A d d e n d u m

Iowa Department of Transportation
Office of Contracts

Date of Letting: April, 19, 2016
Date of Addendum: April 12, 2016

B.O.	Proposal ID	Proposal Work Type	County	Project Number	Addendum
004	52-3715-652	BRIDGE REPLACEMENT - OTHER	JOHNSON	HDP-3715(652)--71-52	19APR004.A02

Make the following changes to the PROPOSAL SCHEDULE OF PRICES:

Change Proposal Line No. 1260 2519-3300600 FENCE, SAFETY;
From: 408.000 LF
To: 5,408.000 LF

Change Proposal Line No. 1620:
From: 2554-0207000 VALVE, GATE, DIP, 16 IN
To: 2554-020600 BUTTERFLY VALVE, DIP, 16 IN

Add Proposal Line No. 2312 2520-3350015 FIELD OFFICE; 1.000 EACH

If the above changes are not made, they will be made as shown here.

Make the following changes to the PROPOSAL SPECIAL PROVISIONS LIST & TEXT:

Replace SP-156042 with the attached SP_156042a

Replace SP-156045 with the attached SP_156045a

Replace plan sheets C.3, C.4, C.5, C.6, U.71, V.58, & V.128 with the attached:

Changes shown in yellow highlight.

Regarding the change in pay item from 16" Water Valves, the correct Pay Item is Butterfly Valve, DIP, 16 inch for **ALL** 16" water valves. However the U Sheets still refer to 16" Gate Valves. All bidders should be advised to bid the project based on the current pay item for this work, ignoring the discrepancy with annotation in the U Sheets.

SPECIAL PROVISIONS
FOR
WATER MAIN AND APPURTENANCES

Johnson County
HDP-3715(652)--71-52

Effective Date
April 19, 2016

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

PART 1 GENERAL

1.01 SUMMARY

A. Furnish, install and test water distribution system and water services as indicated and specified.

B. Water Division maintains salvage rights to all fire hydrants designated as public. Samples of water main and its appurtenances may also be retained by the Water Division for testing or documentation purposes.

C. Reuse of materials is not allowed without prior permission. Reuse of materials previously attached to another system shall not be allowed.

D. All piping shall be isolated from the existing water system until it has passed all testing procedures and is approved for service.

E. In the event that field conditions prevent the isolation of the new piping from the existing water system, any existing main and valving, and any appurtenances that will be tested against, shall be well flushed and pass the pressure test per part 4.7 of this section before any new system installation is permitted. Any costs associated with testing the existing water main prior to connecting the new pipe will not be paid for separately, but shall be considered incidental to the water main disinfection and pressure testing for the new water main.

F. The approval of reusing any private service main, piping, valves, or appurtenances by the Water Division does not infer any guarantee that it will perform as required. The Water Division accepts no fault for any issues arising from, or possibly related to, the approved reuse of any material on a private service.

1.02 REFERENCES

A. Related Specification Sections:
   1. Special Provisions for Pre-Insulated Water Main and Appurtenances.
   2. Special Provisions for Cathodic Protection System.

B. This specification references the following documents. In their latest edition, the referenced documents form a part of this specification to the extent specified herein. In case of conflict, the requirements of this specification shall prevail.

C. American National Standards Institute and American Water Works Combined Standards:
   1. ANSI/AWWA C104/A21.4: Cement-Mortar Lining for Ductile-Iron Pipe and Fittings
   2. ANSI/AWWA C105/A21.5: Polyethylene Encasement for Ductile-Iron Pipe Systems
   3. ANSI/AWWA C110/A21.10: Ductile-Iron and Gray-Iron Fittings
   4. ANSI/AWWA C111/A21.11: Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
   5. ANSI/AWWA C150/A21.50: Thickness Design of Ductile-Iron Pipe
   6. ANSI/AWWA C151/A21.51: Ductile-Iron Pipe, Centrifugally Cast
   7. ANSI/AWWA C153/A21.53: Ductile-Iron Compact Fittings
   8. ANSI/AWWA C502: Dry-Barrel Fire Hydrants
   9. ANSI/AWWA C504: Rubber-Seated Butterfly Valves, 3 In. through 72 In.
   10. AWWA C509: Resilient-Seated Gate Valves for Water Supply Service
   11. ANSI/AWWA C510: Double Check Valve Backflow Prevention Assembly
   12. ANSI/AWWA C511: Reduced-Pressure Principle Backflow Prevention Assembly
   13. ANSI/AWWA C550: Protective Interior Coatings for Valves and Hydrants
   14. ANSI/AWWA C600: Installation of Ductile Iron Water Mains and Their Appurtenances
   15. ANSI/AWWA C651: Disinfecting Water Mains
   16. ANSI/AWWA C800: Underground Service Line Valves and Fittings
   17. ANSI/AWWA C900: Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 In. through 12 In, for Water Transmission and Distribution

D. American Water Works Association:
   1. AWWA Manual M23: PVC Pipe-Design and Installation
   2. AWWA Manual M17: Installation, Field Testing, and Maintenance of Fire Hydrants

E. American Society for Testing Materials:
   1. ASTM A48: Gray Iron Castings
   2. ASTM B62: Composition Bronze or Ounce Metal Castings
   3. ASTM B75: Seamless Copper Tubing
   4. ASTM B88: Seamless Copper Water Tube
   5. ASTM B584: Copper Alloy Sand Castings for General Applications
   6. ASTM D2241: Polyvinyl Chloride (PVC) Pressure-Rated Pipe (SDR Series)

F. Manufacturers Standardization Society:
   1. MSS-SP-58 Pipe Hangers and Supports, Materials Design and Manufacture
   2. MSS-SP-69 Pipe Hangers and Supports Selection and Application

G. Uni-Bell PVC Pipe Association:
   1. UNI-B-3-88 Recommended Practice for the Installation of Polyvinyl Chloride (PVC) Pressure Pipe (nominal diameters 4-36") complying with AWWA Standard C-900

H. Occupational Safety and Health Administration (OSHA):
   1. Standard 1926, Subpart P-Excavations

1.03 SUBMITTALS

A. Submit to the Engineer the following drawings or details for approval prior to installation. One copy of each with the approval stamp shall be kept at the work site at all times.

B. Plans for initial operations and final operations: Special prepared drawings and typed list of sequences of steps are needed prior to any operation of water distribution system. Submit 2 weeks prior to date of planned operation.

C. Plans for all temporary water connections. Submit 2 weeks prior to planned installation of temporary connection.

D. Detailed plans for construction staging of water distribution system. Submit 2 weeks prior to beginning each construction stage.

E. Shop, Working Drawings, or Construction Plans showing:
   1. Pipe layout with valves, fittings and hydrants shown
   2. Valves
   3. Hydrants
   4. Fittings
   5. Bolts
   6. Joints
   7. Tapping sleeves, couplings, and special piping materials
   8. Polyethylene
   9. Thrust block designs and details
   10. Special backfill

F. Certificates: Sworn certificates of shop tests showing compliance with appropriate standard for all piping materials.

G. Certificates showing compliance with Buy America requirements for all products containing or composed of iron or steel.

1.04 QUALITY ASSURANCE

A. Products containing or composed of steel or iron shall be Buy America compliant.

B. Products used for this work shall be those as listed herein. Any special exception requests shall be submitted to the Contracting Authority in a timely manner for review.

C. Engineer reserves the right to inspect and test by independent service at manufacturer's plant or elsewhere at Engineer's expense.

D. Contractor shall conduct visual inspection before installation.

1.05 RECEIVING, STORAGE AND HANDLING

A. The City may mark materials which are found on the job site and which are determined to be defective or not approved. The marking may be done with spray paint. The Contractor shall promptly remove defective or unapproved materials from the site.

B. While unloading all piping materials:
   1. Do not allow the pipe units to strike anything.
   2. Do not handle pipe units with individual chains or single cables, even if padded.
   3. Do not attach cables to pipe unit frames or banding for lifting.

C. Within the "Storage" language of AWWA M23, change "should" to "shall."

D. Within the "Handling" language of AWWA M23, change "should" to "shall."

E. Follow AWWA C600 for proper storage, handling, and installation of DIP.

1.06 TIME

A. All work which requires shutdown of active water mains must be completed as quickly as

possible to minimize inconvenience to the consumers and risk to the community.

B. Amount of advance notice required to the Iowa City Water Division when materials or services are supplied by the Division are listed below. Serve notice to the Water Division at 319-356-5160.
   1. For tapping service, provide 24 hours' notice.
   2. For notice to customers of disruption of water service, provide 48 hours' notice. This work will be completed with the assistance of Water Division personnel.
   3. For review, comments, and approval of plans of operation, provide 3 days' notice.
   4. For locations of underground facilities, provide notice as required by Iowa One-Call system.

1.07 LICENSES AND APPLICATIONS

A. City of Iowa City:
   1. Contractor's superintendent on the job must have a license as a sewer and water service installer issued by the City to construct water and sewer mains and services in Iowa City.
   2. The Contractor or their agent will be responsible for submitting tapping application forms and record drawings.

PART 2 PRODUCTS

2.01 PIPE

A. Polyvinyl Chloride (PVC) Pipe: Comply with AWWA C900 or AWWA C905 with gray iron pipe equivalent outside diameters.
   1. Minimum Wall Thickness:
      a. 4 inch through 24 inch sizes: DR 18.
      b. Sizes over 24 inches: As specified in the contract documents.
   2. Joint Type: Use restrained push-on joint type, except as otherwise specified in the contract documents or as authorized by the Engineer.
      a. Push-on: According to AWWA C900 or AWWA C905.
      b. Integral Restrained Joint: AWWA C900 or AWWA C905 pipe with restraining system manufactured integrally into pipe end.
   3. Markings on Pipe:
      a. Name of manufacturer.
      b. Size and class.
      c. Spigot insertion depth gauge.
      d. National Sanitation Foundation (NSF) seal.

B. Ductile Iron Pipe (DIP):
   1. Manufacture shall conform to AWWA C151.
   2. Minimum Thickness Class:
      a. 4 inch through 24 inch sizes: Pipe shall be special thickness Class 53.
      b. Sizes over 24 inches: As specified in the contract documents.
      c. Thickness design shall conform to AWWA C150.
   3. Cement-mortar Lined: According to AWWA C104 with asphalt seal coat.
   4. External Coating: Asphalt according to AWWA C151.
   5. Joint Type: Use restrained push-on type joints for new piping, unless otherwise specified in the contract documents or as authorized by the Engineer. Use flange type joints where connecting new ductile iron pipe to existing ductile or cast iron pipe.
      a. Push-on: According to AWWA C111.
      b. Restrained, Buried: Pipe manufacturer's standard field removable system.
      c. Restrained, in Structures: Restraining gland or flanged or.
      d. Flanged: According to AWWA C111.
      e. Gaskets: According to AWWA C111.
   6. Markings on Pipe:
      a. Name of manufacturer.

b. Size and class.
c. Spigot insertion depth gauge.

7. Manufacturer: American, Clow, Griffin, McWane, US Pipe, or equal

C. Casing Pipe:
1. Pipe.

a. Use only new, steel pipe meeting the requirements of ASTM A139/A139M, Grade B; ASTM A252, Grade 2; or ASTM A53/A53M, Grade B. Pipe may be welded or seamless.
b. Casing pipe 18 inch or less in diameter shall have a wall thickness of 0.250 inch. Casing pipe 20 or 24 inch in diameter shall have a wall thickness of 0.312 inch in diameter. Casing pipe 30 inch in diameter shall have a wall thickness of 0.375 inch.

2. Joints.
a. Comply with American Welding Society Code D1.1M/D1.1. Weld joints with full penetrating weld. Welders shall be qualified according to Materials I.M. 560. Welds shall comply with Materials I.M. 558.
b. Upon approval of the Engineer, interlocking casing pipe connection system may be used instead of field welding sections of casing pipe.

3. Pipe Diameter. Minimum inside diameter as specified in the contract documents. If diameter is not specified, use a minimum inside casing diameter of at least 4 inches greater than the largest outside diameter of the carrier pipe, including pipe bells.
4. Spacers and End Seals. See Special Provisions for Cathodic Protection.

2.02 BOLTS FOR WATER MAIN AND FITTINGS

A. Use stainless steel bolts and nuts.

2.03 FITTINGS

A. For DIP and PVC Pipe: Comply with AWWA C110 (ductile iron or gray iron) or AWWA C153 (ductile iron).
1. Joint Type:
a. For pipe sizes 16 inches and less, use restrained push-on joint complying with AWWA C111.
1) Minimum pressure rating same as connecting pipe.
2) Suitable for buried service.
3) Joint restraint system to be field installable, field removable, and re-installable.
b. Use flanged outlet tees where connecting new ductile iron pipe to new PVC pipe.
c. Use of alternate restraint systems must be approved by the Engineer.

2. Lined: Cement mortar lined according to AWWA C104 with asphalt coating.
3. Wall Thickness: Comply with AWWA C153.
4. Gaskets: Comply with AWWA C111.
5. Manufacturer: Clow, Romac, Sigma, Tyler/Union, U.S. Pipe, or equal.

B. Flange Adapter:
1. Use where connecting PVC pipe to ductile iron fittings or valves and where connecting new ductile iron pipe to existing cast or ductile iron pipe.
2. Body: Ductile iron complying with ASTM A536.
3. End Rings (Follower Rings): Ductile iron complying with ASTM A536.
4. Gaskets: New rubber compounded for water service and resistant to permanent set.
5. Bolts and Nuts: High strength, low alloy corrosion resistant steel or carbon steel bolts complying with ASTM A307.
6. Manufacturer: Clow, Romac, Sigma, Tyler/Union, U.S. Pipe, or equal.

C. Pipe Coupling:
1. Use where connecting new PVC pipe to existing PVC pipe.

2. Center Sleeve (Center Ring): Steel pipe or tubing complying with ASTM A53 or ASTM A512, or formed carbon steel with a minimum yield of 30,000 psi.
3. End Ring (Follower Ring): Ductile iron complying with ASTM A536, or steel meeting or exceeding the requirements of ASTM A576, grade 1010 - 1020.
4. Gaskets: New rubber compounded for water service and resistant top permanent set.
5. Bolts and Nuts: Stainless steel.
6. Manufacturer:
   a. Standard solid black sleeve: Griffin, Tyler/Union 5-1442, or equal.
   b. Bolted straight coupling: Romac Style 501, Romac Alpha Wide Range Restrained Coupling, Romac Macro HP Two-Bolt Coupling, Smith-Blair 441, or equal.

2.04 CONCRETE THRUST BLOCKS

A. Use where shown on drawings.

B. Use Class C concrete.

C. Comply with the contract documents for dimensions and installation of thrust blocks. Comply with Standard Road Plan WM-101.

2.05 PIPELINE ACCESSORIES

A. Polyethylene Wrap:
   1. Comply with AWWAC105.
   2. Provide tubes or sheets with 8 mil minimum thickness.

B. Tracer System: Comply with drawings.
   1. Tracer Wire:
      a. Solid Single Copper Conductor:
         1) Size: No.12 AWG
         2) Insulation Material: Linear low-density polyethylene (LLDPE) installation suitable for direct burial applications.
         3) Insulation Thickness: 0.045 inch, minimum.
      b. Bimetallic Copper Clad Steel Conductor:
         1) Size: No.12 AWG.
         2) Rating: Direct burial.
         3) Operating Voltage: 30 volts.
         4) Conductivity: 21%.
         5) Copper Cladding: 3% of conductor diameter, minimum.
         6) Insulation Material: High density polyethylene.
         7) Insulation Thickness: 0.030 inch, minimum.
      c. Color: Blue.
      d. Manufacturer: Copperhead, Kris Tech, or equal.
   2. Ground Rod: 3/8 inch diameter minimum, 60 inch steel rod uniformly coated with metallically bonded electrolytic copper.
   3. Ground-rod Clamp: High-strength, corrosion-resistant copper alloy.
   4. Splice Kit:
      a. Color: Blue.
      b. Manufacturer: Copperhead Industries Snake Bite Corrosion Proof Wire Connector LSC1230B, Twister DB Plus Wire Connector, or equal.
   5. Tracer Wire Station: See drawings.
   6. Tracer Wire Terminal Box:
      a. Manufacturer: DWS (Valco) 95E, or equal.

2.06 SPECIAL GASKETS

A. For soils contaminated with gasoline, use nitrile gaskets.

B. For other soil contaminants, contact the Engineer for the required gasket.

2.07 SMALL WATER SERVICE PIPE AND APPURTENANCES

A. Copper Tubing: No couplings or connections are permitted under paving.
   1. Comply with ASTM B75 and ASTM B88.
   2. Wall Thickness: Type K.
   3. Packaging: Shall be in coils for sizes ¾ inch through 11/2 inches, and in coils or straight pipe for size 2 inches.

B. Service Saddles:
   1. Comply with ANSI/AWWA C800 and ASTM B62.
   2. Pressure Rating: Equal, but not to exceed, 200 PSIG.
   3. Body Composition: 85-5-5-5 cast brass.
   4. Strap: Wide band, Type 304L stainless steel with 304L stainless steel studs.
   5. Nuts and Washers: Type 304 stainless steel, nuts supplied with fluorocarbon coating.
   6. Threading: AWWA tap thread (CC thread).
   7. Gaskets: Nitrile gaskets within leaking underground storage tank (LUST) areas.
   8. Manufacturer: AY McDonald 3845, Ford 202BS, Smith Blair 325, or equal.

C. Corporation Valves:
   1. Comply with ANSI/AWWA C800 and ASTM B62.
   2. Pressure Rating: 300 PSIG maximum working pressure.
   3. Body: "No lead brass" alloy, meeting ASTM B584.
   4. Connections: Inlet shall be AWWA taper thread, outlet shall be conductive compression connection for CTS OD tubing.
   5. Valve: Compression ball type.
   6. See drawings for special cathodic protection requirements.
   7. Manufacturer: AY McDonald 74701BQ, Mueller B-25008N, or equal.

D. Ball Curb Valves:
   1. Comply with ANSI/AWWA C800 and ASTM B62.
   2. Pressure Rating: 300 PSIG maximum working pressure.
   3. Body: "No lead brass" alloy, meeting ASTM B584.
   4. Connections: Inlet and outlet shall be compression connection for CTS OD tubing.
   5. Valve: Shall have a quarter turn check with fluorocarbon coated ball and stainless steel reinforced seat, and end pieces shall have O-ring sealed with double O-ring seals.
   6. Manufacturer: AY McDonald 76100Q, Mueller B25209N, or equal.

E. Curb Box:
   1. Comply with ANSI/AWWA C800.
   2. Style: Arch pattern, slide style.
   3. Length: 5-foot box, 1-foot telescope, shall telescope up and down inside the base casting.
   4. Coating: Black dip inside and out.
   5. Rod: 5/8 inch diameter with small key-clamp welded to rod; stainless steel road and cotter pin; 42 inch long.
   6. Manufacturer: AY McDonald 5601 and 5603 with 5660SS, or equal.

F. Curb Box Lids:
   1. All lids:
      a. Brass components shall conform to ASTM B62 and ASTM B584, UNS C83600-85-5- 5-5 (latest revision).
      b. Lids shall be made of cast iron per ASTM A48, Class 25.
      c. Lid shall be coated with black dip.
   2. Regular applications:

a. Shall be tapped 1 inch with brass insert.
b. Shall be two hole Erie pattern with the "W" in a raised letter.
c. Manufacturer: AY McDonald 5601L, or equal.

3. Cement applications:
a. Shall be tapped with 1 inch brass pentagon plug with word "Water" in raised letters.
b. All pentagon brass plugs shall have a 27/32 inch point to flat side.
c. Manufacturer: AY McDonald 5607L, or equal.

G. Straight Three-Part Unions:
1. Comply with ANSI/AWWA C800 and ASTM B62.
2. Body: "No lead brass" alloy, meeting ASTM B584.
3. Connections: Conductive compression connection for CTS OD on both ends.
4. Gripper band shall be stainless steel and overlap itself so no gasket material can get underneath.
5. Conductor spring shall provide metal-to-metal contact between copper tubing and the fitting for electrical conductivity.
6. Entire gasket shall be enclosed.
7. Fluorocarbon coating shall be on inside surface of nut.
8. Union pressure rating shall be greater than the valve or fitting with which it is used.
9. Manufacturer: AY McDonald4758Q, Mueller H15403N, Universal Cambridge Coupler, or equal.

2.08 NON-SHRINK GROUT

A. Comply with Materials I.M. 491.13.

2.09 VALVES

A. Valve Body: Manufacturer's name and pressure rating cast on valve body.

B. Direction of Opening: The opening direction is counterclockwise as viewed from the top.

C. Joints: For use with ductile iron pipe, use restrained push-on joint valves conforming to AWWA C111. For use with PVC pipe, use flanged with dimensions and drillings according to AWWA C110 or ANSI B16.1 class 125.

D. Valve shall have been manufactured within 5 years of installation date.

E. Gate Valves:
1. Use gate valves where pipe diameter is 12 inch or less.
~~1~~ 2. Standards: Comply with AWWA C509 (gray iron or ductile iron) or AWWA C515 (ductile iron) and NSF 61.
~~2~~ 3. Stem Seals: Double O-rings permanently lubricated between seals. Lubricant certified for use in potable water.
~~3~~ 4. External Bolts and Hex Nuts: Stainless steel according to ASTM A240, Type 304.
~~4~~ 5. Manufacturer: Clow F-2640, Kennedy 8571 SS, Mueller A-2362-20, U.S. Pipe USPO-20, or equal.

F. Butterfly Valves:
1. Use butterfly valves where pipe diameter is 16 inch or greater.
2. Standards: Comply with AWWA C504 class 150B or class 250B (gray iron or ductile iron) and NSF 61.
3. Stem: Stainless steel according to ASTM A 240, Type 304, turned, ground, and polished.
4. For Seat on Body Valves
a. Disc: Ductile iron or gray iron with plasma applied nickel-chromium edge or stainless steel edge according to ASTM A 240, Type 316, and mechanically fixed stainless steel pins.

b. Seat: Synthetic rubber compound mechanically retained to the body.

5. For Seat on Disc Valves
   a. Disc: Ductile iron according to ASTM A 536 with synthetic rubber compound seat mechanically retained to the disc.
   b. Seat: Continuous Type 316 stainless steel seat.
6. External Bolts and Hex Nuts: Stainless steel according to ASTM A 240, Type 304.
7. Manufacturer: Clow, DeZurik, GAV 800 Series, Kennedy, M & H, Mueller, Pratt, Val-Matic, or equal.

~~F~~ G.Tapping Valve Assemblies:

1. Tapping Valve: Gate valve complying with AWWA C509.
2. Sleeve:
   a. Minimum 14 gauge.
   b. Stainless steel according to ASTM A240, Type 304.
   c. Minimum working pressure 150 psi.
   d. Must fully surround pipe.
   e. Flanged with dimensions and drillings according to AWWA C110 or ANSI B16.1 class 125.
   f. Manufacturer: Clow F-2640, Kennedy 8950 SS, Mueller T-2362-16, U.S. Pipe A-USPO-16, or equal.

~~G~~ H.Combination Air Valves:

3. Provide combination air valve assembly in vault where shown on Drawings.
4. Manufacturer: Val-matic 201C.2, APCO 143C, Cla-val 361-CAV564.3, or equal.

2.10 FIRE HYDRANT ASSEMBLY

A. Material: Comply with AWWA C502.

B. Manufacturers: American Darling Mark 73-5, American Darling B-84-B-5, Clow F-2545 Medallion with all stainless steel shaft, Mueller Super Centurion, or equal.

C. Fire hydrant assembly shall have been manufactured within 5 years of installation date.

D. Features:
   1. Breakaway Items: Stem coupling and flange.
   2. Inlet Nominal Size: 6 inch diameter.
   3. Inlet Connection Type: Flange joint.
   4. Hose Nozzles: Two, each 2 ½ inches in diameter, with caps attached with chains.
   5. Direction of Opening: Clockwise.
   6. Items to be specified:
      a. Operating nut: 1½ inch, standard pentagon.
      b. Pumper nozzle: one 4½ inch pumper nozzle.
      c. Nozzle threads: National Standard Hose Threads.
      d. Main valve nominal opening size: 4½ inches on main smaller than 12 inches in diameter, 5¼ inches on main 12 inches and larger.

E. Painting:
   1. Shop coating according to AWWA C502.
   2. Color: Safety Red, unless otherwise indicated by the Water Division.

F. External Bolts and Hex Nuts: Stainless steel according to ASTM A193, Grade B8.

G. Gate Valve: Comply with this section.

H. Pipe and Fittings: Comply with this section.

2.11 APPURTENANCES

A. Valve Box:
   1. Applicability: For all buried valves.
   2. Manufacturer: Tyler – Series 6855 & Item 666A, or equal.
   3. Type: Slip (slide) type.
   4. Material: Gray iron.
   5. Cover: Gray iron, labeled "WATER"
   6. Wall Thickness: 3/16 inch, minimum.
   7. Inside Diameter: 5 inch, minimum.
   8. Length: Adequate to bring top to finished grade, including valve box extensions, if necessary.
   9. Factory Finish: Asphalt coating.
   10. Valve Box Centering Ring:
      a. Include in installation.
      b. Manufacturer: Adaptor, Inc Valve Box Adaptor II.

B. Valve Stem Extension: For all buried valves, provide as necessary to raise 2 inch operating nut to within 3 feet of the finished grade. Stem diameter according to valve manufacturer's recommendations, but not less than 1 inch. Shall be stainless steel.

C. Stainless Steel Repair Clamps:
   1. All stainless steel, single section, double section, or triple section, depending upon size of main.
   2. Shall have stainless steel bolts and nuts.
   3. Manufacturer: Ford FS1, Romac SS1, Smith-Blair 261, or equal.

2.12 LUMBER

A. Lumber for bracing or supports shall be hardwood. (i.e. oak, maple). Do not use creosoted lumber in contact with piping materials.

2.13 WATER

A. Reasonable amounts of water will be provided for use in the final operations of water main flushing, disinfecting and testing. Prior notice must be given to the Water Division.

B. Contractor will not be charged for the water used as long as there is reasonable care to control and conserve the rate and volume used. If there is waste or carelessness, Contractor will be charged for water.

2.14 DISINFECTION AGENT - CHLORINE

A. Liquid Chlorine complying with AWWA B300 and AWWA B301.

B. Sodium Hypochlorite complying with AWWA B300.

C. Calcium Hypochlorite complying with AWWA B300.

D. All disinfecting agents to be NSF 60 certified. Supply and store in the original container.

PART 3 EXECUTION

3.01 REFERENCES AND DOCUMENTS

A. Contractor must have all required documents on the site before commencing with the work. Water mains, valves, hydrants, and special fittings shall be installed in the locations shown on

the plans or as directed by the Engineer.

B. Valves, fittings, hydrants and ductile-iron pipe shall be installed in accordance with ANSI/AWWA C600 except as noted herein.

C. PVC pipe must be furnished and installed in accordance with AWWA M23, ANSI/AWWA-C605 and Uni-Bell PVC Pipe Association UNI-B-3-88 except as noted herein.

D. Contractor must prepare and retain a set of "as-built" drawings on the job site with accurate and current information on the location of all valves, pipe and special construction features. Survey or GPS points are accepted, but not in lieu of written as-built information. Minimum information required for submittal to the Water Division:
   1. Pipe size and material; length of pipe between fittings (center-to-center).
   2. Fitting type, size, restraint type, note if installed vertically or horizontally.
   3. Tracer wire box locations.
   4. Any changes in pipe depth, and where the main is buried greater than 7 feet or less than 5 feet.
   5. Any special fittings or construction materials.

E. Contractor shall have all buried utilities located by the Iowa One-Call Utility Location service and shall do exploratory excavation as necessary to determine specific conflicts between existing utilities and new water main.

3.02 PIPE INSTALLATION

A. General:
   1. Do not use deformed, defective, gouged, or otherwise damaged pipes or fittings.
   2. Keep trench free of water. Clean pipe interior prior to placement in the trench.
   3. Clean joint surfaces thoroughly and apply lubricant approved for use with potable water and recommended by the manufacturer.
   4. Push pipe joint to the indication line on the spigot end of the pipe before making any joint deflections.
   5. Limit joint deflections to one degree less than pipe manufacturer's recommended maximum limit.
   6. Tighten bolts in a joint evenly around the pipe.
   7. Install concrete thrust blocks where indicated on drawings.
   8. Keep exposed pipe ends closed with rodent-proof end gates at all times when pipe installation is not occurring.
   9. Close the ends of the installed pipe with watertight plugs during nights and non-working days.
   10. Do not allow any water from the new pipeline to enter the existing distribution system piping until testing and disinfection are successfully completed.

B. Additional requirements for DIP installation:
   1. Utilize full-length gauged pipe for field cuts. Alternatively, field-gauge pipe selected for cutting to verify the outside diameter is within allowable tolerances.
   2. Cut the pipe perpendicular to the pipe barrel. Do not damage the cement lining. Bevel cut the ends for push-on joints according to the manufacturer's recommendations.
   3. Encase all pipe, valves, and fittings with polyethylene.
   4. Provide pre-insulated pipe and fittings where indicated on drawings.

C. Additional requirements for PVC pipe installation:
   1. Cut the pipe perpendicular to the pipe barrel. Deburr and bevel cut spigot end of the pipe barrel to match factory bevel. Re-mark the insertion line.
   2. When connecting to shallow-depth bells, such as on some cast iron fittings or valves, cut the spigot end square to remove factory bevel. Deburr the end and form a partial bevel on the end.

3.03 POLYETHYLENE ENCASEMENT INSTALLATION

A. Apply polyethylene encasement to buried ductile iron pipe and to buried fittings, fire hydrants, and appurtenances. The polyethylene encasement is used to prevent contact between the pipe and the bedding material, but need not be airtight or watertight.

B. Install polyethylene encasement according to AWWA C105, using tubes or flat sheets, and pipe manufacturer's recommendations.

C. Do not expose the polyethylene encasement to sunlight for long periods before installation.

D. Remove all lumps of clay, mud, cinders, etc. on the pipe surface before encasing the pipe. Take care to prevent soil or bedding material from becoming trapped between the pipe and polyethylene.

E. Lift polyethylene-encased pipe with a fabric-type sling or padded cable.

F. Secure and repair encasement material using polyethylene tape, or replace as necessary.

3.04 TRACER SYSTEM INSTALLATION

A. Install with all buried water main piping. Comply with Figures CIC-5010.100 through 104 for tracer wire installation.

B. Begin and terminate the system at all connections to existing mains.

C. Install wire continuously along the ten or two position of the pipe. Do not install wire along the bottom of the pipe. Attach wire to the pipe at the midpoint of each pipe length; use 2 inch wide, 10 mil thickness polyethylene pressure sensitive tape.

D. Install splices only as authorized by the Engineer. Allow the Engineer to inspect all below grade splices of tracer wire prior to placing the backfill material.

E. Install ground rods adjacent to connections to existing piping and at locations specified in Figures CIC-5010.100 through 103 and Figures CIC-4C.1 and CIC- 4C.2.

F. Bring two wires to the surface at each fire hydrant location and terminate with a tracer wire station (comply with Figure CIC-5010.100 and CIC-5010.101).

G. Final inspection of the tracer system will be conducted by the Water Division at the completion of the project and prior to acceptance by the owner. Verify the electrical continuity of the system. Repair discontinuities.

H. A minimum of 18 inch of wire slack at every tracer wire terminal box lid shall be installed.

I. Every splice along the tracer wire shall have a minimum of 18 inch of wire slack added to the line.

J. No uninsulated wire shall be installed along any length of run or at splice points. All exposed wire shall be mended as directed by Water Division personnel, and all splices shall include dielectric grease.

K. Ground rods should be placed 6 inch to 10 inch from the pipe and not make contact with any part of the water system or any other utility.

3.05 LOCATION, ALIGNMENT, SEPARATION AND GRADE

A. Water main shall be installed with a minimum depth of cover of 5½ feet, except where otherwise indicated on drawings. Generally, the maximum depth shall not exceed 7 feet, except where otherwise indicated on drawings.

B. No water pipe shall pass through or come in contact with any part of a sewer manhole.

C. Should physical conditions exist such that exceptions to this standard are necessary, the design engineer must detail how the sewer and water main are to be engineered to provide protection equal to that required by these sections.

D. Sewers constructed of standard sewer materials shall not be laid within 75 feet of a public well or 50 feet of a private well. Sewers constructed of water main materials may be laid within 75 feet of a public well and within 50 feet of a private well but no closer than 25 feet of either.

E. Horizontal Separation of Gravity Sewers from Water Mains:
   1. Separate gravity sewer mains from water mains by a horizontal distance of at least 10 feet unless:
      a. The top of a sewer main is at least 18 inch below the bottom of the water main, and
      b. The sewer is placed in a separate trench or in the same trench on a bench of undisturbed earth at a minimum horizontal separation of 3 feet from the water main.
   2. When it is impossible to obtain the required horizontal clearance of 3 feet and a vertical clearance of 18 inch between sewers and water mains, the sewers must be constructed of water main materials meeting the requirements set forth in this section. However, provide a linear separation of at least 2 feet.

F. Separation of Sewer Force Mains from Water Mains: Separate sewer force mains and water mains by a horizontal distance of at least 10 feet unless:
   1. The force main is constructed of water main materials meeting a minimum pressure rating of 150 psi and the requirements of Section 2.01 A or B of this special provision and
   2. The sewer force main is laid at least 4 linear feet from the water main.

G. Separation of Sewer and Water Main Crossovers:
   1. Vertical separation of sanitary and storm sewers crossing under any water main should be at least 18 inch when measured from the top of the sewer to the bottom of the water main. If physical conditions prohibit the separation, the sewer may be placed not closer than 6 inch below a water main or 18 inch above a water main. Maintain the maximum feasible separation distance in all cases. The sewer and water pipes must be adequately supported and have watertight joints. Use a low permeability soil for backfill material within 10 feet of the point of crossing.
   2. Where the sanitary sewer crosses over or less than 18 inches below a water main, locate one full length of sewer pipe of water main material so both joints are as far as possible from the water main.
   3. Where the storm sewer crosses over or less than 18 inches below a water main, locate one full length of sewer pipe of water main material or reinforced concrete pipe (RCP) with flexible O-ring gasket joints so both joints are as far as possible from the water main.

H. Surface Water Crossings: Comply with the Recommended Standards for Water Works, 2012 Edition.
   1. Above-water Crossings: Ensure the pipe is adequately supported and anchored; protected from vandalism, damage, and freezing; and accessible for repair or replacement.
   2. Underwater Crossings: Provide a minimum cover of 5 feet over the pipe unless otherwise specified in the contract documents. When crossing water courses that are greater than 15 feet in width, provide the following:
      a. pipe with flexible, restrained, or welded watertight joints,
      b. valves at both ends of water crossings so the section can be isolated for testing or repair; ensure the valves are easily accessible and not subject to flooding, and
      c. permanent taps or other provisions to allow insertion of a small meter to determine

leakage and obtain water samples on each side of the valve closest to the supply source.

I. Separation to Other Utilities: Maintain minimum 18 inch clearance around water mains and appurtenances.

3.06 PIPE BEDDING, EXCAVATION, AND BACKFILLING

A. Ductile-iron pipe bedding shall conform to the project plan details or as otherwise specified or directed by the Engineer.

B. PVC pipe bedding shall conform to UNI-B-3-88 laying condition Type 2 including hand excavation for the bell holes. The bedding shall be loose, natural, fine soil which is compacted by hand tamping on the soil along the sides of the pipe to the top of the pipe.

C. Trench width within the pipe envelope shall conform to the plans or as directed by the Engineer.

D. Set valves and hydrants on precast concrete bases.

E. All excavations shall comply with the requirements of OSHA Standard 1926, Subpart P-Excavations.

3.07 PIPE RESTRAINT

A. Thrust Restraint:
1. Where indicated on the drawings: For pipe smaller than 10 inch diameter, concrete block shall be used, placing the concrete block next to the fitting and undisturbed soil. For 10 inch and larger diameter pipe, blocking shall be by cast-in-place concrete. Cover fittings and joints with 8 mil polyethylene before placing concrete. Brace fittings with hardwood to prevent shifting before placing concrete. Do not pour excess concrete on top of pipe and fittings.
2. All pipe and fittings shall have restrained joints. Install restrained joints in accordance with manufacturer's recommendations.

B. Socket Pipe Clamps, Tie Rods, and Bridles: Where indicated or necessary to prevent joints or sleeve couplings from pulling apart under pressure, provide suitable socket pipe clamps, tie rods, and bridles. Bridles and tie rod diameter shall be at least 3/4 inch. except where they replace flange bolts of smaller size with nut on each side of flange.

C. Dead Ends:
1. Pipe ends or fittings left for future connections shall be plugged or capped using materials supplied by the pipe manufacturer.
2. All pipe ends or fittings left for future connections shall be blocked against thrust or restrained plugs shall be provided.

3.08 JOINTS AND COUPLINGS

A. Push-on Joints:
1. Inspect bell grooves and clean to assure complete gasket seating.
2. Use extreme care to prevent separation of joints already installed.
3. Do not use push-on joints when boring. Snap-Lok shall be used in casing with locking rubbers.
4. Install push-on restrained joint pipe in accordance with manufacturer's recommendations.

B. Sleeve-Type Coupling:
1. Clean pipe ends for distance of 12 inches.

2. Use soapy water as gasket lubricant.
3. Carefully mark and place the sleeve coupling in the center of the joint.

3.09 VALVES

A. Valve boxes should be centered over valve operating nut and run straight and true (not angled).

B. Valve boxes set in paving shall not be installed with an expansion joint.

C. Install combination air valve in accordance with manufacturer's recommendations.

3.10 FIRE HYDRANT

D. Install according to Figure CIC-5020.201.

E. If the fire hydrant valve is positioned adjacent to the water main, attach it to an anchor tee.

F. If the fire hydrant valve is positioned away from the water main, restrain all joints between the valve and water main.

G. Fire Hydrant Depth Setting:
   1. Use adjacent finished grade to determine setting depth.
   2. Set bottom of breakaway flange between 2 inches and 5 inches above finished grade.
   3. If finished grade is not to be completed during the current project, consult with the Engineer for proper setting depth.

H. Coordinate installation with tracer wire installation.

I. Orient fire hydrant nozzles as directed by the Engineer or Inspector.

3.11 TAPPED CONNECTIONS UNDER PRESSURE

A. Follow manufacturer's installation instructions.

B. Tapping mains for new connections 1 inch to 12 inches in diameter shall be done by the Water Division. This includes connections made on public and private mains.

C. A new and site specific tapping application must be prepared for each tap regardless of size, and submitted to the Water Division. The tapping application must be completed and include location, name, and address of water customer, schematic drawing, and materials of construction.

3.12 WATER MAIN OPERATIONS

A. All work which involves operating the active public water distribution system will require the notice, consent, approval and assistance of the Water Division.

B. An accurate and legible copy of the "as-built" drawings must be on file in the Water Division office prior to using the water supply.

C. If requested by the City, the contractor will work with Water Division personnel to submit a plan for initial operations and a plan for final operations to the Water Division for approval. The plans shall include a drawing and typed list of actions which show all the significant steps necessary to connect to the existing water distribution system or conduct the filling, flushing and testing operations. The purpose of both plans is to minimize the impact of service interruptions and pressure and flow variations on the water distribution system and existing

customers.

3.13 FILLING EXISTING WATER PIPE

A. Water mains and services 4 inch in diameter and larger that are abandoned in place shall be plugged and filled.

B. Prior to plugging and filling the water line, Engineer will verify the water line is not in use and will be abandoned.

C. Construct water line plug by completely filling the end of the pipe with concrete. Force concrete into the end of the pipe for a distance of 12 inches.

D. Fill the line to be abandoned with flowable mortar or CLSM, according to Article 2552.02 G, by gravity flow or pumping.

PART 4 DISINFECTION AND TESTING FOR POTABLE WATER SYSTEMS

4.01 GENERAL

A. Upon completion of a newly installed water main or when repairs to an existing water system are made, the main shall be disinfected according to instructions listed in ANSI/AWWA C651 and the following specifications.

4.02 SCHEDULING AND CONFLICTS

A. Notify the City Inspector or Water Division 2 working days in advance of testing or disinfection operations to coordinate the operations.

B. The Engineer or his/her representative is required to be in attendance during testing or disinfection.

C. Entire testing sequence for a segment shall be completed within an appropriate time frame. If testing sequence for a segment, including tracing, is not satisfactorily completed within 2 weeks from initial disinfection, testing sequence for segment shall start over from initial disinfection. Testing schedules for other segments may be affected.

4.03 SEQUENCE OF TESTING AND DISINFECTION

A. Perform operations according to AWWA C651 in the sequence below. Successfully complete each operation before continuing to the next operation. All mains shall pass two bacteriological tests before pressure testing is allowed. Testing segments shall be no longer than 1200 feet along one main. All legs/lateral mains shall be tested as separate segments. Long main lines over 1200 feet in length shall be tested in discrete testing segments, and adjoining in-line testing segments shall not be tested together in any manner. Water mains must pass all testing before any main or service taps are allowed.

B. Tablet Method (Concurrent with Water Main Installation):
   1. Perform disinfection.
   2. Flush after disinfection.
   3. Perform bacteria tests.
   4. Perform pressure and leak testing.

C. Continuous-Feed or Slug Method (After Water Main Installation): Use this method only if approved by the Engineer. The sequence of testing and disinfection may be modified with approval of the Engineer.
   1. Perform initial flush.

2. Perform disinfection.
3. Flush after disinfection.
4. Perform bacteria tests.
5. Perform pressure and leak testing.

4.04 DISINFECTION

A. General:
   1. Disinfect according to AWWA C651.
   2. Keep piping to be chlorinated isolated from lines in service and from points of use.
   3. Coordinate disinfection and testing with the Engineer.
   4. Obtain and test water samples, unless otherwise provided by the Engineer.

B. Procedure:
   1. Induce a flow of potable water through the pipe.
   2. Introduce highly chlorinated water to the pipe at a point within 5 pipe diameters of the pipe's connection to an existing potable system, or within 5 pipe diameters of a closed end, if there is no connection to an existing system.
   3. Introduce water containing a minimum of 25 mg/L free chlorine until the entire new pipe contains a minimum of 25 mg/L free chlorine.
   4. Retain chlorinated water in the pipe for at least 24 hours and no more than 48 hours.

4.05 FLUSHING

A. Flush pipe using potable water until chlorine residual equals that of the existing potable water system.

B. Dispose of chlorinated water to prevent damage to the environment. Dechlorinate highly chlorinated water from testing before releasing into the ground or sewers. Obtain Jurisdiction approval prior to flushing activities.
   1. Check with the local sewer department for the conditions of disposal to the sanitary sewer.
   2. Chlorine residual of water being disposed will be neutralized by treating with one of the chemicals listed in the following table.

Table 5030.02: Amounts of Chemicals Required to Neutralize Various Residual Chlorine Concentrations in 100,000 Gallons of Water

Residual Chlorine Concentration mg/L	Sulfur Dioxide (SO2) lb	Sodium Bisulfite (NaHSO3) lb	Sodium Sulfite (Na2SO3) lb	Sodium Thiosulfate (Na2S2O3 + 5H2O) lb	Ascorbic Acid (C6O8H6) lb
1	0.8	1.2	1.4	1.2	2.1
2	1.7	2.5	2.9	2.4	4.2
10	8.3	12.5	14.6	12.0	20.9
50	41.7	62.6	73.0	60.0	104

4.06 BACTERIA SAMPLING

A. Test water mains according to AWWA C651, including collection of two consecutive sets of acceptable bacteria samples 24 hours apart. If the initial disinfection procedure fails to produce satisfactory bacteriological results or if other water quality is affected, repeat the disinfection procedure.

4.07 PRESSURE AND LEAK TESTING

A. Secure unrestrained pipe ends against uncontrolled movement.

B. Isolate new piping from the existing water system.

C. Fill and flush all new piping with potable water. Ensure all trapped air is removed.

D. Pressurize the new pipe to the test pressure at the highest point in the isolated system. Do not pressurize to more than 5 psi over the test pressure at the highest point in the isolated system.

E. Test and monitor the completed piping system at 1.5 times the system working pressure or 150 psi, whichever is greater, for 2 continuous hours.

F. If the measured pressure loss does not exceed 5 psi, the test will be considered acceptable.

G. Repair all visible leaks regardless of test.

H. Addition of makeup water is not allowed.

4.08 SYSTEMS CHECK

A. Valve Operations: All valves shall be located and tested to verify operation. Remove the valve box lid, insert the valve key and open and close each valve. Count the turns and record the results.

B. Hydrant Operations:
1. After the hydrant has been installed and the main and hydrant have been pressure tested, each hydrant shall be flushed and checked for proper operation.
2. After hydrant has been flushed, close it and check for drainage. This is done by placing a hand over the nozzle opening and checking for a vacuum. Then check the hose thread for proper fit.
3. Replace nozzle cap, then open hydrant again and inspect all joints for leaks.

C. Final Trace: All tracer wire terminal boxes shall be to grade, located appropriate distance from hydrant/valve, and with tracer wire correctly attached. A Water Division locator shall complete a trace of the new pipe(s), including connections to existing main. Any tracing deficiencies noted by the locator shall be corrected before the water pipe is accepted and opened for service.

4.09 PUTTING WATER MAIN IN SERVICE

A. The Water Division shall put the completed water system in service only after system has satisfactorily passed all testing and documentation requirements.

PART 5 METHOD OF MEASUREMENT AND BASIS OF PAYMENT

5.1 METHOD OF MEASUREMENT

A. Water Service Stubs: Each type and size of water service and stub from the water main to the stop box or connection to existing water service will be counted.

B. Combination Air Valve Vault: Each combination air valve vault will be counted.

C. Filling Existing Water Pipe: Measurement for each size of pipe filled and plugged will be in linear feet from end of pipe to end of pipe.

D. Removal of Water Pipe: Measurement for each type and size of pipe removed will be in linear feet from end to end.

E. Removal of Fire Hydrant: Each fire hydrant removed will be counted.

F. Connection to existing: Each permanent connection of new water main to existing water main or new water service to existing water service will be counted. Temporary connections between new and existing pipe will not be counted.

5.2 BASIS OF PAYMENT

A. Water Service Stubs:
   1. Payment will be made at the contract unit price for each type and size of water service stub.
   2. For ¾ inch to 2 inches water service stubs payment is full compensation for service saddle, corporation, service pipe, stop valve, and stop box.
   3. For water service stubs larger than 2 inches payment is full compensation for flange adapter and service pipe.

B. Combination Air Valve Vault.
   1. Payment will be made at the contract unit price for each combination air valve vault.
   2. Payment is full compensation for structure, casting, and combination air valve assembly, including associated piping and valves.

C. Filling Existing Water Pipe:
   1. Payment will be at the contract unit price per linear foot for each size of pipe filled and plugged.
   2. Payment is full compensation for plugging pipe, filling pipe, and any additional excavation and backfilling required for accessing the pipe to plug or fill it.

D. Removal of Water Pipe:
   1. Payment will be at the contract unit price per linear foot for each type and size of pipe.
   2. Payment is full compensation for removal, disposal, and capping (if specified) of pipe.

E. Removal of Fire Hydrant:
   1. Payment will be made at the contract unit price for each fire hydrant removed.
   2. Payment is full compensation for removal of hydrant, auxiliary valve with valve box, and all components in between; associated excavation and backfilling; and disposal of non-public fire hydrants.

F. Connection to Existing:
   1. Payment will be made at the contract unit price for each connection to existing.
   2. Payment is full compensation for locating existing pipe at connection point, cutting existing pipe as needed, connecting new pipe to existing pipe, and all associated appurtenances.

SPECIAL PROVISIONS
FOR
PRE-INSULATED WATER MAIN AND APPURTENANCES

Johnson County
HDP-3715(652)--71-52

Effective Date
April 19, 2016

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

PART 1 GENERAL

1.1 SUMMARY

A. This Section of the Specification includes all labor, materials, equipment, and testing required to furnish and install all pre-insulated water main and appurtenances.

1.2 RELATED REQUIREMENTS

A. Refer to Special Provisions for Water Main and Appurtenances for requirements pertaining to furnishing, installing, disinfecting, and testing water mains and fittings to be pre-insulated.

1.3 QUALITY ASSURANCE

A. Steel pipe hangers and supports shall have the manufacturer's name, part number, and applicable size stamped in the part itself for identification.

B. Hangers and supports shall be designed and manufactured in conformance with MSS SP 58.

1.4 SUBMITTALS

A. Product data on all hanger and support devices, including shields and attachment methods. Product data to include, but not be limited to materials, finishes, approvals, load ratings, and dimensional information for proposed hanger configuration. If the hanger provided is different than detailed in the plans, the design of the hangers shall be provided and sealed by a Professional Engineer licensed in the State of Iowa.

B. Product data on pipe insulation system, including factory installed insulation, field joints, and all field installed insulation.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery: All materials shall be clearly marked and undamaged when they are delivered to the site.

B. Storage and Handling: All materials shall be stored on pallets or supports so that no materials are in direct contact with the ground and in accordance with manufacturer's recommendations. All materials should be handled to protect them from damage and contamination. All materials shall be in working condition and free of contaminants when installed.

PART 2 PRODUCTS

2.1 PIPE INSULATION

A. Service pipe insulation shall be spray applied 0.18 k-factor and nominal 2 pounds per cubic foot density, polyurethane foam for straight sections and flexible polyurethane foam for all fittings. To ensure no voids are present, all insulation shall be inspected by one of the following two methods:
   1. Visually checked prior to application of the protective jacket.
   2. Infrared inspection of the entire length 24 hours after foaming is complete.

B. Insulation shall be applied to the minimum thickness of 2.5 inches.

C. Insulation shall be provided by Perma-Pipe.

2.2 PIPE HANGERS

A. Pipe hangers shall consist of two adjustable steel yoke pipe rollers with rod hangers.

B. Hanger rods shall be threaded both ends or continuous threaded rods of circular cross section. Use adjusting locknuts at upper attachments and hangers. No wire, chain, or perforated straps are allowed.

C. Hangers and strut shall be hot dip galvanized after fabrication in accordance with ASTM A123. All hanger hardware shall be hot dip galvanized or stainless steel. Zinc plated hardware is not acceptable for outdoor or corrosive use.

2.3 PROTECTIVE JACKET

A. Straight sections of the pre-insulated piping system shall be filament wound resin/fiberglass reinforcement composite directly applied on the insulating foam. The manufacturer shall filament wind fiberglass directly onto the polyurethane foam and taper the jacket down onto the ductile iron to seal each section of pipe.

B. The projective jacket shall have a minimum thickness of 100 mils of FRP.

C. Thermoplastic casing materials are not allowed.

D. Protective jacket shall be as manufactured by Perma-Pipe.

2.4 SADDLE SUPPORTS

A. Saddle supports should be provided on top and bottom of insulated water main on the bridge at each pipe hanger location.

B. Saddle supports shall extend around the top and bottom of the insulated pipe for 120 degrees and be placed between the protective jacket and rollers.

C. Saddle supports shall be constructed of galvanized carbon steel.

D. Length of the saddle supports shall be between 12 and 18 inches. Exact length shall be determined by Perma-Pipe.

2.5 FIELD JOINTS

A. Buried field joint locations shall be a flexible foam insulation banded in place over the bell of the ductile iron pipe and the tapered end of the protective jacket and then sealed with a shrink sleeve.

B. Field joints for the water main on the bridge shall be flexible foam insulation banded in place over the bell of the ductile iron pipe and the tapered end of the protective jacket and then sealed with a shrink sleeve.

C. Apply FRP rock shield over field joint location for added protection.

2.6 FIELD INSULATION FOR FITTINGS

A. Insulation of fittings shall consist of a flexible foam insulation banded in place over the ductile iron pipe fitting and then sealed with a shrink sleeve.

2.7 FLEXIBLE EXPANSION JOINTS

A. Provide force balanced flexible expansion joints where indicated in the plans.

B. Pressure rating: 350 psi.

C. Manufacture of ductile iron conforming to material requirements of ASTM A536 and ANSI/AWWA C153/A21.53.

D. Joints: Flanged.

E. Manufacturer: EBAA Iron, Inc., Force Balanced “Flex-Tend.”

2.8 COMBINATION AIR VALVE ASSEMBLY

A. Provide combination air valve assembly as shown on plans.

B. Manufacturer: Val-Matic 201C.2, APCO 143C, or equal.

PART 3 EXECUTION

3.1 PIPE INSTALLATION

A. Factory-trained field technical assistance shall be provided for critical periods of installation; unloading, field joint instruction, and testing.

B. Hydrostatically test pipe prior to installation of insulation on field joints or fittings.

C. Follow manufacturer’s recommendations for installation of insulated piping system.

3.2 HANGER INSTALLATION

A. Pipe shall be adequately supported by pipe hanger and supports. Hangers for insulated pipe shall be sized to accommodate insulation thickness.

B. Do not support piping from other pipes, intermediate diaphragms, or other equipment this is not the bridge structure.

3.3 FLEXIBLE EXPANSION JOINT INSTALLATION

A. Install flexible expansion joints in accordance with manufacturer’s recommendations.

B. Do not insulate flexible expansion joints.

3.4 COMBINATION AIR VALVE ASSEMBLY

A. Install combination air valve, heat tracing system, and insulation in accordance with manufacturer's recommendations.

3.5 TESTING AND DISINFECTION

A. Test and disinfect water main in accordance with Special Provision for Water Mains and Appurtenances.

PART 4 METHOD OF MEASUREMENT AND BASIS OF PAYMENT

4.1 METHOD OF MEASUREMENT

A. Water Main on Bridge, Pre-insulated: Measurement for each type and size of pre-insulated pipe installed on bridge will be in linear feet along the centerline of the pipe, including the length through the fittings.

B. Water Main, Trenched, Pre-insulated: Measurement for each type and size of pre-insulated pipe installed in an open trench will be in linear feet along the centerline of the pipe, including the length through the fittings.

C. Flexible Expansion Joints: Measurement for each type and size of flexible expansion joint installed as specified will be counted.

D. Combination Air Valve Assembly: Each combination air valve assembly will be counted.

4.2 BASIS OF PAYMENT

A. Water Main on Bridge, Pre-insulated:
   1. Payment will be the contract unit price per linear foot for each type and size of pipe.
   2. Payment is full compensation for furnishing and installing pre-insulated pipe and fittings, pipe hangers, field joint insulation, and combination air valve assembly.

B. Water Main, Trenched, Pre-insulated:
   1. Payment will be the contract unit price per linear foot for each type and size of pipe.
   2. Payment is full compensation for trench excavation, dewatering, furnishing bedding material, placing bedding and backfill material, tracer system, testing, disinfection, and polyethylene wrap for ductile iron pipe and ductile iron fittings.

C. Flexible Expansion Joints:
   1. Payment will be the contract unit price for each size of flexible expansion joint.
   2. Payment is full compensation for furnishing, installing, and testing for flexible expansion joint.

D. Combination Air Valve Assembly.
   1. Payment will be at the contract unit price for each combination air valve assembly.
   2. Payment is full compensation for combination air valve assembly, including piping, associated valves, associated heat tracing system, and insulation.

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
		1. Meet the requirements of Section 2303
		B. Pavement Removal
		Remove temporary pavement and replace at no additional cost to the Contracting Authority, all concrete or asphalt adjacent to the temporary pavement damaged during operation of placement and removal of temporary pavement.
		Method of Measurement: Temporary Pavement placed, in square yards will be the quantity shown in the contract documents.
		Basis of Payment:
		A. Payment for Temporary Pavement will be the contract price per square yard.
		B. Payment is full compensation for furnishing material, equipment, and labor to construct and remove the temporary pavement in accordance with the contract documents.
19	2401-6745356	REMOVAL OF CONCRETE FOOTINGS OF LIGHT POLES
		Refer to Tab 110-16 in the C Sheets.
20	2401-6745650	REMOVAL OF EXISTING STRUCTURES
		Refer to Tab 110-2 in the C Sheets.
21	2401-6745765	REMOVAL OF LIGHT POLES
		Refer to Tab 110-16 in the C Sheets.
		All existing light poles to be removed shall be salvaged and set on-site for pickup by the University of Iowa.
22	2402-0425030	GRANULAR BACKFILL
		Refer to V Sheets for additional details.
23	2402-0425040	FLOODED BACKFILL
		Refer to Tab 104-3 and Tab 104-4 in the C Sheets.
24	2402-2720000	EXCAVATION, CLASS 20
		This quantity is for excavation of RCB culverts.
25	2403-0100020	STRUCTURAL CONCRETE (RCB CULVERT)
		Includes 98.9 cy concrete for barrel sections labeled “cast-in-place”. Includes 12.5 cy for 1 end section.
		Includes 3.6 cy for closure walls at 10’ x 8’ RCB culvert. Includes certified plant inspection in accordance with Section 2521 of the Standard Specifications.
26	2403-0900001	STRUCTURAL CONCRETE, CLASS C
		This item is for Retaining Wall #13 and #14. Refer to V Sheets for additional details.
		Includes certified plant inspection in accordance with Section 2521 of the Standard Specifications.
27	2404-7775000	REINFORCING STEEL
		Includes 17,774 lbs reinforcing steel for RCB culvert barrel sections labeled IN.cast-in-place IN..
		Includes 1851 lbs for 1 RCB end section.
		Includes 960 lbs for closure walls at 10' x 8' RCB culvert.
		Includes 7648 lbs for Retaining Wall #13 and #14.
28	2414-6444100	STEEL PIPE PEDESTRIAN HAND RAILING
		This item is for box culvert end sections.
29	2414-6625502	STRUCTURAL STEEL RAILING, TRAFFIC
		Refer to V Sheets for additional details. Refer to Sheet V.5 for tabulation.
30	2414-6772020	STEEL FENCE, WELDED WIRE MESH
		This item is for Retaining Wall #13 and #14. Refer to V Sheets for additional details.
31	2415-2110604	PRECAST CONCRETE BOX CULVERT, 6 FT. X 4 FT.
32	2415-2110805	PRECAST CONCRETE BOX CULVERT, 8 FT. X 5 FT.
		Includes material and labor associated with providing and installing the culvert ties, lifting hole plugs, engineering fabric, joint material, and grout as required.
33	2415-2111004	PRECAST CONCRETE BOX CULVERT, 10 FT. X 4 FT.
		Refer to J Sheets for details. Includes 8 ft box extension for Stage 1 traffic control.
		Removal shall be incidental to bid item.
		Includes material and labor associated with providing and installing the culvert ties, lifting hole plugs, engineering fabric, joint material, and grout as required.
34	2415-2111008	PRECAST CONCRETE BOX CULVERT, 10 FT. X 8 FT.
		Includes material and labor associated with providing and installing the culvert ties, lifting hole plugs, engineering fabric, joint material, and grout as required.
35	2415-2200604	PRECAST CONCRETE BOX CULVERT STRAIGHT END SECTION, 6 FT. X 4 FT.
		Includes material and labor associated with providing and installing the culvert ties, lifting hole plugs, engineering fabric, joint material, and grout as required.
		Includes 1 0° skew precast end section, 1 30° skew precast end section, 2 45° skew precast end sections, 4 precast lintel beams, and 4 precast curtain walls.
36	2415-2200805	PRECAST CONCRETE BOX CULVERT STRAIGHT END SECTION, 8 FT. X 5 FT.
		Includes material and labor associated with providing and installing the culvert ties, lifting hole plugs, engineering fabric, joint material, and grout as required.
		Includes 4 0° skew precast end sections, 4 30° skew precast end sections, 8 precast lintel beams, and 8 precast curtain walls.
37	2416-0100015	APRON, CONCRETE, 15 IN.
		Refer to Tab 104-3 in the C Sheets.

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Item No.	Item Code	Description
38	2416-0100018	APRON, CONCRETE, 18 IN.
39	2416-0100027	APRON, CONCRETE, 27 IN.
40	2416-0100036	APRON, CONCRETE, 36 IN.
41	2416-0100048	APRON, CONCRETE, 48 IN.
42	2416-1160015	CULVERT, CONCRETE ENTRANCE PIPE, 15 IN. DIA.
43	2416-1180018	CULVERT, CONCRETE ROADWAY PIPE, 18 IN. DIA.
		Refer to Tab 104-3 in the C Sheets.
44	2432-0000100	MECHANICALLY STABILIZED EARTH RETAINING WALL
		Refer to V Sheets for additional details.
		Includes 2,574 SF for Wall #9, 1,875 SF for Wall #10, 17,515 SF for Wall #11 and 1,786 SF for Wall #12.
45	2435-0130148	MANHOLE, SANITARY SEWER, SW-301, 48 IN.
		Construction of some manholes in two stages due to project phasing shall be incidental to bid item.
		Provide castings with City of Iowa City covers as shown on Sheet B.15 unless otherwise noted in the plans.
		Class III, Class IVA, and Class IVB are not acceptable backfill materials.
		Refer to Tab 104-5B in the U Sheets.
46	2435-0140148	MANHOLE, STORM SEWER, SW-401, 48 IN.
47	2435-0140148	MANHOLE, STORM SEWER, SW-401, 48 IN., TYPE 3B CASTING
48	2435-0140160	MANHOLE, STORM SEWER, SW-401, 60 IN.
49	2435-0140160	MANHOLE, STORM SEWER, SW-401, 60 IN., TYPE 3B CASTING
50	2435-0140172	MANHOLE, STORM SEWER, SW-401, 72 IN.
51	2435-0140172	MANHOLE, STORM SEWER, SW-401, 72 IN., TYPE 3B CASTING
52	2435-0140184	MANHOLE, STORM SEWER, SW-401, 84 IN.
53	2435-0140200	MANHOLE, STORM SEWER, SW-402, 4' X 4'
54	2435-0140300	MANHOLE, STORM SEWER, SW-403, 4' X 4'
		Provide castings with City of Iowa City covers as shown on Sheet B.15 unless otherwise noted in the plans.
		Class III, Class IVA, and Class IVB are not acceptable backfill materials.
55	2435-0140410	MANHOLE, STORM SEWER, SW-404 MODIFIED
		Item is for precast junction box shown on Sheet V.52.
		Modify standard detail for rectangular openings from precast box in lieu of circular opening from pipe.
		Provide castings with City of Iowa City covers as shown on Sheet B.15 unless otherwise noted in the plans.
		Class III, Class IVA, and Class IVB are not acceptable backfill materials.
56	2435-0250100	INTAKE, SW-501
57	2435-0250500	INTAKE, SW-505
58	2435-0250700	INTAKE, SW-507
59	2435-0250800	INTAKE, SW-508
60	2435-0250900	INTAKE, SW-509
61	2435-0251000	INTAKE, SW-510
		Refer to Tab 104-5B in the M Sheets.
		Provide castings with City of Iowa City covers as shown on Sheet B.15 unless otherwise noted in the plans.
		Class III, Class IVA, and Class IVB are not acceptable backfill materials.
62	2435-0251010	INTAKE, SW-510 MODIFIED
		Refer to Tab 104-5B in the M Sheets.
		Contractor to coordinate with a precast supply company to make the necessary changes needed to accommodate the additional depth of these structures.
		Provide castings with City of Iowa City covers as shown on Sheet B.15 unless otherwise noted in the plans.
		Class III, Class IVA, and Class IVB are not acceptable backfill materials.
63	2435-0251224	INTAKE, SW-512, 24 IN., TYPE 3B CASTING
64	2435-0251300	INTAKE, SW-513
65	2435-0254100	INTAKE, SW-541
66	2435-0254200	INTAKE EXTENSION UNIT, SW-542
67	2435-0254500	INTAKE, SW-545
		Refer to Tab 104-5B in the M Sheets.
		Provide castings with City of Iowa City covers as shown on Sheet B.15 unless otherwise noted in the plans.
		Class III, Class IVA, and Class IVB are not acceptable backfill materials.
68	2435-0400000	DROP CONNECTION, SW-307
		Provide ductile iron pipe with ceramic epoxy lining.
69	2435-0600010	MANHOLE ADJUSTMENT, MINOR
70	2435-0600020	MANHOLE ADJUSTMENT, MAJOR
		Refer to Tab 104-11 in the C Sheets.
		Class III, Class IVA, and Class IVB are not acceptable backfill materials.
71	2435-0700010	CONNECTION TO EXISTING MANHOLE
72	2501-0201253	PILES, STEEL, HP 12 X 53
		This item is for Retaining Wall #13 and #14. Refer to V Sheets for additional details.
73	2501-8400172	TEMPORARY SHORING
		Due to restricted right-of-way and traffic control requirements, temporary shoring may be required for, but not limited to, the construction of utility trenches, retaining walls and the Park Road bridge abutments.
74	2502-2308110	CONTINUOUS TRENCH DRAIN (500-20)
		Refer to B.14 for additional details.
		Grate shall be ADA compliant and heel-proof.

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Item No.	Item Code	Description
75	2502-8212036	SUBDRAIN, LONGITUDINAL, (SHOULDER) 6 IN.
		Refer to Tab 104-9 in the C Sheets.
		Use dual walled corregated polyethylene pipe.
76	2502-8215121	SUBDRAIN, CORRUGATED METAL PIPE, 21 IN. DIA.
		Refer to Tab 104-5B in the M Sheets.
77	2502-8221304	SUBDRAIN OUTLET, DR-303
		Refer to Tab 104-9 in the C Sheets.
		Use dual walled corregated polyethylene pipe.
78	2503-0114218	STORM SEWER GRAVITY MAIN, TRENCHED, RCP 2000D, 18 IN.
79	2503-0114224	STORM SEWER GRAVITY MAIN, TRENCHED, RCP 2000D, 24 IN.
80	2503-0114236	STORM SEWER GRAVITY MAIN, TRENCHED, RCP 2000D, 36 IN.
81	2503-0114415	STORM SEWER GRAVITY MAIN, TRENCHED, RCP 3000D, 15 IN.
82	2503-0114421	STORM SEWER GRAVITY MAIN, TRENCHED, RCP 3000D, 21 IN.
83	2503-0114427	STORM SEWER GRAVITY MAIN, TRENCHED, RCP 3000D, 27 IN.
84	2503-0114430	STORM SEWER GRAVITY MAIN, TRENCHED, RCP 3000D, 30 IN.
85	2503-0114436	STORM SEWER GRAVITY MAIN, TRENCHED, RCP 3000D, 36 IN.
86	2503-0114448	STORM SEWER GRAVITY MAIN, TRENCHED, RCP 3000D, 48 IN.
		Refer to Tab 104-5B in the M Sheets.
87	2503-0200036	REMOVE STORM SEWER PIPE LESS THAN OR EQUAL TO 36 IN. DIAMETER
88	2503-0200136	REMOVE STORM SEWER PIPE GREATER THAN 36 IN. DIAMETER
89	2503-0200341	STORM SEWER ABANDONMENT, FILL AND PLUG, LESS THAN OR EQUAL TO 36 IN. DIA.
		Refer to Tab 110-14 in the C Sheets.
90	2504-0112424	SANITARY SEWER GRAVITY MAIN, TRENCHED, RCP, 3000D (CLASS IV), 24 IN.
91	2504-0112442	SANITARY SEWER GRAVITY MAIN, TRENCHED, RCP, 3000D (CLASS IV), 42 IN.
92	2504-0112448	SANITARY SEWER GRAVITY MAIN, TRENCHED, RCP, 3000D (CLASS IV), 48 IN.
93	2504-0112648	SANITARY SEWER GRAVITY MAIN, TRENCHED, RCP, 3750D (CLASS V), 48 IN.
		See Special Provision for Sanitary and Storm Sewer Pipe and Structural Materials and Standard Specifications 2504 and 4149.
		Refer to Tab 104-5B in the U Sheets. Temporary bypassing is incidental to bid item.
94	2504-0114008	SANITARY SEWER GRAVITY MAIN, TRENCHED, PVC, 8 IN.
95	2504-0114010	SANITARY SEWER GRAVITY MAIN, TRENCHED, PVC, 10 IN.
96	2504-0114012	SANITARY SEWER GRAVITY MAIN, TRENCHED, PVC, 12 IN.
		Provide PVC truss pipe unless indicated otherwise.
		Provide PVC pressure pipe and concrete pipe collars where indicated on drawings.
		PVC pressure pipe shall be AWWA C900 pipe. Concrete pipe collars shall be incidental to bid item.
		Refer to Tab 104-5B in the U Sheets. Temporary bypassing is incidental to bid item.
97	2504-0116008	SANITARY SEWER GRAVITY MAIN, TRENCHED, DIP, 8 IN.
98	2504-0116010	SANITARY SEWER GRAVITY MAIN, TRENCHED, DIP, 10 IN.
99	2504-0116048	SANITARY SEWER GRAVITY MAIN, TRENCHED, DIP, 48 IN.
		Provide with ceramic epoxy lining.
		Refer to Tab 104-5B in the U Sheets.
100	2504-0200406	SANITARY SEWER SERVICE STUB, PVC, 6 IN.
		Connect sanitary sewer service stub to existing service.
		Service length beyond what is shown on drawings shall be approved by City Engineer.
		Locating and connecting to existing service shall be incidental to bid item.
		Refer to Tab 104-5B in the U Sheets.
101	2504-0200806	SANITARY SEWER SERVICE STUB WITH RISER, PVC, 6 IN.
		Connect sanitary sewer service stub with riser to existing service.
		Service length beyond what is shown on drawings shall be approved by City Engineer.
		Locating and connecting to existing service shall be incidental to bid item.
		Refer to Tab 104-5B in the U Sheets.
102	2504-0220000	SANITARY SEWER SERVICE RELOCATION
103	2504-0240036	REMOVE SANITARY SEWER PIPE LESS THAN OR EQUAL TO 36 IN.
104	2504-0240236	SAN SEWER ABANDONMENT, FILL AND PLUG, LESS THAN OR EQUAL TO 36 IN. DIA.
		Refer to Tab 110-14 in the C Sheets.
105	2505-4008120	REMOVAL OF STEEL BEAM GUARDRAIL
		Refer to Tab 110-7A in the C Sheets.
106	2505-4021020	STEEL BEAM GUARDRAIL END ANCHOR, W-BEAM
		Refer to Sheet E.14 details and location.
107	2506-4984000	FLOWABLE MORTAR
		Refer to Tab 104-3 in the C Sheets.
		Includes certified plant inspection in accordance with Section 2521 of the Standard Specifications.
108	2507-6799000	BANK SHAPING
		Refer to V Sheets for bank shaping.
109	2507-6800000	MATERIAL FOR FILTER BLANKET
		Material shall conform to Article 4122.02A and 4122.03A.
		Refer to V Sheets for additional details.

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Item No.	Item Code	Description
		Bid item includes 10% additional quantity along walls and bridge abutments for embedment.
		This item includes geotextile fabric for separation and shall be considered incidental to this bid item.
110	2507-6800021	REVETMENT, CLASS B
		Refer to V Sheets for additional details.
		Recycled PCC pavement or broken concrete not acceptable.
		Bid item includes the area below the typical four foot revetment section along the slopes in fill areas.
		Bid item includes 10% additional quantity along walls and bridge abutments for embedment.
		Revetment shall conform to USACE-MVR requirements and approved source downstation of 106+91.66.
111	2507-6800061	REVETMENT, CLASS E
		Refer to V Sheets for additional details.
		Item is for box culvert end sections.
		Recycled PCC pavement or broken concrete not acceptable.
112	2510-6745850	REMOVAL OF PAVEMENT
		Refer to Tab 110-1 in the C Sheets.
		Includes 16,754 SY removal of detour pavement. Refer to J Sheets for details.
113	2510-6750600	REMOVAL OF INTAKE AND UTILITY ACCESS
		Refer to Tab 110-15 in the C Sheets.
114	2511-0302800	RECREATIONAL TRAIL, PCC, 8 IN.
		Refer to B Sheets for details and locations.
		Includes certified plant inspection in accordance with Section 2521 of the Standard Specifications.
		Includes pavement smoothness in accordance with Section 2301.03.H.4 of the Standard Specifications.
115	2511-0310100	SPECIAL COMPACTION OF SUBGRADE FOR RECREATIONAL TRAIL
		Refer to B Sheets for details and locations.
116	2511-6745900	REMOVAL OF SIDEWALK
		Refer to Tab 110-5 in the C Sheets.
117	2511-7526006	SIDEWALK, PCC, 6 IN.
		Refer to Tab 113-1 in the C Sheets.
		Includes certified plant inspection in accordance with Section 2521 of the Standard Specifications.
		Includes pavement smoothness in accordance with Section 2301.03.H.4 of the Standard Specifications.
118	2511-7528101	DETECTABLE WARNING
		Refer to Tab 113-1 in the C Sheets.
119	2512-1750006	CURB AND GUTTER, P.C. CONCRETE, AS PER PLAN
		Refer to Tab 112-4 in the C Sheets.
		Includes certified plant inspection in accordance with Section 2521 of the Standard Specifications.
120	2513-0001081	CONCRETE BARRIER, TAPERED END, BA-108
		Refer to Tab 108_18B_MOD in the C Sheets.
		Attach tapered end section to Bridge approach pavement using Standard Road Plan BA-108.
121	2515-2475006	DRIVEWAY, PCC, 7 IN.
122	2515-2475009	DRIVEWAY, PCC, 9 IN.
		Refer to Tab 102-3 in the C Sheets.
		Includes certified plant inspection in accordance with Section 2521 of the Standard Specifications.
123	2515-6745600	REMOVAL OF PAVED DRIVEWAY
		Refer to Tab. 110-8 in the C Sheets.
124	2516-8625000	COMBINED CONCRETE SIDEWALK AND RETAINING WALL
		Refer to Tab 108-16 in the C Sheets.
		Includes certified plant inspection in accordance with Section 2521 of the Standard Specifications.
		Includes pavement smoothness (applies to sidewalk only) in accordance with Section 2301.03.H.4 of the Standard Specifications.
125	2518-6910000	SAFETY CLOSURE
		Refer to Tab 108-13A in the C Sheets.
126	2519-3300600	FENCE, SAFETY
		Refer to Sheet E.1, E.3 and E.5 for details and locations.
		The quantity includes 5000 LF to be placed as directed by the Engineer
127	2519-3760000	ENTRANCE BOLLARD
128	2520-3350015	FIELD OFFICE
129	2523-0000200	ELECTRICAL CIRCUITS
130	2523-0000310	HANDHOLES AND JUNCTION BOXES
131	2523-0000400	CONTROL CABINET
132	2523-0000500	UNDERDECK LIGHTING
133	2523-6765009	REMOVE AND REINSTALL LIGHT POLE AND LUMINAIRE
		Refer to P Sheets for additional details.
134	2525-0000100	TRAFFIC SIGNALIZATION
135	2525-0000120	REMOVAL OF TRAFFIC SIGNALIZATION
		Refer to schedule of quantities in the N Sheets.
		See Special Provision for Traffic Signalization requirements.

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Item No.	Item Code	Description
136	2526-8285000	CONSTRUCTION SURVEY
137	2527-9263109	PAINTED PAVEMENT MARKING, WATERBORNE OR SOLVENT-BASED
138	2527-9263131	WET RETROREFLECTIVE REMOVABLE TAPE MARKINGS
139	2527-9263137	PAINTED SYMBOL AND LEGEND, WATERBORNE OR SOLVENT BASED
140	2527-9263600	REMOVABLE, NONREFLECTIVE, PREFORMED TAPE
		Refer to Tab 108-22 and 108-29 in the C Sheets.
		Refer to J Sheets for additional details.
141	2528-8400048	TEMPORARY BARRIER RAIL, CONCRETE
		Refer to Tab 108-33 in the C Sheets.
		Refer to J Sheets for additional details.
		Terminate Temporary Barrier Rail ends with tapered end sections.
142	2528-8400157	TEMPORARY FLOODLIGHTING LUMINAIRE
		Refer to P Sheets for additional details.
143	2528-8400256	TEMPORARY TRAFFIC SIGNALS
		Refer to Tab 108-28 in the C Sheets.
		Refer to J Sheets for additional details.
		See Special Provisions for Temporary Traffic Signalization requirements.
144	2528-8445110	TRAFFIC CONTROL
		Refer to Traffic Control Plan and additional information on J Sheets.
		This item includes providing detour routes and furnishing, erecting, maintaining and removing all detour signs.
145	2528-8445113	FLAGGERS
146	2533-4980005	MOBILIZATION
147	2552-0000140	ROCK EXCAVATION
148	2552-0000230	SPECIAL PIPE EMBEDMENT OR ENCASEMENT
		Encase 8” sanitary sewer. Refer to Sheet V.54 for details.
149	2552-0000300	TRENCH COMPACTION TESTING
		Includes testing of trench backfill material for water main, storm sewer, sanitary sewer, electrical conduits,
		and fiber conduit.
150	2554-0112006	WATER MAIN, TRENCHED, DIP, 6 IN.
151	2554-0112008	WATER MAIN, TRENCHED, DIP, 8 IN.
152	2554-0112012	WATER MAIN, TRENCHED, DIP, 12 IN.
153	2554-0112016	WATER MAIN, TRENCHED, DIP, 16 IN.
154	2554-0132008	WATER MAIN WITH CASING PIPE, TRENCHED, DIP, 8 IN.
155	2554-0132012	WATER MAIN WITH CASING PIPE, TRENCHED, DIP, 12 IN.
156	2554-0132016	WATER MAIN WITH CASING PIPE, TRENCHED, DIP, 16 IN.
		See Special Provision for Water Mains and Appurtenances. Temporary bypassing is incidental to bid item.
157	2554-0202200	FITTINGS BY COUNT, DUCTILE IRON
		See Special Provision for Water Mains and Appurtenances. Includes (1) 12" Cap.
158	2554-0202400	FITTINGS BY COUNT, POLYVINYL CHLORIDE (PVC)
159	2554-0204000	WATER SERVICE STUB, PVC, 4 IN.
160	2554-0204000	WATER SERVICE STUB, PVC, 6 IN.
161	2554-0204000	WATER SERVICE STUB, PVC, 8 IN.
162	2554-0204120	WATER SERVICE STUB, COPPER, 2 IN.
163	2554-0206000	BUTTERFLY VALVE, DIP, 16 IN.
164	2554-0207000	GATE VALVE, DIP, 2 IN.
165	2554-0207004	GATE VALVE, DIP, 4 IN.
166	2554-0207006	GATE VALVE, DIP, 6 IN.
167	2554-0207008	GATE VALVE, DIP, 8 IN.
168	2554-0207012	GATE VALVE, DIP, 12 IN.
169	2554-0210201	FIRE HYDRANT ASSEMBLY, WM-201
170	2554-0212020	VALVE BOX EXTENSION
171	2554-0212030	VALVE BOX REPLACEMENT
172	2554-0214000	FIRE HYDRANT ADJUSTMENT
		See Special Provision for Water Mains and Appurtenances.
173	2599-9999001	NATIVE TURF SEED MIX
		See Sheet K.1 for Method of Measurement and Basis of Payment information.
174	2599-9999003	STONE BACKFILL
		Refer to V Sheets and Special Provisions for MSE Wall Stone Backfill details.
		Includes quantities along walls and bridge abutments.
175	2599-9999005	ROADWAY LIGHTING POLES
176	2599-9999005	TRAIL/SIDEWALK LIGHTING POLES
177	2599-9999005	BRIDGE MOUNTED LIGHTING POLES
178	2599-9999005	LUMINAIRE ON TRAFFIC SIGNAL STRUCTURE
		See Sheet P.1 for Method of Measurement and Basis of Payment information.
179	2599-9999005	DECORATIVE BENCH
		See Sheet K.1 for Method of Measurement and Basis of Payment information.
180	2599-9999005	IN-LINE ELASTOMERIC CHECK VALVE

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Item No.	Item Code	Description
		Furnish and install slip-in style check valve. Construction shall be all rubber and of the flow operated check
		type with slip-in cuff connection. Secure with stainless steel hardware in accordance with manufacturer's
		recommended installation. Includes (1) 15" and (1) 21". Refer to Sheet M.19 and M.31 for locations.
		Method of Measurement: Measurement will be for each item installed.
		Basis of Payment: Payment will be the contract unit price for each item installed per plan. Payment is full
		compensation for all labor, equipment and materials to install the check valve in accordance with
		manufacturer's recommendations.
181	2599-9999005	COMBINATION AIR VALVE ASSEMBLY, 1 IN.
182	2599-9999005	COMBINATION AIR VALVE VAULT
183	2599-9999005	CONNECTION TO EXISTING
184	2599-9999005	REMOVE EXISTING HYDRANTS
185	2599-9999005	FLEXIBLE EXPANSION JOINT, 12 IN.
		See Special Provision for Water Mains and Appurtenances and Special Provision for Pre-Insulated Water Mains
		and Appurtenances.
186	2599-9999005	MANHOLE, SANITARY SEWER, SW-301 MODIFIED, 48 IN.
187	2599-9999005	MANHOLE, SANITARY SEWER, SW-301 MODIFIED, 72 IN.
188	2599-9999005	MANHOLE, SANITARY SEWER, SW-301 MODIFIED, 84 IN.
189	2599-9999005	MANHOLE, SANITARY SEWER, SW-303 MODIFIED, 48 IN.
190	2599-9999005	MANHOLE, SANITARY SEWER, SW-303 MODIFIED, 72 IN.
191	2599-9999005	MANHOLE, SANITARY SEWER, SW-303 MODIFIED, 144 IN.
		See Standard Specification 2435.
		Construction of some manholes in two stages due to project phasing shall be incidental to bid item.
		Provide castings with City of Iowa City covers as shown on Sheet B.15 unless otherwise noted in the plans.
		Class III, Class IVA, and Class IVB are not acceptable backfill materials.
		Refer to Tab 104-5B in the U Sheets.
		Method of Measurement and Basis of Payment shall be noted in Standard Specification Section 2435.04 and 2435.05
		for Manhole.
192	2599-9999005	HANDHOLE, 30 IN. X 48 IN.
193	2599-9999005	HANDHOLE, 48 IN. X 48 IN. X 51 IN.
194	2599-9999009	CONDUIT, HDPE, 2 IN.
195	2599-9999009	CONDUIT, HDPE, 4 IN.
		See Special Provision for Telecommunications Outside Plant and Materials.
		Five percent has been added to lengths for HDPE Conduit, Pull Tape, and Tracer Wire to account for necessary
		field adjustments in routing and connections to existing facilities.
196	2599-9999009	CONDUIT ON BRIDGE, GALVANIZED RIGID STEEL, 2 IN.
197	2599-9999009	CONDUIT ON BRIDGE, GALVANIZED RIGID STEEL, 4 IN.
		See Iowa DOT Standard Specification 2523 for conduit material specifications.
		See bridge plans (V Sheets) for additional details.
		Method of Measurement: Measurement will be linear feet from end to end.
		Basis of Payment: Payment will be at the contract price per linear foot. Payment is full compensation for
		labor, equipment and materials for installation.
198	2599-9999009	PULL TAPE FOR CONDUIT
199	2599-9999009	TRACER WIRE FOR HDPE CONDUIT
		See Special Provision for Telecommunications Outside Plant and Materials.
		Five percent has been added to lengths for HDPE Conduit, Pull Tape, and Tracer Wire to account for necessary
		field adjustments in routing and connections to existing facilities.
200	2599-9999009	WATER MAIN, PREINSULATED, DIP, 8 IN.
201	2599-9999009	WATER MAIN, PREINSULATED, DIP, 16 IN.
202	2599-9999009	WATER MAIN ON BRIDGE, PREINSULATED, DIP, 12 IN.
		See Special Provision for Pre-Insulated Water Mains and Appurtenances.
203	2599-9999009	FILL EXISTING WATER PIPE
204	2599-9999009	REMOVE EXISTING WATER PIPE
		See Special Provision for Water Mains and Appurtenances.
205	2599-9999009	PEDESTRIAN RAILING WITH CURB
		Refer to V Sheets for additional details.
		Method of Measurement: Measurement will be linear feet from end to end.
		Basis of Payment: Payment will be at the contract price per linear foot. Payment is full compensation for
		labor, equipment and materials to install the railing.
206	2599-9999010	CATHODIC PROTECTION
		See Special Provision for Cathodic Protection.
207	2599-9999010	SEAT WALL
		Refer to V Sheets for additional details.
		Method of Measurement: Measurement of lump sum includes completed seat wall per plan.
		Basis of Payment: Payment will be at the contract unit price of lump sum for completed work per plan.
		Payment is full compensation for labor, equipment and materials to install cast-in-place concrete seat wall.
208	2599-9999010	INTERMEDIATE FOUNDATION IMPROVMENTS
209	2599-9999010	INTERMEDIATE FOUNDATION IMPROVMENTS VERIFICATION AND TESTING
		Refer to V Sheets and Special Provisions for Intermediate Foundation Improvements.
210	2599-9999010	AESTHETIC LIGHTING
		See Special Provision for Aesthetic Lighting.
211	2599-9999014	TEMPORARY MECHANICALLY STABILIZED EARTH RETAINING WALL

ESTIMATE REFERENCE INFORMATION

Item No.	Item Code	Description
		Refer to V Sheets for additional details.
		Include 9790 SF for Temporary Wall S2 and 1128 SF for Temporary Wall S4.
		The temporary walls are to be left in place.
		Method of Measurement: Measurement will be in square feet.
		Basis of Payment: Payment will be the contract unit price of square feet. Payment is full compensation for
		all labor, equipment and materials to install the temporary retaining wall.
212	2599-9999018	MOMENT SLAB
		Refer to V Sheets for additional details.
		Method of Measurement: Measurement will be in square yards.
		Basis of Payment: Payment will be at the contract unit price of square yards.
		Payment is full compensation for labor, equipment and materials to install the moment slab.
213	2599-9999018	COLORED/STAMPED SIDEWALK, PCC, 6 IN.
		Refer to Tab 113-1 in the C Sheets.
		Iowa City will provide stamping pattern. Color to be Dark Gray as approved by Iowa City.
		Includes certified plant inspection in accordance with Section 2521 of the Standard Specifications.
		Method of Measurement and Basis of Payment shall be noted in Standard Specification Section 2511.04 and 2511.05
		for Sidewalk or Recreational Trail.
214	2601-2633100	MOWING
215	2601-2634450	COMPOST
216	2601-2636015	NATIVE GRASS SEEDING
217	2601-2636018	WETLAND GRASS SEEDING
218	2601-2636044	SEEDING AND FERTILIZING (URBAN)
219	2601-2639010	SODDING
220	2601-2640350	SPECIAL DITCH CONTROL, WOOD EXCELSIOR MAT
221	2601-2642120	STABILIZING CROP - SEEDING AND FERTILIZING (URBAN)
		Refer to K Sheets for additional details.
222	2602-0000020	SILT FENCE
223	2602-0000071	REMOVAL OF SILT FENCE OR SILT FENCE FOR DITCH CHECKS
224	2602-0000101	MAINTENANCE OF SILT FENCE OR SILT FENCE FOR DITCH CHECK
225	2602-0000306	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 6 IN. DIA.
226	2602-0000309	PERIMETER AND SLOPE SEDIMENT CONTROL DEVICE, 9 IN. DIA.
		Refer to Tab 100-19 in the C Sheets for details and locations.
227	2602-0010010	MOBILIZATION, EROSION CONTROL
228	2610-0000600	TILLAGE
229	2610-0000180	FLOWERS, AS PER PLAN
230	2611-0000100	SHRUBS, FURNISHED AND INSTALLED (WITH WARRANTY)
231	2611-0000200	TREES, FURNISHED AND INSTALLED (WITH WARRANTY)
232	2612-0000500	ROADSIDE SPRAYING
233	2612-0000520	ROADSIDE SPRAY FOR WEED CONTROL
		Refer to K Sheets for additional details.
		Deer protection is the Contractor's responsibility.

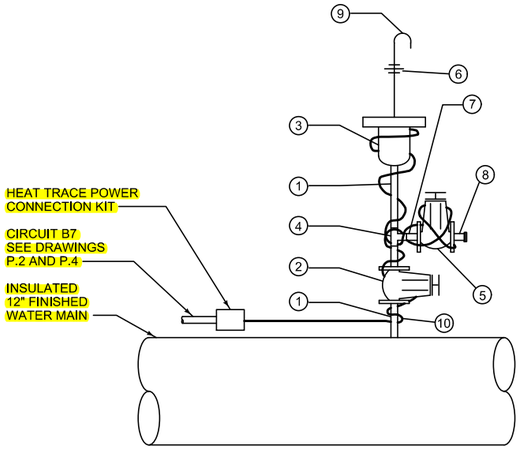
ENGLISH STANDARD CULVERT PLANS

STANDARD	ISSUED	REVISED
PRCB G1-13	1-13	1-13
PRCB G2-13	1-13	1-13
PRCB 6-13	1-13	1-13
PRCB 8-13	1-13	1-13
PRCB 10-13	1-13	1-13
PES 1-13-T1	1-13	5-13
PES 1-13-T3	1-13	5-13
PES 2-13-T3	1-13	5-13
PES 3-13-T3	1-13	1-13
PEP 1-13	1-13	10-14
RCB G1-12	4-12	10-12
RCB G2-12	4-12	7-14
RCB 10-4-12	4-12	4-12
PWH 0-1-12	4-12	4-12
PWH 0-2-12	4-12	4-12
PWH 0-3-12	4-12	4-12
PWH 0-4-12	4-12	4-12
PWH 0-6-12	4-12	4-12

STANDARD ROAD PLANS

The following Standard Road Plans apply to construction work on this project.

Number	Date	Title
BA-104	04-20-10	34" Concrete Barrier for use with Reinforced Paved Shoulder
BA-108	04-19-11	Concrete Barrier Tapered End Section
BA-401	04-16-13	Temporary Barrier Rail (Precast Concrete)
DR-101	04-19-16	Pipe Culvert (Bedding and Backfill)
DR-103	04-21-15	Pipe Culvert (Installation Details)
DR-104	04-19-16	Depth of Cover Tables for Concrete and Corrugated Pipe
DR-111	04-21-15	Box Culvert (Backfill)
DR-121	10-20-15	Connected Pipe Joints
DR-122	04-21-15	Construction of Type "C" Concrete Adaptors for Pipe Culvert Connections
DR-201	04-21-15	Concrete Aprons
DR-213	04-21-15	Pipe Apron Guard
DR-303	10-20-15	Subdrains (Longitudinal)
DR-304	04-21-15	Outlets for Longitudinal, Transverse and Backslope Subdrains
DR-305	04-21-15	Subdrain Outlets (Standard Subdrain, Pressure Release and Special)
DR-601	10-20-15	Reinforced Concrete Pipe Culvert
EC-101	04-19-16	Wood Excelsior Mat for Ditch Protection
EC-103	04-21-15	Wood Excelsior Mat for Slope Protection
EC-201	04-21-15	Silt Fence
EC-204	04-19-16	Perimeter and Slope Sediment Control Devices
EC-501	04-21-15	Trees and Shrubs
EW-101	10-20-15	Embankment and Rebuilding Embankments
EW-102	10-20-15	Allowable Placement of Unsuitable Soil in Embankments
EW-103	10-20-15	Embankment Subgrade Treatment, Moisture Density Control and Special Compaction
EW-212	10-20-15	Settlement Plate
EW-503	10-20-15	Side Road Grading
LI-101	10-21-14	Light Pole Location
LI-103	10-21-14	Conduit and Precast Handholes
LI-104	10-21-14	Junction box (cast Iron)
LI-130	10-21-14	Temporary Floodlighting Luminaires
LI-141	10-21-14	Electrical Installation (Roadway Ducts)
LI-142	04-21-15	Electrical Installation (Bases)
LI-151	10-21-14	Control Cabinet (Pole-Mounted)
LI-152	10-21-14	Control Cabinet (Pad-Mounted)
LI-201	04-19-16	Light Pole Foundation
LI-210	10-21-14	Transformer Base (Cast Aluminum)
LI-211	10-20-15	Slip-Base for Light Poles
MI-210	10-20-15	PCC Driveways and Alleys
MI-220	10-20-15	Detectable Warnings and Pedestrian Ramp
MI-221	10-20-15	Combined Retaining Wall - Sidewalk
PM-110	04-16-13	Line Types
PM-111	04-21-15	Symbols and Legends
PV-101	04-19-16	Joints
PV-102	04-15-14	PCC Curb Details
PV-103	04-19-11	Manhole Boxouts in PCC Pavement
PV-104	04-19-11	Ramped Median Nose
SI-881	10-15-13	Special Signs for Workzones
SI-882	04-20-10	Special Signs for Restricted Width Traffic Control Zones
SW-101	04-21-09	Trench Bedding and Backfill Zones
SW-102	10-20-15	Rigid Gravity Pipe Trench Bedding
SW-103	10-20-15	Flexible Gravity Pipe Trench Bedding
SW-104	04-21-09	Pressure Pipe Trench Bedding
SW-201	04-21-09	Sanitary Sewer Service Stub
SW-211	10-16-12	Special Pipe Connections for Storm Sewer
SW-301	Modified	Circular Sanitary Sewer Manhole
SW-303	Modified	Sanitary Sewer Manhole over Existing Sewer
SW-306	04-21-15	Chimney Seals for Sanitary Sewer Manholes
SW-307	04-21-09	Drop Connection for Sanitary Sewer
SW-401	04-21-09	Circular Storm Sewer Manhole
SW-402	04-21-09	Rectangular Storm Sewer Manhole
SW-404	04-17-12	Rectangular Base/Circular Top Storm Sewer Manhole
SW-501	10-16-12	Single Grate Intake
SW-505	10-16-12	Double Grate Intake
SW-507	10-21-14	Single Open-Throat Intake, Small Box
SW-509	10-21-14	Double Open-Throat Curb Intake, Small Box
SW-511	04-21-09	Rectangular Area Intake
SW-512	10-21-14	Circular Area Intake
SW-513	04-21-09	Open-Sided Area Intake
SW-514	04-21-09	Boxouts for Grate Intakes
SW-541	10-16-12	Open-Throat Curb Intake under Pavement
SW-545	10-18-11	Single Open-Throat Curb Intake with Extended Opening
SW-601	Modified	Castings for Sanitary Sewer Manholes
SW-602	Modified	Castings for Storm Sewer Manholes
SW-603	10-15-13	Castings for Grate Intakes
SW-604	10-20-09	Castings for Area Intakes
TC-1	04-16-13	Work Not Affecting Traffic (Two-Lane or Multi-Lane)
TC-61	04-21-15	Two-Lane, Two-way Operation
TC-252	04-19-16	Routes Closed to Traffic
TC-423	04-15-14	Closure of Two Adjacent Lanes on Undivided Highway
TC-433	10-21-14	Pavement Marking Operations
TC-601	10-18-11	Pedestrian Detour
TC-602	10-18-11	Sidewalk Diversion
WM-101	04-21-09	Thrust Blocks



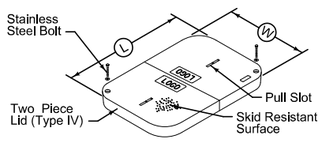
1	1" BRONZE NIPPLE
2	1" GATE VALVE
3	COMBINATION AIR VALVE
4	1" X 1/2" REDUCING BRONZE TEE
5	1/2" GLOBE VALVE
6	1" GALV UNION
7	1/2" BRONZE NIPPLE
8	1/2" THREADED PLUG-BRONZE
9	1" GALV STEEL VENT PIPE
10	HEAT TRACE

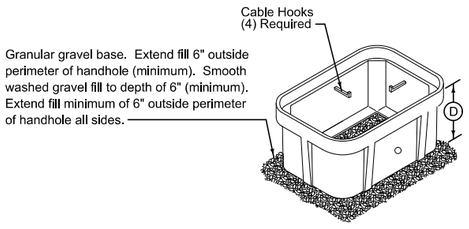
WATER MAIN COMBINATION AIR VALVE ASSEMBLY DETAIL

NO SCALE

NOTES:
1. HEAT TRACE AND INSULATE COMBINATION AIR VALVE ASSEMBLY INCLUDING SMALL DIAMETER PIPING AND VALVES.
2. USE RAYCHEM #5 BTV, OR EQUAL WITH POWER CONNECTION KIT AND CAPILLARY BULB THERMOSTAT CONTROL SET AT 45°F. CABLE TO BE PLACED UNDER INSULATION AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. PROVIDE 20A, 2-POLE, 30mA BREAKER AT SOURCE PANEL.
3. COORDINATE DIMENSIONS OF AIR VALVE ASSEMBLY WITH CLEARANCE UNDER BRIDGE.

HANDHOLE DIMENSIONS TABLE (NOMINAL)			
TYPE	(L)	(W)	(D)
IV	48"	30"	36"

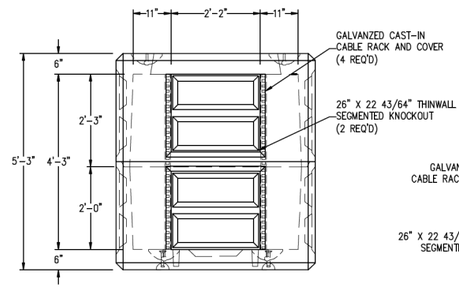




NOTES:
1. Install new grounding busbar. support from handhole wall with bolt, nut, flat washers and lock washer. All fastening hardware shall be stainless steel. Mount on long wall and centered between walls.
2. Extend HDPE ducts into handhole 8" to 12". Extend ducts through existing openings where available. Enlarge openings as necessary. Saw-cut new openings where necessary. Do not oversize openings. Route ducts into handhole through open bottom if necessary. Typical for all ducts entering handhole.
3. Install geotextile woven fabric. Extend geotextile 12" (minimum) outside perimeter of handhole.

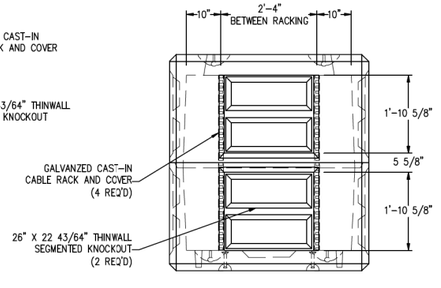
HANDHOLE DETAIL (30"x48")

NO SCALE



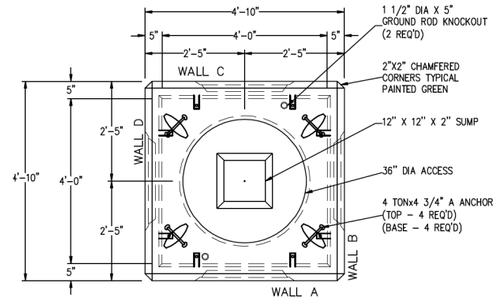
WALL A, C

SCALE: 3/8" = 1'-0"



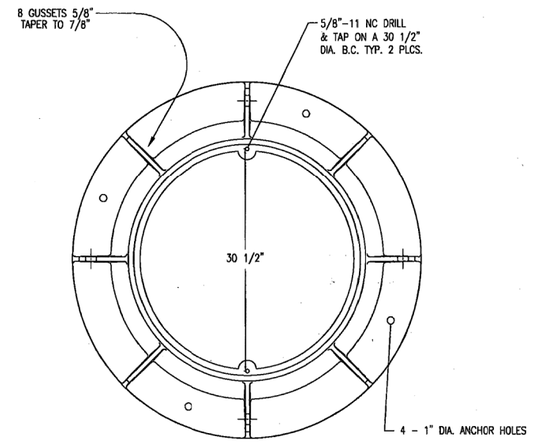
WALL B, D

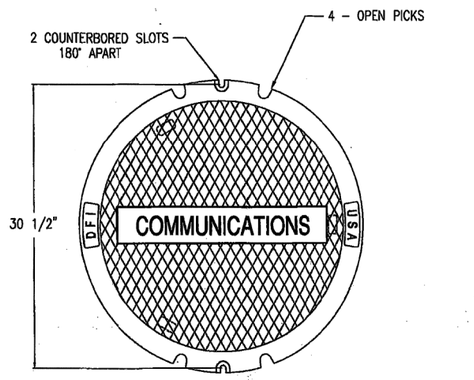
SCALE: 3/8" = 1'-0"

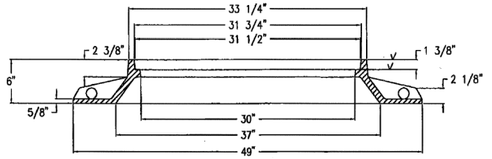


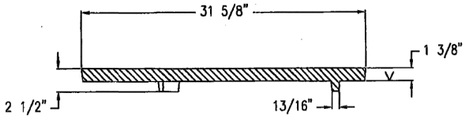
PLAN VIEW

SCALE: 3/8" = 1'-0"









HANDHOLE DETAIL (48"x48"x51", WITH COVER)

NO SCALE

ENGLISH	IOWA DOT	DESIGN TEAM HNTB\Stanley Consultants, Inc.	JOHNSON COUNTY	PROJECT NUMBER HDP-3715(652)--71-52	SHEET NUMBER U.71

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GENERAL NOTES CONTINUED:

THE TOP OF THE TIE GIRDER, CAST-IN-PLACE FLOORBEAMS AND PRECAST FLOORBEAMS SHALL HAVE A $\frac{1}{4}$" AMPLITUDE RAKED FINISH IN THE WET CONCRETE. INTENTIONALLY ROUGHEN SLAB CONCRETE UNDER THE CONCRETE BARRIER RAILING AND THE 6" CURB.

ALL CONCRETE CONSTRUCTION JOINTS SHALL BE KEYED AS SHOWN IN THE TYPICAL CONSTRUCTION JOINT DETAIL. ALL SURFACES OF THE JOINT SHALL BE COATED WITH AN APPROVED BONDING AGENT. THIS INCLUDES THE JOINTS IN THE CAST-IN-PLACE CONCRETE AND THE JOINT BETWEEN THE PRECAST FLOORBEAM AND THE CAST-IN-PLACE TIE GIRDER.

A $\frac{3}{4}$" X $\frac{3}{4}$" FILLET SHALL BE ADDED TO ALL EXPOSED CORNERS OF PRECAST OR CAST-IN-PLACE CONCRETE MEMBERS MEASURING 90 DEGREES OR LESS.

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

THE COMPOSITE TIE GIRDER IS DESIGNED TO SATISFY SEVERE CORROSION STRESS REQUIREMENTS IN THE DECK OF 0.0948 SQRT(f'c).

LONG TERM LOSSES HAVE BEEN CALCULATED IN ACCORDANCE TO CEB-FIP MODEL CODE 1990 FOR A RELATIVE HUMIDITY OF 70%.

THE PRECAST FLOORBEAMS SHALL BE AGED 90 DAYS PRIOR TO BEING MADE CONTINUOUS WITH THE TIE GIRDER.

THE PLANS SHOW THE CENTERLINE OF THE TENDON FOR VERTICAL GEOMETRY CONTROL AND CENTERLINE OF DUCT FOR HORIZONTAL GEOMETRY CONTROL UNLESS NOTED OTHERWISE. THE DUCT SIZE AND LOCATION SHALL BE INDICATED ON THE SHOP DRAWINGS. DUCT LOCATIONS SHOWN ON THE SHOP DRAWINGS SHALL BE SUCH THAT THE FINAL CENTERLINE OF TENDON LOCATION MATCHES THAT SHOWN IN THE PLANS. THE CONTRACTOR SHALL INSTALL DUCTS AT THE LOCATIONS SHOWN IN THE SHOP DRAWINGS.

THE ENTIRE SLAB POURING SEQUENCING AND POST-TENSIONING OF TENDONS U1 THROUGH U8 SHOULD OCCUR WHEN TEMPERATURES ARE ABOVE 40 DEGREES F AND RISING.

AT THE CONTRACTOR'S OPTION, MECHANICAL SPLICES (MECHANICAL COUPLERS) FOR REINFORCING BARS CAN BE USED WITH WRITTEN APPROVAL FROM THE ENGINEER AND SHALL MEET THE REQUIREMENTS OF I.M. 451. THE CONTRACTOR SHALL PROVIDE DETAILED DRAWINGS INDICATING AASHTO BAR CLEARANCES AND SPACING REQUIREMENTS ARE MET. THE COST OF CONTRACTOR PROPOSED MECHANICAL SPLICES IS TO BE INCLUDED WITH THE PRICE BID FOR "REINFORCING STEEL", AND NO SEPARATE PAYMENT WILL BE MADE.

IN THE EVENT MILD REINFORCING STEEL IS IN CONFLICT WITH THE POST-TENSIONING DUCT, THE POST-TENSIONING DUCT LOCATION SHALL TAKE PRECENDENCE OVER THE MILD STEEL. WRITTEN APPROVAL FROM THE ENGINEER WILL BE REQUIRED FOR MILD STEEL ADJUSTMENTS EXCEEDING $\pm\frac{1}{2}$" FROM PLAN DIMENSIONS.

MILD REINFORCING STEEL SHALL BE ASTM A615 GRADE 60 UNLESS OTHERWISE NOTED. GRADE 75 AND STAINLESS STEEL REINFORCING ARE USED IN THIS PLAN SET AND ARE INDICATED ON THE PLANS.

COORDINATE THE EAST ABUTMENT BACKWALL CONSTRUCTION WITH THE MAINTENANCE OF TRAFFIC PHASING.

SIDEWALK AND MULTI-USE PATH ARE USED TO DENOTE THE WALKING SURFACE ON THE NORTH AND SOUTH OF THE BRIDGE.

GALVANIZING SHALL BE REPAIRED IN ACCORDANCE WITH MATERIAL I.M. 410.

PROVIDE VENT HOLES FOR GALVANIZING. SHOW LOCATION AND SIZE OF VENT HOLES ON SHOP DRAWINGS.

GROOVING OF THE BRIDGE DECK IS NOT REQUIRED.

CONSTRUCTION JOINTS WILL BE PERMITTED AT LOCATIONS SHOWN IN THE PLANS. ADDITIONAL CONSTRUCTION JOINTS OR ALTERATIONS TO THESE SHOWN WILL REQUIRE WRITTEN APPROVAL OF THE ENGINEER.

THE STRUCTURAL CONCRETE COATING SHALL BE TEX-COTE "XL 70 "W" BRIDGE COTE" OR APPROVED EQUAL WITH FEDERAL STANDARD 595C COLOR NUMBER 36622, WARM GREY. THE STRUCTURAL CONCRETE COATING SHALL BE APPLIED TO THE FOLLOWING SURFACES, THE TOP, FRONT FACE AND BACK OF THE CONCRETE BARRIER RAILING, ALL 4 SIDES OF THE KNUCKLES, ARCH RIBS AND COLUMNS, THE TOP AND VERTICAL FACE OF THE PEDESTRIAN CURB, THE EXTERIOR FACE AND BOTTOM OF THE TIE GIRDER, THE SLAB FASCIA AND ALL SIDES OF THE EXTERIOR FLOORBEAMS. A COLOR SAMPLE SHALL BE SUBMITTED AND APPROVED BY THE ENGINEER PRIOR TO APPLYING THE CONCRETE COATING. PREPARE SURFACES AND APPLY COATING IN ACCORDANCE WITH THE DEVELOPMENTAL SPECIFICATION FOR STRUCTURAL CONCRETE COATING (DS-15035).

UTILITIES EXPOSED ON THE OUTSIDE FACE OF THE STRUCTURE MAY BE REQUIRED TO BE PAINTED A SIMILAR COLOR AS APPROVED FOR THE CONCRETE COATING. ITEMS TO BE FIELD PAINTED WILL BE AT THE DIRECTION OF THE ENGINEER AND WILL BE INCLUDED WITH THE COSTS TO INSTALL UTILITY SCREEN.

SEE SPECIAL PROVISIONS FOR ASBESTOS MATERIAL TO BE REMOVED AS PART OF THIS CONTRACT.

AS DISCUSSED IN THE GEOTECHNICAL REPORT, AT LEAST TWO OLD BRIDGES WERE LOCATED ALONG THE ALIGNMENT OF THE PROPOSED BRIDGE. BURIED REMNANTS OF THESE BRIDGES AND DEBRIS ASSOCIATED WITH CONSTRUCTION OF THE EXISTING BRIDGES MAY BE PRESENT. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING OR BYPASSING OBSTRUCTIONS THAT IMPEDE CONSTRUCTION OF TEMPORARY AND PERMANENT WORKS.

CONCRETE FILLED STEEL CASINGS ASSOCIATED WITH AN OLD BRIDGE WERE ENCOUNTERED DURING SITE EXPLORATIONS AND ARE SHOWN IN PLAN ON THE BRIDGE SITUATION PLAN AND SHEET V.31 OF RETAINING WALL #12. CONTRACTOR SHALL REMOVE THE CASING LOCATED IN THE RIVER TO 2 FEET BELOW MUDLINE AND SHALL BE CONSIDERED INCIDENTAL TO THE BID ITEM "STRUCTURAL CONCRETE 4500 PSI OR GREATER". ADDITIONAL REMOVAL OF THIS REMNANT AND ANY SIMILAR REMNANTS DISCOVERED IN THE RIVER DURING CONSTRUCTION SHALL BE REMOVED AT THE DIRECTION OF THE ENGINEER. REMOVAL OF OLD CASING(S) IN THE RIVER AND ANY BURIED REMNANTS THAT OBSTRUCT CONSTRUCTION WILL BE CONSIDERED EXTRA WORK. A CHANGE ORDER WILL BE ISSUED AND AGREED UPON BETWEEN THE OWNER AND THE CONTRACTOR PRIOR TO REMOVAL.

DESIGN HISTORY AT THIS SITE

JOB NO.	TYPE OF WORK
-	TWO SPAN TRUSS
-	THREE SPAN TRUSS
I.M.I. - 13.S-20.59	SIX SPAN PRESTRESSED CONCRETE BEAM BRIDGE

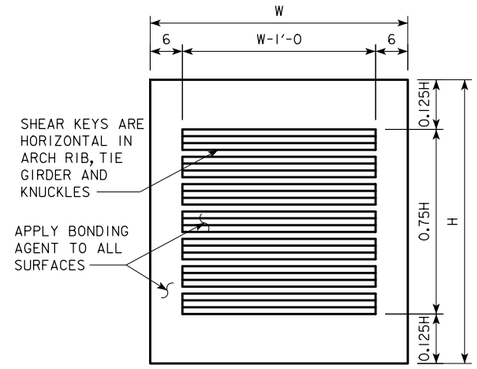
WATER MAIN, ASSOCIATED HARDWARE AND BRACKETS ARE SHOWN IN THE BRIDGE PLANS BUT INCLUDED IN THE ROADWAY BID ITEM "WATER MAIN ON BRIDGE PRE-INSULATED, DIP, 12 INCH".

UTILITY CONDUITS ON THE SOUTH CANTILEVER OF THE BRIDGE ARE SHOWN IN THE BRIDGE PLANS BUT INCLUDED IN THE ROADWAY BID ITEMS.

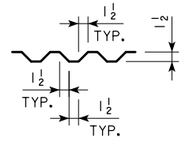
ELECTRICAL CONDUITS FOR LIGHT POLES AND AESTHETIC LIGHTING ARE EMBEDDED IN THE BRIDGE RAILINGS AND PEDESTRIAN CURB. SEE ELECTRICAL PLANS FOR SIZE, LOCATION AND BID ITEM.

ABBREVIATIONS:

U.N.O.:	UNLESS NOTED OTHERWISE	DIA.:	DIAMETER
P.T.:	POST-TENSIONING	RAD.:	RADIUS
B.F.:	BACK FACE	R.:	RADIUS
E.F.:	EACH FACE	DTI:	DIRECT TENSION INDICATOR
F.F.:	FRONT FACE	PC:	PIECE
ABT.:	ABOUT		
ABUT.:	ABUTMENT		
W.P.:	WORK POINT		
BRG.:	BEARING		
CL.:	CLEAR		
EQ.:	EQUAL		
SPA.:	SPACE		
TYP.:	TYPICAL		



SHEAR KEY LIMITS



SHEAR KEY DETAIL

TYPICAL CONSTRUCTION JOINT DETAIL

HANGER REPLACEMENT SEQUENCE

(FOR INFORMATION ONLY):

TO FACILITATE FUTURE MAINTENANCE ACTIONS:

1. NEW HANGERS AND MATERIALS SHALL CONFORM TO THE DETAILS SHOWN ON THE PLANS.
2. RESTRICT ALL TRAFFIC TO THE TWO LANES ON OPPOSITE SIDE OF BRIDGE FROM THE HANGER BEING REPLACED. TRAFFIC CONTROL WILL BE REQUIRED.
3. ONLY ONE SINGLE STRAND PER HANGER (2 STRANDS PER HANGER LOCATION) SHALL BE REPLACED AT A TIME. AT THE TIE GIRDER CONNECTION, DETENSION ONE STRAND PER MANUFACTURER'S RECOMMENDATIONS. ONE STRAND REMAINS IN PLACE TO CARRY THE ADDITIONAL LOAD.
4. REMOVE THE STRAND FROM THE ARCH RIB.
5. CLEAN, LUBRICATE AND INSPECT THE TIE GIRDER AND ARCH RIB ANCHORAGE DEVICES.
6. MAKE REPAIRS AS NEEDED.
7. PLACE THE NEW STRAND AT THE ARCH RIB.
8. TENSION THE HANGER PER THE MANUFACTURER'S RECOMMENDATIONS.
9. TIGHTEN ANCHORAGES AS NEEDED.

DESIGN FOR 0° SKEW

443'-6 x 97'-0 PARTIAL THRU ARCH BRIDGE

96'-9 END SPANS 250'-0 CENTER SPAN

GENERAL NOTES

STA. 353+07.39 DEC 2015

JOHNSON COUNTY

CITY OF IOWA CITY

DESIGN SHEET NO. 4 OF 101 FILE NO. _____ DESIGN NO. _____

DESIGN TEAM HNTB | JOHNSON COUNTY | PROJECT NUMBER HDP-3715(652)--71-52 | SHEET NUMBER V.58

4/7/2016 3:44:06 PM tthompson pw:\\hntbw356.hntb.org:PWCentralDiv\Documents\Kansas City Projects\50670_DubuqueStParkRdBridge\Bridges\Plans\Drawings\52380652-1.brg 52380652s003

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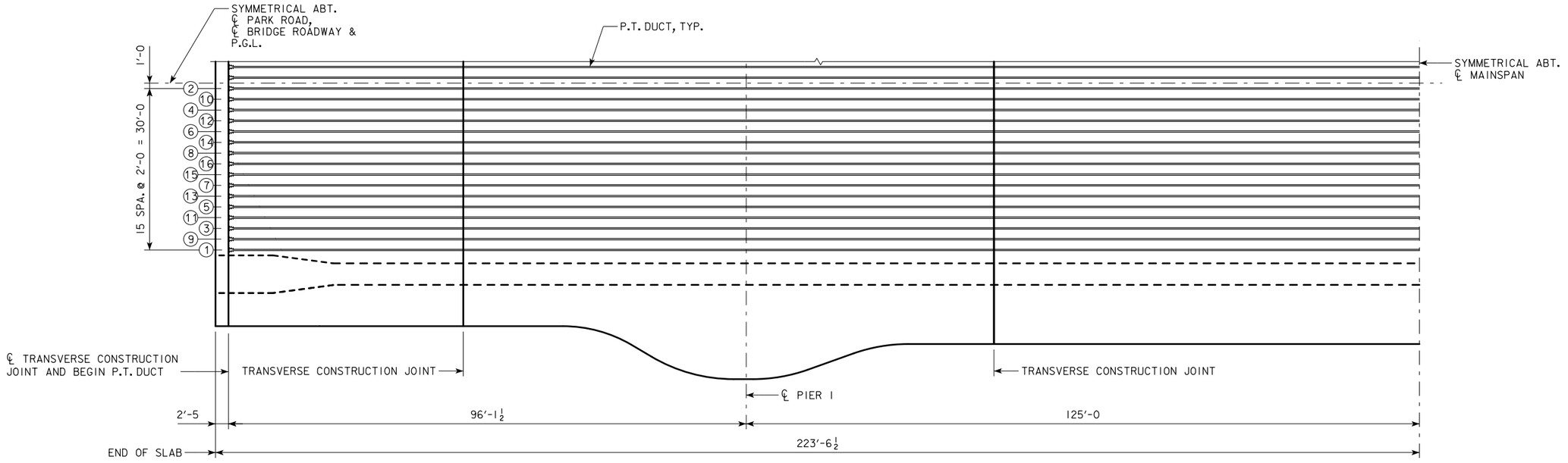


ⓝ DENOTES TENDON STRESSING SEQUENCE

DECK POST-TENSIONING PARTIAL PLAN

BRIDGE DECK POST-TENSIONING SEQUENCE:

ALL TENDONS:

STEP 1: SLAB POST-TENSIONING SHALL NOT OCCUR PRIOR TO STEPS 1 THRU 8 IN STAGE 6 OF THE SUGGESTED ERECTION SEQUENCE. AFTER THE SLAB CONCRETE HAS REACHED THE MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI, ALL POST-TENSIONING TENDONS SHALL BE STRESSED FROM BOTH ENDS TO 166 KIPS/TENDON IN THE ORDER INDICATED ON THIS PLAN SHEET. THE STRESSING SEQUENCE IS SYMMETRIC ABOUT ℄ BRIDGE ROADWAY AND P.G.L.

STEP 2: AFTER POST-TENSIONING IS COMPLETE, THE CONTRACTOR SHALL VERIFY THAT ALL TENDONS HAVE ACHIEVED A TOTAL EFFECTIVE STRESS OF 177 KSI.

BRIDGE DECK POST-TENSIONING NOTES:

POST-TENSIONING DUCTS SHALL BE PLACED AT MID-DEPTH OF THE SLAB THROUGHOUT THE LENGTH OF THE DUCT. THE LOCATION OF THE DUCTS TRANSVERSE TO THE BRIDGE MAY BE ADJUSTED TO AVOID FLOORBEAM REINFORCING AS LONG AS 2 FT MAXIMUM SPACING AND LONGITUDINAL STRAIGHTNESS ARE MAINTAINED.

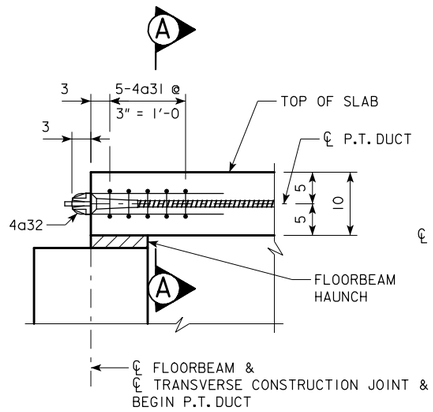
EACH OF THE DECK POST-TENSIONING TENDONS SHALL CONSIST OF 4x0.6Φ ASTM A416, SEVEN-WIRE, LOW RELAXATION PRESTRESSING STRANDS.

THE DUCTS FOR ALL TENDONS SHALL BE GROUTED AFTER POST-TENSIONING IS COMPLETE WITH NON-SHRINK GROUT. VENT AND GROUT TUBES SHALL BE PROVIDED AS REQUIRED TO ACHIEVE ADEQUATE GROUT DISTRIBUTION THROUGHOUT THE LENGTH OF EACH DUCT.

THE TOTAL EFFECTIVE STRESS OF 177 KSI DOES NOT INCLUDED LOSSES DUE TO CREEP AND SHRINKAGE OF THE CONCRETE OR RELAXATION OF THE PRESTRESSING STEEL.

THE POST-TENSIONING DETAILS ARE PROVIDED FOR ESTIMATING PURPOSES ONLY. FOR SLAB POST-TENSIONING QUANTITIES, SEE DESIGN SHEET 1.

THE CONTRACTOR SHALL SUBMIT DETAILS OF THE PROPOSED POST-TENSIONING SYSTEM FOR APPROVAL BY THE ENGINEER.



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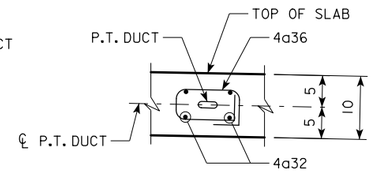

SECTION A-A

NOTE:
FOR THE SUGGESTED ERECTION SEQUENCE, SEE DESIGN SHEET 100 AND 101.

DESIGN FOR 0° SKEW

443'-6 x 97'-0 PARTIAL THRU ARCH BRIDGE

96'-9 END SPANS 250'-0 CENTER SPAN

SUPERSTRUCTURE DETAILS

STA. 353+07.39 DEC 2015

JOHNSON COUNTY

CITY OF IOWA CITY

DESIGN SHEET NO. 74 OF 101 FILE NO. _____ DESIGN NO. _____

DESIGN TEAM HNTB | JOHNSON COUNTY | PROJECT NUMBER HDP-3715(652)--71-52 | SHEET NUMBER V.128

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