisions of this Agreement, provided no costs incurred prior to April 13, 2020, the date the IEDA Loan was approved, shall be eligible for reimbursement.

5. **REIMBURSEMENT PROCEDURE.** Grantee's request for reimbursement shall be submitted to the City in writing upon Project completion and shall include final invoice(s) from Grantee's contractor(s) and documentation of payment to Grantee's contractor(s), including but not limited to one or more cancelled checks. It is in the City's discretion to reimburse at a more frequent interval based on the size of the project, the contracted payment schedule, the amount of work completed, and other factors deemed pertinent.

6. **MAINTENANCE OF INSURANCE.** Grantee shall maintain the Property in good repair and condition, ordinary wear and tear excepted, and shall not suffer or commit waste or damage upon the Property. Grantee shall pay for and maintain casualty insurance in an amount not less than the full insurable value of the Property. Grantee shall provide the City with a copy of every insurance policy in effect relative to the Property upon execution of this Agreement, with subsequent notice to the City of any change thereto or cancellation thereof.

7. **RELATIONSHIP OF PARTIES; INDEMNIFICATION.** Grantee shall be solely responsible for completing all work on the Project, which shall under no circumstance be considered a joint venture between Grantee and the City. Nor shall either party be considered an agent of the other for purposes of the Project. Further, Grantee agrees to indemnify, defend, and hold harmless the City from all claims, actions, damages, and costs of every name and description, arising out of or resulting from the Project or Grantee's obligations under this Agreement.

8. **ASSIGNMENT.** Grantee may not assign or transfer this Agreement, by transfer of the Property or otherwise, without the City's prior written consent.

9. **GENERAL PROVISIONS.** This Agreement contains the entire understanding between the City and Grantee with respect to the Project. In the performance of each part of this Agreement, time shall be of the essence. Failure to promptly assert rights herein shall not, however, be a waiver of such rights or a waiver of any existing or subsequent default. This Agreement shall apply to and bind the successors in interest of the parties. This Agreement contains the entire agreement of the parties and shall not be amended, except by a written instrument duly signed by Grantee and the City. Paragraph headings are for convenience of reference and shall not limit or affect the meaning of this Agreement. Words and phrases herein shall be construed as in the singular or plural number, and as masculine, feminine, or neuter gender according to the context.

10. **MISCELLANEOUS.** Any publications or media releases related to the Project shall contain the following with note that the Project is sponsored in part by the IEDA and the City: (a) the City's obligation to provide funds is contingent on funds being available to the City from the IEDA Loan; (b) Grantee shall hold the City harmless from any damage Grantee sustains as a result of funds for the Project being unavailable; and (c) the Mayor, City Councilmembers, and

employees of the City of Marshalltown, and their immediate family members will not be paid for any work they perform on the Project through contracts with Grantee unless that work was contracted through a competitive bidding process.

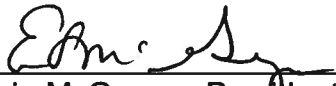
11. **EXECUTION.** When and if executed by both Grantee and the City, this Agreement shall become a binding contract.

MCGREGOR'S FURNITURE

CITY OF MARSHALLTOWN, IOWA,
an Iowa municipal corporation

Dated this 15th day of May 2020

Dated this ____ day of _____ 2020

By: 
Erin McGregor, President

By: _____
Joel Greer, Mayor

Attest: _____
Shari Coughenour, City Clerk

Address: _____

Address: Marshalltown City Hall
24 N Center Street
Marshalltown, IA 50158

Telephone: (____) _____-_____

Telephone: (319) 646-2154

**RESOLUTION APPROVING A GRANT AGREEMENT WITH WIN KYAW FOR EXTERIOR
WALL REPAIRS AT 9-11 EAST STATE STREET**

WHEREAS, the City of Marshalltown has secured a loan from the Nuisance Property and Abandoned Building Remediation Loan Program administered by the Iowa Economic Development Authority for the purpose of repairing exposed shared or party walls located in the Marshalltown Central Business District; and

WHEREAS, the building located at 9-11 East State Street, owned by Win Kyaw, will have an exposed wall following the demolition of an adjoining building in the near future; and

WHEREAS, a scope of work has been obtained from a contractor and arrangements have been made with the City to have a structural engineer inspect the building following the adjacent demolition to ensure the proposed repairs are in the best interest of the City and the building owner;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF MARSHALLTOWN, IOWA, that the attached Grant Agreement with Win Kyaw for a grant not-to-exceed \$30,000 is hereby approved and the Mayor is directed to execute the agreement.

Passed this 26th day of May, 2020, and signed this _____ day of May, 2020.

CITY OF MARSHALLTOWN, IOWA

Joel T.S. Greer, Mayor

ATTEST:

Shari L. Coughenour, CMC, City Clerk

**CITY OF MARSHALLTOWN
GRANT AGREEMENT
FOR THE REPAIR OF A SHARED WALL**

This Grant Agreement ("Agreement") is made this ____ day of _____ 2020 by and between the CITY OF MARSHALLTOWN, IOWA ("City"), an Iowa municipal corporation, and WIN KYAW ("Grantee").

Recitals

WHEREAS, the City has secured a loan ("IEDA Loan") from the Nuisance Property and Abandoned Building Remediation Loan Program administered by the Iowa Economic Development Authority ("IEDA") for the purpose of repairing exposed shared or party walls located in the Marshalltown Central Business District; and

WHEREAS, the City is granting funds from the IEDA Loan to owners of eligible properties, including the property ("Property") located at 9-11 East State Street, and legally described as follows:

Lot G in Block 10 of the Original Town of Marshall, Marshall County, Iowa; and

WHEREAS, Grantee, as owner of the Property, accepts this grant of funds ("Grant") upon the terms and conditions set out in this Agreement.

Agreement

NOW, THEREFORE, in consideration of the mutual promises contained in this Agreement and other good and valuable consideration, the parties agree as follows:

1. **PROJECT.** "Project" means the activities and other obligations to be performed or accomplished by Grantee to repair one or more exterior shared or party wall(s) upon the Property, as more fully described in the Scope of Work, attached hereto as "Exhibit A" and incorporated herein by this reference.

2. **PROJECT COMPLETION PERIOD.** The Project must be completed, and accepted as complete by the City, in its discretion, within one (1) year from the effective date of this Agreement, being the date of last signature below.

3. **GRANT AMOUNT.** The amount of the Grant shall not exceed Thirty Thousand and 00/100 Dollars (\$30,000). The City's obligation to provide Grantee funds pursuant to this Agreement is contingent upon the availability of funds from the IEDA Loan. Grantee agrees to hold the City harmless from any damage Grantee may sustain as a result of funds for the Project being unavailable from the IEDA Loan.

4. **REIMBURSABLE COSTS.** Payment of Grant funds shall be made on a reimbursement basis. Reimbursable costs under this Agreement constitute those costs incurred by Grantee that are directly related to the Project. Costs incurred by the Grantee for work on the Project completed prior to City Council approval of this Agreement may be included as reimbursable Project costs if otherwise eligible pursuant to the provisions of this Agreement,

provided no costs incurred prior to April 13, 2020, the date the IEDA Loan was approved, shall be eligible for reimbursement.

5. **REIMBURSEMENT PROCEDURE.** Grantee's request for reimbursement shall be submitted to the City in writing upon Project completion and shall include final invoice(s) from Grantee's contractor(s) and documentation of payment to Grantee's contractor(s), including but not limited to one or more cancelled checks. It is in the City's discretion to reimburse at a more frequent interval based on the size of the project, the contracted payment schedule, the amount of work completed, and other factors deemed pertinent.

6. **MAINTENANCE OF INSURANCE.** Grantee shall maintain the Property in good repair and condition, ordinary wear and tear excepted, and shall not suffer or commit waste or damage upon the Property. Grantee shall pay for and maintain casualty insurance in an amount not less than the full insurable value of the Property. Grantee shall provide the City with a copy of every insurance policy in effect relative to the Property upon execution of this Agreement, with subsequent notice to the City of any change thereto or cancellation thereof.

7. **RELATIONSHIP OF PARTIES; INDEMNIFICATION.** Grantee shall be solely responsible for completing all work on the Project, which shall under no circumstance be considered a joint venture between Grantee and the City. Nor shall either party be considered an agent of the other for purposes of the Project. Further, Grantee agrees to indemnify, defend, and hold harmless the City from all claims, actions, damages, and costs of every name and description, arising out of or resulting from the Project or Grantee's obligations under this Agreement.

8. **ASSIGNMENT.** Grantee may not assign or transfer this Agreement, by transfer of the Property or otherwise, without the City's prior written consent.

9. **GENERAL PROVISIONS.** This Agreement contains the entire understanding between the City and Grantee with respect to the Project. In the performance of each part of this Agreement, time shall be of the essence. Failure to promptly assert rights herein shall not, however, be a waiver of such rights or a waiver of any existing or subsequent default. This Agreement shall apply to and bind the successors in interest of the parties. This Agreement contains the entire agreement of the parties and shall not be amended, except by a written instrument duly signed by Grantee and the City. Paragraph headings are for convenience of reference and shall not limit or affect the meaning of this Agreement. Words and phrases herein shall be construed as in the singular or plural number, and as masculine, feminine, or neuter gender according to the context.

10. **MISCELLANEOUS.** Any publications or media releases related to the Project shall contain the following with note that the Project is sponsored in part by the IEDA and the City: (a) the City's obligation to provide funds is contingent on funds being available to the City from the IEDA Loan; (b) Grantee shall hold the City harmless from any damage Grantee sustains as a result of funds for the Project being unavailable; and (c) the Mayor, City Councilmembers, and employees of the City of Marshalltown, and their immediate family members will not be paid for any work they perform on the Project through contracts with Grantee unless that work was contracted through a competitive bidding process.

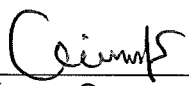
11. **EXECUTION.** When and if executed by both Grantee and the City, this Agreement shall become a binding contract.

WIN KYAW

CITY OF MARSHALLTOWN, IOWA,
an Iowa municipal corporation

Dated this 20 day of May 2020

Dated this ____ day of _____ 2020

By: 
Win Kyaw, Owner

By: _____
Joel Greer, Mayor

Attest: _____
Shari Coughenour, City Clerk

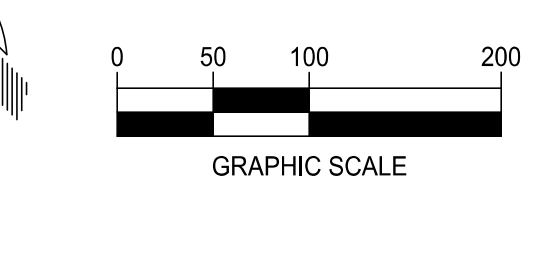
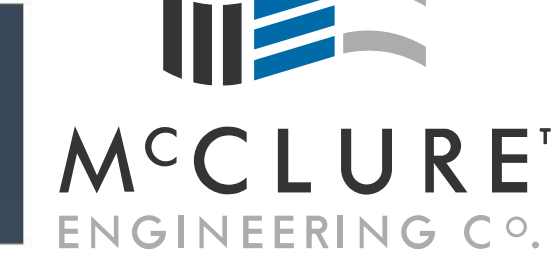
Address: 11 E State Street
Marshalltown IA 50158

Address: Marshalltown City Hall
24 N Center Street
Marshalltown, IA 50158

Telephone: (515) 664 - 9797

Telephone: (319) 646-2154

E. Merle Hibbs Blvd Extension East Extension
City of Marshalltown





RESOLUTION 2020- APPROVING PLANS, SPECIFICATIONS, FORM OF CONTRACT AND COST FOR THE EAST MERLE HIBBS EXTENSION PROJECT , PROJECT NO. ECO19001

WHEREAS there was placed on file in the office of the Clerk of the City of Marshalltown, Iowa, proposed plans and specifications, proposed form of contract and estimated cost for a public improvement in the City of Marshalltown, Iowa, for the EAST MERLE HIBBS EXTENSION Project No. ECO19001, as fully set forth in the resolution ordering same, and that public notice of hearing on such plans, specifications and form of contract were duly published in the Marshalltown Times-Republican in time for hearing now before the Council, and

WHEREAS written public comments to the plans, specifications and form of contract have been called for, as well as oral public comments being called for, and with consideration to the public comments, it is the decision of this Council that such plans, specifications, form of contract and estimate of cost should be approved.

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF MARSHALLTOWN, IOWA, that the plans, specifications, form of contract and estimated cost heretofore placed on file and upon which public notice has been duly given and no objections thereto have been made either in writing or in open council, the Council does now adopt and approve the plans, specifications, form of contract and estimate of cost for Project No ECO19001, being the EAST MERLE HIBBS EXTENSION PROJECT in the city of Marshalltown, Iowa.

Passed this 26th day of May 2020, and signed this _____ day of May 2020.

CITY OF MARSHALLTOWN

Joel Greer, Mayor

ATTEST:

Shari L. Coughenour, CMC, City Clerk

Affidavit of Publication

STATE OF IOWA,
Marshall County, ss.

City of Marshalltown
Notice of Public Hearing

I, Colleen Ward, being first duly sworn, on oath depose and say that Marshalltown Newspaper, LLC is a corporation for pecuniary profit organization under the law of the State of Iowa, with its principal place of business in Marshalltown, Iowa; that the "Times-Republican" is a daily newspaper of general circulation printed wholly in the English language and published by said corporation at the city of Marshalltown, in Marshall County, Iowa; that I am the Accounting Manager of said corporation and a full time employee of the said newspaper, and have personal knowledge of the facts stated herein; that the Notice hereto attached in the above entitled action was published in the regular daily edition of the said "Times-Republican" for:

One

consecutive weeks on the days and dates as follows, to-wit
April 18, 2020

Statutory fees for publishing said notice are:
17.36

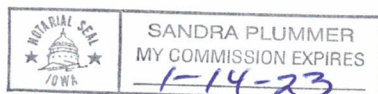
Colleen Ward

Sworn to before me and subscribed in my
presence by the said Colleen Ward, this
Twenty-fourth Day of April, 2020

Sandra Plummer

Sandra Plummer, Notary Public
Marshall County, Iowa
Commission No. 766297
Commission Expires January 14, 2020

Account No. and Account Name
D02000 City of Marshalltown





Joel Greer, Mayor
Jessica Kinser, Administrator
Justin Nickel, Public Works Director
24 North Center Street
Marshalltown, IA 50158-4911
Tel - (641) 754-5760
Fax - (641) 754-5781

DEPARTMENT OF PUBLIC WORKS

May 4, 2020

To: Mayor Joel Greer
Members of the City Council

From: Jay C. Koch
Civil Engineer II

Re: Order Construction – East Merle Hibbs Boulevard Extension, ECO19001.

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

Recommendation: Staff recommends approving the Resolution ordering construction of the E. Merle Hibbs Boulevard Extension project.

Background: The East Merle Hibbs Boulevard Extension has been in the works for the past year. This project is Phase 1 of a two phase project to extend East Merle Hibbs Boulevard to 12th Avenue. This portion of the project will extend East Merle Hibbs Boulevard from Walmart to the East to Anson Creek. The roadway will consist of a 45 foot roadway serving as a vital arterial roadway in the City of Marshalltown. The estimated costs for the Phase 1 extension is \$3.9 million. The work will start this year and the roadway is slated to be open by May 31st of 2021. All work on the site will be completed by November 30, 2021.

Budget Impact: This project will be funded with 2019 GO Bond revenues.

Attachment: None

cc: Jessica Kinser, City Administrator

City Council
Susan Cahill, Gary Thompson, Mike Gowdy,
Al Hoop, Gabriel Isom, Bill Martin, Bethany Wirin



DEVELOPMENT AGREEMENT

This Agreement is entered into between the City of Marshalltown, Iowa (the “City”) and Flint Hills Holdings (the “Developer”) as of the 25th day of May, 2020.

WHEREAS, the City has established the Marshalltown Urban Renewal Area No. 4 (the “Urban Renewal Area”), and has adopted a tax increment ordinance for the Urban Renewal Area; and

WHEREAS, the Developer owns certain real property which is situated in the City and in the Urban Renewal Area and is more specifically described as follows:

12 East State Street - South 137 feet, 11 inches of Lot 8, excluding the East 1 foot of the South 80 feet of Lot 8 & North 100 feet of Lot 9, Block 3 in the Town of Marshall
20 East State Street – Lot 10, Block 3, Original Town of Marshall
26 East State Street - Lot 11, Block 3, Original Town of Marshall
28 East State Street – The South 120 feet of Lot 12, Block 3, Original Town of Marshall
104 N 1st Avenue – The North 60 feet of Lot 12, Block 3, Original Town of Marshall
(the “Property”); and

WHEREAS, the Developer has proposed to undertake the development of a fifty-unit rental housing development (the “Housing Project”) on the Property, within which at least 90% of the units will be affordable to families of low and moderate income as defined in Iowa Code Section 403.17(14); and

WHEREAS, the Developer has requested that the City provide financial assistance in the form of incremental property tax payments to be used to reimburse the Developer for a portion of the costs of constructing the Project; 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. Developer’s Covenants

1. Housing Project Construction. The Developer agrees to construct the Housing Project on the Property. The Developer will submit a detailed site plan (the “Site Plan”) for the development of the Housing Project to the City which, upon approval by the City, shall be attached as Exhibit A hereto. The Developer agrees to construct the Housing Project in accordance with the Site Plan and to substantially complete such construction by no later than June 1, 2021.

2. Property Taxes. The Developer agrees to make, or make provision for, timely payment of all property taxes as they come due with respect to the Property and the completed Housing Project, throughout the term of this Agreement and to submit a receipt or

cancelled check to the City Clerk in evidence of each such payment. The Developer hereby acknowledges that the funding of Payments (as hereinafter defined in Section B.1) is contingent upon the full and timely payments of such property taxes as may from time to time become due and owing with respect to the Property

3. Default Provisions. 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:

- a) Failure by the Developer to complete construction of the Housing Project pursuant to the terms and conditions of this Agreement.
- b) Failure by the Developer to fully and timely remit payment of property taxes when due and owing during the term of this Agreement.
- c) A determination by the City that the Developer has failed to provide at least 90% of the units of the Housing Project at a rental level that is affordable to families of low and moderate income as defined in Iowa Code Section 403.17(14).

Whenever any Event of Default described in this Agreement occurs, the City shall provide written notice to the Developer describing the cause of the default and the steps that must be taken by the Developer in order to cure the default. The Developer 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 Developer fails to cure the default or provide assurances, City shall then have the right to:

- a) Pursue any action available to it, at law or in equity, in order to enforce the terms of this Agreement.
- b) Withhold the Payments under Section B.1 of this Agreement, such right being in addition to the right of annual appropriation as set forth in Section B.2 below.

B. City’s Obligations

1. Payments. In recognition of the Developer’s covenants set out above, the City agrees to make Payments to the Developer in each fiscal year during the term of this Agreement, pursuant to Chapters 15A and 403 of the Code of Iowa, provided, however that the aggregate, total amount of the Payments shall not exceed \$575,000, and all Payments shall be made subject to annual appropriation by the City Council as hereinafter set forth.

Payments will be made on December 1 and June 1 of each fiscal year, beginning on the first December 1 for which Incremental Property Tax Revenues (as hereinafter defined) become available with respect to the Property, and continuing for a total of fifteen fiscal years, or until Payments in the total amount of \$575,000 have been made. For example, if an increase in the incremental valuation of the Property is shown on the Marshall County tax rolls as of January 1, 2021, the first Payment could be made on December 1, 2022.

Each Payment shall be in an amount equal to 100% of the Incremental Property Tax Revenues received by the City with respect to the Property during the six (6) months immediately preceding each Payment date. “Incremental Property Tax Revenues” are produced

by multiplying the consolidated property tax levy (city, county, school, etc.) times the incremental valuation of the Property, then subtracting debt service levies of all taxing jurisdictions, subtracting the school district physical plant and equipment levy and instructional support levy and subtracting any other levies which may be exempted from such calculation by action of the Iowa General Assembly.

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 that are attributable to the Property.

2. Annual Appropriation. Each Payment shall be subject to a finding by the City Council that the Developer is in full compliance with each of the Developer's Covenants set out above, and each Payment shall be subject to annual appropriation by the City Council. Prior to November 15 of each year during the term of this Agreement, the City Council shall consider the question of obligating for appropriation to the funding of the Payments due in the next succeeding fiscal year, an amount of Incremental Property Tax Revenues to be collected in such following fiscal year equal to 100% of the City's estimate of the amount of Incremental Property Tax Revenues that could be collected in such year (the "Appropriated Amount"). Each such estimate shall be based on then current consolidated property tax levy and most recent incremental valuation of the Property.

To the extent the City Council decides to obligate funds for appropriation to the Payments, the City agrees to certify to the Marshall County Auditor by December 1 of each year during the term of this Agreement, an amount equal to the most recently determined Appropriated Amount.

In any given fiscal year, if the City Council determines to not obligate the then-considered Appropriated Amount, the City will be under no obligation to fund the Payments scheduled to become due in the following fiscal year, and the Developer will have no rights to compel the City to make such Payments or 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 more than thirty semi-annual Payments shall be made and total Payments shall not exceed \$575,000.

C. Administrative Provisions

1. Amendment and Assignment. This Agreement may not be amended or assigned by either party without the written consent of the other party. However, the City hereby gives its permission that the Developer's rights to receive the Payments hereunder may be assigned by the Developer 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. 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 Developer 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

FLINT HILLS HOLDINGS

By: _____

EXHIBIT A
SITE PLAN

HOLD HEARING ON AND APPROVE
AMENDED DEVELOPMENT
AGREEMENT AND TAX INCREMENT
PAYMENTS

(Flint Hills Holdings/Marshalltown Lofts)

422742-36

Marshalltown, Iowa

May 26, 2020

A meeting of the City Council of the City of Marshalltown, Iowa, was held at 5:30 o'clock p.m., on May 26, 2020 at the Council Chambers, Marshalltown, Iowa, pursuant to the rules of the Council and to published notice.

The Mayor presided and the roll was called, showing members present and absent as follows:

Present: _____

Absent: _____.

It was reported that notice of the intention of the Council to conduct a public hearing on an amendment to a Development Agreement between the City and Flint Hills Holdings, in connection with construction of a 50-unit multi-family housing development, which would increase certain property tax incentives in the form of annual appropriation, incremental property tax payments to a total amount not exceeding \$575,000, had been published according to law and as directed by the Council and that this is the time and place at which the Council shall receive oral or written objections from any resident or property owner of the City. All written objections, statements, and evidence heretofore filed were reported to the Council.

The following named persons presented oral objections, statements, or evidence; filed written objections or statements; or presented other exhibits:

(Here list all persons presenting written or oral statements or evidence and summarize each presentation.)

There being no further objections or comments, the Mayor announced that the hearing was closed.

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_____

Approving Amended Development Agreement with Flint Hills Holdings,
Authorizing Annual Appropriation Tax Increment Payments and Pledging Certain
Tax Increment Revenues to the Payment of the Agreement

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. 4 (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 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, on March 23, 2020, the City Council approved an agreement between the City and Flint Hills Holdings (the “Prior Agreement”), pursuant to which Flint Hills Holdings would construct a 50-unit multi-family housing development in the Urban Renewal Area (the “Marshalltown Lofts Project”) and the City would provide annual appropriation tax increment payments in a total amount not exceeding \$400,000; and

WHEREAS, Flint Hills Holdings has requested that the amount of payments be increased to \$575,000; and

WHEREAS, the City Council, pursuant to Section 403.9 of the Code of Iowa, has published notice, has held a public hearing on an amendment to the Agreement, has determined that the amendment to the Agreement is in compliance with the urban renewal plan for the Urban Renewal Area, and has otherwise complied with statutory requirements for the approval of the amendment to the Agreement; and

WHEREAS, an amended development agreement, dated as of May 26, 2020, has been prepared (the “Amended Development Agreement”); 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;

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 that:

(a) The Marshalltown Lofts Project will add diversity and generate new opportunities for the Marshalltown and Iowa economies;

(b) The Marshalltown Lofts Project will contribute to the revitalization of the Urban Renewal Area and will generate public gains and benefits, particularly in the creation of new jobs, and the expansion of housing opportunities, which are warranted in comparison to the amount of the proposed property tax incentives.

Section 2. The Council further finds that a public purpose will reasonably be accomplished by approving the Amended Development Agreement and providing the increased property tax payments to Flint Hills Holdings in an amount not to exceed \$575,000.

Section 3. The Prior Agreement is hereby terminated and the Amended Development Agreement is hereby approved and is substituted for the Prior Agreement. The Mayor and City Clerk are hereby authorized and directed to execute and deliver the Amended Development Agreement on behalf of the City, in substantially the form and content in which the Amended Development Agreement has been presented to this City Council, and 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 Development Agreement.

Section 4. All payments by the City under the Amended Development Agreement shall be subject to annual appropriation by the City Council, in the manner set out in the Amended Development Agreement. As provided and required by Chapter 403 of the Code of Iowa, the City's obligations under the Amended Development Agreement shall be payable solely from a subfund which is hereby 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 described as follows:

12 East State Street - South 137 feet, 11 inches of Lot 8, excluding the East 1 foot of the South 80 feet of Lot 8 & North 100 feet of Lot 9, Block 3 in the Town of Marshall
20 East State Street – Lot 10, Block 3, Original Town of Marshall
26 East State Street - Lot 11, Block 3, Original Town of Marshall
28 East State Street – The South 120 feet of Lot 12, Block 3, Original Town of Marshall
104 N 1st Avenue – The North 60 feet of Lot 12, Block 3, Original Town of Marshall
(the “Marshalltown Lofts Subfund”)

Section 5. The City hereby pledges to the payment of the Amended Development Agreement the Marshalltown Lofts 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 Amended Development Agreement unless and until monies from the Marshalltown Lofts 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 Marshalltown Lofts 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 May 26, 2020.

Mayor

Attest:

City Clerk

• • • • •

On motion and vote the meeting adjourned.

Mayor

Attest:

City Clerk

STATE OF IOWA
COUNTY OF MARSHALL SS:
CITY OF MARSHALLTOWN

I, the undersigned, Clerk of the City of Marshalltown, hereby certify that the foregoing is a true and correct copy of the minutes of the Council of the City relating to holding a public hearing and adopting a resolution to approve an Amended Development Agreement.

WITNESS MY HAND this _____ day of _____, 2020.

City Clerk

STATE OF IOWA

SS:

COUNTY OF MARSHALL

I, the undersigned, County Auditor of Marshall County, in the State of Iowa, do hereby certify that on the ____ day of _____, 2020, the City Clerk of the City of Marshalltown filed in my office a certified copy of a resolution of the City shown to have been adopted by the Council and approved by the Mayor thereof on May 26, 2020, entitled: "Resolution Approving Amended Development Agreement with Flint Hills Holdings, Authorizing Annual Appropriation Tax Increment Payments and Pledging Certain Tax Increment Revenues to the Payment of the Agreement", and that I have duly placed the copy of the resolution on file in my records.

WITNESS MY HAND this ____ day of _____, 2020.

County Auditor

May 20, 2020

Shari Coughenour
City Clerk/City Hall
24 North Center Street
Marshalltown, IA 50158

Re: Flint Hills Holdings/Marshalltown Lofts/Amended Development Agreement
File No. 422742-36

Dear Shari:

I have prepared proceedings covering the City Council's public hearing on May 26, 2020, related to the proposed Amended Development Agreement with Flint Hills Holdings, followed by a resolution approving the Amended Development Agreement and pledging incremental tax revenues. I have also prepared a new draft of the Amended Development Agreement.

A copy of the Resolution must be filed with the Marshall County Auditor.

We would appreciate receiving one fully executed copy of these proceedings and of the executed Development Agreement as soon as they are available.

Very truly yours,

Robert E. Josten

Cc by email: Jessica Kinser
Diana Steiner

ORDINANCE TO AMEND THE CODE OF ORDINANCES, CITY OF MARSHALLTOWN, IOWA
BY AMENDING CHAPTER 118, PEDDLERS AND SOLICITORS RELATING TO MOBILE
FACILITIES OR VEHICLES

BE IT ORDAINED BY THE COUNCIL OF THE CITY OF MARSHALLTOWN, IOWA:

Section 1. The Code of Ordinances, City of Marshalltown, Iowa is hereby amended by replacing the following section:

118.004 LICENSE APPLICATION.

A written application shall be filed with the City Clerk for a license under this subchapter unless exempted under § [118.003](#) of this chapter. Such application shall set forth the applicant's name; permanent and local address; business address, if any; local and permanent telephone number; physical description of the applicant; and recent photograph. The application also shall set forth the applicant's employer, if any, and the employer's address, telephone number, the nature of the applicant's business, the last three places of such business. An applicant for a license shall also provide a copy of a current Department of Criminal Investigations (DCI) background check. The application shall also set forth the locations of activities and the length of time requested to be covered by the license and be accompanied by current written permission from any property owner upon whose property a transient merchant will be operating, or whose property (including parking) will be affected by the transient merchant's operation. Transient merchants shall also provide recent photographs of all sides of the mobile facility or vehicle which accurately depicts the current condition of the facility or vehicle, and upon request shall make the facility or vehicle available for visual inspection by the Fire Marshal or their designee at a reasonably convenient location.

Section 2. The Code of Ordinances, City of Marshalltown, Iowa, is hereby amending by replacing the following section:

§ 118.010 PERMITTED MOBILE FACILITIES OR VEHICLES.

(A) Mobile vendors shall operate only from facilities or vehicles which are structurally sound, in good repair and appearance, with no visible rust or damage. Adequate waste disposal receptacles shall be conveniently provided for customer use. No waste or garbage shall be allowed to accumulate on the exterior of the facility or vehicle. All grease shall be disposed of lawfully. Electrical connections shall be outdoor rated with functioning ground fault interrupters (GFIs) and no extension cords shall cross any sidewalk or public access.

(B) Electrical connections across any sidewalk or public access shall be made by proper underground wiring method in compliance with the National Electric Code (NEC).

(C) Vendors shall be in compliance with Chapter 91, MARSHALLTOWN FIRE CODE, of the Marshalltown City Code.

Section 3. That this ordinance shall be in full force and effect after its passage and publication as by law.

Passed this ___ day of _____, 2020, and signed this ___ day of _____, 2020.

CITY OF MARSHALLTOWN, IOWA

Joel Greer, Mayor
ATTEST:

Shari L. Coughenour, CMC, City Clerk

I, Shari L. Coughenour, CMC, 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 _____, 2020, and was published in the Marshalltown Times-Republican, a newspaper of general circulation in the City of Marshalltown, Iowa, on the ___ day of _____, 2020.

Shari L. Coughenour, CMC, City Clerk

MARSHALLTOWN

— I O W A —

24 N Center Street
Marshalltown, IA 50158

May 19, 2020

To: Mayor, Members of the City Council and City Administrator

From: Shari L. Coughenour, CMC, City Clerk

Re: Ordinance modification for Transient merchant vehicle inspection

Policy Issue:

Recommendation:

Staff recommends changing two sections in Chapter 118 relating to inspection of transient merchant vehicles, relating to the recent changes in Chapter 91, Marshalltown Fire Code, of the Marshalltown City Code.

The change in Section 118.004 changes the visual inspection from the city clerk to the Fire Marshal, with Section 118.010 adding item C) to require compliance with Chapter 91. The Fire Marshal will determine compliance upon inspection.

Background:

Licenses are issued by the city clerk's office following review of completed application, which now also includes inspection by the Fire Marshal to ensure fire safety.

Budget Impact: none

Attachment: Ordinance

City of Marshalltown
24 N Center Street
Marshalltown, IA 50158

MARSHALLTOWN

— I O W A —

24 N Center Street
Marshalltown, IA 50158

May 22, 2020

To: Mayor, Members of the City Council and City Administrator

From: Shari L. Coughenour, CMC, City Clerk

Re: Ordinance modification, Chapter 72, PARKING RULES

Policy Issue:

Recommendation:

Staff recommend changing Section 72.999, PENALTY, for Parking Rules, to increase the base ticket fee by \$5.00.

PROPOSED PENALTY

<u>Ticket Type</u>	<u>Initial Penalty</u>	<u>Total Due after 30 days</u>
Alternate Parking	\$20.00	\$25.00
Front Yard	\$30.00	\$35.00
Fire Lane	\$30.00	\$35.00

<u>CURRENT PENALTY:</u>	<u>Initial Penalty</u>	<u>Total Due after 30 days</u>
Alternate Parking	\$15.00	\$25.00
Front Yard	\$25.00	\$35.00
Fire Lane	\$25.00	\$35.00

Background:

During our FY21 budget discussion in March, Council agreed to raise parking tickets. Tickets are generally issued by the code enforcement officer, but other police officers write them also

Budget Impact: Raising parking tickets by \$5 each was budgeted to generate an additional \$17,500 for the General Fund.

Attachment: Ordinance

City of Marshalltown
24 N Center Street
Marshalltown, IA 50158

**ORDINANCE TO AMEND THE CODE OF ORDINANCES, CITY OF MARSHALLTOWN, IOWA
BY AMENDING CHAPTER 72, PARKING RULES, RELATING TO PARKING PENALTY**

BE IT ORDAINED BY THE COUNCIL OF THE CITY OF MARSHALLTOWN, IOWA:

Section 1. The Code of Ordinances, City of Marshalltown, Iowa is hereby amended by replacing the following section:

72.999 PENALTY.

(A) (1) The penalty for violating any permit parking, overtime parking, no parking any time and restricted parking provisions shall be a fine of \$20 if paid within 30 days of the violation and, if not so paid within 30 days of the violation, the fine shall be \$25. The penalty for violating fire lane parking shall be a fine of \$30 if paid within 30 days; and, if not so paid within 30 days, the fine shall be \$35. Fines shall not be paid in pennies.

(2) Payment of the fines referred to in division (A)(1) above may be made by depositing the money in the envelope provided in the courtesy box, by paying same at the City Clerk's office, City Hall, or by mailing the fee in the envelope provided by depositing it in any proper U.S. mail box with sufficient U.S. postage affixed thereon.

(3) Each subsequent hour that the vehicle shall remain improperly parked after each summons is issued shall constitute a new and separate violation and shall incur the same penalty.

(4) If such penalty provided for in divisions (A)(1) and (A)(2) above is not paid as provided or if sufficient U.S. postage is not affixed when the citation is mailed such penalty shall be \$5.

(5) If any penalty set forth in this section is not so paid as provided in this section within ten days after such violation, the person, firm or corporation liable shall be chargeable upon an information filed in the appropriate court and shall be subject to such penalty under costs as the court shall determine.

(B) The fine for each violation in § [72.003](#) of this chapter shall be \$50, plus surcharges.

(C) Anyone violating the provisions of § [72.018](#) of this chapter shall be fined \$20, if paid within 30 days of the date of the violation. If not paid within 30 days the fine shall be \$25. Violations shall be charged and collected in the same manner as other parking violations, by notice of a fine payable to the City Clerk.

(D) (1) *Number of parked vehicles, 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 number of parked vehicles, composition, location and size of driveways and driveway extensions contained in §§ [72.038](#)(A), (B) and (C) and [72.039](#)(A)(1), (A)(2), (A)(3) and (A)(4) of 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. Each day that a violation occurs or is permitted to exist constitutes a separate offense, whether charged as a simple misdemeanor or municipal infraction.

(2) *Front, side and rear yard parking regulations.* Any person, corporation or legal entity who violates any of the regulations for parking or storing a motor vehicle or vehicle in the front, side or rear

yard of a residential lot contained in §§ [72.040](#)(A) and (B) and 72.041 of this chapter is subject to the following procedures.

(a) Any such violator may be issued a notice of violation and fine due and payable to the City Clerk. The fine for any such violation shall be \$30 if paid within 30 days of the date upon which the violation occurred, and \$35 if not paid within 30 days of the date upon which the violation occurred, due and payable to the City Clerk. Each day that a violation occurs or is permitted to exist constitutes a separate violation. Payment of any such fine may be made by depositing the money in the envelope provided in any courtesy box, by payment at the City Clerk's office in City Hall, or by mailing the money in the envelope provided by depositing it in the U.S. mail with sufficient U.S. postage affixed thereon. The City Clerk is not required to accept any coin in payment of any such fine.

(b) Any such violator may be charged either with a simple misdemeanor, which, upon conviction, is punishable pursuant to § [10.999](#)(A) of this chapter, 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, if any such violator either denies any violation contained in any notice of violation issued pursuant to division (E)(2)(a) above or fails to pay the fine provided in division (E)(2)(a) above and indicated in any notice of violation issued pursuant thereto within 30 days of the date upon which the violation occurred. Each day that a violation occurs or is permitted to exist constitutes a separate offense, whether charged under this division (E)(2)(b) as a simple misdemeanor or municipal infraction.

Section 2. That this ordinance shall be in full force and effect after its passage and publication as by law.

Passed this ___ day of _____, 2020, and signed this ___ day of _____, 2020.

CITY OF MARSHALLTOWN, IOWA

Joel Greer, Mayor

ATTEST:

Shari L. Coughenour, CMC, City Clerk

I, Shari L. Coughenour, CMC, 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 _____, 2020, and was published in the Marshalltown Times-Republican, a newspaper of general circulation in the City of Marshalltown, Iowa, on the ___ day of _____, 2020.

Shari L. Coughenour, CMC, City Clerk

MARSHALLTOWN

I O W A

Joel Greer, Mayor
Jessica Kinser, Administrator
Diana Steiner, Finance Director
24 North Center Street
Marshalltown, IA 50158-4911
Tel - (641) 754-5760
Fax - (641) 754-5781

FINANCE DEPARTMENT

May 20, 2020

To: Mayor Joel Greer
Members of the City Council

From: Diana Steiner, Finance Director

Re: FY21 General Fund Budget Update Due to Covid-19 Pandemic

Discussion: The Council adopted the FY2021 budget this past March for the fiscal year beginning July 1, 2020. Since then, the Covid-19 pandemic hit, which has caused a reduction in the City's revenues, specifically hotel/motel tax, local option sales tax, and road use tax. Other revenues could be affected as well, but we are making the following assumptions for General Fund revenues:

1. Property tax collections will be on target with what was budgeted.
2. Courts will be re-open again.
3. The library's fine collections will return upon reopening.
4. Park Shelter and Campground revenues will be on target.
5. No changes are being made at this time to the Summer Blast and Aquatic Center budgets pending further Council discussions.
6. Permits and rental registrations will be on target.
7. Parking tickets will be on target.
8. The General Fund will continue to have a transfer from the Road Use Tax Fund to support the Public Works department wages. The remaining RUT fund budget is on a separate Council agenda item for discussion.
9. For Hotel/Motel taxes, we had budgeted \$495,000 and now are projecting \$262,640. The payments we receive are 5-6 months behind from when hotel owners collect the tax. The chart below shows our historical collections and the assumptions we are now using for FY21. We projected the first quarterly payment to be similar to prior years, since it was for the hotel stays January-March. The second quarterly payment we estimated 36% of the average for FY17,18 & 20 (we did not include FY19 as collections were higher due to the tornado). Thirty-six percent was the approximate occupancy for a few motels that were contacted to estimate the April-June quarter. For the third and fourth quarter, we are estimating a 50% average.

City Council

Susan Cahill, Gary Thompson, Mike Gowdy,
Al Hoop, Gabriel Isom, Bill Martin, Bethany Wirin

Motel Collection Period:	Q3- Jan-Mar	Q4-Apr- Jun	Q1- Jul-Sept	Q2- Oct-Dec	Fiscal Year
Month paid in FY:	August	December	March	June	Total
2017	149,336.04	161,265.86	115,076.71	89,118.40	514,797.01
2018	114,114.98	116,309.62	93,266.32	79,718.60	403,409.52
2019	113,820.56	212,486.05	152,876.22	88,570.44	567,753.27
2020	113,626.80	140,897.75	142,405.76	77,500.00	474,430.31
2021	113,000.00	50,216.79	58,458.13	40,964.84	262,639.76
Assumptions for FY21:	Normal	36% of average	50% of average	50% of average	
3 Yr AVG (2018-2020)	113,854.11			81,929.68	
3 Yr AVG (2017,2018,2020)		139,491.08	116,916.26		
Tornado July 2018 (FY19)					

In order to account for 67% of hotel/motel tax revenues received to go to fund the Chamber of Commerce and to make the correction in the original adopted budget expense, this would leave a budget shortfall in the General Fund of \$124,249.

General Fund 001:	Adopted Budget	Change	Revised Budget
Revenues:			
Hotel/Motel Tax	\$ 495,000	\$ (232,360)	\$ 262,640
Expenses			
MCVB contract	\$ 284,080	\$ (108,111)	\$ 175,969
Revenue less expenditures	\$ 210,920	\$ (124,249)	\$ 86,671

In an effort to balance the budget, job positions that are now known to become vacant during FY21 due to retirements were re-evaluated and reclassified to a lower pay grade. The employee roster in January also did not account for the retirements of two tenured Police staff this current fiscal year. Total projected savings is \$127,835, which will cover the shortfall from Hotel/Motel tax of \$124,249.

City Clerk from paygrade 25 to 23			\$ 21,382
Parks Superintendent to Park Supervisor from paygrade 25 to 23 and left vacant Oct-Feb			\$ 41,313
Police Officer			\$ 20,471
Lieutenant			\$ 44,669
			\$ 127,835

We are not recommending any other adjustments to General Fund operations at this time. Staff will continue to look for other savings throughout the year and revenues will be projected more frequently. If new information comes to light about lower projected revenues, the Council will be informed.

City Council

Susan Cahill, Gary Thompson, Mike Gowdy,
Al Hoop, Gabriel Isom, Bill Martin, Bethany Wirin

Attachment: N/A

cc: Jessica Kinser, City Administrator

City Council
Susan Cahill, Gary Thompson, Mike Gowdy,
Al Hoop, Gabriel Isom, Bill Martin, Bethany Wirin

MARSHALLTOWN

— I O W A —

City Administrator's Office

Joel Greer, Mayor
Jessica Kinser, Administrator
Shari L. Coughenour, Clerk
24 North Center Street
Marshalltown, IA 50158-4911
Tel - (641) 754-5799
Fax - (641) 754-5717

To: Mayor Greer and the City Council
From: Jessica Kinser, City Administrator
Date: May 18, 2020
RE: FY21 Road Use Tax Reductions

The State of Iowa has advised that Road Use Tax revenues, which are shared between the State, counties, and cities, have been impacted by COVID-19, as vehicle traffic dropped by 50 percent during March and April. This necessitated a look at the fiscal year 2021 Road Use Tax budget, which was adopted by the City Council on March 23rd.

At this time, the DOT is estimating a 25% reduction. We had budgeted \$3.6 million in revenue for FY21, which is a loss of \$900,000. Fortunately, we had put together a capital improvement plan (CIP) in the Road Use Tax Fund to use fund balance over the next 4 years in order to advance street projects and equipment purchases. Therefore, the CIP can be reduced, and annual operating expenses do not need to be reduced.

Attached with this memo is the original CIP adopted and a revised CIP with some notes. Staff was able to remove nearly \$420,000 from the CIP in the next fiscal year, and believes additional changes can/will be made based upon future decisions related to two projects:

- Railroad Crossing Safety Improvements- if the Council does not move forward with borrowing \$600,000, there will be no use of the \$400,000 in the CIP.
- LOST-Capital- much of the LOST-Capital funding was pledged to the Edgewood Extension project. We removed the amount to come from RUTF, and if an EDA grant is received, we can likely reduce what is needed from LOST-Capital and apply part of the cost of Washington Street to that funding source.

Also because we were proposing the use of fund balance in years beyond fiscal year 2021, we do have the ability to see what the revenue from the State looks like before making adjustments to future years. At this time, staff is recommending the changes noted on the attachment with additional to occur as other decisions are made which have a direct impact on projects.

City Council
Susan Cahill, Michael Gowdy, Al Hoop,
Gabriel Isom, Bill Martin, Gary Thompson, Bethany Wirin



City of Marshalltown, Iowa
City Capital Plan Equipment Replacment
 FY '20 thru FY '24

SOURCES AND USES OF FUNDS

Source		FY '20	FY '21	FY '22	FY '23	FY '24
110 - ROAD USE TAX \$						
Beginning Balance		0	0	(400,000)	(400,000)	(400,000)
<u>Revenues and Other Fund Sources</u>						
<i>ROAD USE TAX</i>						
4320.040 ROAD USE TAXES		1,702,981	3,336,468	2,285,000	1,508,000	1,500,000
<i>Total</i>		1,702,981	3,336,468	2,285,000	1,508,000	1,500,000
Total Revenues and Other Fund Sources		1,702,981	3,336,468	2,285,000	1,508,000	1,500,000
Total Funds Available		1,702,981	3,336,468	1,885,000	1,108,000	1,100,000
<u>Expenditures and Uses</u>						
<i>Capital Projects & Equipment</i>						
<u>ENGINEERING</u>						
Field Laptops	3504	0	0	(9,000)	0	0
Scanner & Plotter	E2181	0	0	0	0	(10,000)
Replace Server and Software	E2184	(16,592)	0	0	0	0
Railroad Crossing Safety Improvements	RR2018	0	(400,000)	0	0	0
New GPS Unit	SE003	0	0	0	0	(35,000)
New Total Station	SE0047	0	0	0	(33,000)	0
<i>Total</i>		(16,592)	(400,000)	(9,000)	(33,000)	(45,000)
<u>PARK & RECREATION</u>						
City Hall/Coliseum Alley Rec Space	21CoAlley	0	(50,000)	0	0	0
Replace Mower and Snow Equipment	21PR728	0	(12,500)	0	0	0
Replace Tractor Mower 713	22PR004	0	0	(14,000)	0	0
Replace Mower 714 w/Snow Equipment	24PR004	0	0	0	0	(15,000)
<i>Total</i>		0	(62,500)	(14,000)	0	(15,000)
<u>PUBLIC WORKS</u>						
Median Improvements- Hwy 14 Olive to La Frenz	2019DOTHWY14	(232,150)	(375,000)	(375,000)	0	0
South Center St. Viaduct	BR035410	0	0	(300,000)	(300,000)	0
Edgewood Extension	CY20EdgExt	0	(152,668)	0	0	0
East Merle Hibbs- Phase 1 Extension	EMHPH1	0	(250,000)	0	0	0
Mill and Overlay of Streets with Tornado Impact	FEMA1	0	(887,300)	0	0	0
Annual Street Resurfacing	M3170	(350,000)	(350,000)	(350,000)	(350,000)	(350,000)
City-wide Bridge Repair	M3453	(90,000)	(45,000)	(45,000)	(45,000)	(45,000)
Concrete Repairs	M3458	(200,000)	(200,000)	(200,000)	(200,000)	(200,000)
Annual ADA Curb Ramp Construction	M3655	(50,000)	(50,000)	(50,000)	(50,000)	(50,000)

Source		FY '20	FY '21	FY '22	FY '23	FY '24
110 - ROAD USE TAX \$						
Downtown Alley Improvements	MCBDAlley	0	(150,000)	0	0	0
Downtown Street Light Replacement	MCBDStLt	0	(250,000)	0	0	0
<i>Total</i>		(922,150)	(2,709,968)	(1,320,000)	(945,000)	(645,000)
<u>STREET</u>						
Dump Truck	E3510	(348,504)	(300,000)	(300,000)	(300,000)	(300,000)
Street Sweeper	E3520	(204,280)	0	0	0	(220,000)
Track Skidloader with Clam Bucket	E3540	0	(90,000)	0	0	0
Self Propelled Paint Striper	E3550	0	0	(100,000)	0	0
Snow Blower	E3900	0	0	(200,000)	0	0
Slide in oil distributor	E3940	0	(40,000)	0	0	0
Skid steer trailer	T001	0	(10,000)	0	0	0
END LOADER	V2323	0	0	0	(230,000)	0
3/4 Ton Pickup	V3500	(35,000)	(35,000)	(35,000)	0	0
1 Ton Pickup with Utility Box	V3501	(123,455)	0	0	0	0
1 Ton Truck with Dump Body	V3502	0	(40,000)	0	0	0
Motor Grader	V3503	0	0	(300,000)	0	(275,000)
Asphalt Hot Box	V3505	(32,000)	0	0	0	0
<i>Total</i>		(743,239)	(515,000)	(935,000)	(530,000)	(795,000)
<u>UTILITY</u>						
LED Traffic Light Replacement	E3704	0	(10,000)	0	0	0
Replace Traffic Controllers	E3706	(15,000)	0	0	0	0
Traffic Signal Battery Back Ups	E3708	(6,000)	(7,000)	(7,000)	0	0
PICKUP	V2203	0	(32,000)	0	0	0
<i>Total</i>		(21,000)	(49,000)	(7,000)	0	0
Total Expenditures and Uses		(1,702,981)	(3,736,468)	(2,285,000)	(1,508,000)	(1,500,000)
Change in Fund Balance		0	(400,000)	0	0	0
Ending Balance		0	(400,000)	(400,000)	(400,000)	(400,000)

**REVISED
FY21 CIP
Road Use Tax Fund**

	FY '20	FY '21	FY '22	FY '23	FY '24	
ENGINEERING						
Field Laptops	0	0	(9,000)	0	0	This cost will only be incurred if the Council borrows \$600k for project
Scanner & Plotter	0	0	0	0	(10,000)	
Replace Server and Software	(16,592)	0	0	0	0	
Railroad Crossing Safety Improvements	0	(400,000)	0	0	0	
New GPS Unit	0	0	0	0	(35,000)	
New Total Station	0	0	0	(33,000)	0	
PARK & REC						
City Hall/Coliseum Alley Rec Space	0	(25,000)	0	0	0	Estimate reduced based on initial quotes
Replace Mower and Snow Equipment	0	(12,500)	0	0	0	
Replace Tractor Mower 713	0	0	(14,000)	0	0	
Replace Mower 714 w/Snow Equipment	0	0	0	0	(15,000)	
PUBLIC WORKS						
Washington Street		(700,000)				Costs updated to reflect actual bids; Washington St. could come from LOST-capital if EDA grant received. Edgewood and EMH removed based on budget changes.
Median Improvements- Hwy 14 Olive to La		(232,150)	(375,000)	(375,000)		
South Center St. Viaduct	0	0	(300,000)	(300,000)	0	
Edgewood Extension	0	0	0	0	0	
East Merle Hibbs- Phase 1 Extension	0	0	0	0	0	
Mill and Overlay of Streets with Tornado	0	(1,242,270)	0	0	0	
Annual Street Resurfacing	(350,000)	0	(350,000)	(350,000)	(350,000)	
City-wide Bridge Repair	0	(138,000)	(45,000)	(45,000)	(45,000)	
Concrete Repairs	(150,000)	(200,000)	(200,000)	(200,000)	(200,000)	
Annual ADA Curb Ramp Construction	(50,000)	0	(50,000)	(50,000)	(50,000)	
Downtown Alley Improvements	0	(50,000)	0	0	0	
Downtown Street Light Replacement	0	(441,048)	0	0	0	
STREET						
Dump Truck	(348,504)	(150,000)	(150,000)	(300,000)	(300,000)	Dump truck purchase reduced to 1/year for 2 years
Street Sweeper	(204,280)	0	0	0	(220,000)	
Track Skidloader with Clam Bucket	0	(90,000)	0	0	0	
Self Propelled Paint Striper	0	0	(100,000)	0	0	
Snow Blower	0	0	(200,000)	0	0	
Slide in oil distributor	0	(40,000)	0	0	0	
Skid steer trailer	0	(10,000)	0	0	0	
END LOADER	0	0	0	(230,000)	0	
3/4 Ton Pickup	(28,785)	(28,785)	(35,000)	0	0	
1 Ton Pickup with Utility Box	(123,455)	0	0	0	0	
1 Ton Truck with Dump Body	0	(40,000)	0	0	0	
Motor Grader	0	0	(300,000)	0	(275,000)	
Asphalt Hot Box	(33,000)	0	0	0	0	
UTILITY						
LED Traffic Light Replacement	0	(10,000)	0	0	0	
Replace Traffic Controllers	(15,000)	0	0	0	0	
Traffic Signal Battery Back Ups	(6,000)	(7,000)	(7,000)	0	0	
PICKUP	0	(32,000)	0	0	0	
TOTAL	(1,325,616)	(3,848,753)	(2,135,000)	(1,883,000)	(1,500,000)	
BUDGETED Expenditures	(1,702,981)	(3,736,468)	(2,285,000)	(1,508,000)	(1,500,000)	
DIFFERENCE	377,365	(112,285)	150,000	REDUCTION TARGET= \$900,000 Reduced \$415,080		

MARSHALLTOWN

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Diana Steiner, Finance Director
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FINANCE DEPARTMENT

May 20, 2020

To: Mayor Joel Greer
Members of the City Council

From: Diana Steiner, Finance Director

Re: FY21 Local Option Sales Tax (L.O.S.T.) Budget Update Due to Covid-19 Pandemic

Discussion: The Council adopted the FY2021 budget this past March for the fiscal year beginning July 1, 2020. Since then, the Covid-19 pandemic hit, which has caused a reduction in the City's revenues. Staff would like to specifically discuss local option sales tax on this agenda item. Despite efforts made to contact the State to get some kind of estimates, they have not been able to provide any to date. Therefore, the discussion we will have today will reflect a 50% reduction in revenues.

I have updated the attached document to reflect the funding of projects approved by Council since the budget documents were approved in March as well as increasing interest income for FY20 for revenues earned to date. For FY21, I reduced the L.O.S.T. revenue and interest by 50%. As you know, 78% of L.O.S.T. is used for property tax relief, which is used to pay bond debt and 22% is for Council Designated projects.

1. With a 50% reduction in revenues, there will be a shortage of approximately \$709,478 to pay the bond debt if just using L.O.S.T. revenues designated for property tax relief.
 - a. Do you want to allocate Council designated funds to cover the debt payments?
 - b. Do you want to use cash reserve funds? The balance at the end of FY20 is estimated to be \$2.38 million. To use these cash reserve funds, Council would need to publish a notice of the proposed uses and hold a public hearing.
2. In FY21, we budgeted a transfer of \$60,314 to the Cash Flow Reserve Fund. This brought the Reserve up to 15% of the General Fund 001 expenses. Again, if we would need to access any of the reserve funds, Council must publish a notice of the proposed uses and hold a public hearing.

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3. During the budget process, the Council allocated \$61,778 to the General Fund to offset a deficit. The deficit was related to two areas: \$40,000 to support McTV and \$21,778 in a general deficit.
 - a. Does the Council want to continue financial support of McTV with LOST?
 - b. Does the Council want to continue to fill the general deficit in the General Fund with LOST?
4. \$250,000 was budgeted for the downtown new construction incentive in FY20. Only four \$50,000 grants have been made. Do you want to eliminate the remaining \$50,000? There are no known projects at this time that are qualifying and moving forward this year.

Attachment: LOST detail updated May 2020

cc: Jessica Kinser, City Administrator

City Council

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Local Option Sales Tax (LOST) BALANCES
Updated May 2020

	LOST- Prop. Tax Relief	LOST- Council Designated	LOST- Capital Projects	TOTAL
Fund balance 6/30/2019	565,982	1,059,653	2,116,022	3,741,656
Budgeted Revenues (78% Relief, 22% Council)	3,120,000	880,000	-	4,000,000
Interest on Investments (actual allocation may be different)	21,337	31,550	46,092	98,979
Sub-Total Revenues	3,141,337	911,550	46,092	4,098,979
Buy down property tax levy-current revenues (rate 15.94247)	(2,418,000)			(2,418,000)
Buy down property tax levy-fund bal (rate \$15.50713)	(390,000)			(390,000)
Buy down property tax levy- (rate \$15.38434)	(110,000)	-		(110,000)
ADA Transition Plan \$121,000 split between FY19 & FY20		(103,913)		(103,913)
Transfer to Fund 340 - Bike Trail Engineering & Design FY19 \$8401.50: \$65,000		(56,599)		(56,599)
Transfer to Cash Flow Reserve Fund so fund balance at 15% of exp (approved \$50K)		(17,227)		(17,227)
Grant application NEA Art Master Plan for Trails \$5K Transfer to Fund 132		(5,000)		(5,000)
Airport Hangar design to fund 312.2080		(6,200)		(6,200)
Airport Terminal design to fund 312.2080		(54,100)		(54,100)
Downtown New Construction Incentive (\$50K undesignated)		(250,000)		(250,000)
Bolton & Menk: Downtown Design Guidelines Resolution 2019-313		(20,940)		(20,940)
Transfer to Fund 357 CY18 Street Projects (CIP) \$265K S 3rd & 6th St Microsurfacing			(37,792)	(37,792)
Bolton & Menk platting of 74 acres N. of Marion Street			(44,800)	(44,800)
Edgewood Extension (part in FY20 & part in FY21)			(109,750)	(109,750)
Appraisal for properties adjacent to Edgewood Street (Remainder RUT)			(4,450)	(4,450)
Fireworks		(5,000)		(5,000)
Sidewalk Improvement citizen reimbursemet (2020-076)		(50,000)		(50,000)
50% share of Housing Initiative Contract with Chamber		(24,700)		(24,700)
Total Re-estimated Budgeted Expenses	(2,918,000)	(593,679)	(196,792)	(3,708,471)
Projected Fund balance 6/30/2020	789,319	1,377,524	1,965,321	4,132,165
Budgeted Revenues (78% Relief, 22% Council) 50% reduction	1,326,000	374,000	-	1,700,000
Interest on Investments (actual allocation may be different) 50% reduction	1,000	5,000	10,000	16,000
Sub-Total Revenues	1,327,000	379,000	10,000	1,716,000
Buy down property tax levy-current revenues	(2,652,000)			(2,652,000)
Buy down property tax levy-fund bal (per 2/3/20 Council meeting)	(173,797)			(173,797)
Cash Flow reserve 15%		(60,314)		(60,314)
Transfer to General Fund 001 to balance		(61,778)		(61,778)
Edgewood Extension (part in FY20 & part in FY21)			(1,975,321)	(1,975,321)
FEMA tornado costs 15% city-share (doesn't include Cat C-street)		(120,000)		(120,000)
Total Re-estimated Budgeted Expenses	(2,825,797)	(242,092)	(1,975,321)	(5,043,210)
Projected Fund balance 6/30/2021	(709,478)	1,514,432	0	804,955

MARSHALLTOWN

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To: Mayor Greer and the City Council
From: Jessica Kinser, City Administrator
Date: May 22, 2020
RE: FY21 Bonding Review

Attached with this memo you will find a schedule proposed by Speer Financial for proceeding with a debt issuance after July 1, 2020, for fiscal year 2021. Knowing that we have time before actions will come before you, we thought this would be a good opportunity to bring forward the items that were included in the fiscal year 2021 budget, with updated items. We have seen scopes and costs change as we have started to move into the refinement phase and wanted to keep you posted.

The paragraphs below are a quick refresher on each project along with updated information about cost. This is followed by a table with all projects listed together showing the total revised borrowing should you wish to keep things as they were with the cost changes.

FIRE TRUCKS

The original bonding amount for the purchase of 2 fire trucks was \$810,000. This figure double-counted some revenue, on the total cost of \$1.6 million. The actual amount needed in bond funds is \$1,100,000 for both trucks. Other sources of revenue include an estimated \$130,000 for the trade-in of both vehicles and use of \$425,000 in fund 032, which has been accumulating to pay for this larger purchase. If the Council does not wish to borrow the \$1.1 million, there are a few different options. First, the Council could proceed with purchasing the ladder truck only, which would equate to a \$565,000 bond. The second option would be to purchase the two trucks but only pay for the ladder truck up-front. This would still require the \$565,000 to be borrowed now, and would require a bond in early fiscal year 2021 of approximately \$665,000 for the pumper.

AIRPORT HANGAR/TERMINAL/VAULT

The Council discussed accepting a contract with a base bid on this item earlier on the agenda. The overall recommendation is to borrow \$2 million to provide some contingency for the project in addition to the base bid and any alternates selected.

LIBRARY ADDITION

COVID-19 has halted any fundraising for the addition to the Library, so in consultation with the Library Director, we do not see a need for the \$500,000 to be borrowed in fiscal year 2021. The project will continue to be reviewed by the Library Board with recommendations coming forward for a future fiscal year.

TRAIL REPLACEMENT

The scope of this project has not been developed but will address pavement repair and replacement along areas of the Linn Creek Trail which are hazardous and have significant condition issues.

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SOFTBALL COMPLEX PARKING LOT

This project was for the paving of the west half of the parking lot at the MSA complex on South 6th Street. The cost estimate has increased to \$750,000 for replacement of the entire parking lot, with the proposed recommended borrowing from \$250,000 to \$375,000. This project is proposed to occur in Spring 2021.

TENNIS COURT RECONSTRUCTION

Since the budget adoption, the Council has signed an agreement with the Marshalltown Community School District for \$684,000 for the project, which the MCSD is moving forward with. Funds are needed in the first half of the fiscal year.

DOWNTOWN STREETS & SIDEWALKS

The FY21 part of this project is for a consultant to cover multiple priority recommendations from the Downtown Master Plan including a formal assessment of the one-to-two way conversion of Church and Linn Streets, angled parking along Main Street, and streetscaping/street trees. In addition, we will be asking the consultant to analyze redevelopment efforts to propose sidewalk and street replacement schedules and cost estimates. Based on a more defined scope, we have reduced this bonding request from \$200,000 to \$100,000. If any street, sidewalk or streetscaping projects are to occur in FY22, there will be additional engineering fees to develop the plans and specifications for a selected area.

RAILROAD CROSSING SAFETY IMPROVEMENTS

The total cost of the project is \$1 million, with \$600,000 to be borrowed for improvements Union Pacific would need to make at each crossing, and the remaining \$400,000 coming from the Road Use Tax Fund to make street, median, curb, and sidewalk improvements necessary. The initial planning with the Union Pacific requires a \$25,000 fee so no initial level planning has been done outside of the estimate from 2018 by Bolton & Menk.

4TH STREET/MEADOW LANE STORM SEWER

This is the final phase of the storm sewer project which originated with work done by the Police and Fire Building. The cost has increased nearly \$1 million from the estimated \$2.65 million to a new cost of \$3.5 million. At \$3,500,000, a full mill and overlay of the 4th Street (versus only half of the street getting a mill and overlay) along with select sidewalk and curb and gutter replacement are included. If the Council would want to limit the borrowing \$2.65 million, the project quantities can be separated into phases, and another phase can be initiated if the Council wished to do so. The Council could set any budget between \$2.65-3.5 million and various options for completing the project could be reviewed. As a reminder, this counts against the City's debt capacity, but will be repaid from the Stormwater Fund and not the tax levy.

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Fund	Project	<u>FY2021</u> <u>Original</u>	<u>FY2021</u> <u>Revised</u>
32	Fire Trucks	810,000	1,100,000
	Ladder Truck Only - \$565,000		
312	Airport Hangar/Terminal	1,725,000	2,000,000
353	Library Addition	500,000	-
353	Trail Replacement Project	250,000	250,000
353	Softball Complex Parking Lot	250,000	375,000
353	Tennis Court Reconstruction	684,000	684,000
353	Downtown Streets and Sidewalks	200,000	100,000
353	RR Crossing Safety Improvements	600,000	600,000
740	4th/Meadow Lane Storm Sewer	2,650,000	3,500,000
	TOTAL	7,669,000	8,609,000
	Debt Capacity Available		8,900,345

At this time, we are seeking direction on changes to be made to projects based on the amount to be borrowed (or not borrowed). This will help determine what staff should work on in the near future as well as what we need to communicate with our financial agent on our next bond. Two projects, Trail and Softball Parking Lot, are the only two projects that would start in 2021. However, given the dollar amount of those two projects combined, we are recommending the Council proceed with all borrowing for this fiscal year with the proposed borrowing to happen this fall.

CITY OF MARSHALLTOWN, IOWA
BOND ISSUANCE TIMELINE

\$_____ General Obligation Corporate Purpose Bonds, Series 2020

July 13, 2020	SET DATE OF PUBLIC HEARING – NTE \$_____ Resolution provided by Bond Counsel
July 27, 2020	HOLD PUBLIC HEARING APPROVE THE PRELIMINARY OFFICIAL STATEMENT Resolution provided by Bond Counsel
Week of July 27, 2020	RATINGS CALL Participants Needed: City Administrator, Finance Director
August 10, 2020	BOND SALE AND AWARD Resolution provided by Bond Counsel (Speer plans to attend this meeting)
August 24, 2020	AUTHORIZING/ISSUANCE PROCEEDINGS Resolution provided by Bond Counsel
September 8, 2020	BOND CLOSING Day that City will receive Bond Proceeds (No meeting required)

MARSHALLTOWN

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FINANCE DEPARTMENT

May 22, 2020

To: Mayor Joel Greer
Members of the City Council

From: Diana Steiner, Finance Director

Re: Refunding of GO Corporate Purpose Bonds Series 2011B

Discussion: Since interest rates have dropped and if we are going to bond new projects in calendar year 2020, staff recommend refunding the 2011B GO Bond. The original bonds were for \$2,380,000 to be used for street improvements. The current principal amount is \$1,235,000. Speer Financial has run preliminary numbers and the City could save approximately \$24,000 assuming an effective interest rate of 1.75%. The outstanding balance is currently being repaid by 58% of the property tax levy and 42% of TIF #4. The refunded bond payments will be kept on the existing schedule with the final payment due June 2027.

Would the Council like to include this refunding on any future bond issuances?

Budget Impact: Savings of approximately \$24,000.

Attachment: Speer Financial Analysis of Refunding Bonds Series 2011B

cc: Jessica Kinser, City Administrator

City Council
Susan Cahill, Gary Thompson, Mike Gowdy,
Al Hoop, Gabriel Isom, Bill Martin, Bethany Wirin

City of Marshalltown, Marshall County, Iowa

\$1,260,000 General Obligation Corporate Purpose Refunding Bonds, Series 2020B

****PRELIMINARY - SUBJECT TO CHANGE****

Sources & Uses

Dated 09/08/2020 | Delivered 09/08/2020

Sources Of Funds

Par Amount of Bonds	\$1,260,000.00
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Total Sources	\$1,260,000.00
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Uses Of Funds

Total Underwriter's Discount (0.800%)	10,080.00
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Costs of Issuance	5,000.00
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Deposit to Current Refunding Fund	1,243,515.28
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Rounding Amount	1,404.72
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Total Uses	\$1,260,000.00
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City of Marshalltown, Marshall County, Iowa

\$2,380,000 General Obligation Corporate Purpose Bonds, Series 2011B

****Final** Refunding**

Total Refunded Debt Service

Date	Principal	Coupon	Interest	Total P+I	Fiscal Total
12/01/2020	-	-	15,327.50	15,327.50	-
06/01/2021	160,000.00	2.050%	15,327.50	175,327.50	190,655.00
12/01/2021	-	-	13,687.50	13,687.50	-
06/01/2022	165,000.00	2.200%	13,687.50	178,687.50	192,375.00
12/01/2022	-	-	11,872.50	11,872.50	-
06/01/2023	170,000.00	2.350%	11,872.50	181,872.50	193,745.00
12/01/2023	-	-	9,875.00	9,875.00	-
06/01/2024	175,000.00	2.450%	9,875.00	184,875.00	194,750.00
12/01/2024	-	-	7,731.25	7,731.25	-
06/01/2025	180,000.00	2.600%	7,731.25	187,731.25	195,462.50
12/01/2025	-	-	5,391.25	5,391.25	-
06/01/2026	190,000.00	2.750%	5,391.25	195,391.25	200,782.50
12/01/2026	-	-	2,778.75	2,778.75	-
06/01/2027	195,000.00	2.850%	2,778.75	197,778.75	200,557.50
Total	\$1,235,000.00	-	\$133,327.50	\$1,368,327.50	-

City of Marshalltown, Marshall County, Iowa

\$1,260,000 General Obligation Corporate Purpose Refunding Bonds, Series 2020B

****PRELIMINARY - SUBJECT TO CHANGE****

Escrow Summary Cost

Date	Principal	Coupon	Interest	Total P+I	Fiscal Total
09/08/2020	-	-	-	-	-
12/01/2020	-	-	5,083.75	5,083.75	-
06/01/2021	170,000.00	1.750%	11,025.00	181,025.00	186,108.75
12/01/2021	-	-	9,537.50	9,537.50	-
06/01/2022	170,000.00	1.750%	9,537.50	179,537.50	189,075.00
12/01/2022	-	-	8,050.00	8,050.00	-
06/01/2023	175,000.00	1.750%	8,050.00	183,050.00	191,100.00
12/01/2023	-	-	6,518.75	6,518.75	-
06/01/2024	180,000.00	1.750%	6,518.75	186,518.75	193,037.50
12/01/2024	-	-	4,943.75	4,943.75	-
06/01/2025	180,000.00	1.750%	4,943.75	184,943.75	189,887.50
12/01/2025	-	-	3,368.75	3,368.75	-
06/01/2026	190,000.00	1.750%	3,368.75	193,368.75	196,737.50
12/01/2026	-	-	1,706.25	1,706.25	-
06/01/2027	195,000.00	1.750%	1,706.25	196,706.25	198,412.50
Total	\$1,260,000.00	-	\$84,358.75	\$1,344,358.75	-

Yield Statistics

Bond Year Dollars	\$4,820.50
Average Life	3.826 Years
Average Coupon	1.7500000%
Net Interest Cost (NIC)	1.9591069%
True Interest Cost (TIC)	1.9705978%
Bond Yield for Arbitrage Purposes	1.7502583%
All Inclusive Cost (AIC)	2.0808412%

IRS Form 8038

Net Interest Cost	1.7500000%
Weighted Average Maturity	3.826 Years

City of Marshalltown, Marshall County, Iowa

\$1,260,000 General Obligation Corporate Purpose Refunding Bonds, Series 2020B

****PRELIMINARY - SUBJECT TO CHANGE****

Debt Service Comparison

Date	Total P+I	Net New D/S	Old Net D/S	Savings	Fiscal Total
09/08/2020	-	-	-	-	-
12/01/2020	5,083.75	5,083.75	15,327.50	10,243.75	-
06/01/2021	181,025.00	181,025.00	175,327.50	(5,697.50)	4,546.25
12/01/2021	9,537.50	9,537.50	13,687.50	4,150.00	-
06/01/2022	179,537.50	179,537.50	178,687.50	(850.00)	3,300.00
12/01/2022	8,050.00	8,050.00	11,872.50	3,822.50	-
06/01/2023	183,050.00	183,050.00	181,872.50	(1,177.50)	2,645.00
12/01/2023	6,518.75	6,518.75	9,875.00	3,356.25	-
06/01/2024	186,518.75	186,518.75	184,875.00	(1,643.75)	1,712.50
12/01/2024	4,943.75	4,943.75	7,731.25	2,787.50	-
06/01/2025	184,943.75	184,943.75	187,731.25	2,787.50	5,575.00
12/01/2025	3,368.75	3,368.75	5,391.25	2,022.50	-
06/01/2026	193,368.75	193,368.75	195,391.25	2,022.50	4,045.00
12/01/2026	1,706.25	1,706.25	2,778.75	1,072.50	-
06/01/2027	196,706.25	196,706.25	197,778.75	1,072.50	2,145.00
Total	\$1,344,358.75	\$1,344,358.75	\$1,368,327.50	\$23,968.75	-

PV Analysis Summary (Net to Net)

Gross PV Debt Service Savings	22,531.47
Net PV Cashflow Savings @ 2.081%(AIC)	22,531.47
Contingency or Rounding Amount	1,404.72
Net Present Value Benefit	\$23,936.19
Net PV Benefit / \$1,235,000 Refunded Principal	1.938%
Net PV Benefit / \$1,260,000 Refunding Principal	1.900%

Refunding Bond Information

Refunding Dated Date	9/08/2020
Refunding Delivery Date	9/08/2020

MARSHALLTOWN

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To: Mayor Greer and the City Council
From: Geoff Hubbard, Parks & Recreation Director
Date: May 22, 2020
RE: Coliseum Update on Change Orders and Future Expenses

Construction on the Coliseum began last December and significant work has been completed to date. The project is scheduled to be completed at the end of 2020. To date there have been 16 change orders that have been approved by Council. Staff has been working with the consulting engineering firm CPML to look at future change orders that could come before the Council. There are still many unknowns with this project but we feel the change orders are slowing down and in expense. During the demolition of the inside of the Coliseum several items were uncovered that need to be address before construction can begin. There were also some items not address in the plans by the architects/engineers that have now been addressed so changes in the plans are needed to complete the project. Here is a breakdown of each Change Order and the costs that have occurred to date.

- COR-01 – Add - \$7,494.84 - Remove gypcrete from scope add Homasote sound barrier – due to 2nd floor flex space elevations being uneven would not allow gypcrete to be installed.
- COR-02 – Add - \$5,143.06 – This change order deals with openings and the ceiling in the basement. It was decided to leave a few walls and doors as-is, to use the walls being knocked down as fill material in the basement, and removing the existing framing materials. A to be determined credit is forthcoming upon competing infill of the basement.
- COR-03 – Add - \$10,197.58 – Add stain block primer to gym ceiling instead of latex to provide a better block against existing stains and possible future stains and mildew.
- COR-05 – Add - \$977.77 – Eliminate the rolltop door into the gym and the SW door and infill with masonry and door hardware changes to remaining gym doors leaving 1 leaf active and 1 leave inactive with the ability to open both leaf's to get larger equipment into the building if needed.
- COR-06 – Deduct – (\$1,400.00) – Reduce size of sunshade at new entrance.
- COR-07 – Add - \$2,019.60 – Add wireless scoreboard controllers (2), electrical for wired controllers not shown – The plans did not include power being provided to the scoreboards controllers and adding wireless controllers allows for less outlets in the gym and flexibility of keeping score on different courts.
- COR-08, 09 & 10 – Add - \$68,245.65 – The change order addresses the removal of the stage wall and walls connecting to the back/south wall. During demolition of the walls the south wall began to crack and open up where previous tuckpoint and caulking had occurred. There is a need for the south wall to have added structural modifications and roof blocking. Additional elevator structural steel is needed to support the elevator structure as well as added structural steel for air handling unit above the 2nd floor flex space. Due to the delays these change orders have caused it also includes general

City Council

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conditions for the contractor to extend the schedule 6 weeks. Additional Change Orders will most likely result in additional weeks toward the project completion.

- COR-11 – Add \$5,680.69 – Caulking & masonry work to the interior and exterior of the south wall.
- COR-12 – Add \$47,398.23 – This change order address abandoning the existing 4" sprinkler main due to it leaking and it was not scheduled to be addressed (Removal to main in street-per WaterWorks requirements), changing new water service to 6" in lieu of 4" to allow domestic water and sprinkler supply to utilize same entrance service, adding vent piping to the new water heater (not included on bid documents), eliminate sewage ejector pump (contractor suggestion as value engineering), add gas and vent piping for regulator & move sump pump location & lower due to existing conditions of original pit scheduled to stay in place and add an interior trench drain at base of floor to help avoid future water filtration issues in the basement storage area.
- COR-13 – \$3,702.76 Add an automatic door opener for handicap accessibility to the main entrance doors on the west side of the building
- COR-14 - \$8,189.33 During demolition on the second floor there are sections of wall that have exposed brick and some that still have plaster on them. Rather than remove all the plaster down to the bare brick it was determined that using metal studs and changing the sheetrock and insulation would provide a better barrier and create less work removing the plaster. The City has purchased all the volleyball equipment for the Coliseum which was included in the bid so that cost is being deducted in this change order
- COR-15 – (-\$1,090.66) This change order is a deduct due to modifications of the folding door bulkheads.
- COR-18 - \$25,383.57 When excavating the area for the elevator shaft and the new footings for the new entrance area the soil was tested and determine to not be suitable per testing from Terracon. It was determined the area needed to be over-excavated and gravel material be installed instead of the dirt to support the new elevator shaft and entrance area.

These add up to \$169,547.42

There are several other changes orders that are being discussed between the architects, contractor, and staff. The main one coming up soon is the changing of the gym floor to a shimmed system that will allow the court to be adjusted to make it level without having to any additional demo or infill of the existing floor. There is also a need to caulk the south wall after the removal of the stage walls that caused existing cracks to re-open. Changes were made to eliminate a few doors and other windows and vents were not addressed in the original design and those need to be infilled with brick. There will also be some credits for changes in eliminating doors, changing hardware for doors, and eliminating concessions equipment and sports equipment that the Parks & Recreation Department already own but were included in the project. We are estimating these upcoming changes to be around \$80,000 to make the change order totals at \$250,000. There will still be some unknowns and changes in the project that will come up between now and the end of the project but we think those will be smaller in nature and cost.

Budget Impact: There is still the option of the transferring of LOST or TIF money toward the project to cover current and future change orders. Another option that could be available for the

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project could come from reallocation up to \$400,000 in 2019 GO Bond that were to go toward projects like the Timber Creek Bridge and Anson Park project. The Timber Creek Bridge project is \$150,000 under engineer estimates so moving \$125,000 from the project could help offset the Coliseum change orders. Last week bids were opened for the Anson Park Shelter and bids were \$100,000 and more over the engineer's estimates. At this time we are recommending Council reject those bids. Staff will be working with the architect to change the scope of that project which could reduce the need for all \$300,000 that was designated for that project. There is work that still needs to be done at Anson so it is not recommended in using all the money designated for that project.

Expenditures		Funding	
Garling Construction	3,469,000	Insurance- RC	1,658,366
Alternate 1	22,000	Insurance- ORD	250,000
Alternate 2	8,500	Donations/Grants	1,350,000
GTG Bidding Phase	10,100	Alliant Rebate	48,200
GTG Construction Phase	92,350	City Sources	568,239
CPMI	160,460	SRC Proceeds	428,239
Furniture, Fixtures, AV	100,000	TIF Reimb	140,000
		Content Payment	40,843.45
Total	3,862,410	3,915,648.45	53,238.45
Change Orders 1-12	145,757.42	(3/23/20)	Deficit (128,703.97)
Change Orders 13-15	10,801.43	(4/13/20)	
Change Order 18	25,383.57	(5/11/20)	

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MARSHALLTOWN

— I O W A —

City Administrator's Office

Joel Greer, Mayor
Jessica Kinser, Administrator
Shari L. Coughenour, Clerk
24 North Center Street
Marshalltown, IA 50158-4911
Tel - (641) 754-5799
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To: Mayor Greer and the City Council
From: Jessica Kinser, City Administrator
Date: May 22, 2020
RE: 2020 Aquatic Center Season

COVID-19 has had an impact on the City and will continue to do so into fiscal year 2021. The Aquatic Center (AC) has remained closed under the Governor's order, which was modified this week to allow for lap swimming and swimming lessons. It takes approximately 3 weeks to get the pool ready for opening, and though we do not know what the Governor may decide and when, we do need a decision from the City Council on moving forward.

Jenni Hart, Recreation Supervisor, and Geoff Hubbard, Parks and Recreation Director, have analyzed how the AC could safely operate following CDC and IDPH guidelines for swimming pools and have proposed the following phases:

- Phase 1 - Outdoor pools may be opened for lap swimming, water walking and swim lessons only, no general open swimming. Swimmers will not be allowed entry into the facility if they have any symptoms or exposure risks as listed by the CDC guidelines.
 - o Lap swim – One swimmer per lane (unless in the same household) Max 6 swimmers in lap lanes
 - o Water walking – Appropriate social distancing (masks can be worn) Max of 75 patrons. Limited to 16 & older during this first phase.
 - o Swim Lessons – Max class of 5 with 1 instructor. Social Distancing students along the wall. Instructor will wear mask. Participants are not allowed to wear masks.
- Phase 2 – Opening at 50% capacity

The attachments contain more detail put together by Parks and Recreation to explain how this could work. The AC's capacity is 1,012, so operating at 50% of that capacity is still a large number of people. However, the average daily attendance in 2019 was 325, which is much less than 50% capacity.

While staff believes that operating the AC can be done safely, the second part to this issue is the question of at what cost do we operate the AC. This is somewhat more difficult to answer from a budgetary perspective because the AC crosses fiscal years, but here are some of the things we can project:

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- The current fiscal year budget is expected to generate an additional loss of \$14,000 beyond what was budgeted. The current fiscal year had other revenue losses which were covered through personnel reductions, but those reductions cannot cover the entire amount of the projected loss. A re-estimated budget is attached with this memo.
- The fiscal year 2021 budget is difficult to re-estimate as it includes the end of one season and the beginning of another. Revenues have been decreased in a re-estimated budget, but it is difficult to tell if these are achievable figures due to an unknown public response.
- Season passes would not be sold, and daily admission would be required given a shortened season and unknown use.
- Daily staff costs in phase 1, regardless of use, would be \$727.00. Daily staff costs in phase 2, regardless of admissions, would be \$2,178.50. This does not include any of Jenni or Geoff's time at the facility.

We are requesting the City Council consider both the health and safety and financial aspects of operating the Aquatic Center in 2020 and provide guidance to staff on how to proceed.

Opening the Aquatic Center

Phase 1

Outdoor pools may be opened for lap swimming, water walking and swim lessons only, no general open swimming. Swimmers will not be allowed entry into the facility if they have any symptoms or exposure risks as listed by the CDC guidelines.

Lap swim – One swimmer per lane (unless in the same household) Max 6 swimmers in lap lanes

Water walking – Appropriate social distancing (masks can be worn) Max of 75 patrons. Limited to 16 & older during this first phase.

Swim Lessons – Max class of 5 with 1 instructor. Social Distancing students along the wall. Instructor will wear mask. Participants are not allowed to wear masks.

Lap Swim

- Restricted to paid preregistered Swimmers only.
- Preregistration and payment must be made online at least 30 minutes prior to the Swim Session.
- Hours of operations to be determined
- Offering multiple sessions throughout the day.
- There will be at least 20-minute period between sessions to allow staff to clean. Bathrooms will be cleaned every hour and multi-use surfaces will be cleaned between each session.
- Entry and exit to the Facility will be through the main gate only. The gate will be opened and closed by staff before and after each session as to minimize multiple people touching surfaces. Access to the Restrooms will be available and these doors will remain open.
- Each Swimmer will check in with Swimming Pool Attendant upon entry and be delegated to a specific Swimming Lane and must stay in that lane or will be asked to leave.
- Two Family Restrooms will be available for limited use only. No showers will be available. Lockers will not be available.
- Swimmers are encouraged to place their personal items (backpack, water bottles, etc.) at a safe distance (6 ft.) from other Swimmers items on the Pool Deck.
- All Swimmers must use their own equipment, including and not limited to Kick Boards, Pull Buoys, Flippers, Swimsuits, Goggles and Swim Caps.
- There will be no storage of any items at the Facility.
- Swimmers are encouraged to bring and use hand sanitizer.
- All Swimmers must maintain proper social distance (6 ft. apart) at all times.
- Water fountain, Pool Slides, Recreation Pool, Deck Chairs, Picnic Tables, grassy areas, and Diving boards will not be available.
- Open Swim and all Social Events are suspended until further notice.
- Food and Beverage will not be available. Water bottle are allowed but must be filled before coming.
- Aquatic Center Staff will monitor entry to the facility, use of lanes, use of restrooms, the timely exit of guests from the facility and ensure guidelines are being maintained.
- Aquatic Center Staff will disinfect hand railings and bathrooms between swim sessions.
- Aquatic Center Staff will maintain optimal water quality at all times. The free chlorine level will be maintained per the IDPH & CDC guidelines.
- CDC and Marshall County Health Department recommended “social distancing” protocol signage will be placed at the entrance of the facility and throughout the facility. Announcements will be made during each session reminding these guidelines.
- CDC guidelines regarding pools and any other recommendations that are mandated by State and County Departments of Public Health and Environment will be followed.
- Aquatic Center Staff will be required to wear masks, gloves (when needed) and practice social distancing.
- Failure to follow these guidelines will result in loss of swimming privileges for the 2020 Season.

Water Walking

- Restricted to first 75 patrons.
- Hours of operations to be determined
- Offering multiple sessions throughout the day.
- There will be at least 20-minute period between sessions to allow staff to clean. Bathrooms will be cleaned every hour and multi-use surfaces will be cleaned between each session.
- Entry and exit to the Facility will be through the main gate only. The gate will be opened and closed by staff before and after each session as to minimize multiple people touching surfaces. Access to the Restrooms will be available and these doors will remain open.
- Each Swimmer will check in with Aquatic Center staff before entry into water to keep proper social distancing and will be asked to leave if they do not abide by social distancing guidelines. (masks may be worn by participants).
- Two Family Restrooms will be available for limited use only. No showers will be available. Lockers will not be available.
- Swimmers are encouraged to place their personal items (backpack, water bottles, etc.) at a safe distance (6 ft.) from other Swimmers items on the Pool Deck.
- All Swimmers must use their own equipment
- There will be no storage of any items at the Facility.
- Swimmers are encouraged to bring and use hand sanitizer.
- All Swimmers must maintain proper social distance (6 ft. apart) at all times.
- Water fountain, Pool Slides, Recreation Pool, Deck Chairs, Picnic Tables, grassy areas, and Diving boards will not be available.
- Open Swim and all Social Events are suspended until further notice.
- Food and Beverage will not be available. Water bottle are allowed but must be filled before coming.
- Aquatic Center Staff will monitor entry to the facility, use of lanes, use of restrooms, the timely exit of guests from the facility and ensure guidelines are being maintained.
- Aquatic Center Staff will disinfect hand railings and bathrooms between swim sessions.
- Aquatic Center Staff will maintain optimal water quality at all times. The free chlorine level will be maintained per the IDPH & CDC guidelines.
- CDC and Marshall County Health Department recommended “social distancing” protocol signage will be placed at the entrance of the facility and throughout the facility. Announcements will be made during each session reminding these guidelines.
- CDC guidelines regarding pools and any other recommendations that are mandated by State and County Departments of Public Health and Environment will be followed.
- Aquatic Center Staff will be required to wear masks, gloves (when needed) and practice social distancing.
- Failure to follow these guidelines will resort in loss of swimming privileges for the 2020 Season.

Swim Lessons

- Restricted to 5 groups of 5 participants each session. (Indoor Pool – restricted to 2 or 3 groups of 5 participants)
- Pre-Registration will be required.
- Hours of operations to be determined
- Offering multiple sessions throughout the day.
- There will be at least 20-minute period between sessions to allow staff to clean. Bathrooms will be cleaned every hour and multi-use surfaces will be cleaned between each session.
- Entry and exit to the Facility will be through the main gate only. The gate will be opened and closed by staff before and after each session as to minimize multiple people touching surfaces. Access to the Restrooms will be available and these doors will remain open.

- Each Swimmer will check in with Aquatic Center staff before entry to the facility with proper social distancing guidelines being followed.
- Masks must be worn by parents during the drop off process. Each participant's temperature will be taken and allowed to enter if below regulations. Participants will be escorted to parents at the end of the session.
- Parents will be allowed in the facility.
- All participants must be "swim ready" as there will be limited access to restrooms
- Swimmers will have a designated place for their belongings at a safe distance from other swimmers items on deck.
- All equipment will be sanitized after each session.
- There will be no storage of any items at the Facility.
- Swimmers are encouraged to bring and use hand sanitizer.
- Swimmers will be social distanced in the water (6 ft. apart) at all times.
- Water fountain, Pool Slides, Recreation Pool, Deck Chairs, & Picnic Tables will not be available.
- Open Swim and all Social Events are suspended until further notice.
- Food and Beverage will not be available. Water bottle are allowed but must be filled before coming.
- Aquatic Center Staff will monitor entry to the facility, use of restrooms, the timely exit of guests from the facility and ensure guidelines are being maintained.
- Aquatic Center Staff will disinfect hand railings and bathrooms between swim sessions.
- Aquatic Center Staff will maintain optimal water quality at all times. The free chlorine level will be maintained per the IDPH & CDC guidelines.
- CDC and Marshall County Health Department recommended "social distancing" protocol signage will be placed at the entrance of the facility and throughout the facility. Announcements will be made during each session reminding these guidelines.
- CDC guidelines regarding pools and any other recommendations that are mandated by State and County Departments of Public Health and Environment will be followed.
- Aquatic Center Staff will be required to wear masks, gloves (when needed) and practice social distancing.
- Failure to follow these guidelines will resort in loss of swimming privileges for the 2020 Season.

Hours of operation in Phase 1

8am-9am- water walking/lap swim

9am-9:30am- cleaning

9:30am-11:30- swim lessons

11:30-Noon- cleaning

Noon-1pm – water walking/lap swim

1-1:30pm- cleaning

4-5pm- water walking/lap swim

5-5:30pm- cleaning

5:30-7pm- swim lessons

7-7:30pm- cleaning

7:30-8:30pm- water walking/lap swim

8:30-9pm- cleaning

Phase 2

Opening at 50% Capacity

1. Pool Sanitation- We will continue with sanitizing all pools with the recommended 2-4 ppm of chlorine and the PH between the 7.2-8.0 range suggested by the CDC.

2. Aquatics Staff- The aquatics staff will be structured to ensure total coverage as well as back up coverage in the case of an emergency. Required number of Lifeguards, managers and Supervisors are recommended to be on duty at all operational hours. Some additional staff will be needed for required cleaning duties and monitoring of guidelines. The indoor staff break area will be limited to allow for social distancing and a second break area will be provided under the Red umbrella to ensure social distancing protocols. All Lifeguards will use individualized safety gear (rescue tube and rescue hip pack) and sanitize at the start and end of each shift. All staff will be required to wear a face covering during all hours of work. The exception would be in the event of an emergency and when up on high stands. A face covering would need to be removed to alert the EAP, blow the whistle, enter the water, and perform the appropriate rescue. In the event of an emergency where resuscitation is needed, the staff will use a BVM (bag valve mask) as the primary device to reduce the exposure to Covid-19. All other standard practices will remain the same.

3. Patron Pre-visit Requirements- All participants should shower using soap and water before entering the water. Patrons are required to swim with members of the same household only and maintain social distancing from other families in the pool area. We request the patron be “swim ready” as there will be limited amenities available for changing. Patron’s temperatures will be checked before entering the facility. Anyone with a temperature of 100.2 or more will not be allowed in the facility. Swimmers will not be allowed entry into the facility if they have any symptoms or exposure risks as listed by the CDC guidelines.

4. Facility Amenities- The aquatic operation will look much different in the phased approach and will have limited services to minimize contact with high touch areas. All deck chairs will be removed from the facility. Patrons will be required to bring their owns chairs or loungers for use in the facility. Limited Concessions will be available (pre-packaged only) with limited eating space in concession area as some tables will be marked closed to ensure social distancing. Showers will be available with limiting number of patrons in the bathhouse to ensure social distancing. The water fountain will be shut off. Rest rooms will still be an essential function of the facility. It is suggested that only 4 participants are in the restroom at any given time to help ensure social distancing. Hand soap and hand sanitizer will be stocked at every sink location.

5. Cleaning/ sanitation practices- The restrooms and high touch areas will be cleaned and sanitized frequently. Tubes will be sanitized after each use. Only 24 patrons (in single tubes) will be allowed in the Lazy River at one time. An approved sanitizer will be used to wipe down all high touch surfaces. A hand sanitizing station will be set up inside the entry to the facility and throughout the facility for patron use. The staff will have individualized safety gear for use for their shift. Each shift the equipment will be sanitized for that staff members use.

6. Rates/ Memberships- There will only be a day fee associated with the use of the swimming pool. No memberships will be available. In the case that we digress and return to a stricter phase, there would be less refunds needed

7. Age Requirements- All participants under the age of 14 (16 or younger) will need to be accompanied by an Adult.

8. Signage- Signage will be placed on our website, Facebook page, at the front doors to the facility, in the restrooms, and at other location in the facility stating the Social Distancing protocol and this list of requirements. Additional signage stating Social Distancing protocol and sanitation schedules and practices will include pertinent information as well as current CDC recommendations.

9. Budget and Staffing - In Phase 1 we will open the facility for lap swim and swim lessons with minimal staff to reduce payroll expenses. Staff would be two admission people to check people in and their temperatures. A pool manager to oversee the facility. A lifeguard to watch over swim lessons, two lifeguards for water walking, and swim instructors based on the number of kids registered for lessons. The amount of water walkers and kids in lessons would cover the cost of all staff during these times.

Hours of operation in Phase 2

8am-9am- water walking/lap swim

9am-9:30am- cleaning

9:30am-11:30- swim lessons

11:30-Noon- cleaning

Noon-5pm – open swimming @ 50%

If maximum capacities are met for open swim we may break this time into 2 blocks to allow more swimmers to attend (noon-2:30 and 2:30-5).

Cleaning will occur throughout open swim as needed

5-5:30pm- cleaning

5:30-7pm- swim lessons

7-7:30pm- cleaning

7:30-8:30pm- water walking/lap swim

8:30-9pm- cleaning

Phase 1			Phase 2		
8am-9am	WW/LP	\$57.25	8am-9am	WW/LP	\$57.25
9am-9:30am	Cleaning		9am-9:30am	Cleaning	
9:30-11:30	Swim Lessons	\$249.00	9:30-11:30	Swim Lessons	\$249.00
11:30-12:00	Cleaning		11:30-12:00	Cleaning	
12:00pm-1pm	WW/LP	\$57.25	12-5pm	Open Swim	\$1,566.00
1pm-1:30pm	Cleaning		5-5:30pm	Cleaning	
4pm-5pm	WW/LP	\$57.25	5:30-7pm	Swim Lessons	\$249.00
5-5:30pm	Cleaning		7-7:30pm	Cleaning	
5:30-7pm	Swim Lessons	\$249.00	7:30-8:30pm	WW/LP	\$57.25
7-7:30pm	Cleaning		8:30-9pm	cleaning	
7:30-8:30pm	WW/LP	\$57.25			
8:30-9pm	cleaning			Daily Total	\$2,178.50
	Daily Total	\$727.00			

Hourly costs	
WW/Lap Swim	\$57.25
Swim Lesson	\$99.25
Open Swim	\$261.00

Hourly costs are including all staff needed to run with extra staff for Covid guidelines.

Daily Attendance

Average daily attendance was 325 people in 2019

Pool Capacity is 1012

Free swim day attendance was 854

Largest attended day (minus free swim day) was 685

2019-2020 Aquatic Budget

	Budgeted	YTD Actual	Re-Estimate	Difference w/ Budgeted	
Aquatic Center Fees, Daily	\$ 60,000.00	\$ 45,506.00	\$ 48,506.00	\$ (11,494.00)	Receiving daily fees for water walking
Aquatic Pool Passes	\$ 29,000.00	\$ 959.00	\$ 959.00	\$ (28,041.00)	Recommend not selling pool passes due to uncertainty of pool season
Aquatic Scan Card/Water Walking	\$ 5,000.00	\$ 1,145.00	\$ 2,500.00	\$ (2,500.00)	Based on 2019 season and shorten season
Aquatic Swim Tickets	\$ 2,500.00	\$ 727.00	\$ 3,000.00	\$ 500.00	Because of no season passes we think people will purchase more swim tickets
Swim Lesson Fees	\$ 14,000.00	\$ 5,468.00	\$ 8,000.00	\$ (6,000.00)	Based on 2019 season and shorten season
Aquatic Pool Rentals	\$ 5,000.00	\$ -	\$ -	\$ (5,000.00)	
TOTAL REVENUES	\$ 115,500.00	\$ 53,805.00	\$ 62,965.00	\$ (52,535.00)	
Staff Wages	\$ 157,153.00	\$ 94,250.00	\$ 110,000.00	\$ (47,153.00)	Minimal Staff in June, not open for open swim only lessons and water walking
				\$ -	2 weeks of staff plus trainings
Advertising	\$ 500.00	\$ 149.00	\$ 149.00	\$ (351.00)	
Background Checks	\$ 600.00	\$ 143.00	\$ 143.00	\$ (457.00)	
License and Permits	\$ 1,500.00	\$ 1,797.00	\$ 1,797.00	\$ 297.00	
Dues, Memberships, Subscriptions	\$ -	\$ 45.00	\$ 45.00	\$ 45.00	
Insurance- General	\$ 3,710.00	\$ 3,943.00	\$ 3,943.00	\$ 233.00	
Insurance- Tort Liability	\$ 3,416.00	\$ 3,831.00	\$ 3,831.00	\$ 415.00	
Contract- Outside Help	\$ 9,500.00	\$ 1,473.00	\$ 3,000.00	\$ (6,500.00)	
Rents and Leases	\$ 500.00	\$ 436.00	\$ 436.00	\$ (64.00)	
Contract- Lawn Care	\$ 4,050.00	\$ 3,450.00	\$ 4,050.00	\$ -	
Repairs and Maintenance	\$ 3,500.00	\$ 5,220.00	\$ 5,220.00	\$ 1,720.00	
Telephone/Internet	\$ 4,000.00	\$ 4,500.00	\$ 4,500.00	\$ 500.00	
Conference Expense	\$ 100.00	\$ 50.00	\$ 50.00	\$ (50.00)	
Training	\$ 150.00	\$ 545.00	\$ 545.00	\$ 395.00	
Electricity	\$ 30,000.00	\$ 27,563.00	\$ 30,000.00	\$ -	
Natural Gas	\$ 9,000.00	\$ 9,142.00	\$ 11,000.00	\$ 2,000.00	
Operating Supplies	\$ 6,000.00	\$ 3,800.00	\$ 6,000.00	\$ -	Need to purchase additional cleaning supplies and PPE
Chemical Supplies	\$ 12,000.00	\$ 11,490.00	\$ 15,000.00	\$ 3,000.00	
Bldg Ground Operating	\$ 3,000.00	\$ 1,600.00	\$ 2,000.00	\$ (1,000.00)	
Minor Equipment	\$ 4,000.00	\$ 16,554.00	\$ 16,554.00	\$ 12,554.00	Need to purchase new operational items due to Y not operating
TOTAL EXPENSES	\$ 252,679.00	\$ 189,981.00	\$ 218,263.00	\$ (34,416.00)	
	\$ (137,179.00)	\$ (136,176.00)	\$ (155,298.00)	\$ (18,119.00)	

2020-2021 Aquatic Budget

	Budgeted	Re-Estimate	Difference
Aquatic Center Fees, Daily	\$ 65,000.00	\$ 55,000.00	\$ (10,000.00)
Aquatic Pool Passes	\$ 29,000.00	\$ 20,000.00	\$ (9,000.00)
Aquatic Scan Card/Water Walking	\$ 6,000.00	\$ 4,500.00	\$ (1,500.00)
Aquatic Swim Tickets	\$ 2,500.00	\$ 3,500.00	\$ 1,000.00
Swim Lesson Fees	\$ 15,000.00	\$ 14,000.00	\$ (1,000.00)
Aquatic Pool Rentals	\$ 5,000.00	\$ -	\$ (5,000.00)
TOTAL REVENUES	\$ 122,500.00	\$ 97,000.00	\$ (25,500.00)
Staff Wages	\$ 153,177.00	\$ 150,000.00	\$ (3,177.00)
Advertising	\$ 500.00	\$ 500.00	\$ -
Background Checks	\$ 600.00	\$ 100.00	\$ (500.00)
License and Permits	\$ 1,500.00	\$ 1,500.00	\$ -
Dues, Memberships, Subscriptions	\$ -	\$ 45.00	\$ 45.00
Insurance- General	\$ 3,896.00	\$ 3,896.00	\$ -
Insurance- Tort Liability	\$ 3,587.00	\$ 3,587.00	\$ -
Contract- Outside Help	\$ 6,500.00	\$ 6,500.00	\$ -
Rents and Leases	\$ 500.00	\$ 500.00	\$ -
Contract- Lawn Care	\$ 4,050.00	\$ 4,050.00	\$ -
Repairs and Maintenance	\$ 3,500.00	\$ 3,500.00	\$ -
Telephone/Internet	\$ 4,000.00	\$ 4,000.00	\$ -
Conference Expense	\$ 100.00	\$ 50.00	\$ (50.00)
Training	\$ 150.00	\$ 150.00	\$ -
Electricity	\$ 30,000.00	\$ 32,000.00	\$ 2,000.00
Natural Gas	\$ 9,000.00	\$ 10,000.00	\$ 1,000.00
Operating Supplies	\$ 6,000.00	\$ 6,000.00	\$ -
Chemical Supplies	\$ 12,000.00	\$ 12,000.00	\$ -
Bldg Ground Operating	\$ 3,000.00	\$ 3,000.00	\$ -
Minor Equipment	\$ 4,000.00	\$ 4,000.00	\$ -
TOTAL EXPENSES	\$ 246,060.00	\$ 245,378.00	\$ (682.00)
	\$ (123,560.00)	\$ (148,378.00)	\$ (24,818.00)