

MARSHALLTOWN SUPPLEMENTARY SPECIFICATIONS TO AMEND THE IOWA STATEWIDE URBAN DESIGN AND SPECIFICATIONS (SUDAS)

These Supplementary Specifications amend or supplement the Statewide Urban Design and Standards (SUDAS) and other provisions of the Contract Documents. All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Specifications will have the meanings indicated in SUDAS. The Supplementary Specifications are provided in the same order and format as the SUDAS documents.

The following documents replace the City of Marshalltown's:

Standard Specifications for Sanitary Sewer Construction

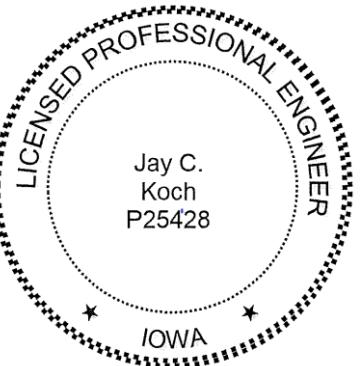
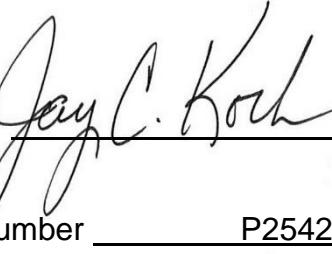
Standard Specifications for Sidewalk and Driveway Construction

Standard Specifications for Storm Sewer Construction

Standard Specifications for Street and Roadway Construction

**Standard Specifications for Street Excavation and Pavement
Restoration Construction**

Standard Specifications for Subdivision Development

	<p>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.</p> <p>Signature:  Date: <u>07/10/2023</u></p> <p>License number <u>P25428</u></p> <p>Printed or typed name: <u>Jay C. Koch, P.E.</u></p> <p>My license renewal date is <u>12/31/2024</u></p> <p>Pages or sheets covered by this seal: <u>All</u></p>
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**PREPARED BY:
PUBLIC WORKS/ENGINEERING DEPARTMENT
CITY OF MARSHALLTOWN
24 N. CENTER STREET
MARSHALLTOWN, IOWA 50158**

GENERAL SUPPLEMENTAL SPECIFICATIONS

The General Supplemental Specifications for the work on this project are represented by the SUDAS Standard Specifications approved by the Board of Directors for the Iowa SUDAS Corporation.

SUPPLEMENTAL SPECIFICATIONS.

These Supplementary Conditions amend or supplement the General Supplemental Specifications approved by the Board of Directors for the Iowa SUDAS Corporation subsequent to publication of the latest edition of the SUDAS Standard Specifications. They involve changes in the SUDAS Standard Specifications and apply only when specified in the contract documents. The General Conditions remain in full force and effect except as amended.

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

Specifications adopted by a Jurisdiction that involve changes to the SUDAS Standard Specifications are as follow:

Section 1040 – Scope of Work

1.06 INCREASE OR DECREASE OF WORK

Add the following new paragraphs immediately after Paragraph C:

D. Adjustments in Unit Price

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:
 - a. the extended price of a particular item of Unit Price Work amounts to five (5) percent or more of the Contract Price (based on estimated quantities at the time of Contract formation) and the variation in the quantity of that particular item of Unit Price Work actually furnished or performed by Contractor differs by more than 25 percent from the estimated quantity of such item indicated in the Agreement; and
 - b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.
2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.
3. Adjusted unit prices will apply to all units of that item.

Section 1070 – Legal Relations and Responsibility to the Public

3.01 PERFORMANCE, PAYMENT, AND MAINTENANCE BOND

Add the following subparagraphs to Paragraph C:

1. 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 **100 percent** of the final contract price for the first two (2) years and **25 percent** of the final Contract Price for the last two (2) years. The warranty bond period will extend to a date **four (4) years** after Substantial Completion of the Work.

3. The warranty bond must be issued by the same surety that issues the performance bond required under Paragraph 3.01 of the General Conditions.

Section 1080 – Prosecution and Progress

1.07 WORK ON SUNDAYS OR LEGAL HOLIDAYS

Add the following new subparagraphs immediately after Paragraph A:

1. No Work shall be done between 6:00pm and 7:00am without permission of Owner. However, emergency work may be done without prior permission.
2. Night Work may be undertaken as a regular procedure with the permission of Owner; such permission, however, may be revoked at any time by Owner if Contractor fails to maintain adequate equipment and supervision for the proper prosecution and control of the Work at night.
3. Owner's legal holidays are: New Year's Day, Good Friday, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, Friday after Thanksgiving, and Christmas Day.

1.09 EXTENSION OF TIME

Amend Paragraph 1.09.B.1 by adding the following subparagraphs:

- 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 A—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.

EXHIBIT A— 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.

Section 1090 - Measurement and Payment

1.05 PROGRESS PAYMENTS

Add the following new Paragraph D:

- D. Contractor's Application for Progress Payment shall be prepared on the EJCDC C-620 form provided in the Contract Documents.**

SUPPLEMENTAL DIVISION 2 - EARTHWORK

DIVISION 2010 – EARTHWORK, SUBGRADE, AND SUBBASE SPECIAL PROVISIONS

PART 1 - GENERAL

1.08 MEASUREMENT AND PAYMENT

I. 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 or in tons.
2. Payment: Payment will be at the unit price per square yard or per 0.1 tons.
3. Includes: Work includes, but is not limited to, furnishing, placing, compacting, and trimming to the proper grade.

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) Geogrid shall be required on all streets and roadways. Geogrid shall be Type 4 or approved equal.

PART 3 – EXECUTION

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. In lieu of moisture density testing, Contractor may perform a proof roll on the subbase. Proof roll 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 the truck at a speed less than 10 mph. Make one pass on every lane. The subgrade will be considered unstable if, under the operation of the loaded truck, the surface shows yielding or rutting of more than 0.25 inches measured from the top to the bottom of the rut at the outside edges.

SUPPLEMENTAL DIVISION 3 - TRENCH AND TRENCHLESS CONSTRUCTION

SECTION 3010 - TRENCH EXCAVATION AND BACKFILL

PART 1 - GENERAL

NO REVISIONS

PART 2 – PRODUCTS

NO REVISIONS

PART 3 – EXECUTION

3.06 (REVISE) PIPE BEDDING AND BACKFILL SEE DIVISION 4

SECTION 3020 - TRENCHLESS CONSTRUCTION (BORING, JACKING, AND TUNNELING)

PART 1 - GENERAL

NO REVISIONS

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.

PART 3 – EXECUTION

NO REVISIONS

SUPPLEMENTAL DIVISION 4 - SEWERS AND DRAINS

SECTION 4010 - SANITARY SEWERS

PART 1 - GENERAL

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.

PART 3 – EXECUTION

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.

3.06 SANITARY SEWER SERVICE STUBS

A. Provide sanitary sewer service stubs at locations specified in the contract documents. No sanitary sewer service shall be connected directly to a manhole. Sanitary sewer services will be connected to the main line piping a minimum distance of 2 feet from any other lateral connection, manhole, or pipe joint with approved wye or insert-a-tee as provided herein.

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 new sanitary sewer services that extend 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: _____

<p>LIST SECTION TESTED: DATE: _____</p> <p>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)</p> <p>Comments: _____</p>	<p>TEST INFORMATION:</p> <p>Constant Pressure Method: Rotameter reading: _____ cf/min Computed Air Loss: _____ cf/min</p> <p>CONCLUSION: The section of pipe tested complies with ASTM: F 1417, 8.2.1 for acceptance: Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p><i>Time-Pressure Drop Method</i> Time for 1.0 psi drop: _____ Min(s) --OR-- Variance in Test Pressure: _____ psi Variance allowed by local jurisdiction: _____ psi</p> <p>CONCLUSION: The section of pipe tested complies with ASTM: F 1417, 8.2.2 for acceptance: Yes <input type="checkbox"/> No <input type="checkbox"/></p>
<p>LIST SECTION TESTED: DATE: _____</p> <p>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)</p> <p>Comments: _____</p>	<p>TEST INFORMATION:</p> <p>Constant Pressure Method: Rotameter reading: _____ cf/min Computed Air Loss: _____ cf/min</p> <p>CONCLUSION: The section of pipe tested complies with ASTM: F 1417, 8.2.1 for acceptance: Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p><i>Time-Pressure Drop Method</i> Time for 1.0 psi drop: _____ Min(s) --OR-- Variance in Test Pressure: _____ psi Variance allowed by local jurisdiction: _____ psi</p> <p>CONCLUSION: The section of pipe tested complies with ASTM: F 1417, 8.2.2 for acceptance: Yes <input type="checkbox"/> No <input type="checkbox"/></p>
<p>LIST SECTION TESTED: DATE: _____</p> <p>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)</p> <p>Comments: _____</p>	<p>TEST INFORMATION:</p> <p>Constant Pressure Method: Rotameter reading: _____ cf/min Computed Air Loss: _____ cf/min</p> <p>CONCLUSION: The section of pipe tested complies with ASTM: F 1417, 8.2.1 for acceptance: Yes <input type="checkbox"/> No <input type="checkbox"/></p> <p><i>Time-Pressure Drop Method</i> Time for 1.0 psi drop: _____ Min(s) --OR-- Variance in Test Pressure: _____ psi Variance allowed by local jurisdiction: _____ psi</p> <p>CONCLUSION: The section of pipe tested complies with ASTM: F 1417, 8.2.2 for acceptance: Yes <input type="checkbox"/> No <input type="checkbox"/></p>
<p>Testing procedures observed and Information recorded by: _____</p> <p>Results reviewed and affirmed by: _____</p>	
<p>Project Representative _____ City of Marshalltown, Iowa</p>	<p>Project Engineer _____</p>

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# _____

Downstream MH# _____

Station: _____

Station: _____

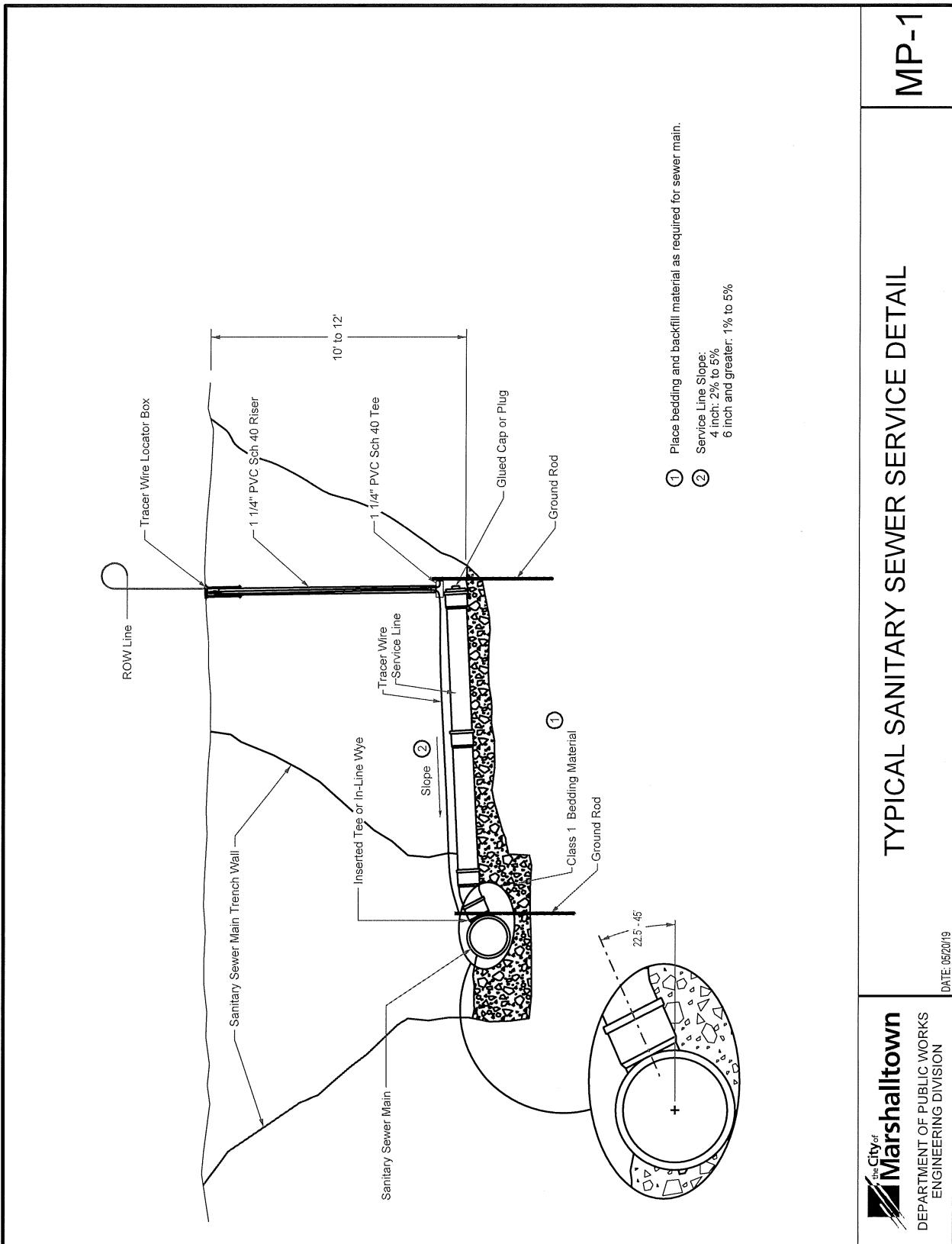
Wye Station: _____

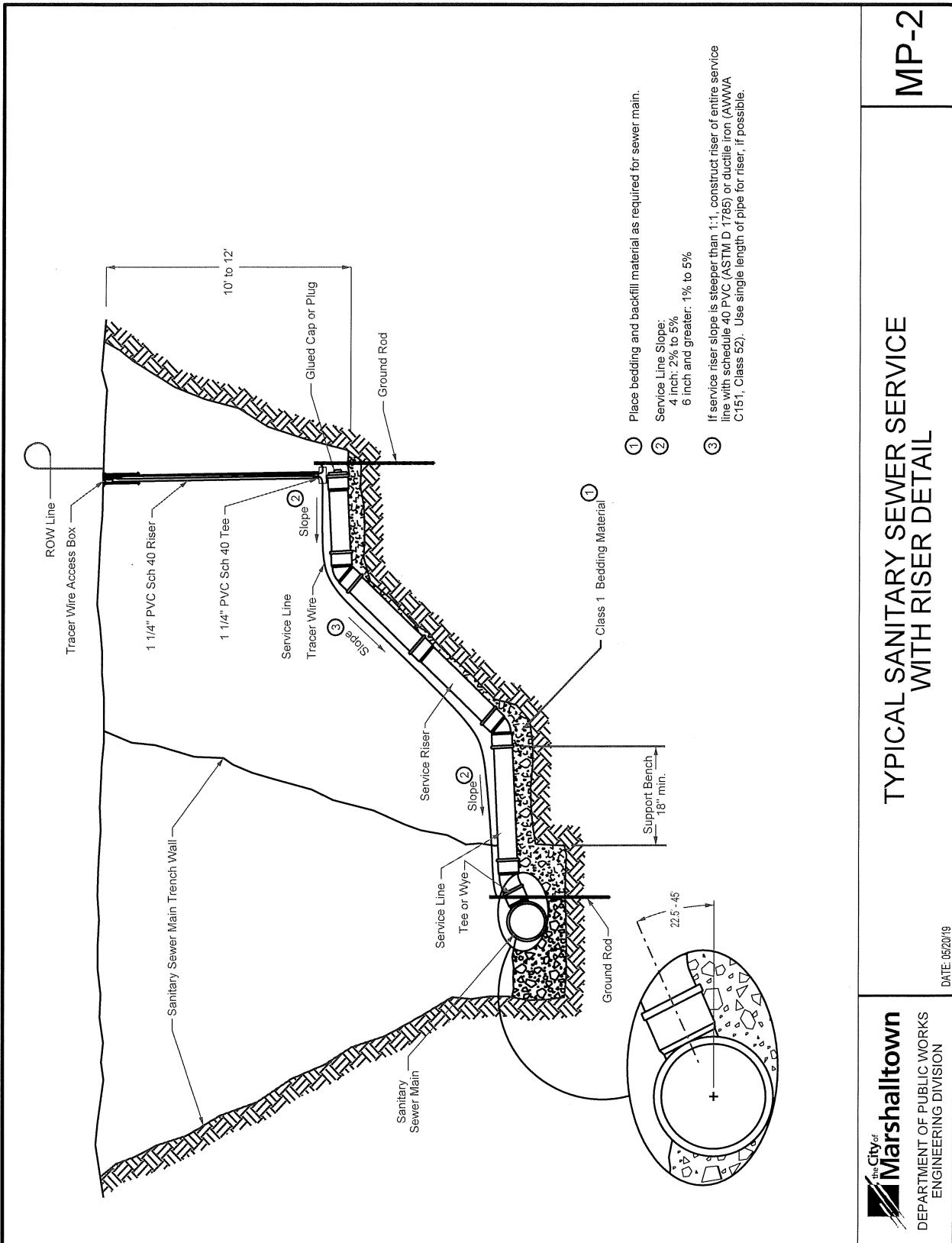
Service end Station: _____

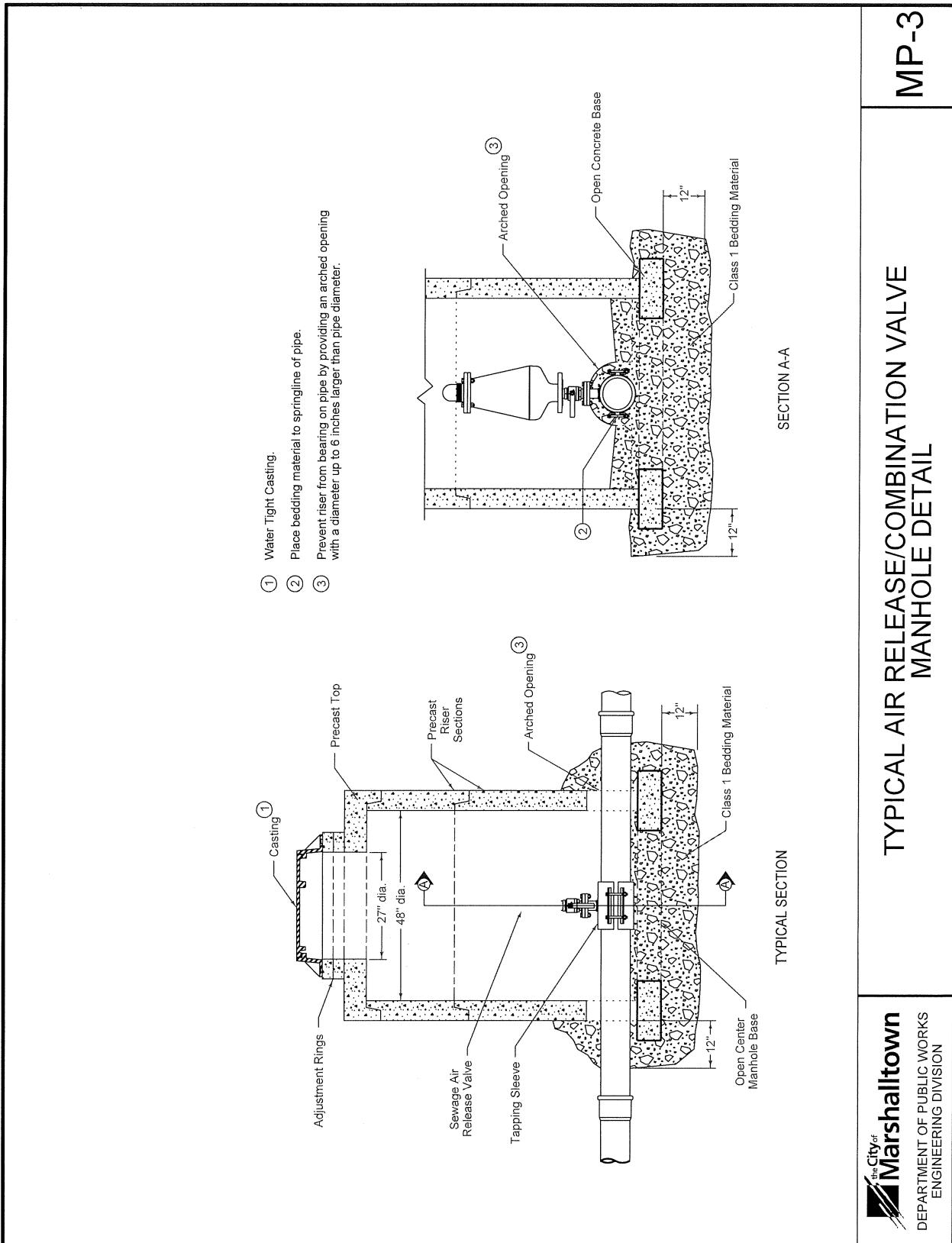
Service Offset Direction/Distance (feet): _____

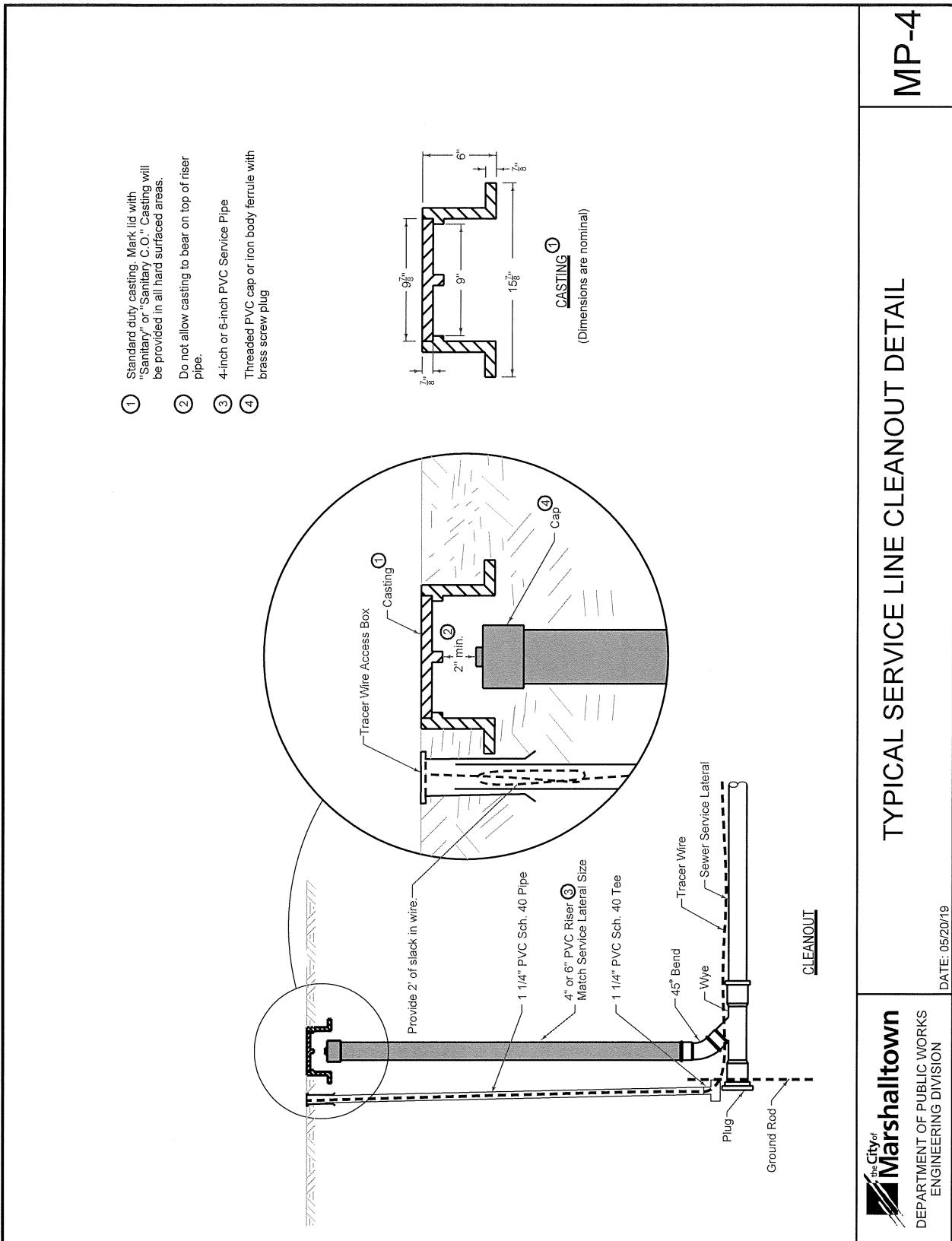
Inspector: _____

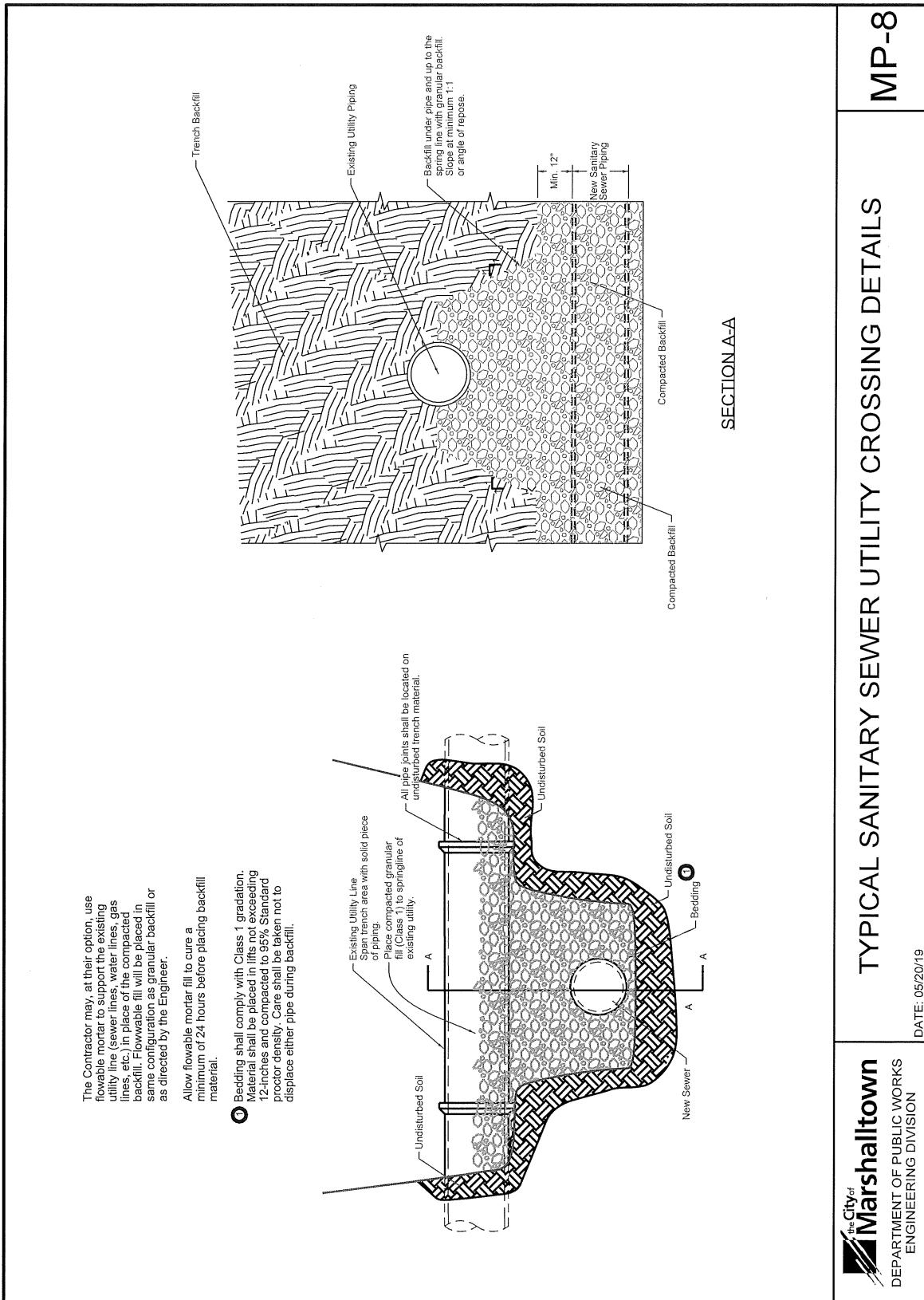
Department of Public Works
Engineering Division

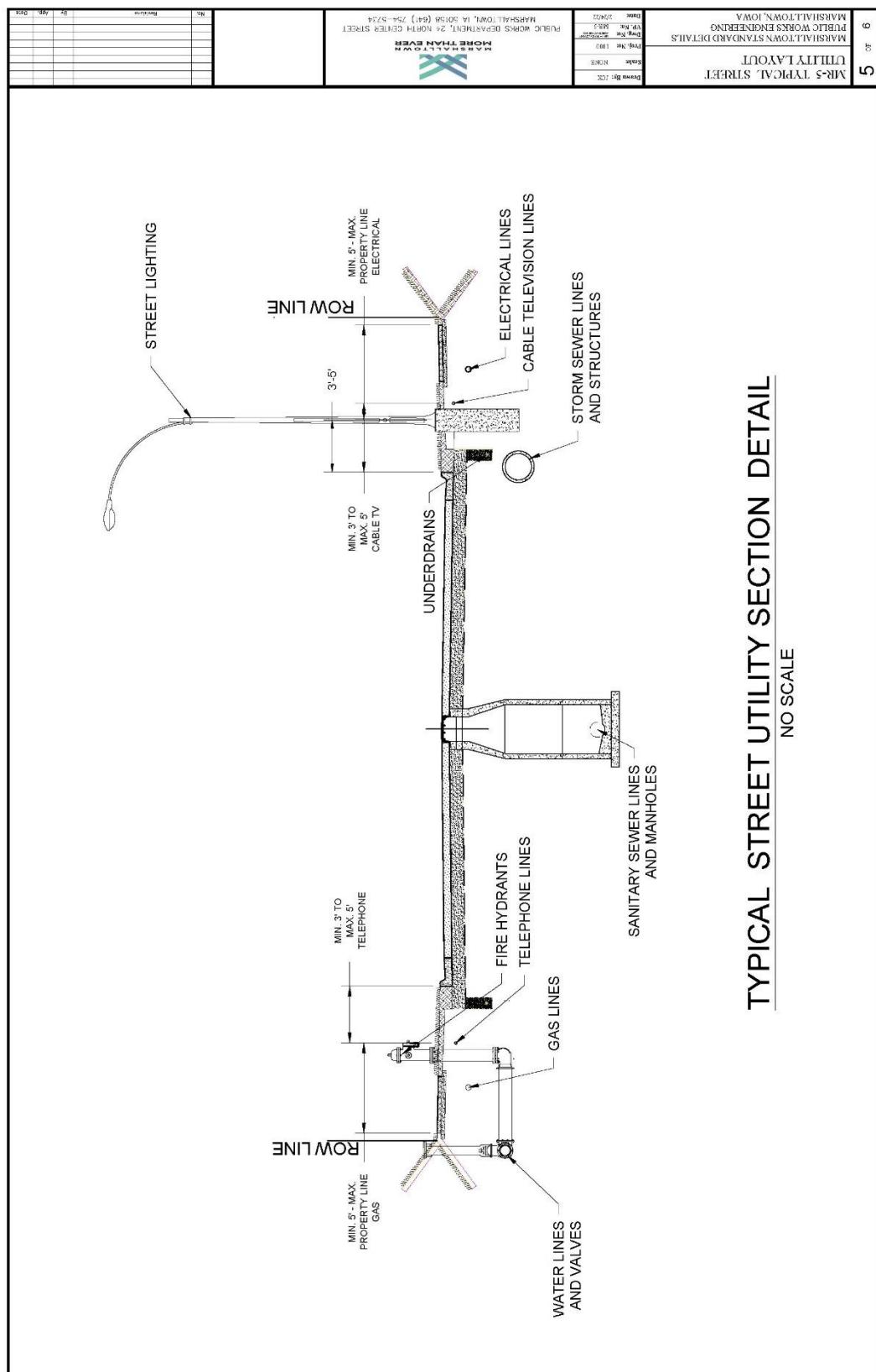


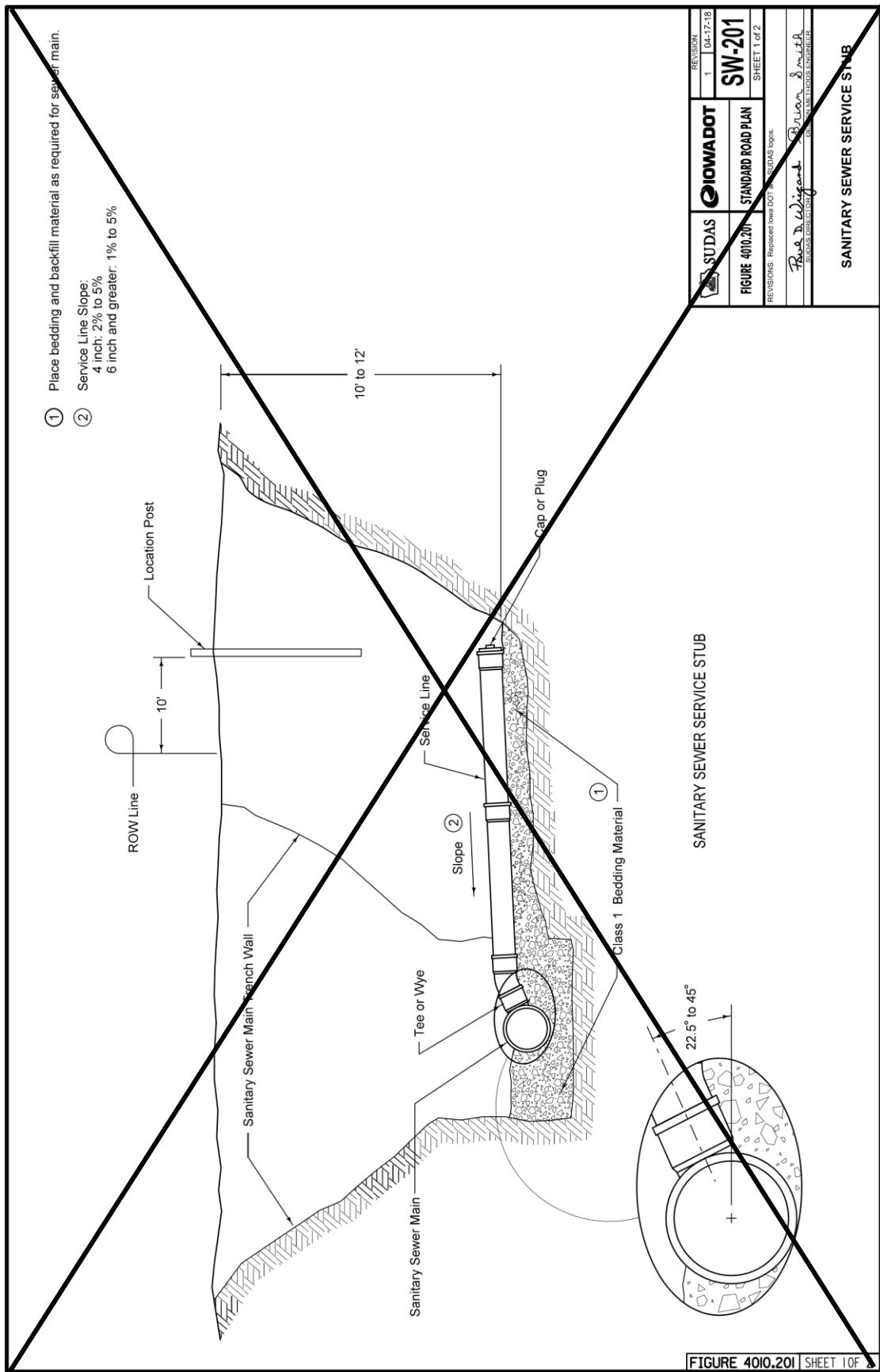


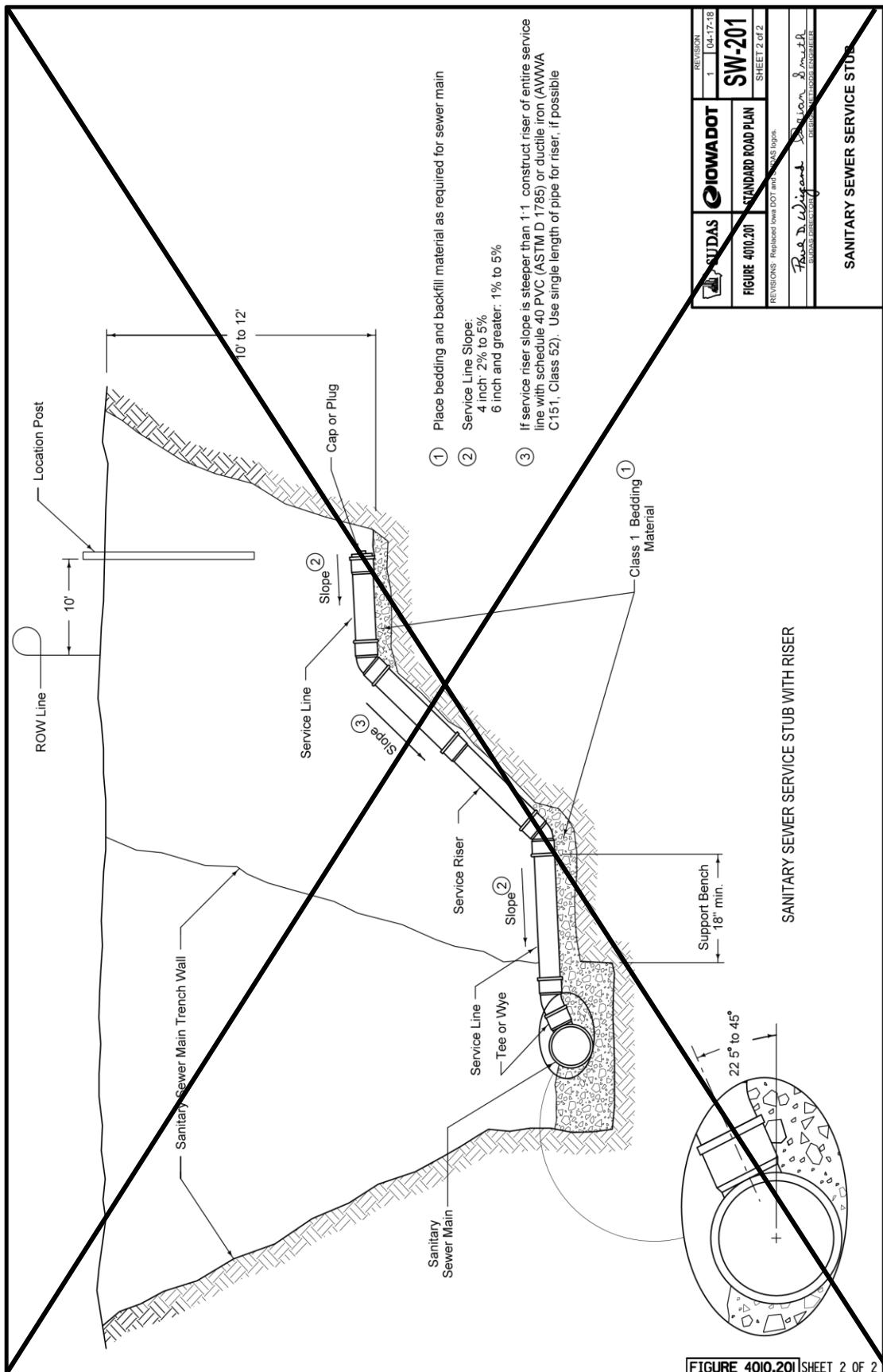


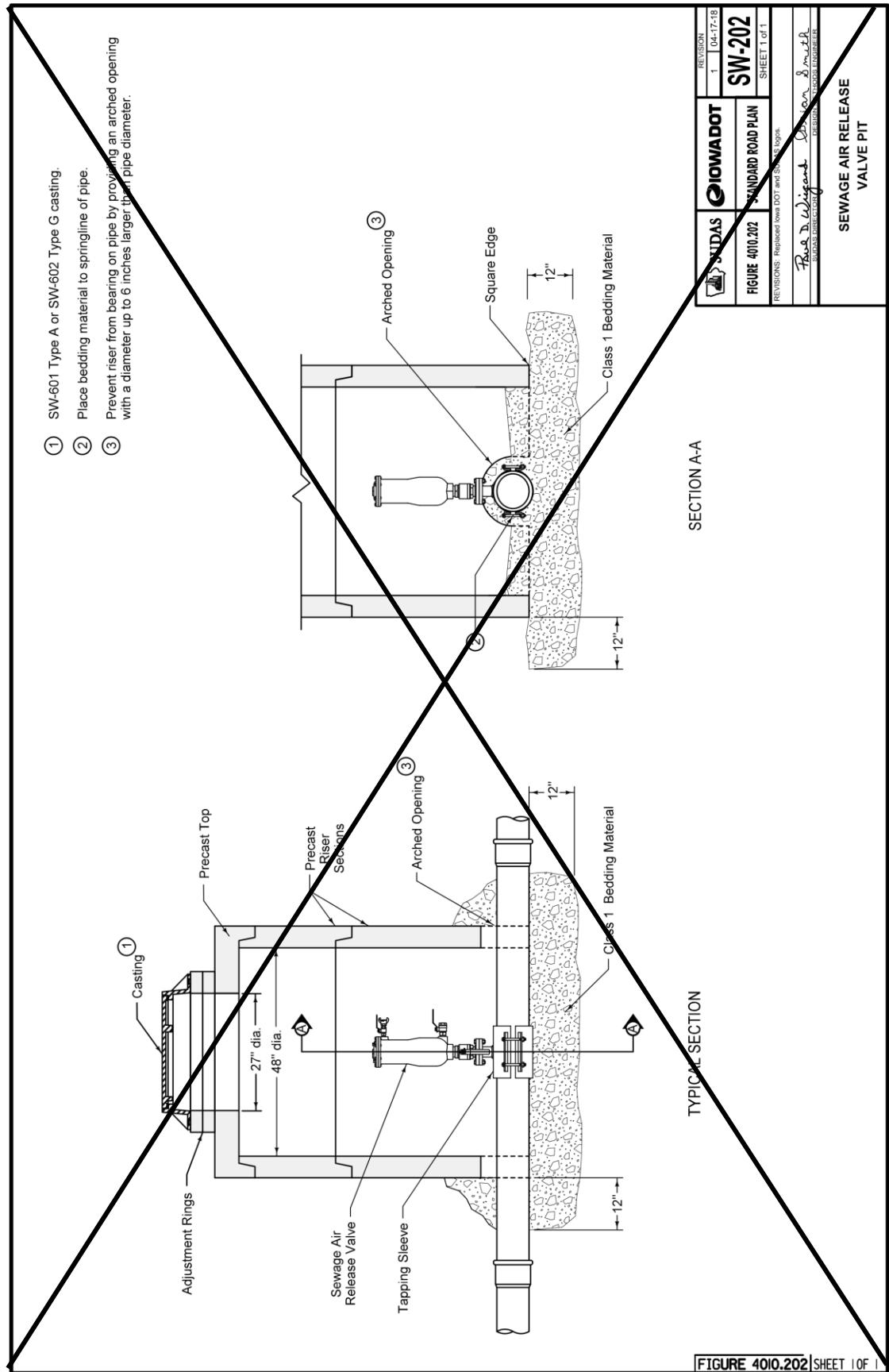


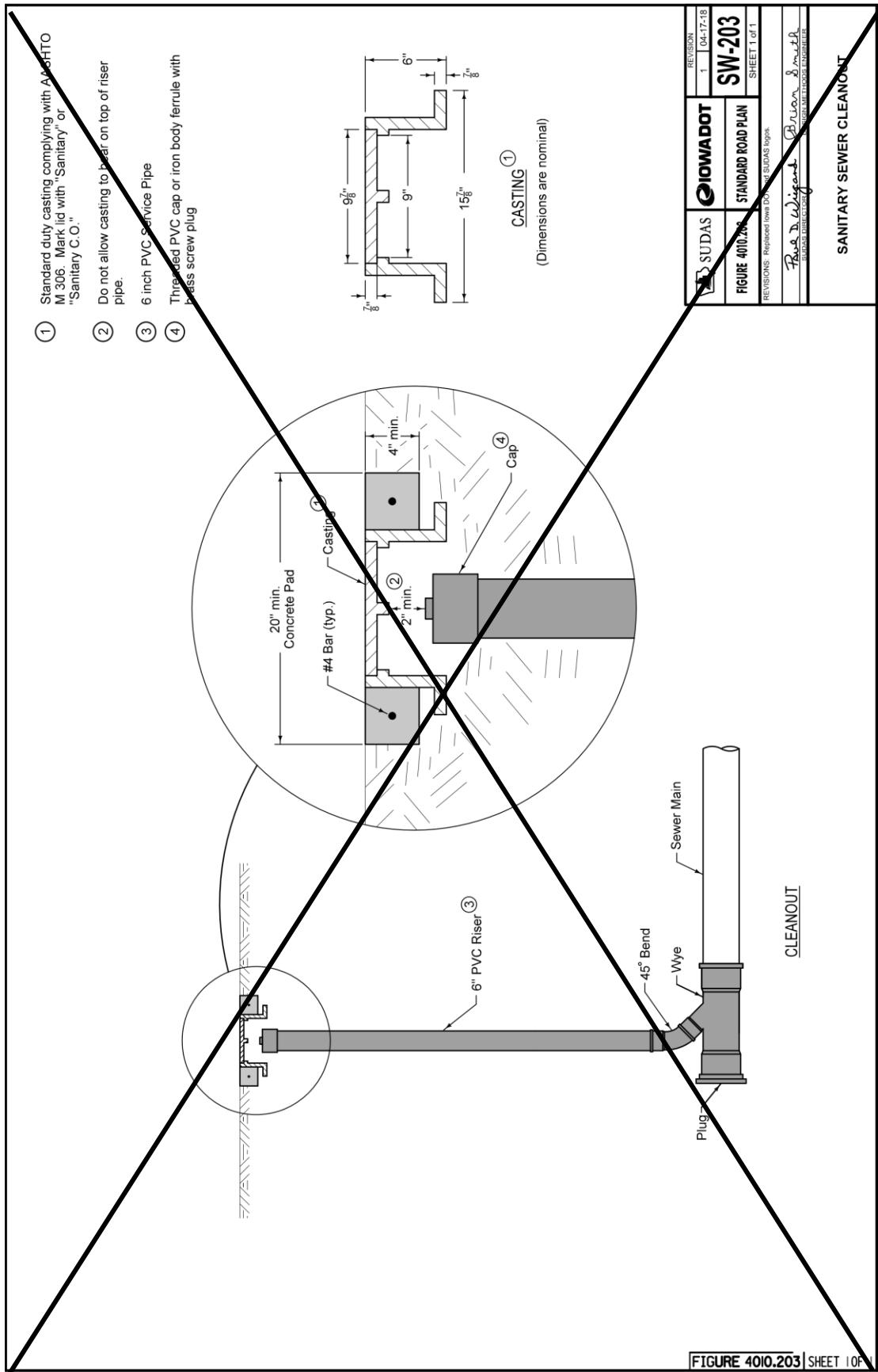












SECTION 4020 - STORM SEWERS

PART 1 - GENERAL

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

NO REVISIONS

PART 3 – EXECUTION

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.

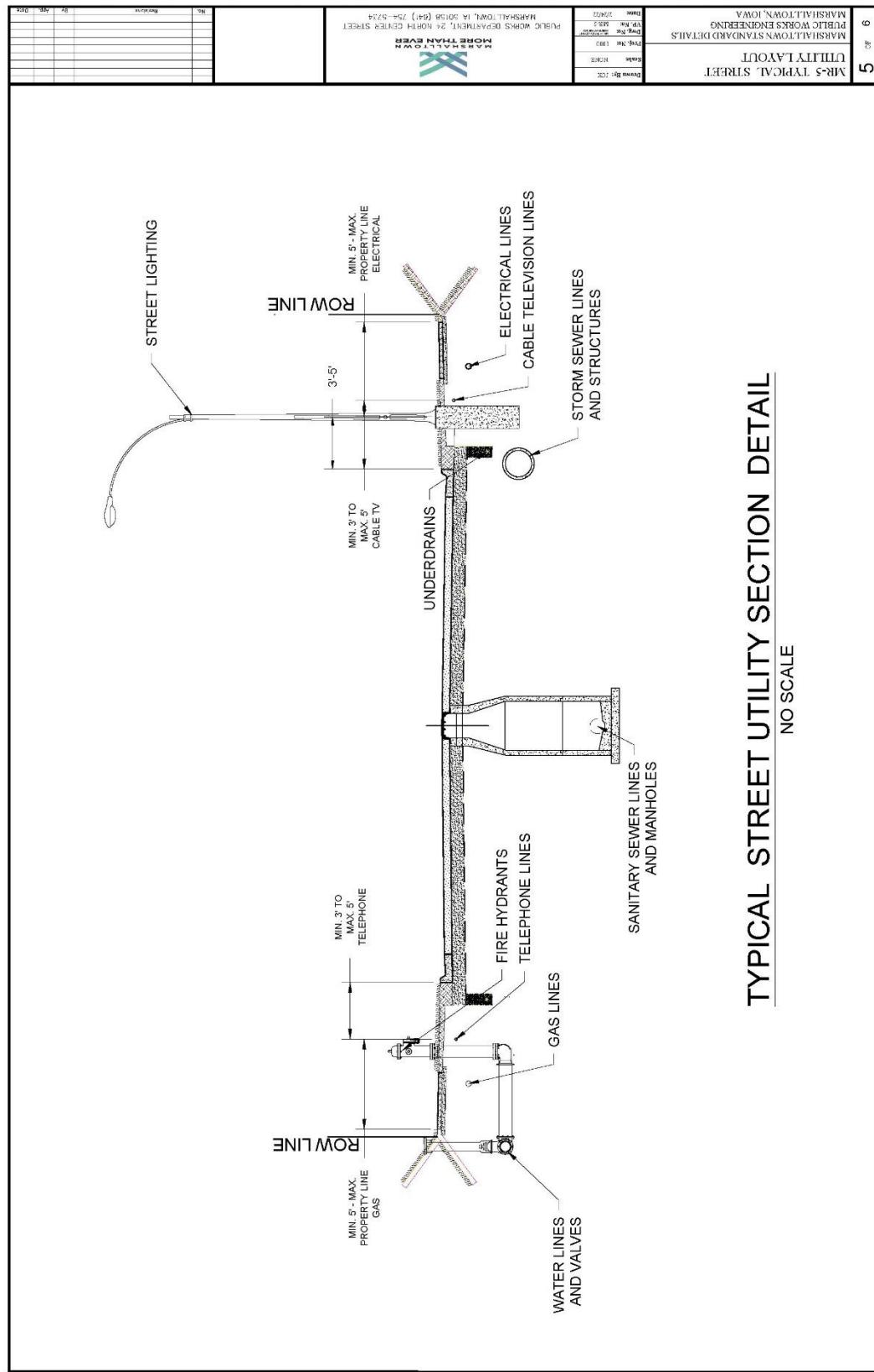
B. Separation of Sewer Force Mains from Water Mains: Separate storm sewer force mains and water mains by a horizontal distance of at least 10 feet unless:

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 - Bidding and Contract Documents and Part II - Technical Specifications

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

**SECTION OF PIPE CONNECTOR
(Concrete Pipe to Corrugated Pipe)**

**SECTION OF PIPE CONNECTOR
(Concrete Pipe to Concrete Pipe)**

OPTIONAL BOLTS/CONNECTORS

PIPE JOINT WRAPPING

TYPE 1 CONNECTION

Wrap all joints on concrete roadway pipe culverts.

Use Type 3 Connections 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 franchises methods.

For belled concrete pipe joints, connector may be installed on the inside of the pipe.

TYPE 2 (Sealed Joint)

One connector at the top of the pipe section.

TYPE 3 (Non-Sealed Joint)

Two connections near the top of the pipe section. For details of reinforcement, refer to AASHTO M 170 for the class of pipe required. Refer to Materials I.M. 449.00 for seal requirements.

TYPE 4 (Engineering fabric for embankment erosion control.)

Possible Tabulations:

PIPE SIZE (in)	CONNECTOR AND BOLT SIZE (in)	HOLE FOR CONNECTOR (in)
12 to 27	5	7
30 to 60	4	1.0
66 to 132	1.0	1.4

REVISIONS: Added 10-17-17 to Pavement Tabulations. Added Type 3 connection to concrete culvert.

APPROVED BY DESIGN ENGINEER
Bruce Smith

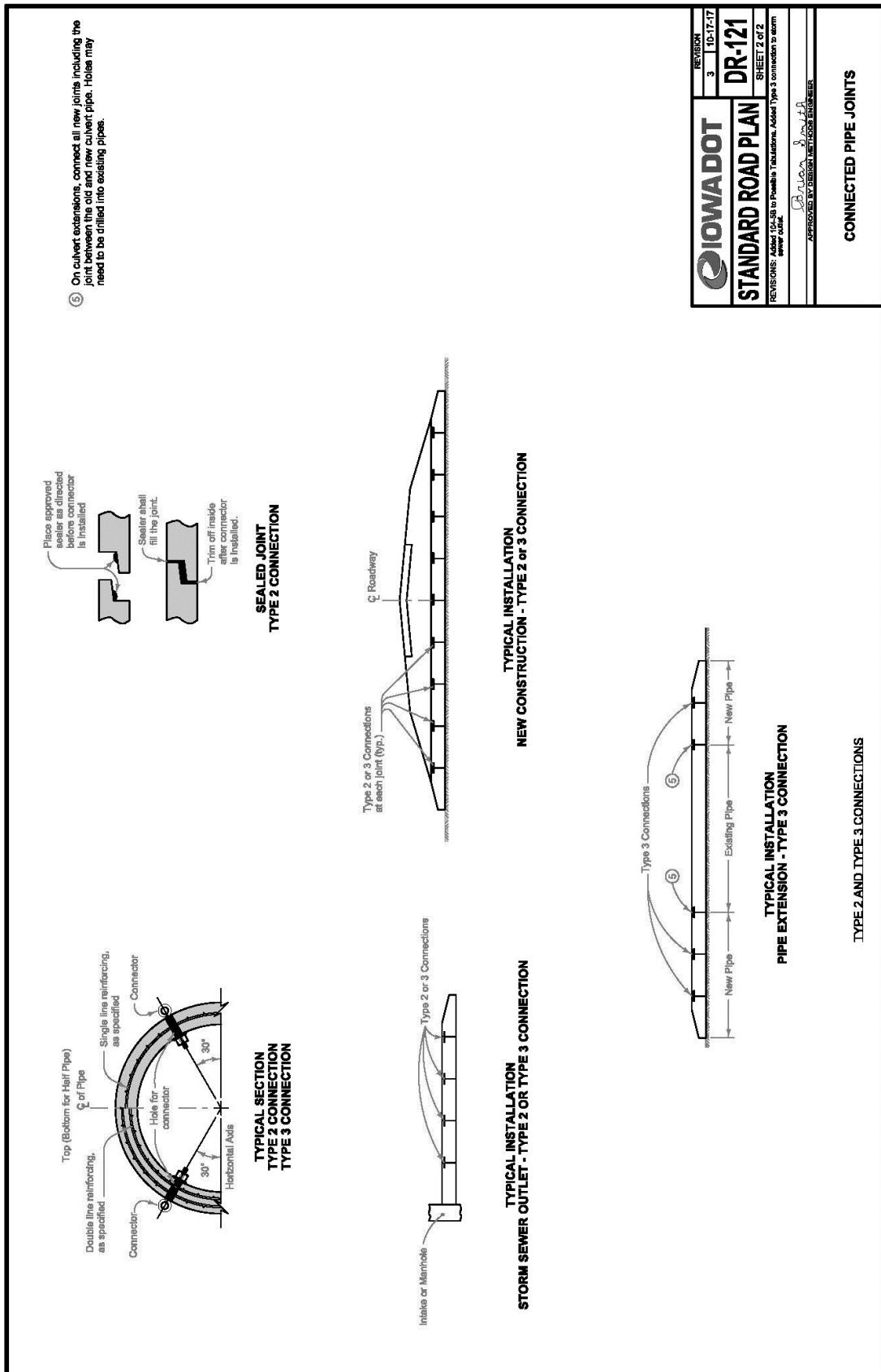
APPROVED BY CONSTRUCTION SUPERVISOR
Bruce Smith

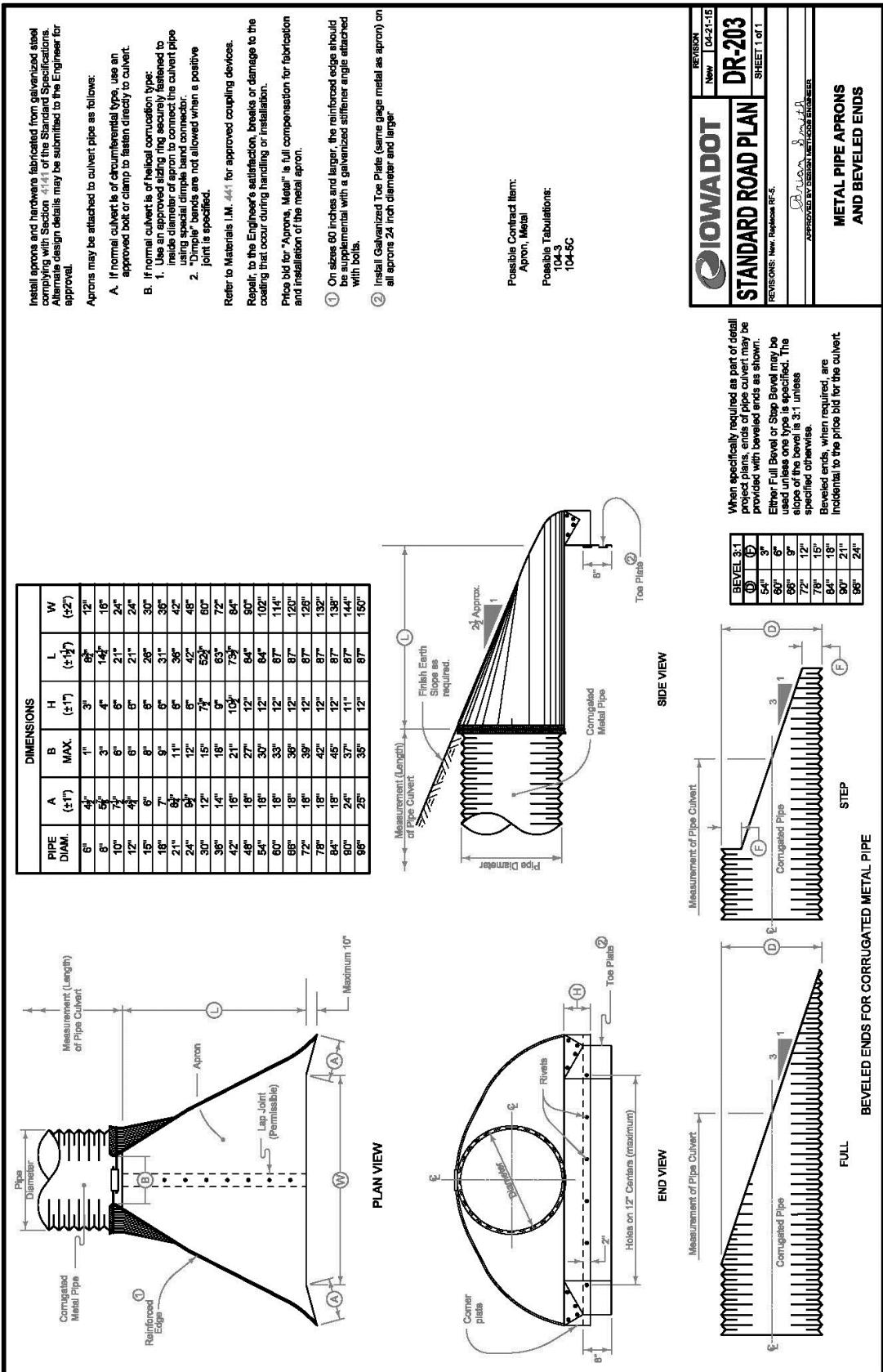
CONNECTED PIPE JOINTS

Updated 07/14/2020

Division 4 – Sewers and Drains

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For reinforcing steel used in construction of "Beveled Pipe and Guard", use deformed bars meeting the requirements of Article 4151.03 of the Standard Specifications and hot-dip galvanized according to ASTM A123.

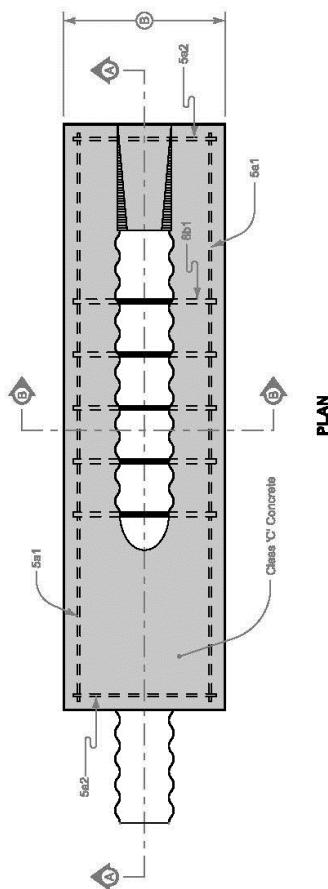
Use Class 'C' Concrete in the construction of Beveled Pipe and Guard.

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.

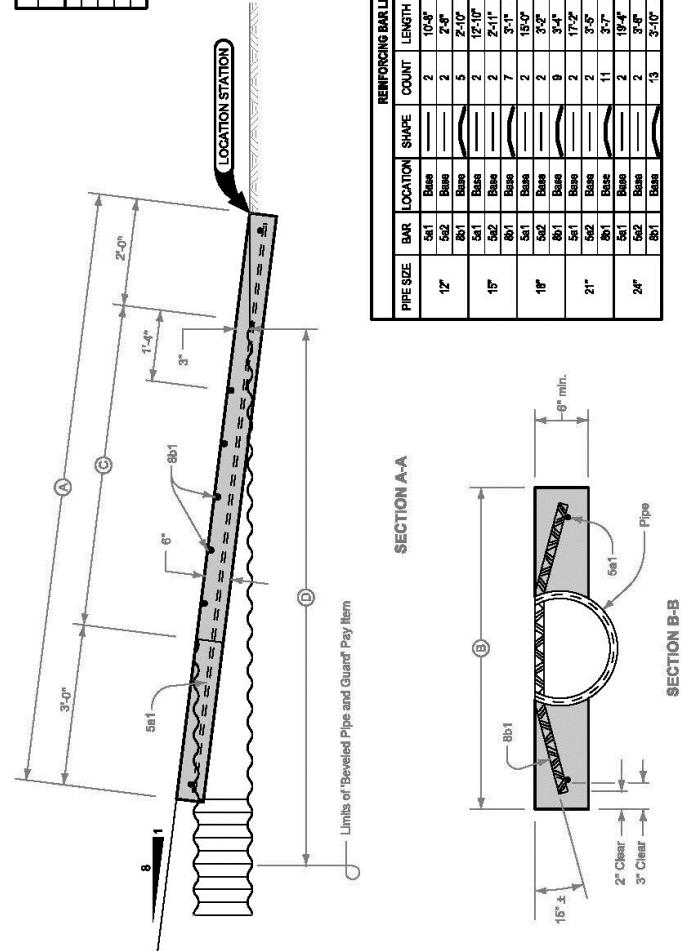
Price bid for "Beveled Pipe and Guard" each is full compensation for furnishing all materials and constructing the Beveled Pipe and Guard.

Special Note:

A silt fence ditch check is required immediately upstream from the inlet. Refer to EC-207 for construction details.



PLAN



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 - Bidding and Contract Documents and Part II - Technical Specifications"

PART 2 – PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

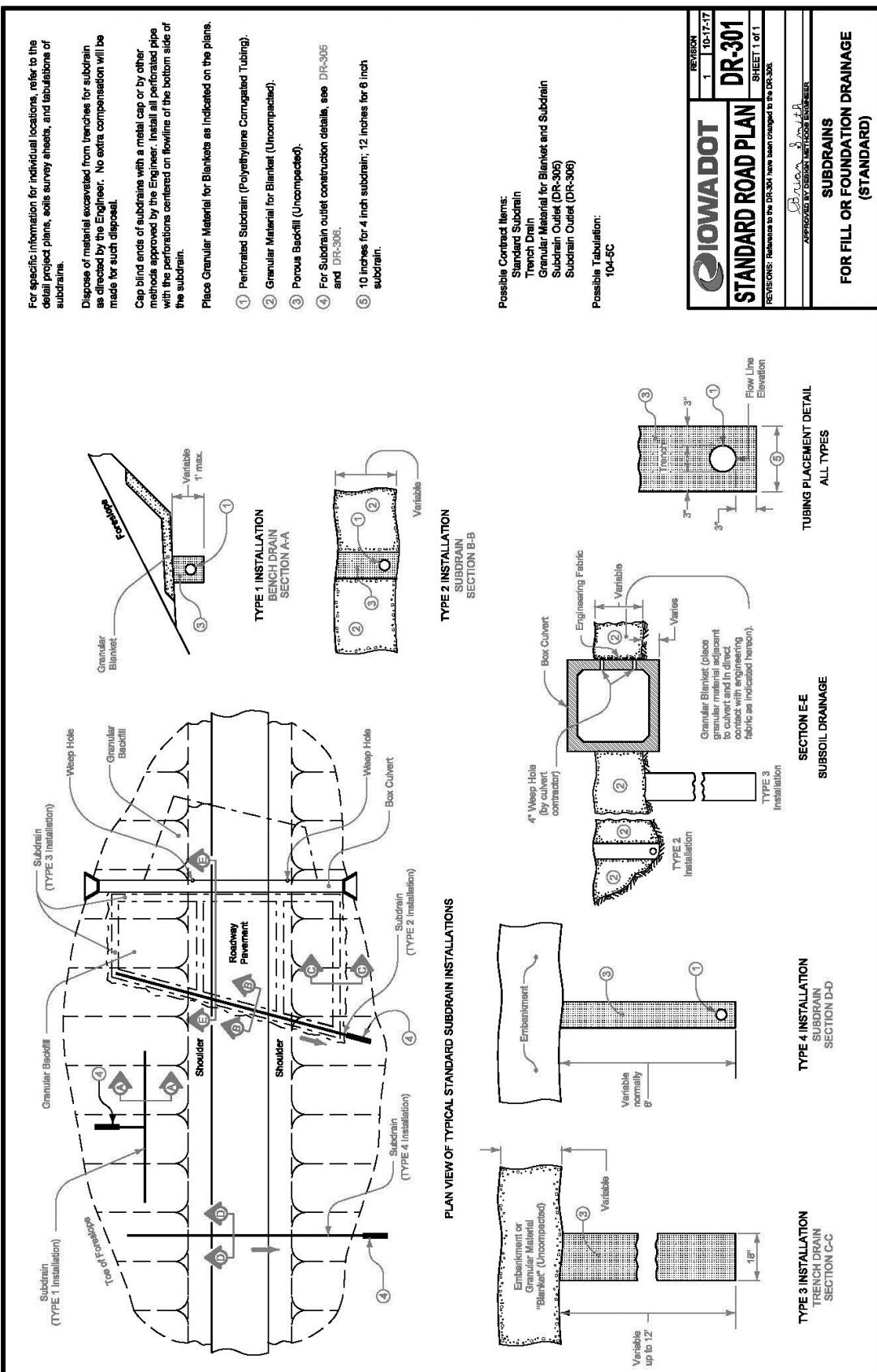
3.01 SUBDRAINS

- 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.



When culverts which are less than 1 foot below the trench bottom are encountered within a tabulated subdrain, stop the trench 3 feet from the culvert and resume 3 feet beyond the culvert.

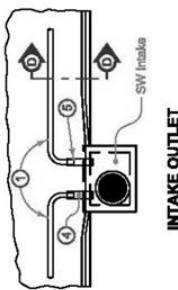
On new construction projects, place the subdrain after the special backfill, if required, and prior to granular or paved shoulder material.

Except for backfill installations, if the Contractor's operations result in a trench - place and compact granular shoulder material in the trench to be level with the adjacent surface prior to opening lanes to traffic.

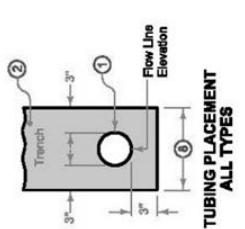
- ① Perforated Subdrain (Corrugated Polyethylene Tubing).
- ② Porous Backfill for Subdrain (compacted).
- ③ Subdrain outlets. See DR-306.

④ 2 foot section of corrugated metal pipe of diameter 2^{1/2} larger than subdrain or 2 foot section of double-walled PE or PVC pipe of the same diameter as subdrain. Pipe will be paid for as "Subdrain" Outlet (DR-303).

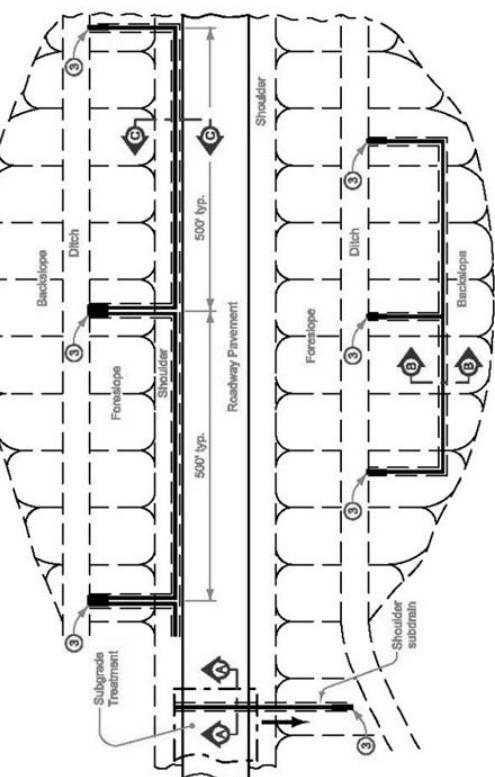
- ⑤ Connect PE or PVC outlet with an appropriate coupler. Connect CMP outlet one of two ways: (1) inside-fit reducer coupler (1 foot minimum fit inside CMP); or (2) Insert 1 foot of the 4 inch subdrain into 6 inch CMP and fully seal entire opening with grout.
- ⑥ Place porous backfill in direct contact with a minimum of 2 inches of pavement and continuous to shoulder material as per note 10 or 11.
- ⑦ If the trench is inadvertently carried over the culvert, repair the trench as detailed on this sheet. If obstruction is 1 foot or more below trench bottom, carry subdrain line over in continuous alignment. No payment will be made for trench repair.
- ⑧ 10 Inches for 4 inch subdrain. 12 Inches for 6 inch subdrain.



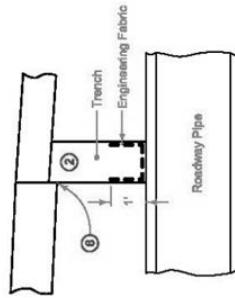
INTAKE OUTLET



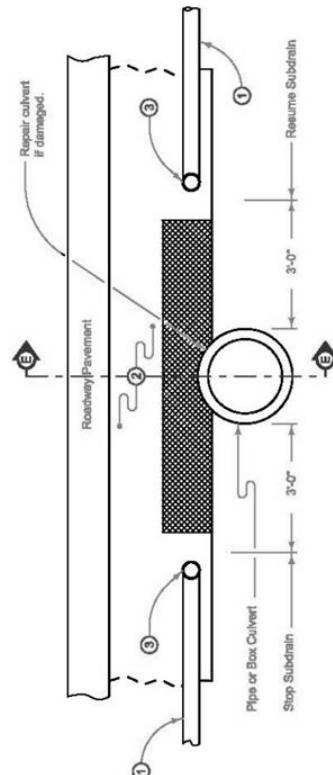
TUBING PLACEMENT
ALL TYPES



PLAN

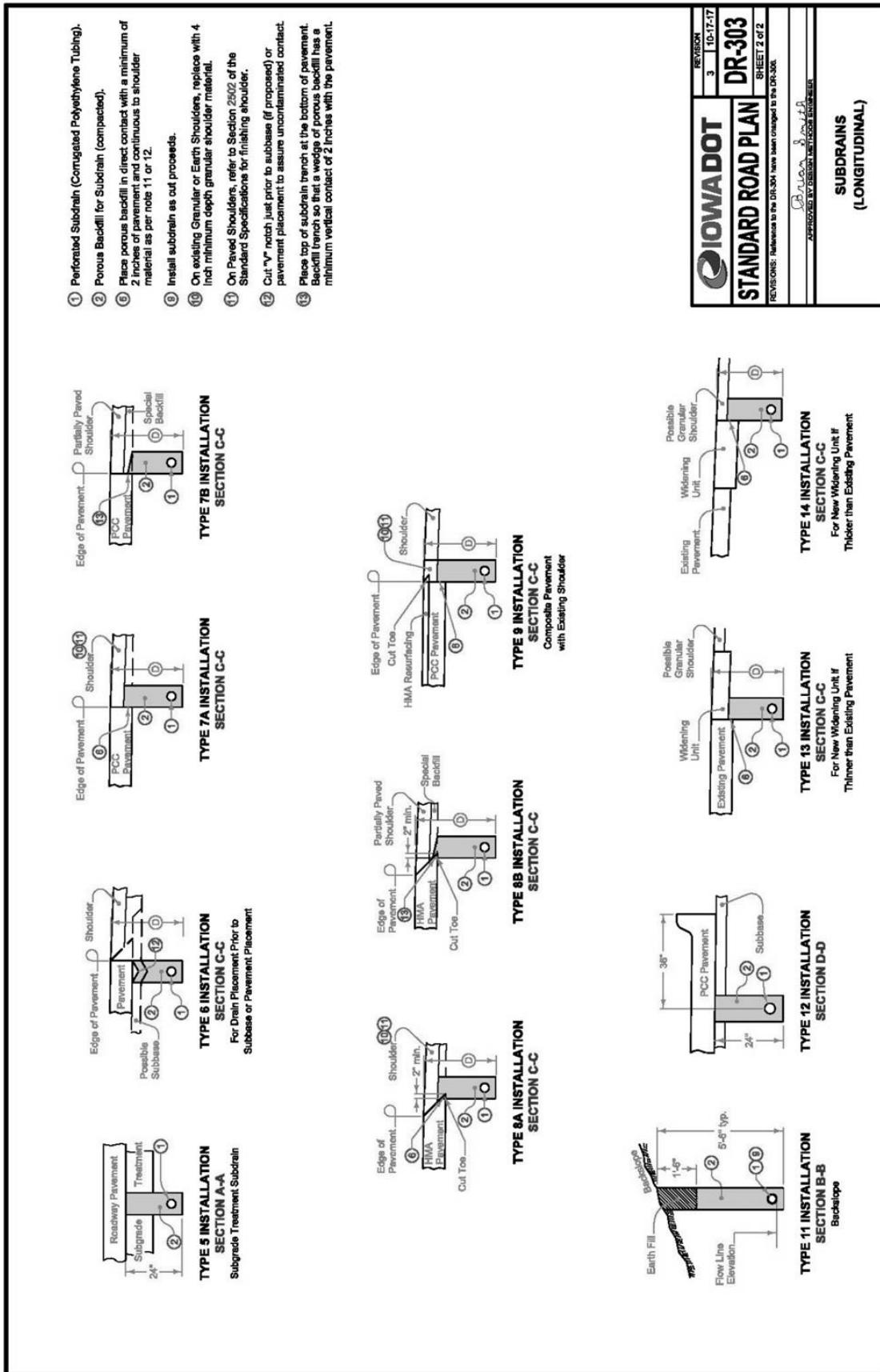


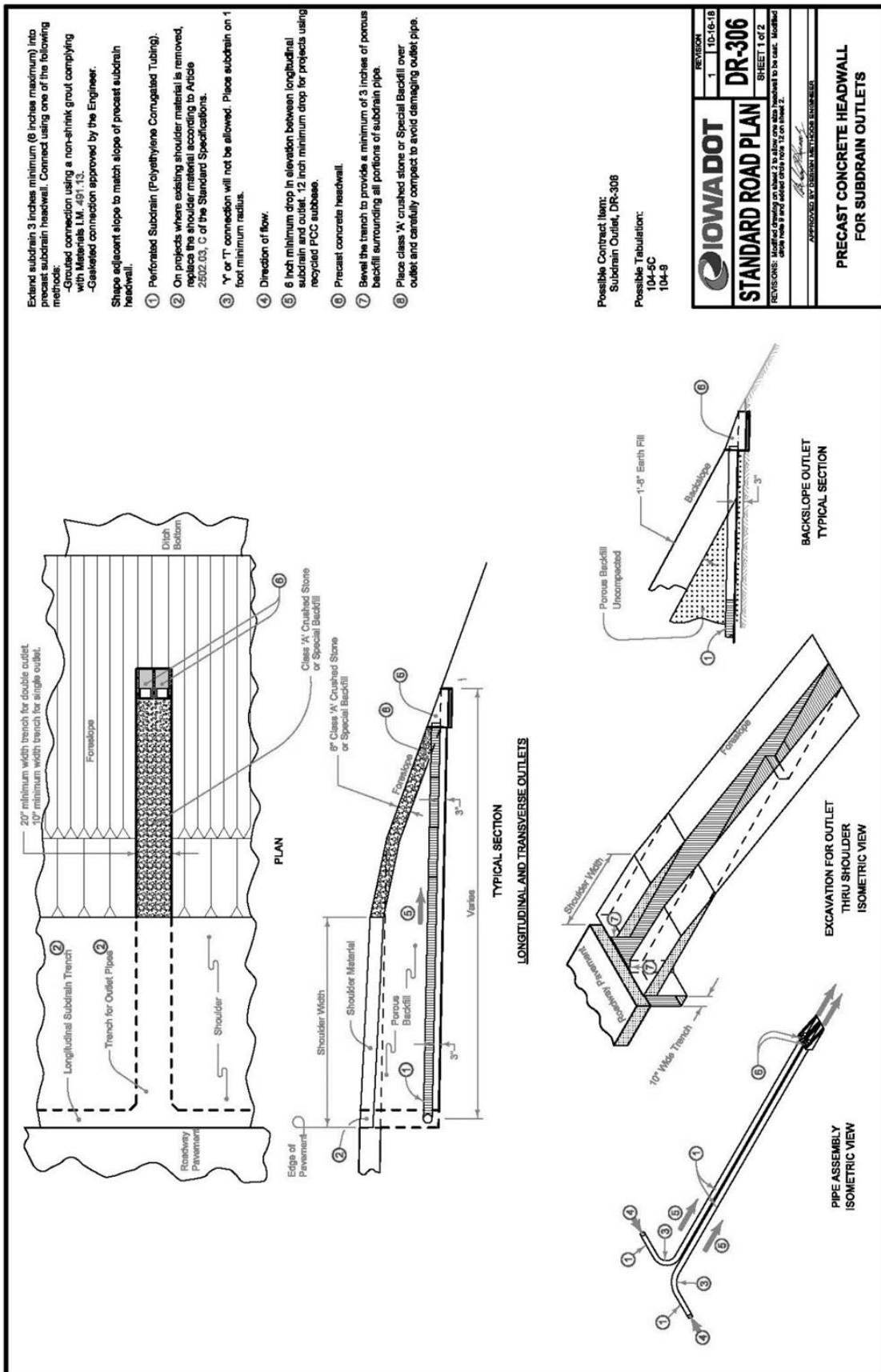
SECTION E-E

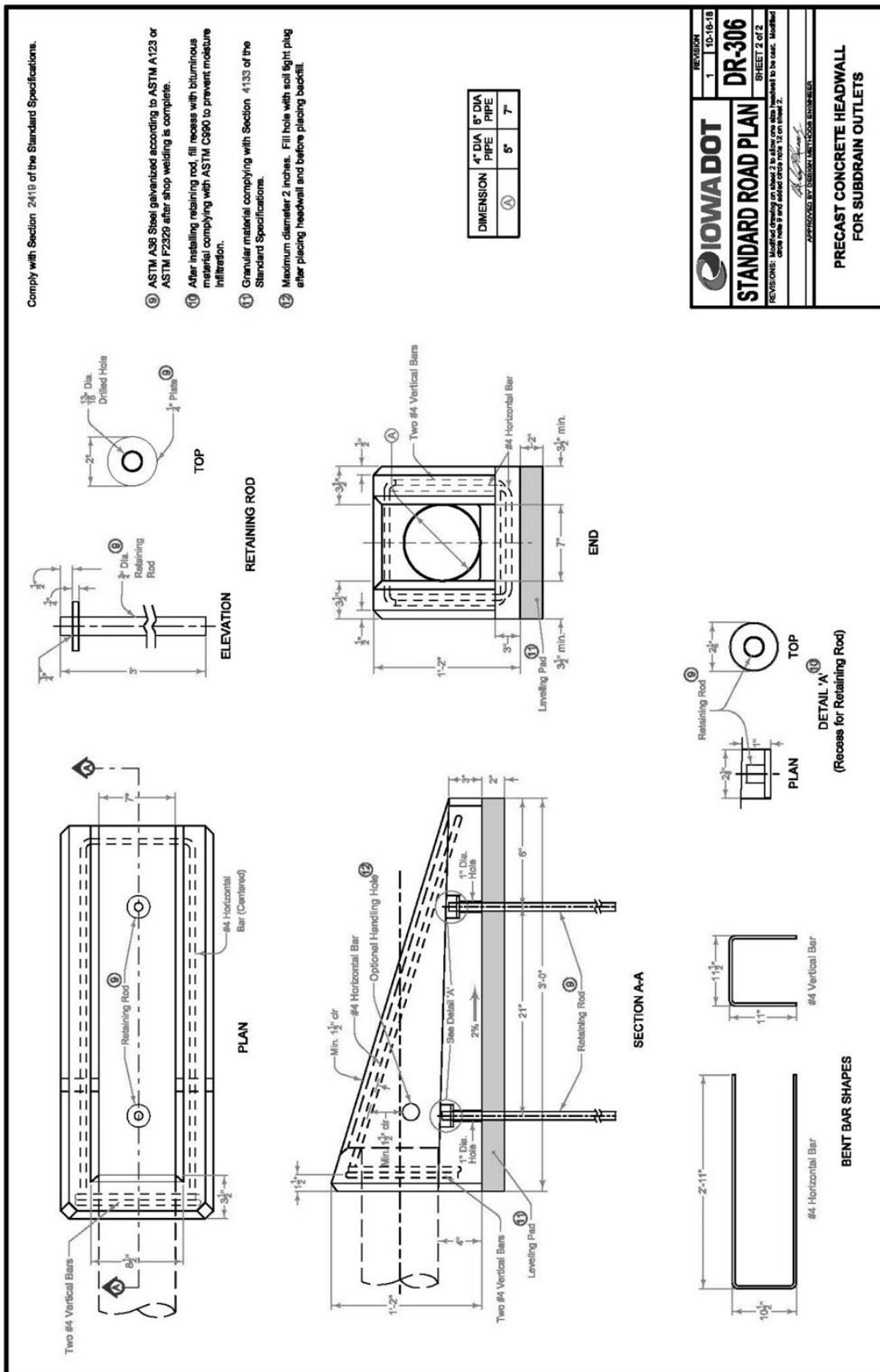


TRENCH REPAIR AT PIPE CULVERT 7

REVISED	3-10-7-17	DR-303	STANDARD ROAD PLAN	
			SHEET 1 of 2	
REVISONS: References to the DR-303 have been changed to the DR-306.		 		APPROVED BY DIVISION OF HIGHWAY ENGINEER
SUBDRAINS (LONGITUDINAL)				







SECTION 4050 - PIPE REHABILITATION

PART 1 - GENERAL

NO REVISIONS

PART 2 – PRODUCTS

NO REVISIONS

PART 3 – EXECUTION

NO REVISIONS

SECTION 4060 - CLEANING, INSPECTION, AND TESTING OF SEWERS

PART 1 - GENERAL

NO REVISIONS

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)

SUPPLEMENTAL DIVISION 6 - STRUCTURES FOR SANITARY AND STORM SEWER

SECTION 6010 - STRUCTURES FOR SANITARY AND STORM SEWERS

PART 1 - GENERAL

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-7.2, 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-7.2, 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-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. 6010.513 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)

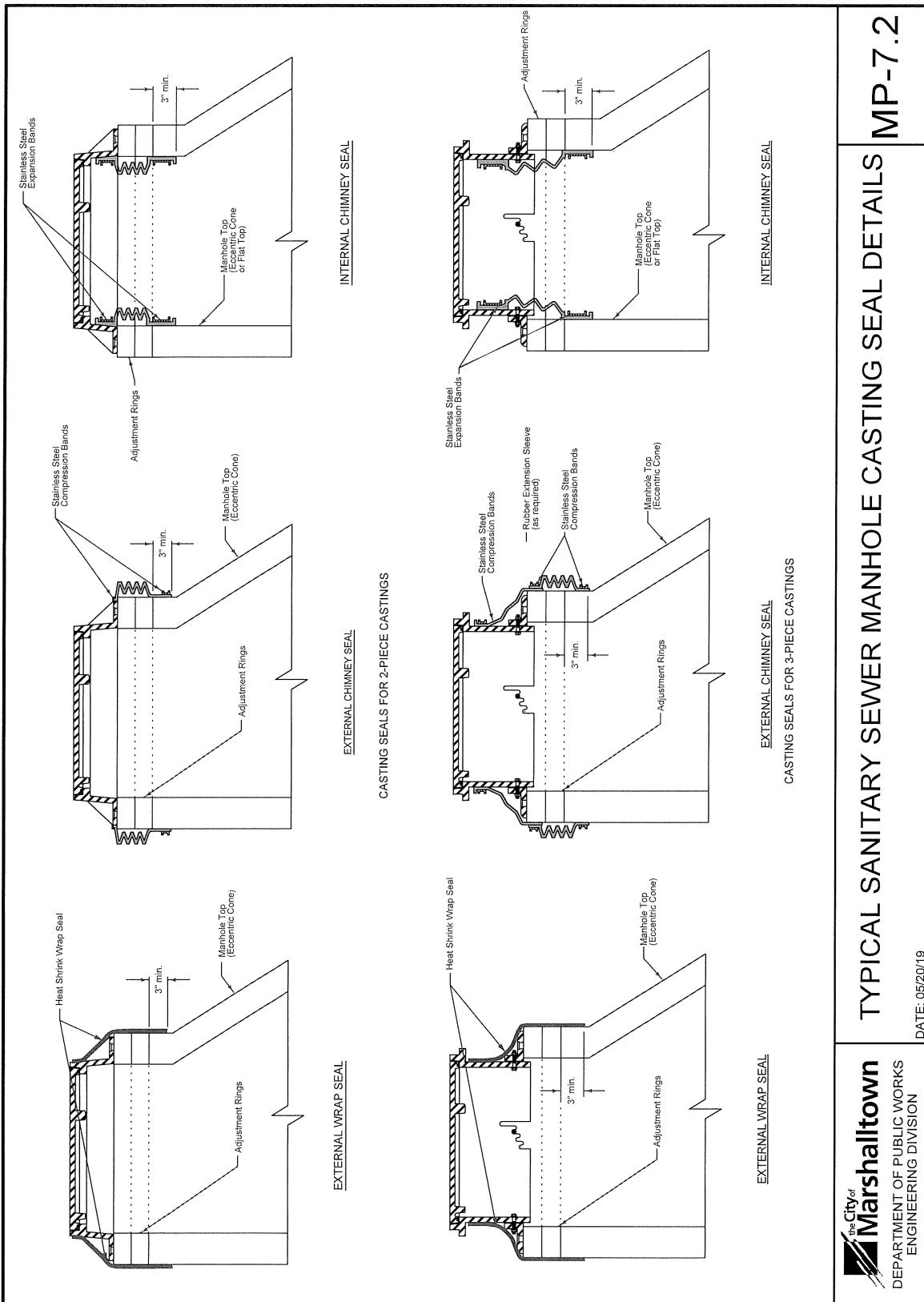
LOW PRESSURE/VACUUM TESTING OF SANITARY MANHOLES

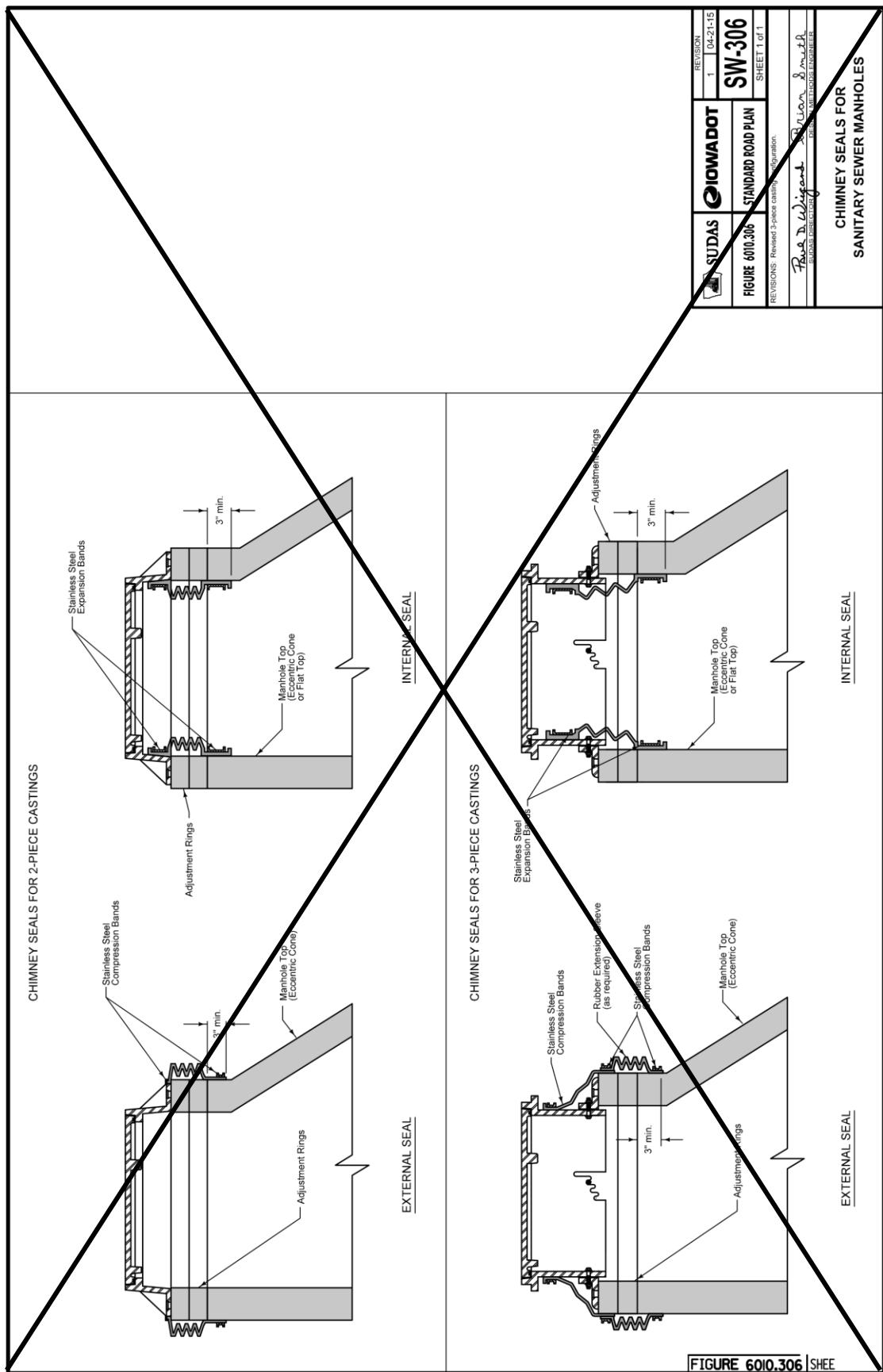
PROJECT NAME: _____

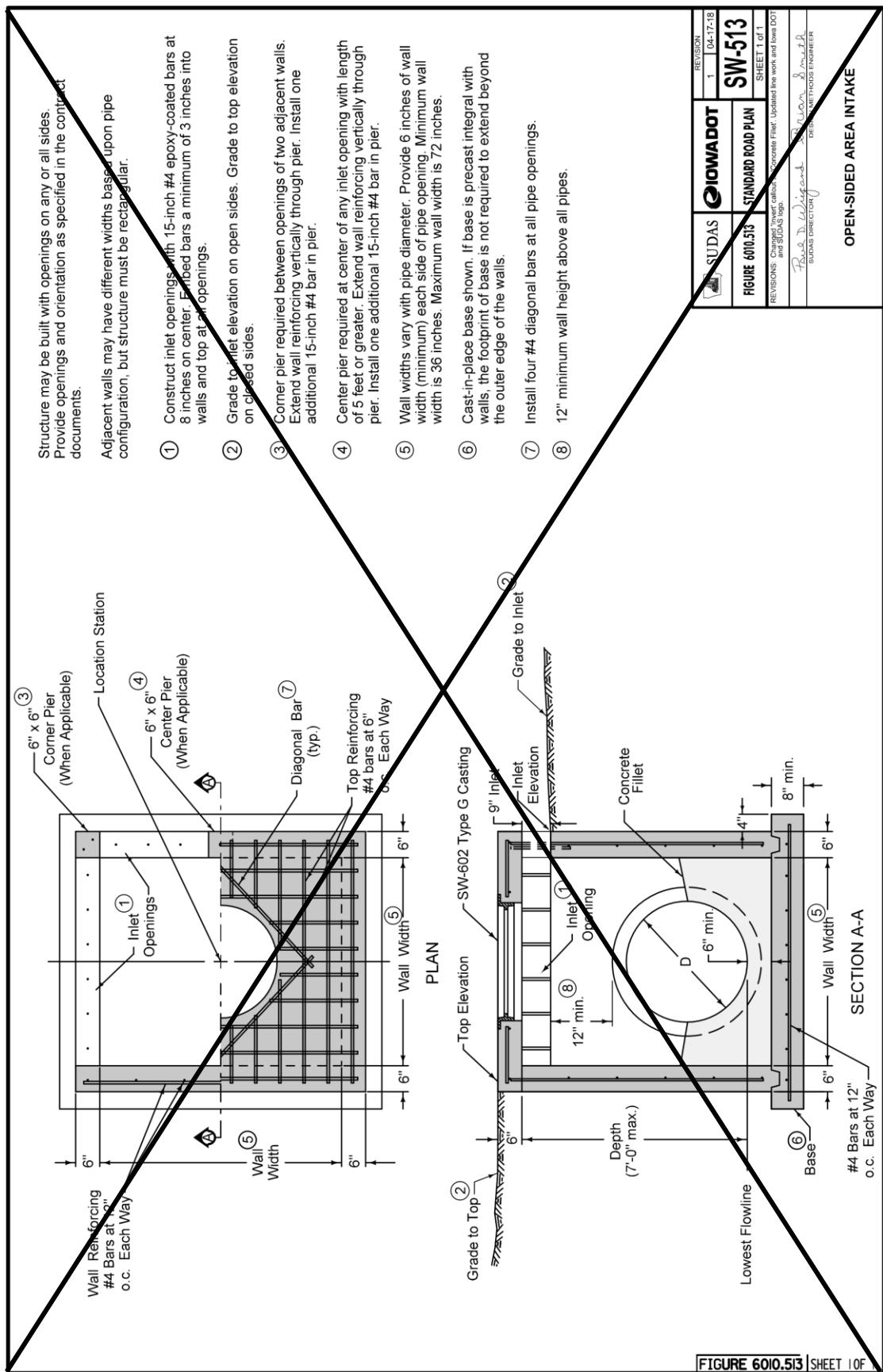
LOCATION: _____

CONTRACTOR: _____

<p><u>LIST MANHOLE TESTED:</u> DATE _____</p> <p>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</p>	<p style="text-align: center;">TEST INFORMATION:</p> <p>Low Pressure Method: Initial Pressure: _____ psi Starting Test Pressure: _____ psi Ending Test Pressure: _____ psi Test Duration: _____ Sec(s)</p> <p>CONCLUSION: Complies: Yes _____ No _____</p> <p style="text-align: center;"><i>Vacuum Method</i></p> <p>Initial Vacuum: _____ Hg Starting Test Vacuum: _____ Hg Ending Test Vacuum: _____ Hg Test Duration: _____ Sec(s)</p> <p>CONCLUSION: Complies: Yes _____ No _____</p>		
<p><u>LIST MANHOLE TESTED:</u> DATE _____</p> <p>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</p>	<p style="text-align: center;">TEST INFORMATION:</p> <p>Low Pressure Method: Initial Pressure: _____ psi Starting Test Pressure: _____ psi Ending Test Pressure: _____ psi Test Duration: _____ Sec(s)</p> <p>CONCLUSION: Complies: Yes _____ No _____</p> <p style="text-align: center;"><i>Vacuum Method</i></p> <p>Initial Vacuum: _____ Hg Starting Test Vacuum: _____ Hg Ending Test Vacuum: _____ Hg Test Duration: _____ Sec(s)</p> <p>CONCLUSION: Complies: Yes _____ No _____</p>		
<p><u>LIST MANHOLE TESTED:</u> DATE _____</p> <p>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</p>	<p style="text-align: center;">TEST INFORMATION:</p> <p>Low Pressure Method: Initial Pressure: _____ psi Starting Test Pressure: _____ psi Ending Test Pressure: _____ psi Test Duration: _____ Sec(s)</p> <p>CONCLUSION: Complies: Yes _____ No _____</p> <p style="text-align: center;"><i>Vacuum Method</i></p> <p>Initial Vacuum: _____ Hg Starting Test Vacuum: _____ Hg Ending Test Vacuum: _____ Hg Test Duration: _____ Sec(s)</p> <p>CONCLUSION: Complies: Yes _____ No _____</p>		
<p>Testing procedures observed and Information recorded by: _____</p> <p style="text-align: center;">Results reviewed and affirmed by:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;">Project Representative</td> <td style="width: 50%; text-align: center;">Project Engineer City of Marshalltown, Iowa</td> </tr> </table>		Project Representative	Project Engineer City of Marshalltown, Iowa
Project Representative	Project Engineer City of Marshalltown, Iowa		







SECTION 6020 - REHABILITATION OF EXISTING MANHOLES

PART 1 - GENERAL

NO REVISIONS

PART 2 - PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

NO REVISIONS

SECTION 6030 - CLEANING, INSPECTION, AND TESTING OF STRUCTURES

PART 1 - GENERAL

NO REVISIONS

PART 2 - PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

NO REVISIONS

SUPPLEMENTAL DIVISION 7 - STREETS AND RELATED WORK

SECTION 7010 -PORTLAND CEMENT CONCRETE PAVEMENT

PART 1 - GENERAL

NO REVISIONS

PART 2 - PRODUCTS

2.01 (ADD) MATERIALS

P. Fiber Reinforcement – See Section 7011, 2.01. E.

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.

E. (ADD) Bar and Reinforcement Placement:

5. If noted on the plans, fiber mesh reinforcing shall be used with all concrete sidewalk and pavement. See Section 7011 for dosage rates. The fiber shall be added directly to the truck at the time of mixing.

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

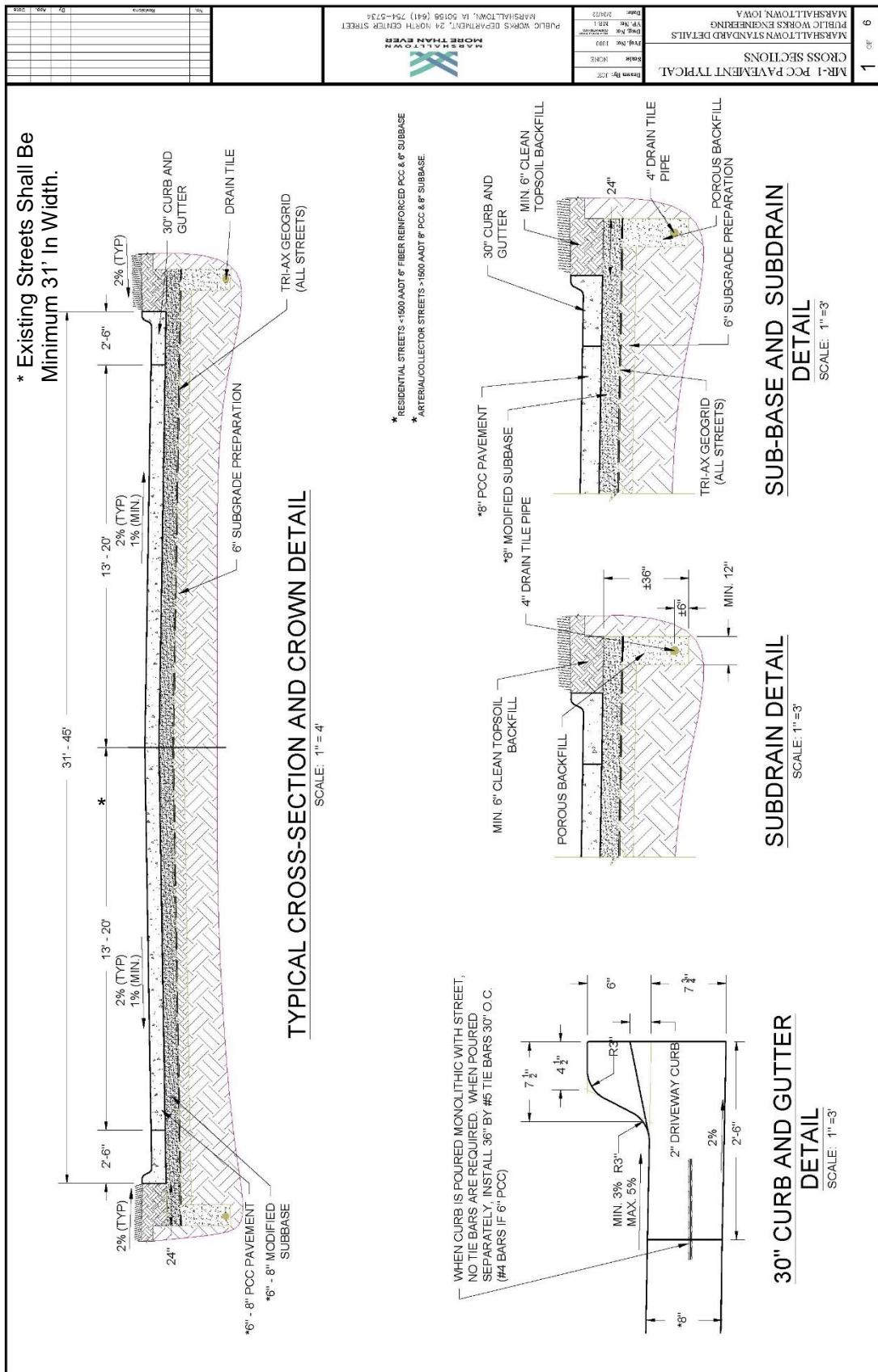
		Section size, minimum dimension			
		< 12 in. (300 mm)	12 to 36 in. (300 to 900 mm)	36 to 72 in. (900 to 1800 mm)	> 72 in. (1800 mm)
Line	Air Temperature	Minimum concrete temperature as placed and maintained			
1		55°F (13°C)	50°F (10°C)	45°F (7°C)	40°F (5°C)
		Minimum concrete temperature as mixed for 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)

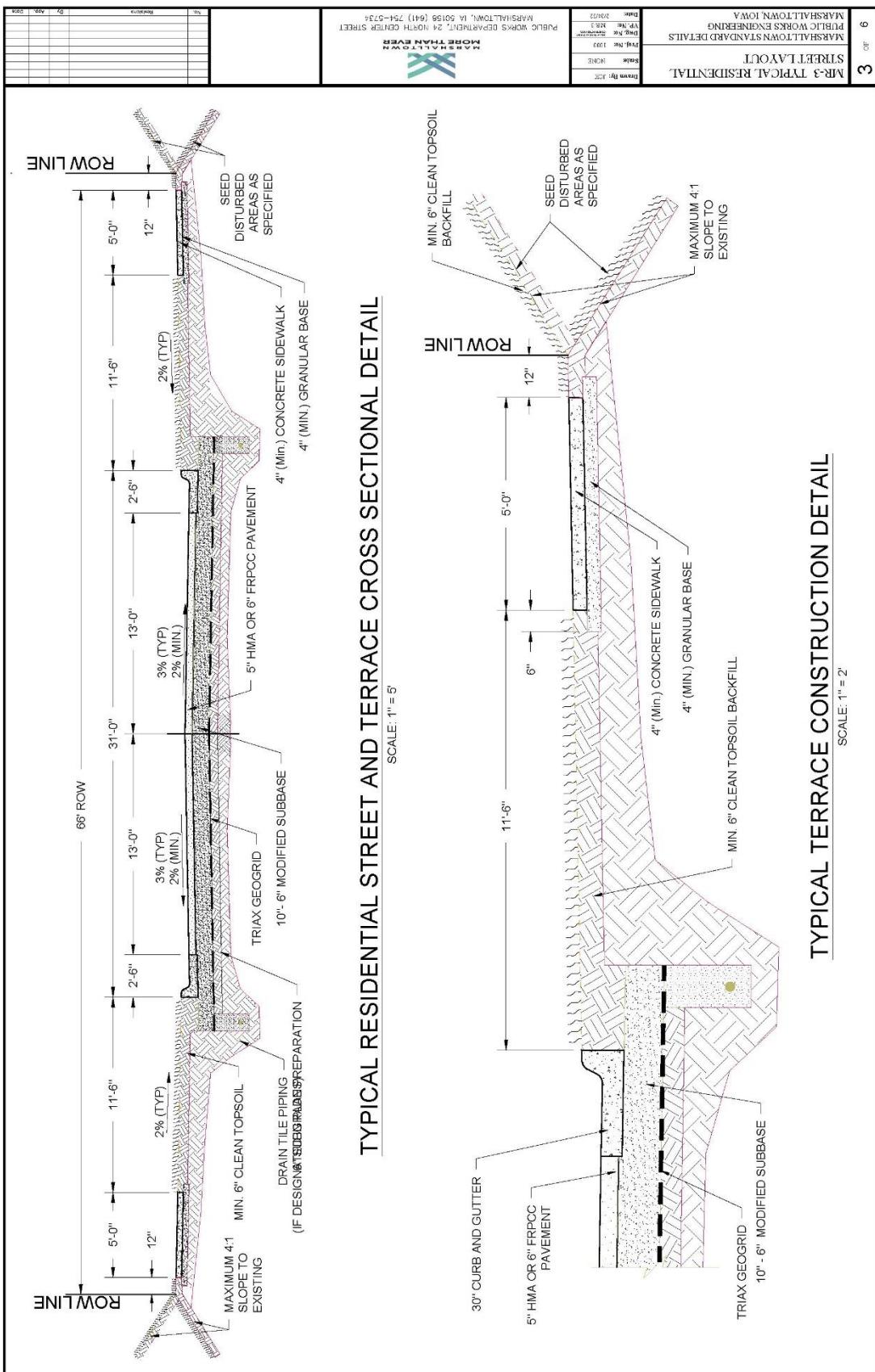
* For colder weather, a greater margin in temperature is provided between concrete as mixed and required minimum temperature of fresh concrete in place.

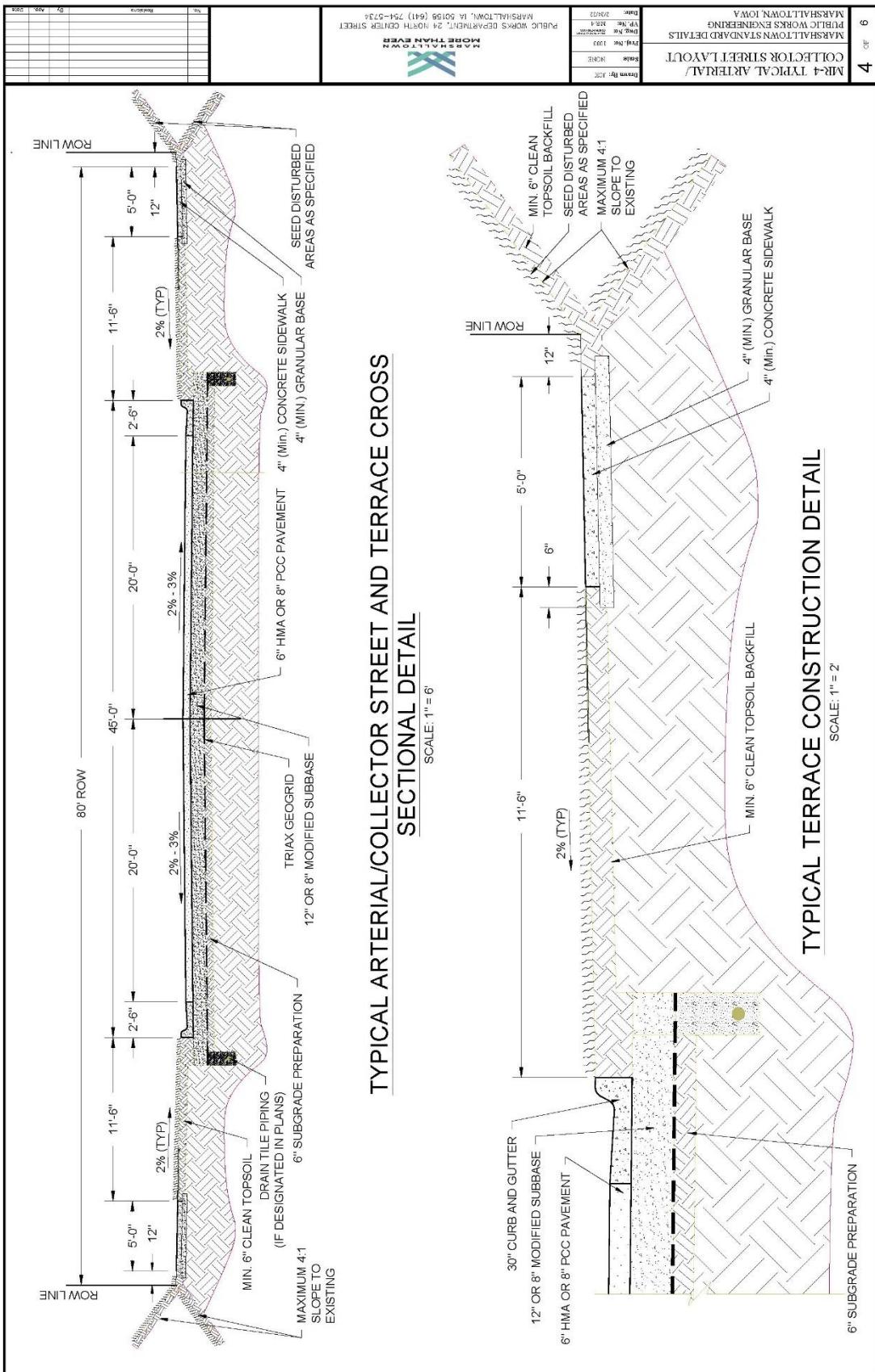
3.08 (ADD) MARSHALLTOWN STANDARD DETAILS

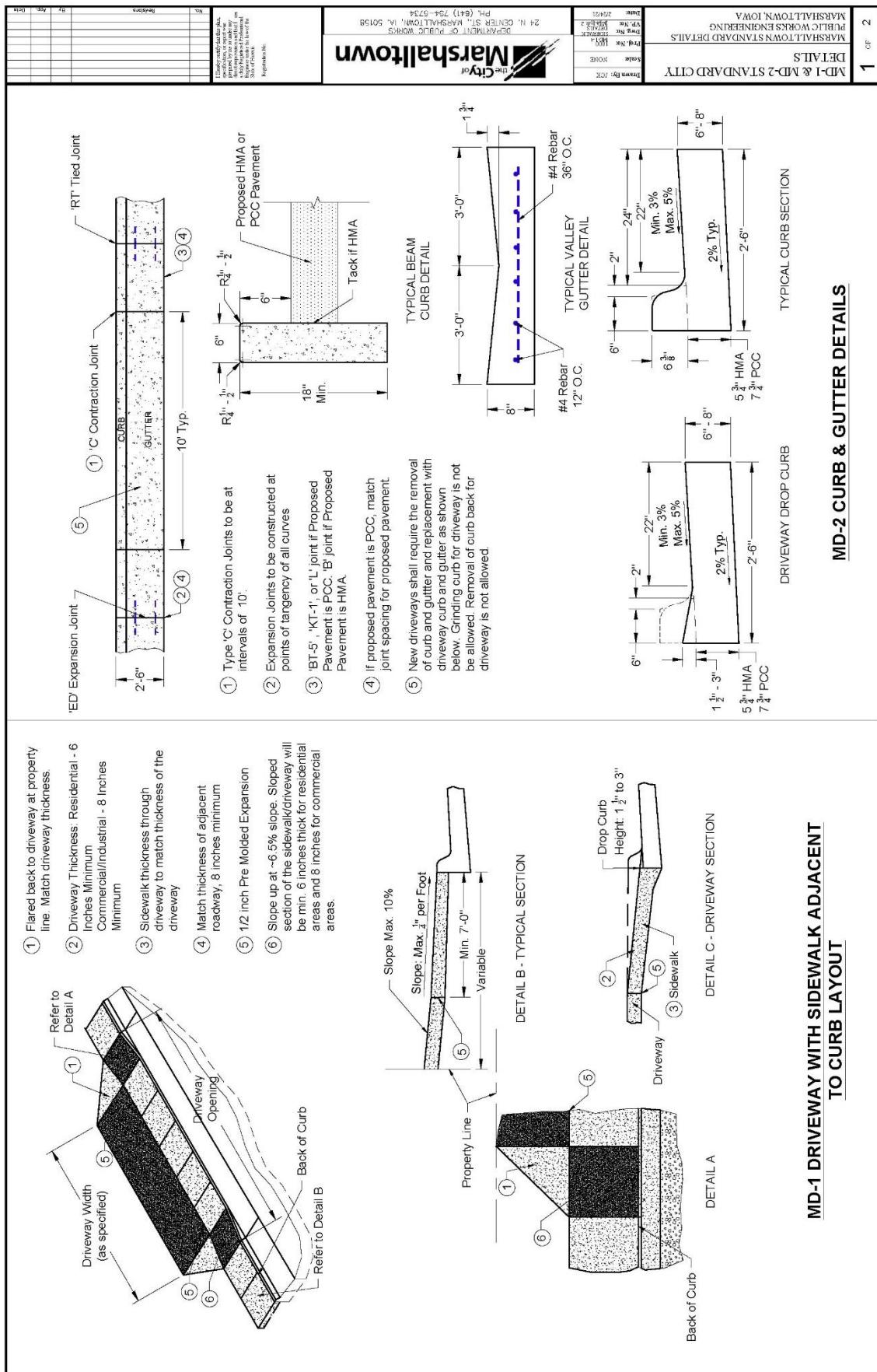
A. Added the following details:

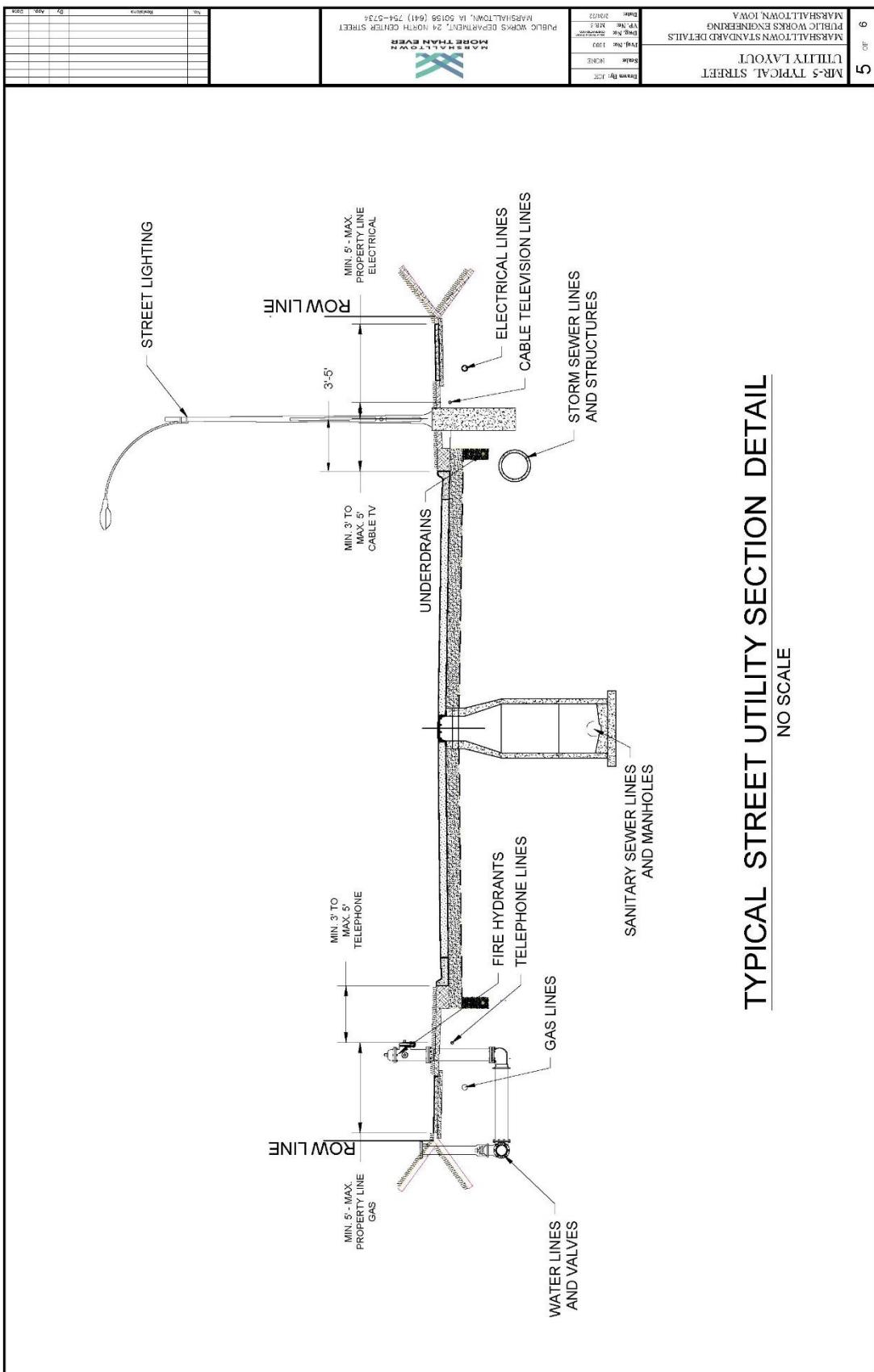
1. MR-1 PCC Pavement Typical Cross Sections
2. MR-3 Typical Residential Street Layout
3. MR-4 Typical Arterial/Collector Street Layout
4. MD-2 Typical Curb and Gutter Details
5. MR-5 Typical Street Utility Section Detail
6. MR-6 Typical Street Intersection Detail

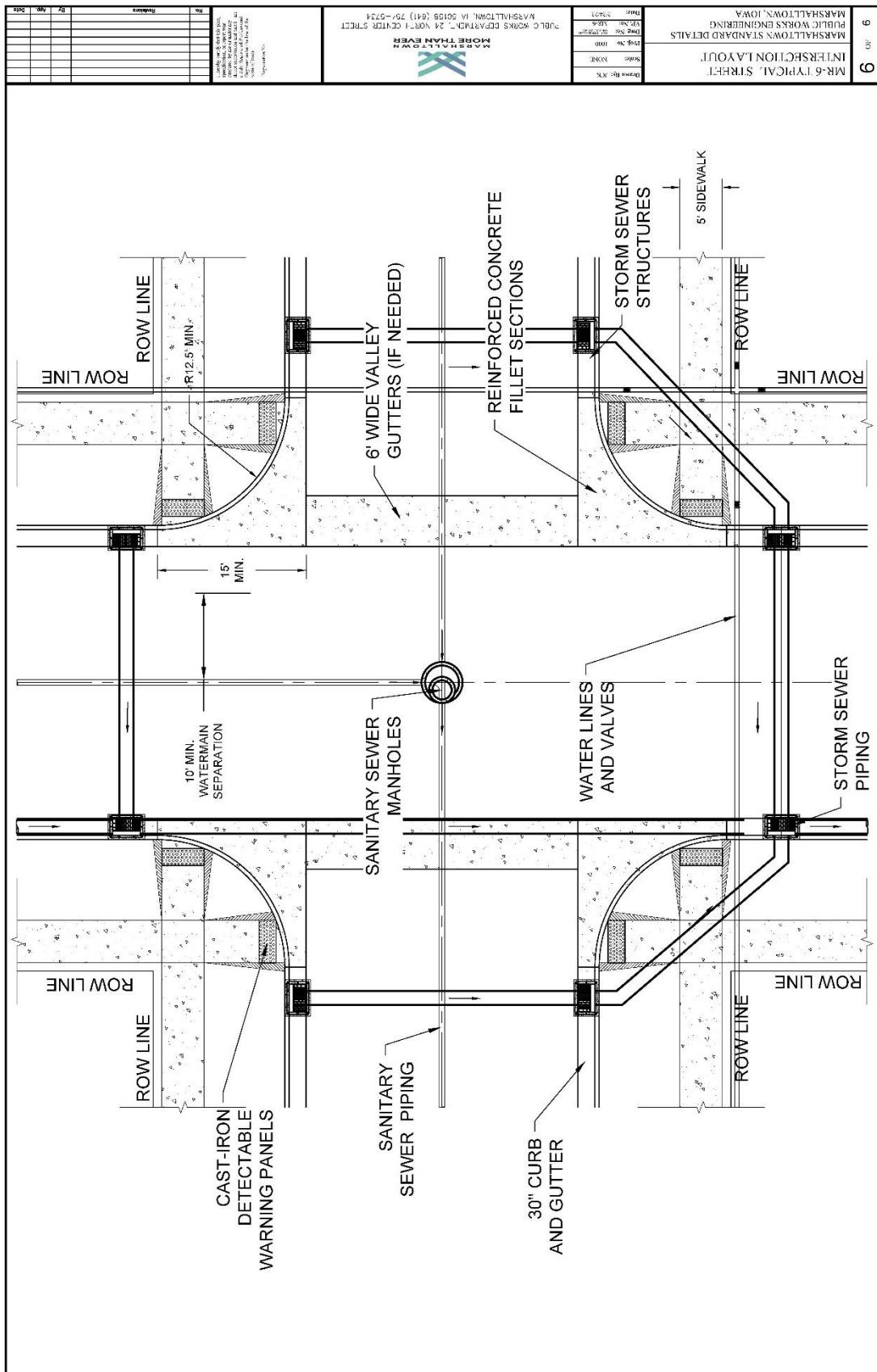












SECTION 7011 - PORTLAND CEMENT CONCRETE OVERLAYS

PART 1 - GENERAL

NO REVISIONS

PART 2 - PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

NO REVISIONS

SECTION 7020 - HOT MIX ASPHALT PAVEMENT

PART 1 - GENERAL

NO REVISIONS

PART 2 - PRODUCTS

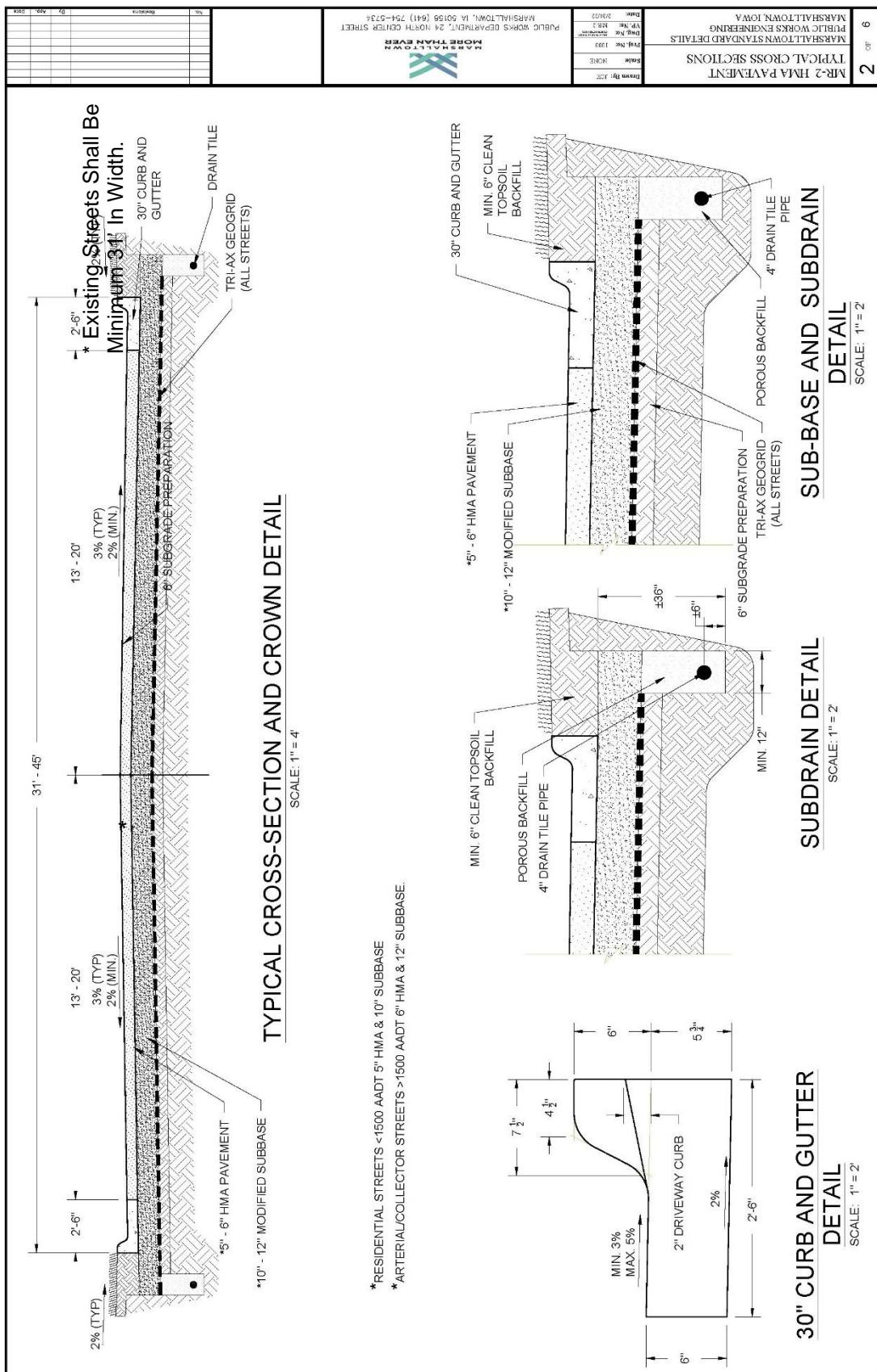
NO REVISIONS

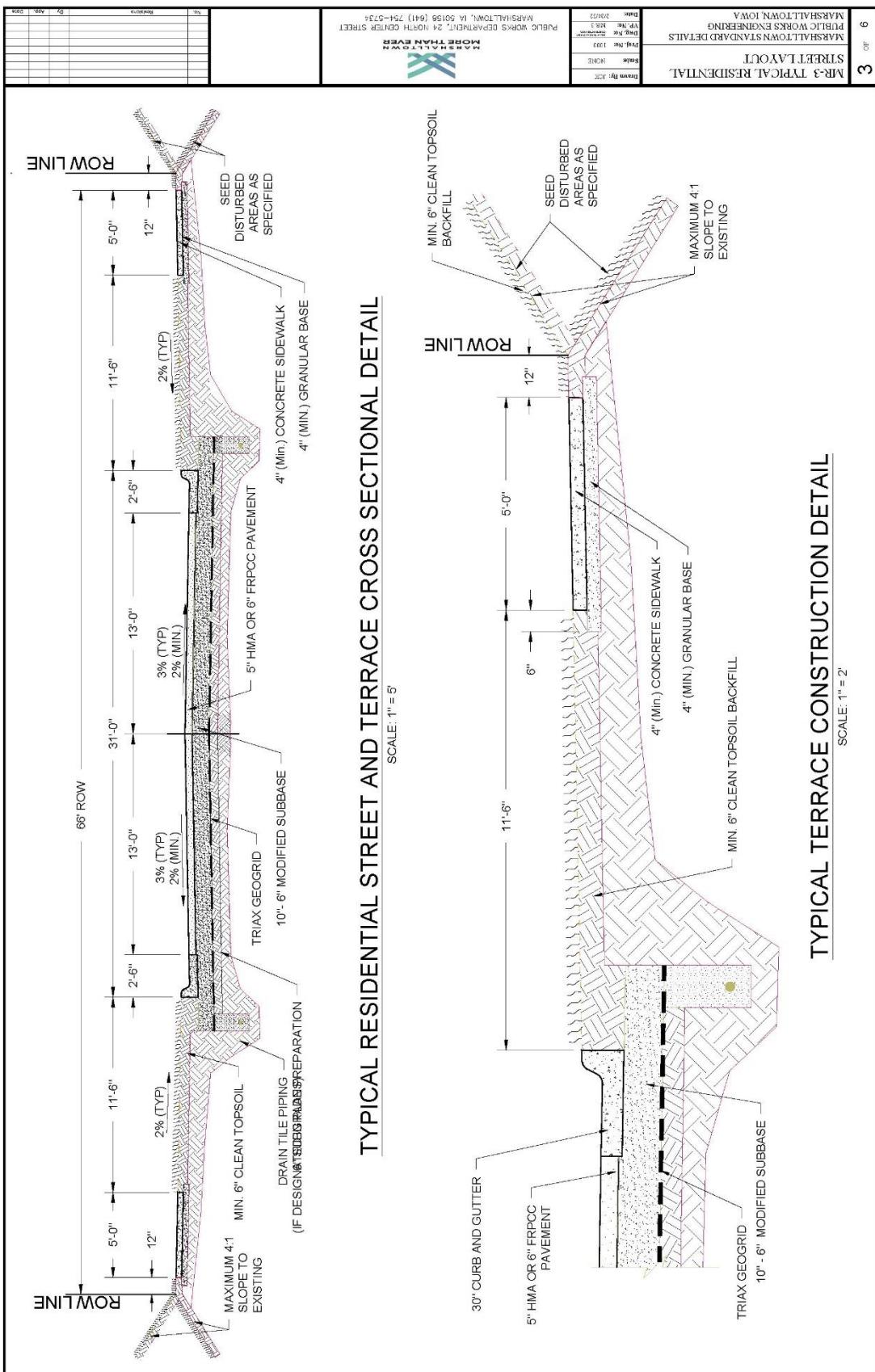
PART 3 - EXECUTION

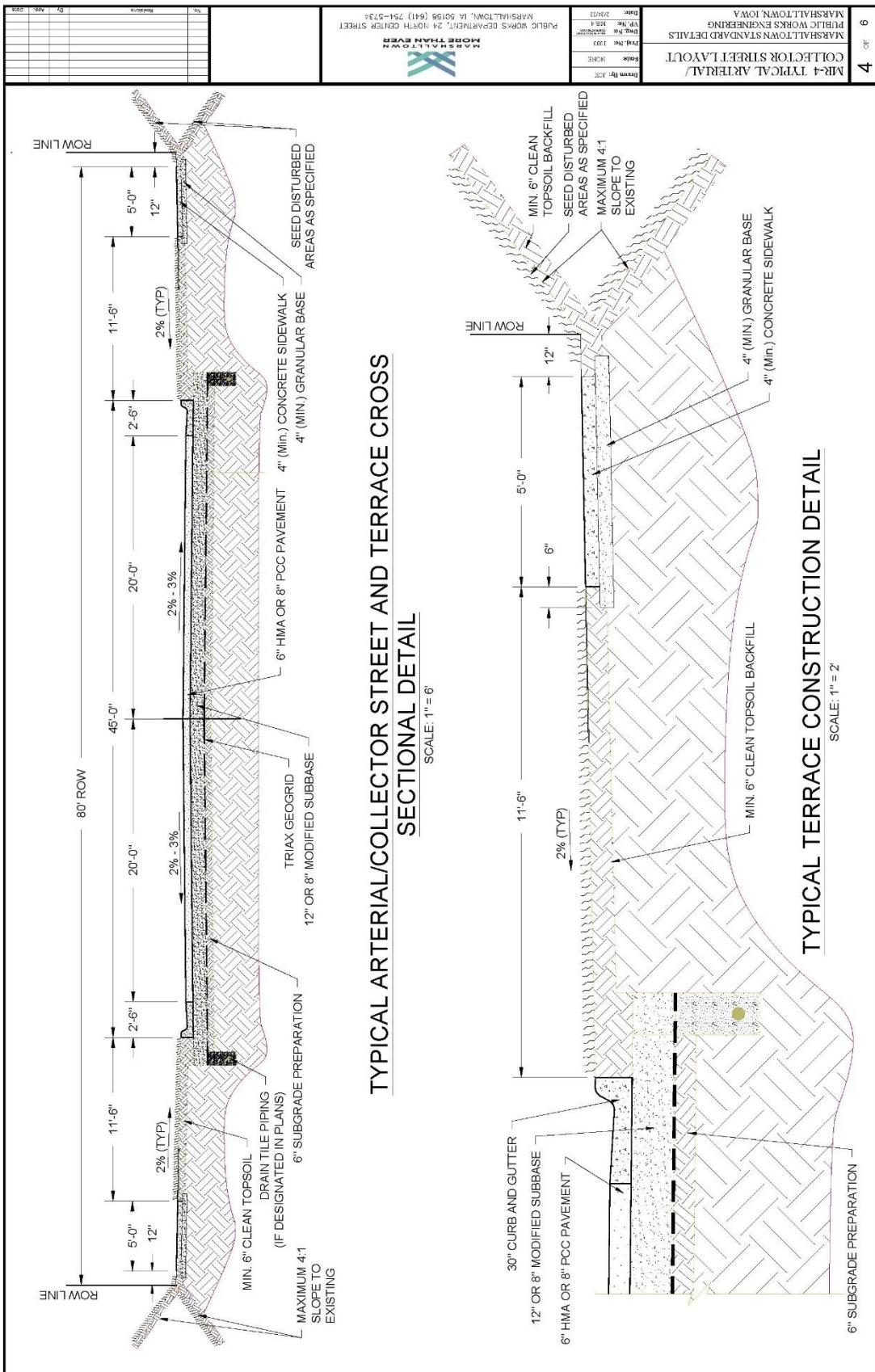
3.09 (ADD) MARSHALLTOWN STANDARD DETAILS

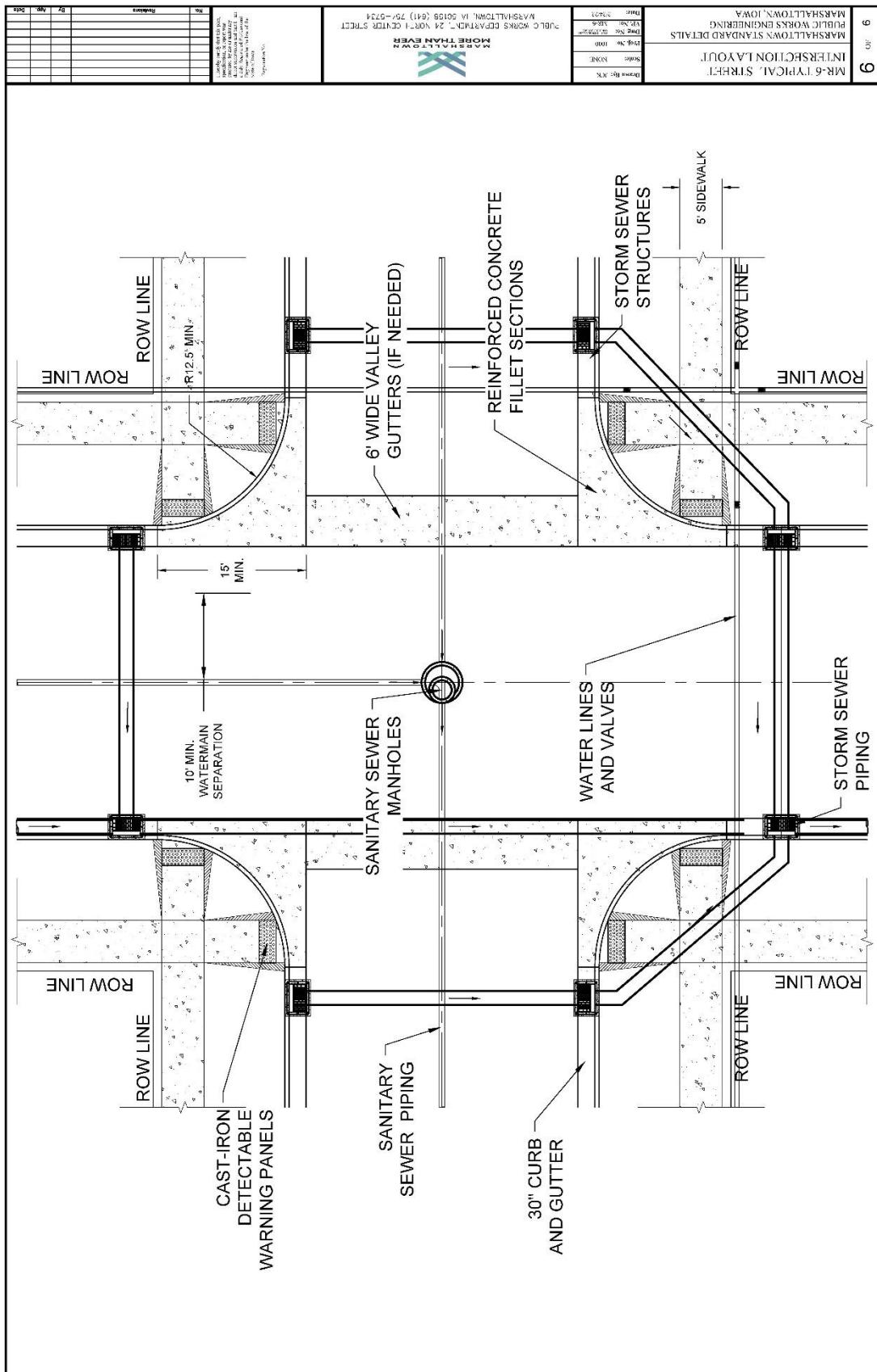
A. Added the following details:

1. MR-2 HMA Pavement Typical Cross Sections
2. MR-3 Typical Residential Street Layout
3. MR-4 Typical Arterial/Collector Street Layout
4. MR-6 Typical Street Intersection Detail









SECTION 7021 - HOT MIX ASPHALT OVERLAYS

PART 1 - GENERAL

NO REVISIONS

PART 2 - PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

NO REVISIONS

SECTION 7030 - SIDEWALKS, SHARED USE PATHS, AND DRIVEWAYS

PART 1 - GENERAL

NO REVISIONS

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.
- 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

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%

- C. (ADD) Fiber Reinforcement – See Section 7011, 2.01. E.

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

(ADD) Coarse Aggregate Quality (Virgin Material)

Coarse Aggregate Quality	Maximum Percent Allowed	Test Method
(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 1-1/2 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 (¼) inch per foot maximum across the sidewalk and half (½) 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.

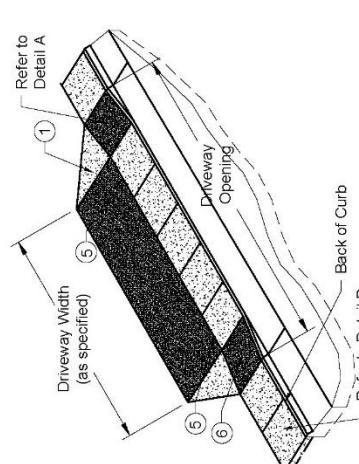
3.18 (ADD) MARSHALLTOWN STANDARD DETAILS

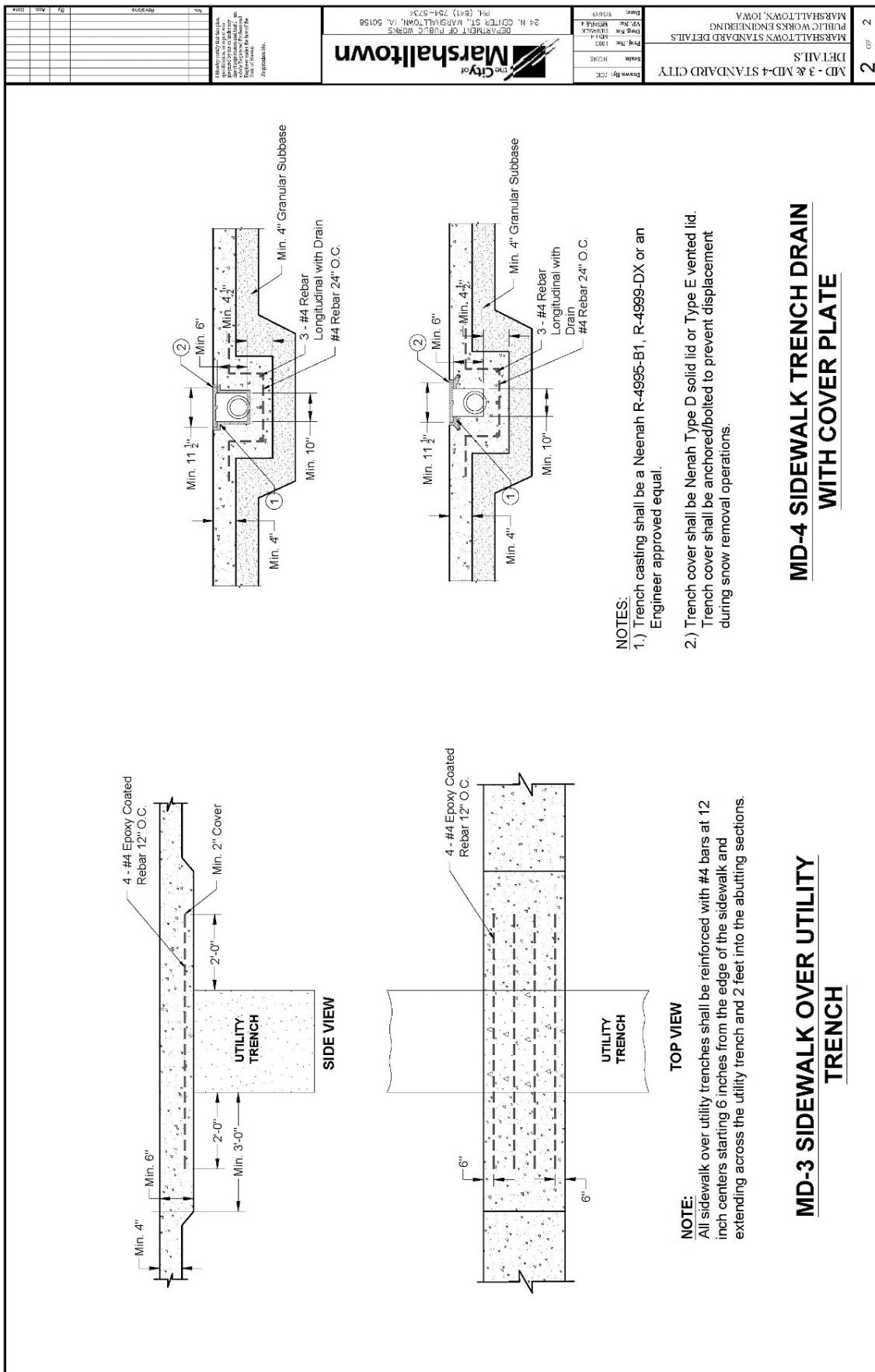
- A. Added the following details:

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 7030.2.08 - Added detail for preformed expansion joints.
9. Figure 7030.209 – Changed minimum ramp and turning width to 5'-0".

 <p>Marshalltown CITY OF</p>	
<p>11200 Second Street, P.O. Box 5734 Marshalltown, IA 50158 (515) 263-5734 Fax: (515) 263-5735 E-mail: info@cityofmarshalltown.org</p>	
DETAILS	MD-1 & MD-2 STANDARD CITY
<p>MD-1 DRIVEWAY WITH SIDEWALK ADJACENT TO CURB LAYOUT</p> <p>① Flared back to driveway at property line. Match driveway thickness. ② Driveway Thickness: Residential - 6 inches; Minimum Commercial/Industrial - 8 inches Minimum ③ Sidewalk thickness through driveway to match thickness of the driveway ④ Match thickness of adjacent roadway, 8 inches minimum ⑤ 12 inch Pre-Molded Expansion ⑥ Slope up at -6.5% slope. Sloped section of the sidewalk/driveway will be min. 6 inches thick for residential areas and 8 inches for commercial areas.</p> <p>DETAIL A</p>  <p>DETAIL B - TYPICAL SECTION</p> <p>DETAIL C - DRIVEWAY SECTION</p>	<p>MD-2 CURB & GUTTER DETAILS</p> <p>MD-2 CURB SECTION</p> <p>DRIVEWAY DROP CURB</p>



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.

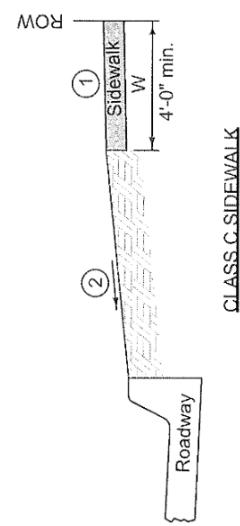
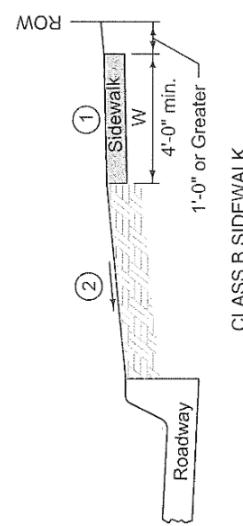
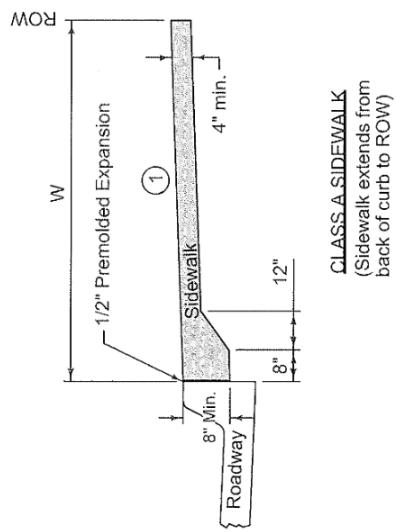


FIGURE 7030.201 SHEET 1 OF 1

FIGURE 7030.201	STANDARD ROAD PLAN	REVISION 2 10-20-15
REVISIONS: Revised Class A sidewalk layout and added premolded expansion material. (City of Marshalltown)	7030.201	SHEET 1 OF 1

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%.

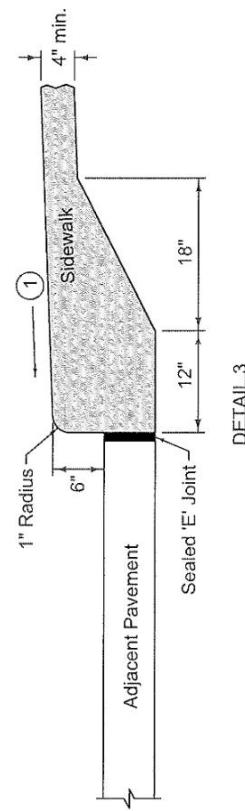
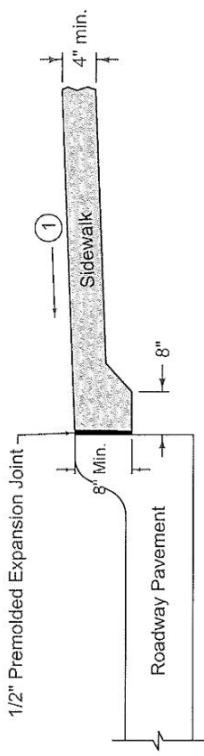
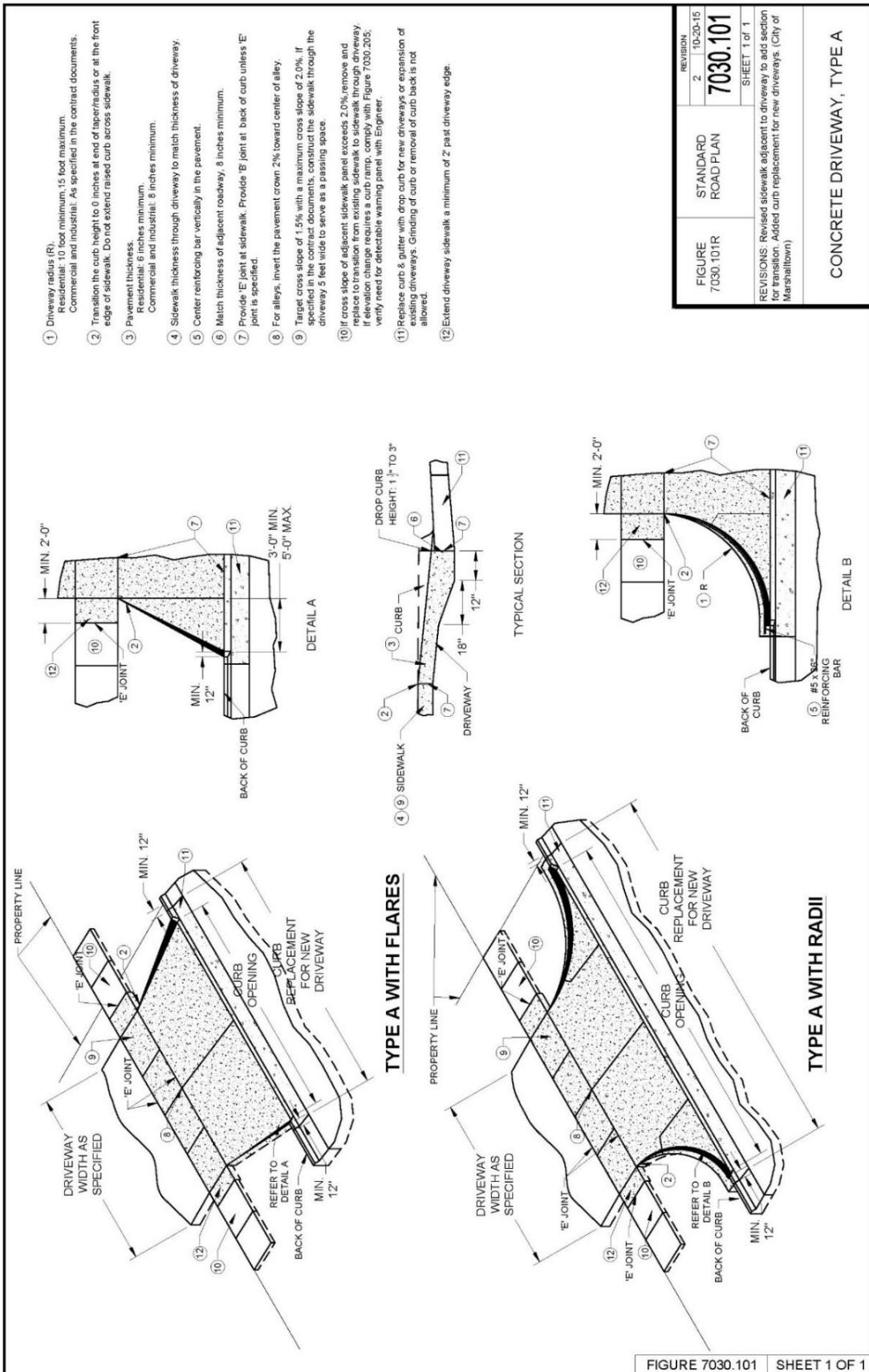
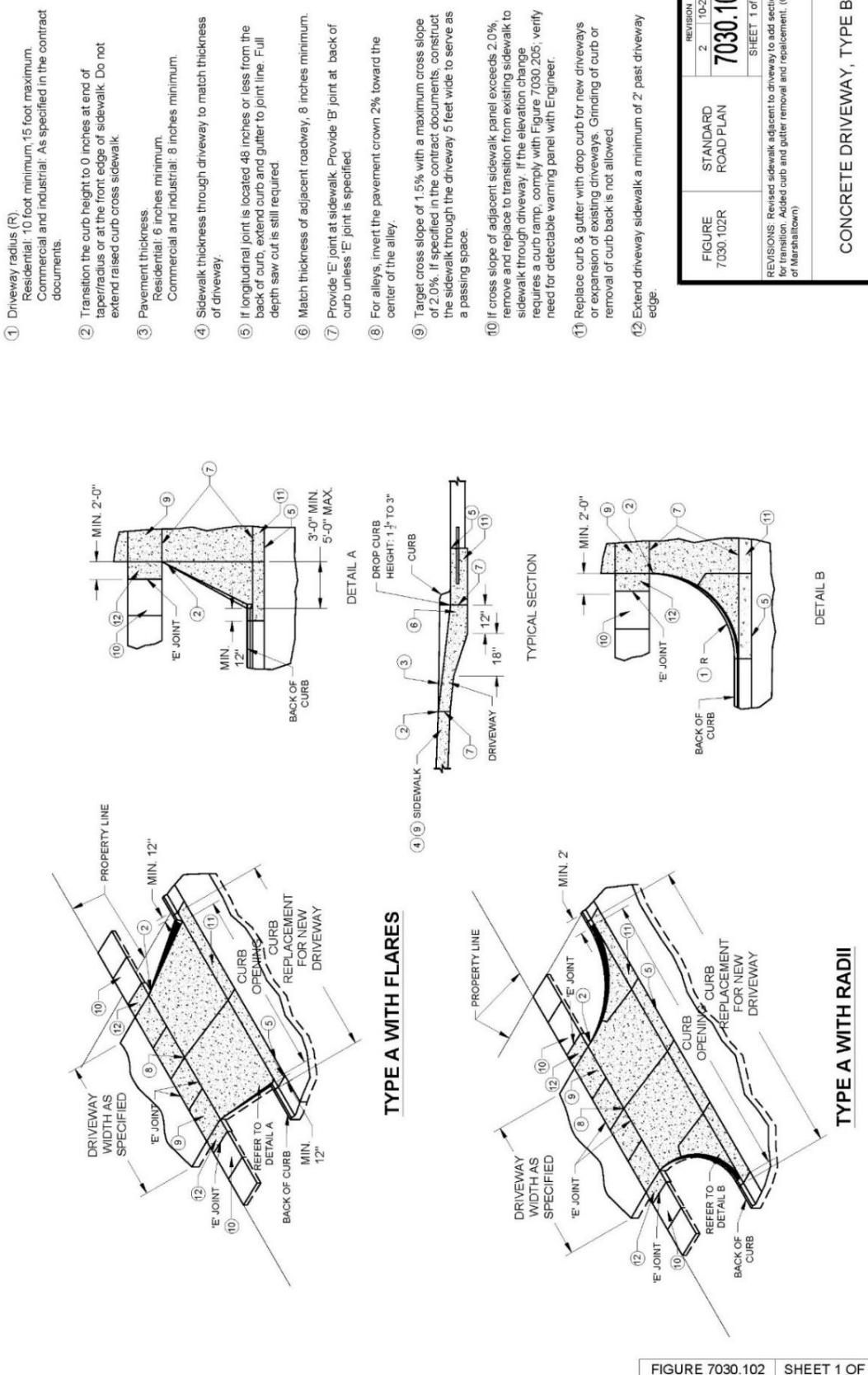


FIGURE 7030.202 SHEET 1 OF 1

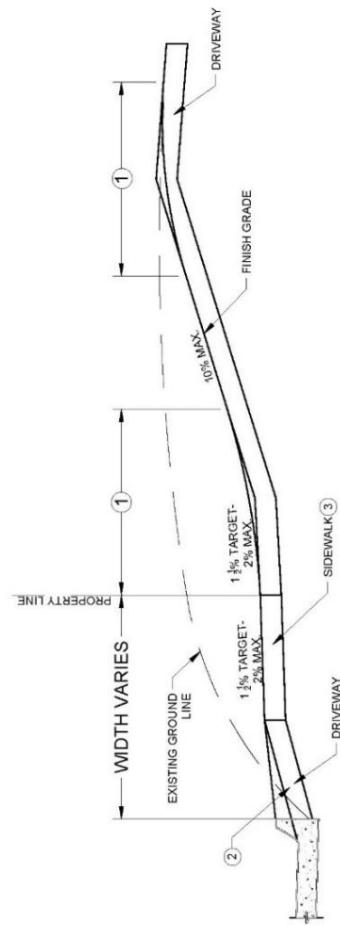
FIGURE 7030.202R	STANDARD ROAD PLAN	REVISION 3 10-26-15
REVISIONS: Removed Detail 1; Revised Detail 2 (City of Marshalltown)	SHEET 1 OF 1	7030.202

CURB DETAILS FOR
CLASS A SIDEWALK

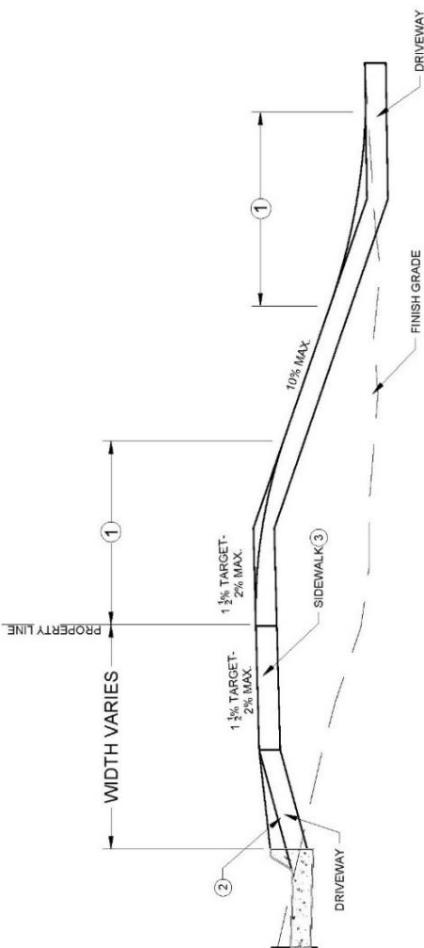




- ① 10 foot vertical curve required for 5% or greater change in grade.
- ② Slope varies. See contract documents.
- ③ Target cross slope of 1.5% with a maximum cross slope of 2.0%.



TYPICAL CUT SECTION



TYPICAL FILL SECTION

FIGURE	STANDARD	REVISION
7030.103R	ROAD PLAN	2 / 10-20-15
		SHEET 1 of 1

REVISIONS: Revision to sidewalk location and property line. Added target slope to sidewalk. (City of Marshalltown)

DRIVEWAY GRADING

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.

FIGURE	STANDARD	REVISION
7030.201R	ROAD PLAN	1 10-20-15
		SHEET 1 of 1

REVISIONS: Revised Class A sidewalk layout and added premoded expansion material. (City of Marshalltown)

CLASSES OF SIDEWALKS

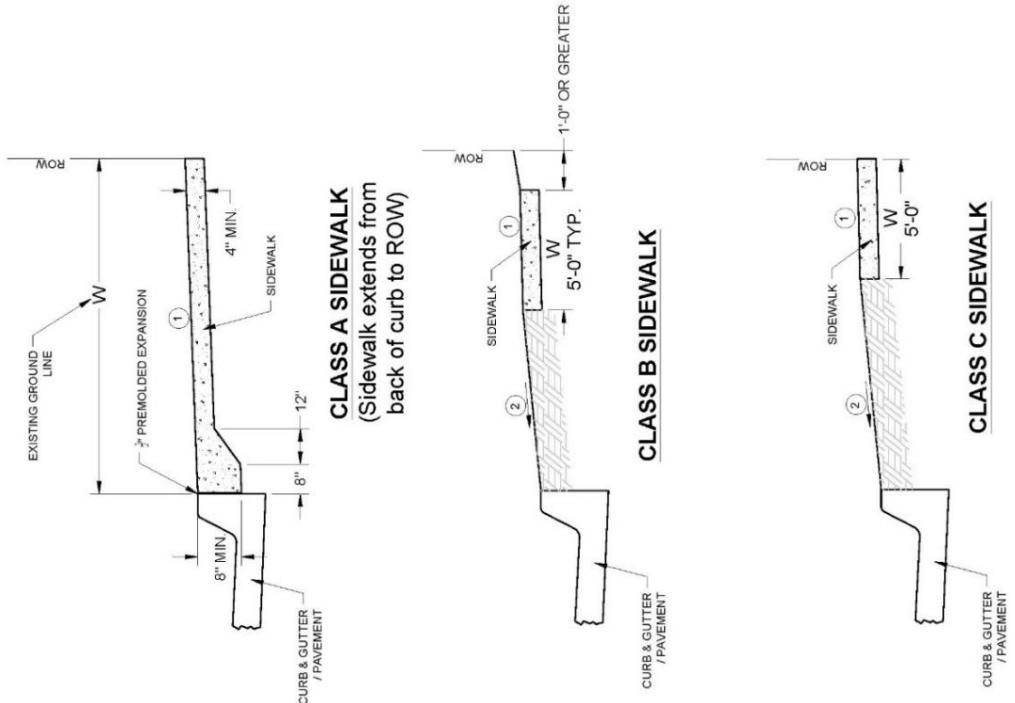
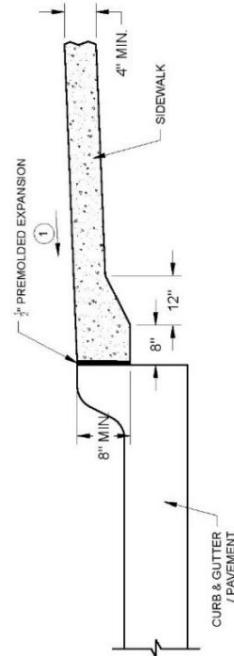


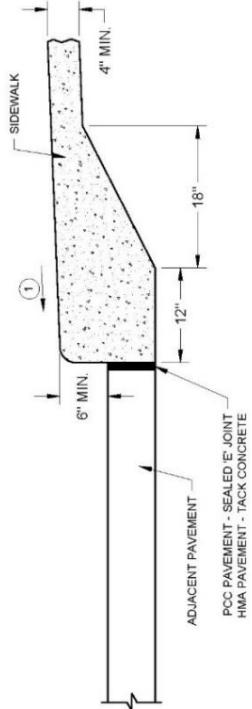
FIGURE 7030.201 SHEET 1 OF 1

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%.



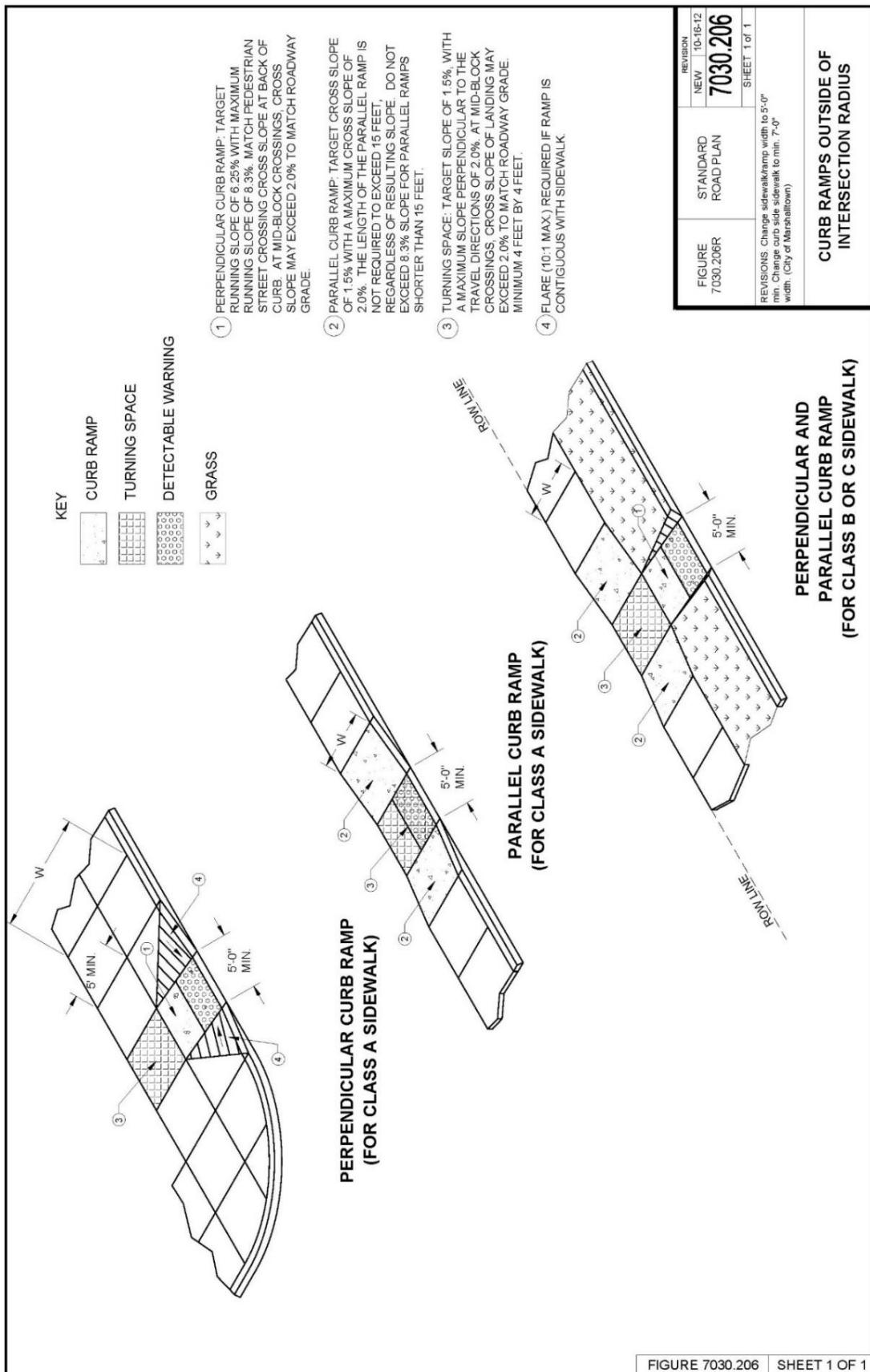
DETAIL 2



DETAIL 3

FIGURE 7030.202R	STANDARD ROAD PLAN	REVISION 3 - 10-20-15
REVISIONS: Removed Detail 1 Revised Detail 2. (City of Marshalltown)		
7030.202		

**CURB DETAILS FOR CLASS A
SIDEWALK**



- 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.
- ② 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.
- ③ TURNING SPACE: TARGET SLOPE OF 1.5% WITH MAXIMUM SLOPE 6.25% PERPENDICULAR TO THE TRAVEL DIRECTIONS OF 2.0%. MINIMUM 4 FEET BY 4 FEET.
- ④ PERPENDICULAR CURB RAMP: TARGET RUNNING SLOPE OF 6.25% WITH MAXIMUM RUNNING SLOPE OF 8.3%.
- ⑤ TARGET CROSS SLOPE OF 1.5% WITH A MAXIMUM CROSS SLOPE OF 2.0%.
- ⑥ MATCH PEDESTRIAN STREET CROSSING CROSS SLOPE OR FLATTER.

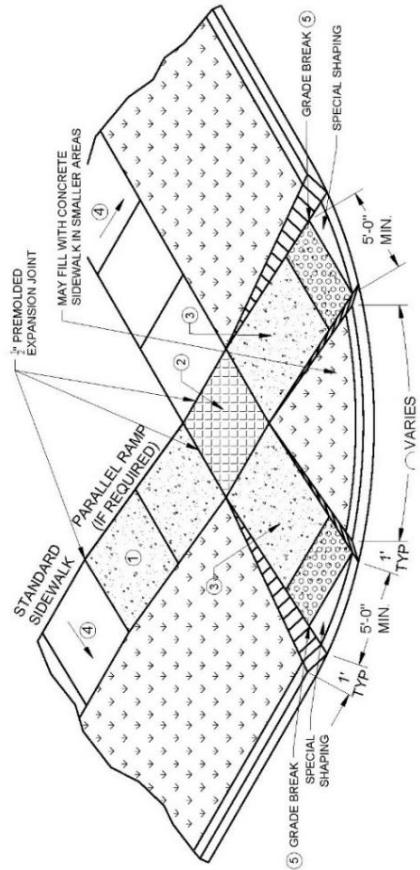


FIGURE 7030.207 SHEET 1 OF 1

FIGURE 7030.207R	STANDARD ROAD PLAN	REVISION	NEW / 10-16-12
		7030.207	
		SHEET 1 of 1	
REVISIONS: Added detail for preferred expansion joints. City of Marshalltown			

REVISIONS: Added detail for preformed expansion joints.
(City of Marshalltown)

**CURB RAMP FOR
CLASS B OR C SIDEWALK**

Updated 07/14/2020

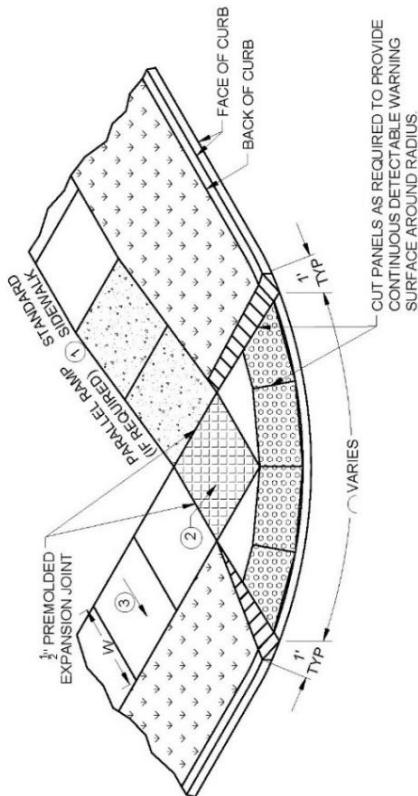
Division 7 – Streets and Related Work

Page 98 of 121

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 DIRECTION OF TRAVEL OF 2.0%. MINIMUM 5 FEET BY 5 FEET

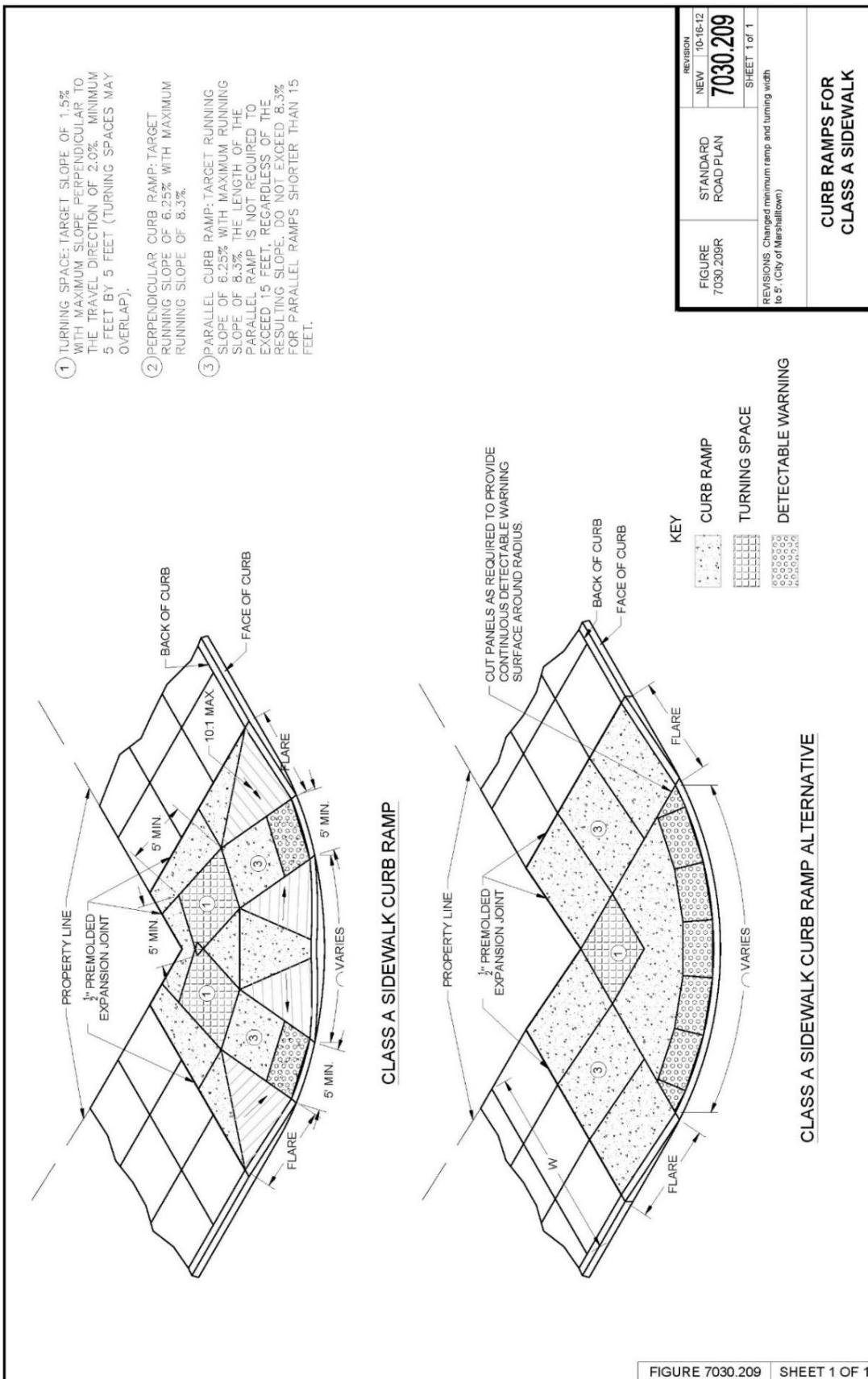
③ TARGET CROSS SLOPE OF 1.5% WITH A
MAXIMUM CROSS SLOPE OF 2.0%.



**ALTERNATIVE CURB RAMP FOR
CLASS B OR C SIDEWALK**

FIGURE 7030.208R	STANDARD ROAD PLAN	REVISION	NEW	10-16-12
		7030.208		
REVISIONS. Added detail for performed expansion joints. CITY OF MARSHALLTOWN				
SHEET 1 of 1				

FIGURE 7030.208 SHEET 1 OF 1



SECTION 7040 - PAVEMENT REHABILITATION

PART 1 - GENERAL

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

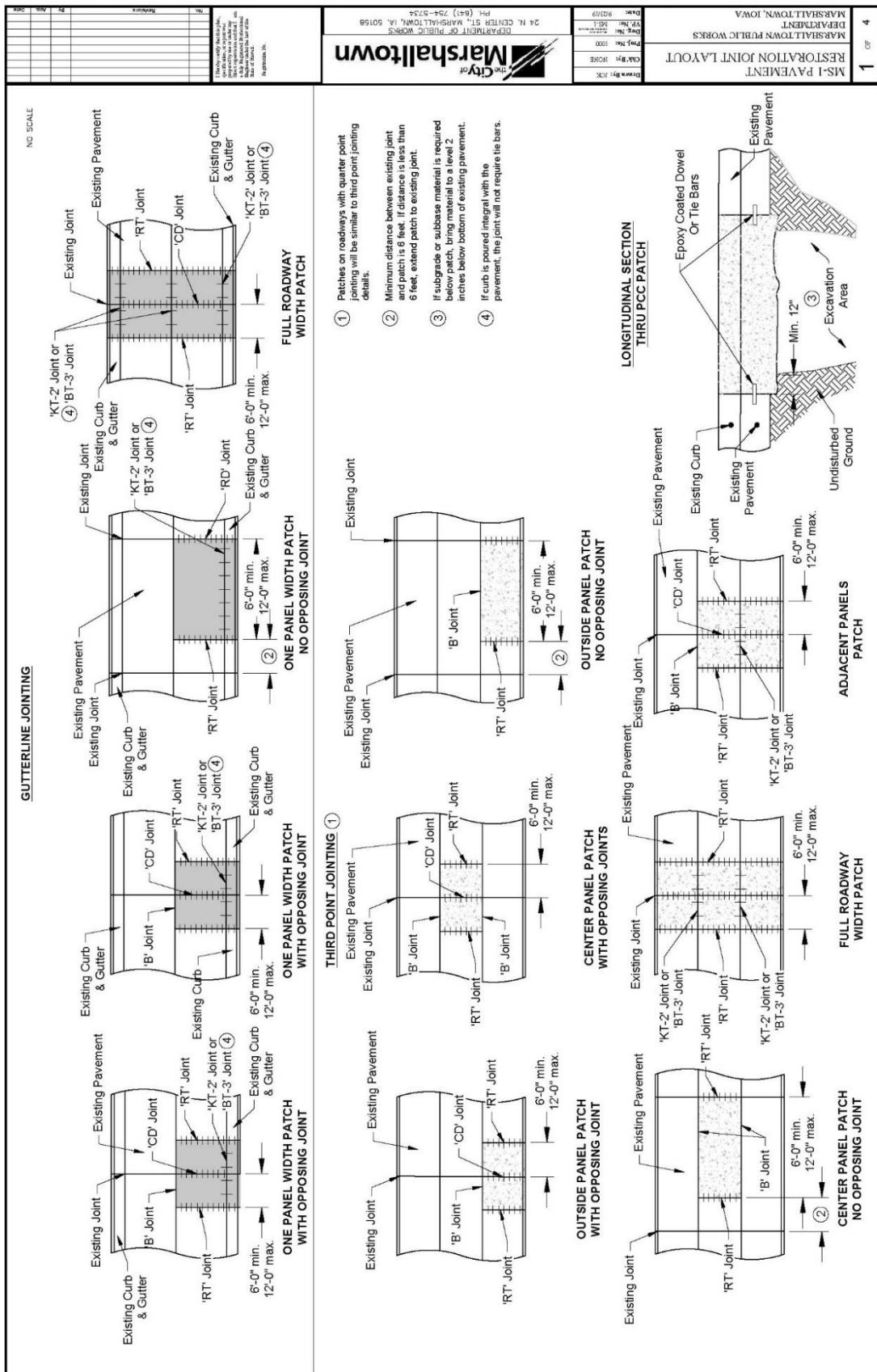
B. MS-3 Manhole Boxout Details

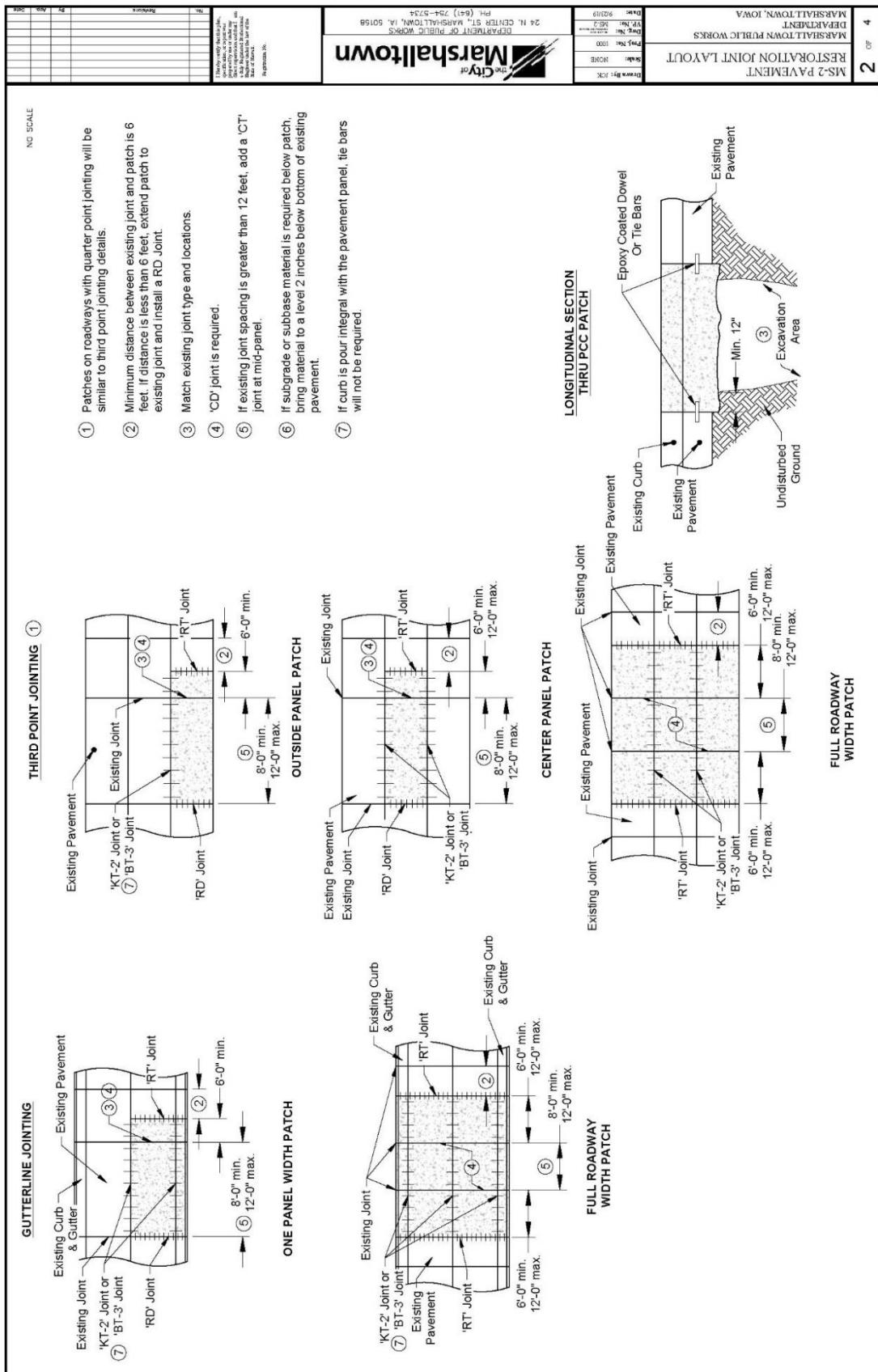
C. MS-4 Pavement Restoration Details

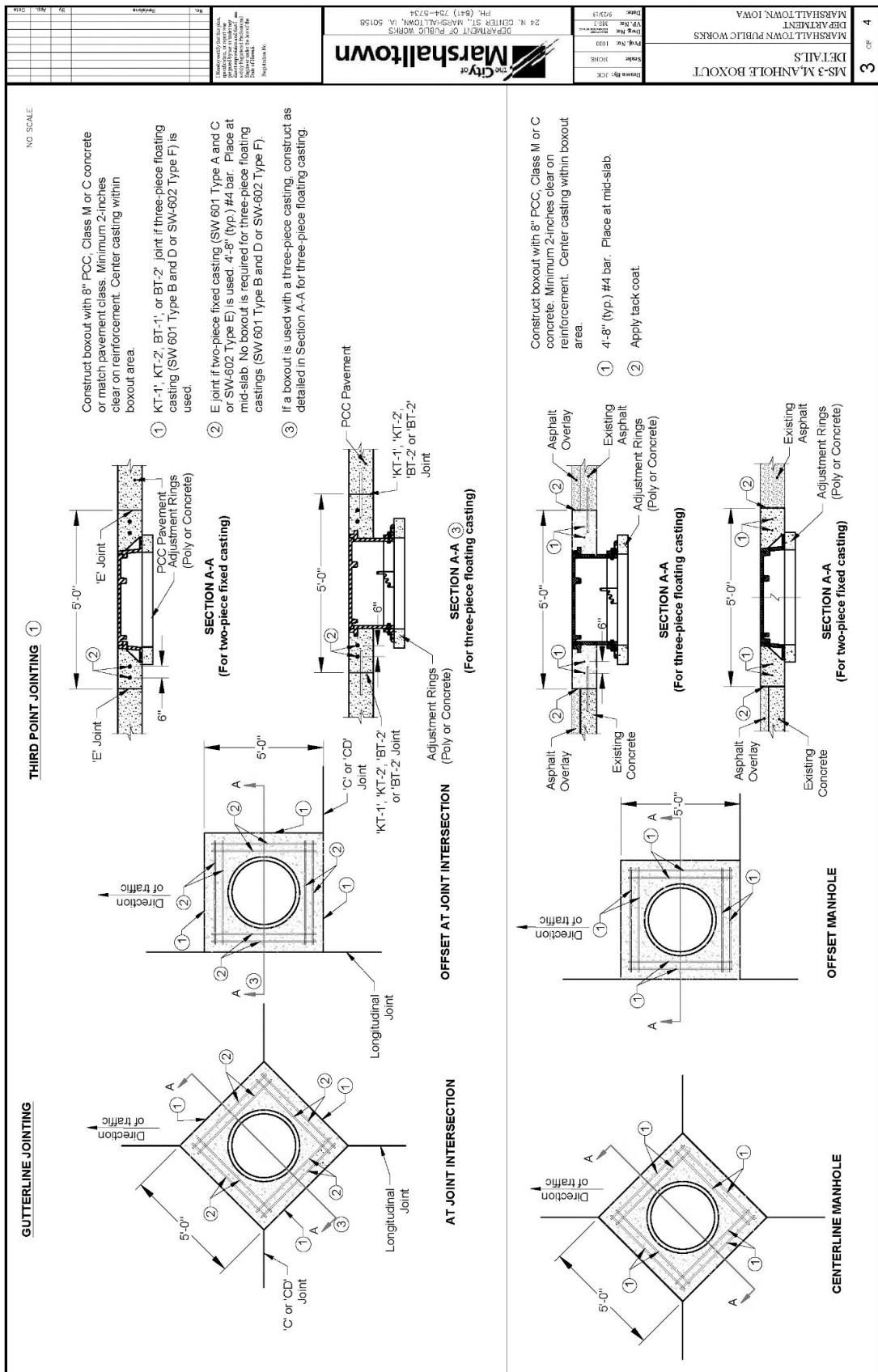
3.12 (ADD) DELETED SUDAS STANDARD DETAILS

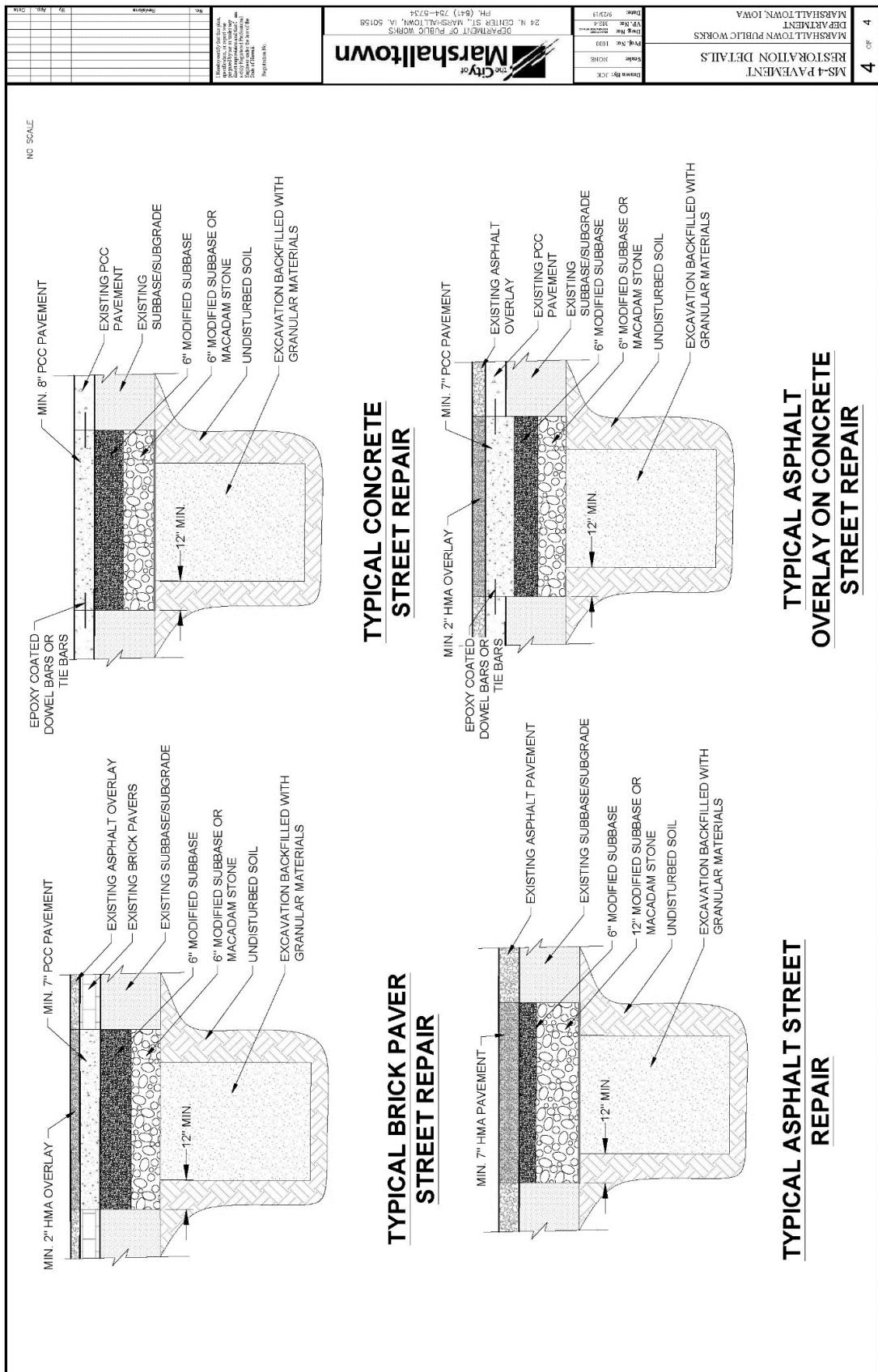
A. 7040.101 Full Depth PCC Patches Less Than or Equal to 15' Long

B. 7040.102 Full Depth PCC Patches Greater Than 15' Long









<p>GUTTERLINE JOINTING</p> <p>ONE PANEL WIDTH PATCH WITH OPPOSING JOINT</p> <p>THIRD POINT JOINTING (1)</p> <p>OUTSIDE PANEL PATCH WITH OPPOSING JOINT</p> <p>ONE PANEL WIDTH PATCH NO OPPOSING JOINT</p> <p>OUTSIDE PANEL PATCH NO OPPOSING JOINT</p> <p>CENTER PANEL PATCH WITH OPPOSING JOINT</p> <p>CENTER PANEL PATCH NO OPPOSING JOINT</p> <p>CENTER PANEL PATCH THRU PCC PATCH</p> <p>FULL ROADWAY WIDTH PATCH</p>	<p>(1) Patches on roadways with quarter point jointing will be similar to third point jointing details.</p> <p>(2) Minimum distance between existing joint and patch is 6 feet. If distance is less than 6 feet, extend patch to existing joint.</p> <p>(3) If subgrade or subbase material is required below patch, bring material to a level 2 inches below bottom of existing pavement.</p>
<p>OUTSIDE PANEL PATCH WITH OPPOSING JOINT</p> <p>ONE PANEL WIDTH PATCH NO OPPOSING JOINT</p> <p>OUTSIDE PANEL PATCH NO OPPOSING JOINT</p> <p>CENTER PANEL PATCH WITH OPPOSING JOINT</p> <p>CENTER PANEL PATCH NO OPPOSING JOINT</p> <p>CENTER PANEL PATCH THRU PCC PATCH</p> <p>FULL ROADWAY WIDTH PATCH</p>	<p>LONGITUDINAL SECTION THRU PCC PATCH</p> <p>SUDAS Standard Specifications</p> <p>FULL DEPTH PCC PATCHES LESS THAN OR EQUAL TO 15' LONG</p> <p>FIGURE 7040.101 SHEET 1 OF 2 16-17-17 SUDAS 7040.101</p>

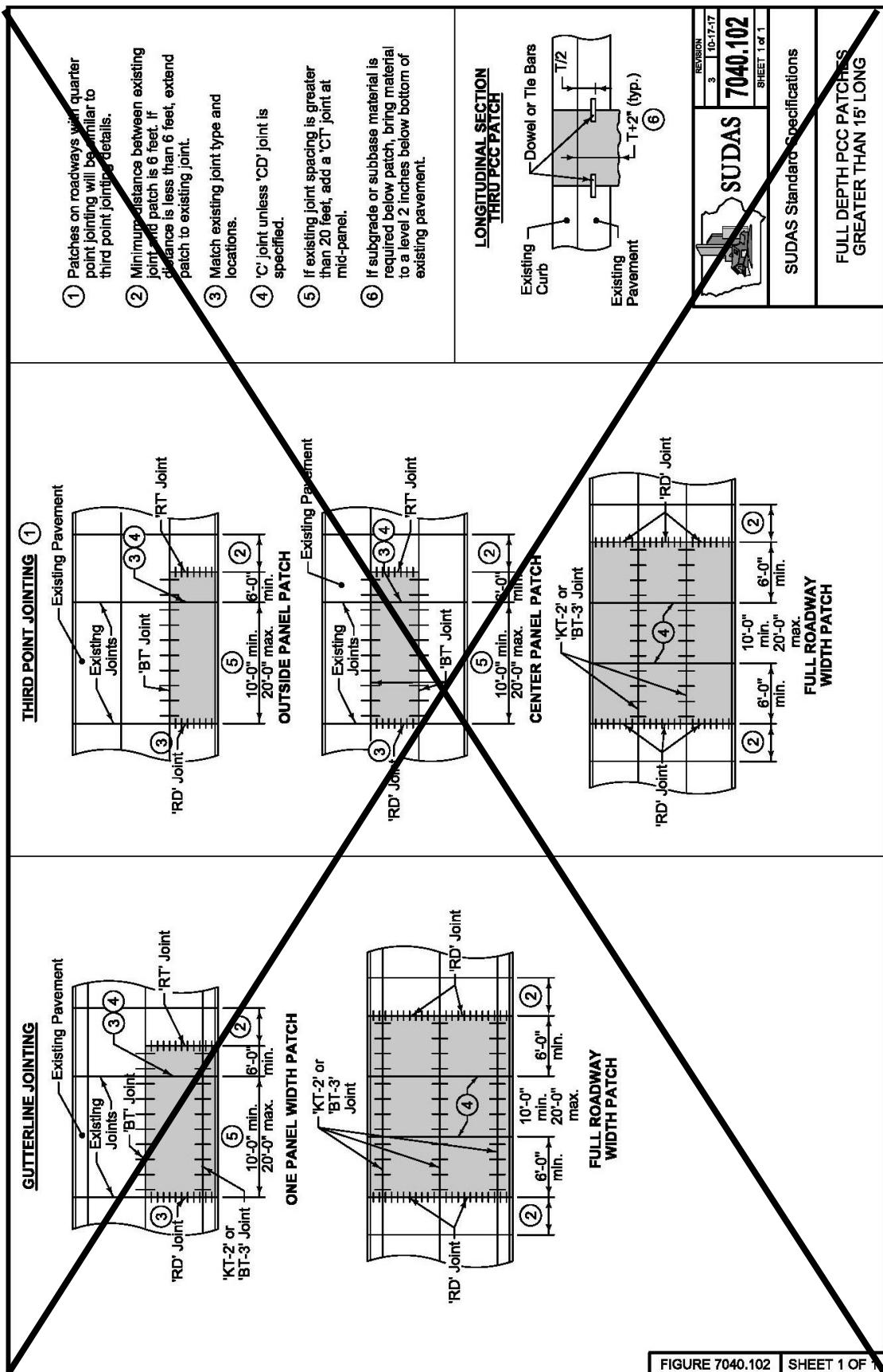


FIGURE 7040.102 | SHEET 1 OF 1

SECTION 7050 - ASPHALT STABILIZATION

PART 1 - GENERAL

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.

PART 2 - PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

NO REVISIONS

SECTION 7060 - BITUMINOUS SEAL COAT

PART 1 - GENERAL

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 2 - PRODUCTS

NO REVISIONS

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

NO REVISIONS

PART 2 - PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

NO REVISIONS

SECTION 7080 - PERMEABLE INTERLOCKING PAVERS

PART 1 – GENERAL

NO REVISIONS

PART 2 - PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

NO REVISIONS

SECTION 7090 - COLD-IN-PLACE PAVEMENT RECYCLING

PART 1 – GENERAL

NO REVISIONS

PART 2 - PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

NO REVISIONS

SECTION 7091 - FULL DEPTH RECLAMATION

PART 1 – GENERAL

NO REVISIONS

PART 2 - PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

NO REVISIONS

SECTION 7092 - CRACK AND SEAT EXISTING PCC PAVEMENT

PART 1 – GENERAL

NO REVISIONS

PART 2 - PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

NO REVISIONS

SUPPLEMENTAL DIVISION 8 – TRAFFIC CONTROL

SECTION 8010 - TRAFFIC SIGNALS

PART 1 - GENERAL

1.07 SPECIAL REQUIREMENTS

B. (ADD) Coordinate all design and construction work with the City of Marshalltown's Public Works Electrical Superintendent.

PART 2 - PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

NO REVISIONS

SECTION 8020 - PAVEMENT MARKINGS

PART 1 - GENERAL

1.06 SCHEDULING AND CONFLICTS

B. (ADD) Schedule and coordinate all line markings with the Public Works Street Superintendent.

PART 2 - PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

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

NO REVISIONS

PART 2 - PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

NO REVISIONS

SUPPLEMENTAL DIVISION 9 – SITE WORK AND LANDSCAPING

SECTION 9010 - SEEDING

PART 1 - GENERAL

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

NO REVISIONS

PART 2 - PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

NO REVISIONS

SECTION 9030 - PLANT MATERIAL AND PLANTING

PART 1 - GENERAL

1.03 SUBMITTALS

F. (ADD) Provide trees and shrubs planted in terrace areas in accordance with the City of Marshalltown's Code of Ordinances, Chapter 58 – Vegetation.

G. (ADD) The placement of trees shall be in accordance with Chapter 10B-1 of the SUDAS Design Manual.

PART 2 - PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

3.06 PLANTING

A. Bare Root Plants: (ADD) Not allowed without written approval of the City Engineer.

SECTION 9040 - EROSION AND SEDIMENT CONTROL

PART 1 – GENERAL

NO REVISIONS

PART 2 - PRODUCTS

NO REVISIONS

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

NO REVISIONS

PART 2 - PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

NO REVISIONS

SECTION 9060 - CHAIN LINK FENCE

PART 1 – GENERAL

NO REVISIONS

PART 2 - PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

NO REVISIONS

SECTION 9070 - LANDSCAPE RETAINING WALLS

PART 1 – GENERAL

NO REVISIONS

PART 2 - PRODUCTS

NO REVISIONS

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

NO REVISIONS

PART 2 - PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

NO REVISIONS

SECTION 9072 - COMBINED CONCRETE SIDEWALK AND RETAINING WALL

PART 1 – GENERAL

NO REVISIONS

PART 2 - PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

NO REVISIONS

SECTION 9080 - CONCRETE STEPS, HANDRAILS, AND SAFETY RAIL

PART 1 – GENERAL

NO REVISIONS

PART 2 - PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

NO REVISIONS

SUPPLEMENTAL DIVISION 10 – DEMOLITION

SECTION 10,010 - DEMOLITION OF BUILDING STRUCTURES

PART 1 – GENERAL

NO REVISIONS

PART 2 - PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

NO REVISIONS

SUPPLEMENTAL DIVISION 11 – MISCELLANEOUS

SECTION 11,010 - CONSTRUCTION SURVEY

PART 1 – GENERAL

NO REVISIONS

PART 2 - PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

NO REVISIONS

SECTION 11,020 – MOBILIZATION

PART 1 – GENERAL

NO REVISIONS

PART 2 - PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

NO REVISIONS

SECTION 11,030 - TEMPORARY SERVICES DURING CONSTRUCTION

PART 1 – GENERAL

NO REVISIONS

PART 2 - PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

NO REVISIONS

SECTION 11,040 - TEMPORARY SIDEWALK ACCESS

PART 1 – GENERAL

NO REVISIONS

PART 2 - PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

NO REVISIONS

SECTION 11,050 - CONCRETE WASHOUT

PART 1 – GENERAL

NO REVISIONS

PART 2 - PRODUCTS

NO REVISIONS

PART 3 - EXECUTION

NO REVISIONS