SUPPLEMENTAL SPECIFICATIONS

January 2020

Approved by Iowa City Council Resolution 20-1 on January 7, 2020
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DIVISION 1 -
GENERAL PROVISIONS AND
COVENANTS
SECTION 1010 – DEFINITIONS

1.03 DEFINITIONS AND TERMS

**BID SECURITY.** (REPLACE) The security furnished by the bidder with its bid as guaranty that the bidder will execute the contract and furnish bond for the work if the proposal is accepted. The security shall be according to Iowa Code Chapter 26 and shall be in the amount of 10% of the bid unless otherwise required in the Purchasing Policy or the Contract Documents.

**(ADD) BIDDER STATUS FORM.** A form providing business organization information to be completed by the Contractor and submitted with the Proposal, in accordance with the Specifications.

**COMPETITIVE QUOTATION.** (REPLACE) A properly signed written offer of the Contractor according to Iowa Code Chapter 26 and the Purchasing Policy.

**(ADD) COMPLETION DATE.** The Final Completion Date as defined in this section.

**(ADD) CONTRACT COMPLIANCE PROGRAM.** The City of Iowa City Contract Compliance Program effective at the date of publication of the Notice to Bidders unless a different effective date is identified in the Contract Documents.

**CONTRACTING AUTHORITY.** (REPLACE) City of Iowa City, Iowa, a municipal corporation.

**ENGINEER.** (REPLACE) The City Engineer or their designee.

**GOVERNMENTAL ENTITY.** (REPLACE) City of Iowa City, Iowa, a municipal corporation.

**JURISDICTION.** (REPLACE) City of Iowa City, Iowa, a municipal corporation.

**(ADD) FINAL COMPLETION DATE.** For completion date contracts, the final completion date is typically thirty calendar days after the Substantial Completion Date unless otherwise specified in the Contract Documents. Between the Substantial and Final Completion Dates, only minor work items (e.g. punch list items) should remain. On or before the Final Completion Date, the Contractor shall complete the Work to the satisfaction of the Jurisdiction and be ready for Acceptance and Final Payment as detailed in 1090, 1.08.

**(ADD) PROJECT MANUAL.** The bound documentary information prepared for bidding and constructing the Work. The list of the contents of the Project Manual, which may bound in one or more volumes, is contained in the table(s) of contents. The Project Manual is the basis for developing the Contract and Contract Documents.

**(ADD) PURCHASING POLICY.** The City of Iowa City Purchasing Policy Manual effective at the date of publication of the Notice to Bidders unless a different effective date is identified in the Contract Documents.

**(ADD) RECORD DOCUMENTS.** A maintained copy, recording actual changes in the Materials or Work, of the Project Manual, Addenda, Change Orders, Shop Drawings, manufacturer's information, and other modifications to the Contract Documents.

**(ADD) SUBSTANTIAL COMPLETION DATE.** For completion date contracts, substantial completion is the state in the progress of Work when the Work or designated portion thereof is
sufficiently complete in accordance with the Contract Documents so the public can occupy or utilize the Work for its intended use. Project specific requirements to meet substantial completion can be specified in the Contract Documents. Minor work items (e.g. punch list items), as determined by the Jurisdiction, might remain to be completed before the Final Completion Date.

(ADD) WAGE THEFT POLICY. The City of Iowa City Wage Theft Policy effective at the date of publication of the Notice to Bidders unless a different effective date is identified in the Contract Documents.

SECTION 1020 – PROPOSAL REQUIREMENTS AND CONDITIONS

1.03 QUANTITIES AND UNIT PRICES

A. (REPLACE) When unit prices are requested in the proposal form, the quantities indicated on the proposal form are approximate only, and do not constitute a warranty or guarantee by the Jurisdiction as to the actual quantities involved in the work. Such quantities are to be used for the purpose of comparison of bids and determining the amount of bid security, contract, and performance, payment, and maintenance bond. In the event of discrepancies between unit prices and unit price extensions listed in a bidder’s proposal, unit prices shall govern and unit price extensions shall be corrected, as necessary, for agreement with unit prices. The Jurisdiction expressly reserves the right to increase or decrease the quantities during construction as outlined in Section 1040, 1.06 – Increase or Decrease of Work, and to make reasonable changes in design, provided such changes do not materially change the intent of the contract, as determined by the Engineer. The amount of work to be paid for shall be based upon the actual quantities performed.

1.08 TAXES

B. Alternate Sales and Use Tax: (REPLACE) If the Jurisdiction, at its option, decides to utilize the sales and use tax option, it will so state by special provision and publication in the Notice of Public Hearing.

1.14 OPENING OF PROPOSALS

(REPLACE) At the time and place set forth in the Contract Documents, proposals will be opened and read aloud. Proposals will be rejected if not accompanied by a bidder status form, and a bid security (if required in the Project Manual) submitted in a separate, marked envelope. Submittals that do not include acknowledgement of each addendum to the Contract Documents will be rejected, except in those instances, in the opinion of the Engineer, where the addendum not acknowledged by a bidder will have no effect on the bid amount. Bid openings will be open to the public.

SECTION 1030 – APPROVAL FOR AWARD AND AWARD OF CONTRACT

1.02 RELEASE OF BID SECURITY

(REPLACE) Release of bid security shall be in accordance with Iowa Code Chapter 26.
SECTION 1040 – SCOPE OF WORK

1.03 COORDINATION OF SPECIFICATIONS, PLANS, AND SPECIAL PROVISIONS

A. (REPLACE) In case of any discrepancy between the various items included in the Contract Documents, the items shall prevail, or govern, in the following descending order:

1. Change Orders
2. Addenda
3. Contract
4. Proposal
5. Special Provisions
6. Plans, including plan notes
7. Supplemental Specifications
8. General Supplemental Specifications
9. SUDAS Standard Specifications

In case of a discrepancy within any contract document, the following shall prevail, or govern, in descending order: written text, numerals, drawings.

1.05 PLANS

(ADD) As part of the requirements for Section 1090, 1.08 – Acceptance and Final Payment, Record Documents must be developed and submitted to the Engineer.

1.07 CHANGE ORDERS

B. Written Orders: (REPLACE) The Engineer may in his/her discretion, and subject to formal approval as described in the Purchasing Policy, issue written change orders changing the scope of the work and/or adjusting the amount to be paid to the Contractor for performing such work; however, the Engineer may, in case of emergency of endangering life or property, orally authorize such a change order as allowed by the Purchasing Policy. Each written change order for extra work shall be explicit in its instruction and shall be duly executed by the Jurisdiction. One copy of said change order shall be filed with the Contractor. Each change order shall stipulate the amount and method of payment.

1.10 DISPUTED CLAIMS FOR EXTRA COMPENSATION

C. (DELETE) Request for Arbitration: In the event a Contractor's claim as outlined in the above procedure has been disallowed, in whole or in part, the Contractor may, within 30 calendar days from the date the ruling of the Jurisdiction is mailed, make a written request to the Jurisdiction that its claim or claims be submitted to a board of arbitration. The Jurisdiction shall decide if the matter is subject to arbitration and shall, within 30 calendar days of the receipt of the request for arbitration, grant or deny the request for arbitration. The Jurisdiction’s decision shall be final.

D. (DELETE) Board of Arbitration and all subsections.
E. **DELETE** Arbitration Proceedings: The board of arbitration shall make its own rules of procedure and shall have authority to examine records kept by the Jurisdiction and the Contractor. If the desired records are not produced within 10 calendar days after they are requested, the board of arbitration shall proceed without them as best it may. Notification of arbitration proceedings shall be made by the arbitration board to both the Jurisdiction and the Contractor, and each shall have the opportunity to attend all sessions of the arbitration board. In determining the findings or award or both, a majority vote of the board shall govern. Copies of the findings or award or both, signed by the arbitrators, shall be filed with the Jurisdiction and the Contractor. A unanimous report or majority report may be used. The board of arbitration shall fix the cost of the proceedings, including a reasonable compensation to the arbitrators, and shall determine how the total cost shall be borne by the parties.

F. **DELETE** Jurisdiction of Board of Arbitration: The board of arbitration shall have jurisdiction to pass upon questions involving compensation to the Contractor for work actually performed or materials furnished and upon claims for extra compensation that have not been allowed by the Jurisdiction. The board’s jurisdiction shall not extend to a determination of quality of workmanship or materials furnished, or to an interpretation of the intent of the plans and specifications except as to matters of compensation. Jurisdiction of the board shall not extend to setting aside or modifying the terms or requirements of the contract.

G. **DELETE** Determination of Board of Arbitration Final: The findings or award, or both, of the arbitration board, if acceptable to both parties to the contract, may become a basis for final payment. If the findings of the arbitration board are unacceptable to either party to the contract, said findings may become the basis for further negotiation between the parties. In the event a solution agreeable to both parties has not been reached through the filing of a claim, through arbitration, or if arbitration has been denied, either party may resort to whatever other methods for resolving the claim are available to it. The Contractor shall not initiate any suit against the Jurisdiction for the adjudication of any claim until said claim has been first presented to the Jurisdiction, pursuant to this article, and either submitted to arbitration or a request for arbitration is denied.

SECTION 1070 – LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

1.01 MUNICIPAL REGULATIONS, STATE, AND FEDERAL LAWS AND REGULATIONS

C.

2. Nondiscrimination: (REPLACE) Neither the Contractor nor their subcontractors, shall employ any person whose physical or mental condition is such that his/her employment will endanger the health and safety of themselves or others employed on the project.

Contractor shall not commit any of the following employment practices and agrees to include the following clauses in any subcontracts:

To discriminate against any individual in terms, conditions, or privileges of employment because of race, creed, color, sex, national origin, religion, age, sexual orientation, gender identity, marital status, genetic information, veteran status, mental or physical disability or disability unless such disability is related to job performance of such person or employee, or other class/category protected by federal, state, or local law.

To discharge from employment or refuse to hires any individual because of race, creed, color, sex, national origin, religion, age, sexual orientation, gender identity, marital status, genetic information, veteran status, mental or physical disability unless such disability is
related to job performance of such person or employee, or other class/category protected by federal, state, or local law.

For all contracts of $25,000 or more, the Contractor shall abide by the requirements of the Contract Compliance Program.

3. **(DELETE)** Solicitations for Subcontracts, Including Procurement of Materials and Equipment: In all solicitations either by competitive bidding or negotiation made by the contractor for work to be performed under a subcontract, including procurement of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the contractor of the contractor's obligations under this contract and the Regulations relative to nondiscrimination on the grounds of race, color, national origin, sex, age, or disability.

6. **(REPLACE)** For all contracts of $25,000 or more, the Contractor shall abide by the requirements of the Wage Theft Policy.

7. **(ADD)** Incorporation of Provisions: The contractor shall include the provisions of paragraphs (1) through (7) in every subcontract, including procurement of materials and leases of equipment, unless exempt by the Regulations, or directives issued pursuant thereto. The contractor shall take such action with respect to any subcontract or procurement as the Contracting Authority, the Iowa DOT, or the FHWA may direct as a means of enforcing such provisions including sanctions for non-compliance. Provided, however, that, in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the contractor may request the Contracting Authority or the Iowa DOT to enter into such litigation to protect the interests of the Contracting Authority or the Iowa DOT; and, in addition, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

**1.11 BUSINESS ORGANIZATION REQUIREMENTS**

E. **(ADD)** Completed and signed Bidder Status Form shall be included with all bid submissions.

**3.01 PERFORMANCE, PAYMENT, AND MAINTENANCE BOND**

D. **(ADD)** For all public improvement contracts $25,000 or higher, the contract must be accompanied by a bond, with surety, conditioned for the faithful performance of the contract, and for fulfillment of other requirements as provided by Iowa law in accordance with Iowa Code section 573.2.

**3.02 INSURANCE REQUIREMENTS**

A. **(REPLACE)** The Contractor shall purchase and maintain insurance to protect the Contractor and the Jurisdiction against all hazards herein enumerated throughout the duration of the contract. Said insurance shall be provided by an insurance company or companies, “admitted” or “non-admitted" to do business in the State of Iowa, having an A.M. Best rating of “A” or better.
C.

2. c. Operations by independent contractors. (ADD) Includes property damage to work performed by independent contractors or their subcontractors.

8. (ADD) To the fullest extent permitted by applicable state law, a Waiver of Subrogation Clause shall be added to the General Liability and Workers’ Compensation policies in favor of Contractor and Jurisdiction, and this clause shall apply to the Contractor’s and Jurisdiction’s officers, agents and employees, with respect to all Projects during the policy term.

SECTION 1080 – PROSECUTION AND PROGRESS

1.01 SUBLETTING OR ASSIGNMENT OF CONTRACT

A. Work by Contractor:

1. (REPLACE) The Contractor shall perform, with its own organization and forces, work amounting to no less than 30% of the total contract cost.

1.10 CONTRACTOR’S EMPLOYEES, METHODS, AND EQUIPMENT

B. (DELETE) Workers: and all subsections.

1.12 LIQUIDATED DAMAGES

A. (REPLACE) Time is of the essence of the contract. As delay in the diligent prosecution of the work may inconvenience the public, obstruct traffic, interfere with business, and/or increase costs to the Jurisdiction such as engineering, administration, and inspection, it is important the work be prosecuted vigorously to completion. Should the Contractor, or in case of default the surety, fail to complete the work within the contract time plus such extensions of time as may be allowed by the Jurisdiction, a deduction at the liquidated damages rate specified in the contract will be made for each and every calendar day (completion day contracts) or working day (working day contracts), whichever is specified, that such contract remains uncompleted after expiration of the contract time. In either event, the Contractor or the Contractor’s surety shall be responsible for all costs incident to the completion of the work, and shall be required to pay to the Jurisdiction the liquidated damages stipulated in the Contract Documents.

1.13 BREACH OF CONTRACT

A.

3. (REPLACE) Failure by the Contractor to comply with an order of the Engineer within a reasonable time;

4. (REPLACE) Contractor’s disregard of laws, ordinances, or instructions of the Engineer;

5. (REPLACE) Contractor’s failure to provide sufficient workers, equipment, or materials to ensure the proper and timely completion of the work;

6. (REPLACE) Failure by the Contractor to remove rejected materials;
7. (REPLACE) Failure by the Contractor to replace, perform anew, or correct any defective or unacceptable work;

9. (REPLACE) Bankruptcy or insolvency of the Contractor, or the making of an assignment for the benefit of creditors by the Contractor;

10. (REPLACE) Failure by the Contractor to carry on the work in an acceptable manner; or

11. (ADD) Assignment of any portion of the contract to a different party without prior written approval of the Jurisdiction.

SECTION 1090 – MEASUREMENT AND PAYMENT

1.08 ACCEPTANCE AND FINAL PAYMENT

E. (ADD) Contractor shall submit Record Documents including:

1. General:
   a. Store Record Document separately and do not use Record Documents in the field for construction purposes.
   b. Protect Record Documents from deterioration and loss in a secure, fire-resistance location.
   c. Provide access to Record Documents for the reference of the Engineer, or their designee, during normal working hours.
   d. Record information concurrent with Section 1080, 1.03 – Work Progress and Schedule, not less than weekly.

2. Record Documents:
   a. Furnish a complete set of Plans to be utilized by Contractor and all Subcontractors for recording all changes from the Contract Documents.
      1) Mark the Plans to show the actual installation where the installation varies from the Contract Documents.
      2) Mark which drawing is most capable of showing conditions fully and accurately.
      3) Where Shop Drawings are used, record a cross-reference at the corresponding location on the Plans.
         a) Give particular attention to concealed elements that would be difficult to measure and record at a later date.
   b. Mark record sets legibly in red.
      1) Use other colors to distinguish between variations in separate categories of the Work.
   c. Mark new information that is important to the Engineer but was not shown on Plans or Shop Drawings.
   d. Note related Change Order numbers where applicable.
   e. Organize Record Documents into manageable sets.
      1) Bind sets with durable paper cover sheets; print suitable titles, dates, and other identification on the cover of each set.
f. Give particular attention to substitutions and selection of options and information on concealed construction that cannot otherwise be readily discerned later by direct observation.

g. Identify and date each Record Document; include designation "PROJECT RECORD DOCUMENT" in a prominent location.

h. Upon completion of the Work, submit Record Documents to the Engineer.
DIVISION 2 - EARTHWORK
SECTION 2010 – EARTHWORK, SUBGRADE, AND SUBBASE

1.08 MEASUREMENT AND PAYMENT

J. Removals:

1. Structures:
   c. Includes: (REPLACE) Unit price includes, but is not limited to removal, furnishing, backfilling, and compacting backfill material in the resulting void, and proper disposal of existing structures. Backfill shall be Class II Material (see 3010, 2.03.A). Backfill material will not be measured separately but shall be considered incidental.
DIVISION 3 -
TRENCH AND TRENCHLESS CONSTRUCTION
SECTION 3010 – TRENCH EXCAVATION AND BACKFILL

1.08 MEASUREMENT AND PAYMENT

A. General:

5. (REPLACE) Furnishing, placing, and compacting backfill material.

2.03 BACKFILL MATERIAL

A. Class II Material: (REPLACE) Class A Roadstone (Iowa DOT Gradation #11) shall be used for granular trench backfill unless otherwise approved by the Engineer.

3.04 DEWATERING

A. (REPLACE) Maintain ground water level a minimum of two feet below the bottom of the trench.

3.05 PIPE BEDDING AND BACKFILL

D. Primary and Secondary Backfill:

2. Granular Material:

b. (ADD) Compact Class II backfill material to at least 95% Standard Proctor Density.

3. Suitable Backfill Material:

b. (REPLACE) Under and within five feet of paved surfaces, including streets, sidewalks and driveways, backfill material shall be Class II backfill material compacted to 95% Standard Proctor Density.

E. Final Trench Backfill:

3. Class I and Class II Backfill Material:

a. (REPLACE) Under and within five feet of paved surfaces, including streets, sidewalks and driveways, backfill material is to be compacted to at least 95% Standard Proctor Density up to the final one foot. The final one foot should be compacted to at least 98% Standard Proctor Density.

b. (REPLACE) If not under pavement or within five feet of paved surfaces, backfill to within 12 inches of finished surface. Backfill material is to be compacted to at least 95% Standard Proctor Density

5. (REPLACE) In areas to remain unpaved and not within five feet of paved surfaces, terminate backfill material 12 inches below finished grade. Use topsoil for the final 8 inches above trench backfill material. Remaining four inches can be suitable job excavated material compacted to 90% Standard Proctor Density.
SECTION 3020 – TRENCHLESS CONSTRUCTION (BORING, JACKING, AND TUNNELING)

1.03 SUBMITTALS

E. (ADD) Contractor shall provide post construction CCTV videos with inclinometer readings for gravity pipes.
DIVISION 4 -
SEWERS AND DRAINS
SECTION 4010 – SANITARY SEWERS

1.08 MEASUREMENT AND PAYMENT

E. Sanitary Sewer Service Stub: (REPLACE) The portion of the sanitary sewer service, within the public right-of-way, from the sewer main to a point ten feet beyond the right-of-way line or the outer utility easement line, whichever is greater. This distance can be otherwise specified in the contract documents. Comply with Figure 4010.201.

1. Measurement: Each type and size of pipe will be measured in linear feet along the centerline of the pipe from the end of the pipe to the centerline of the sewer main.

2. Payment: Payment will be made at the unit price per linear foot for each type and size of sanitary sewer service stub.

3. Includes: Unit price includes, but is not limited to, trench excavation; furnishing and installing pipe; furnishing, placing, and compacting bedding and backfill material; tap; fittings; testing; and inspection.

H. Removal of Sanitary Sewer:

3. Includes: (REPLACE) Unit price includes, but is not limited to, excavation; removal, disposal, and capping of pipe (if specified); and furnishing, placing, and compacting backfill material.

2.01 SANITARY SEWER (GRAVITY MAINS)

A. Solid Wall Polyvinyl Chloride Pipe (PVC) 8 inch to 15 inch:

5. (ADD) Restrained Joint on Trenchless Construction: Pipe shall be joined using a non-metallic spline-lock system. High-strength, flexible thermoplastic splines shall be inserted into mating, precision-machined grooves in the pipe and bell to provide full 360-degree restraint with evenly distributed loading. Integral bell joints shall incorporate an elastomeric sealing gasket meeting the requirements of ASTM F 477. Joints shall be designed to meet the leakage test requirements of ASTM D 3139.

   a) Approved Products and Manufacturers: CertaFlo GreenLine SDR 21, CertainTeed Corporation, Malvern, Pennsylvania; or approved equal.

   b) PVC Restrained Joint on Trenchless Construction can be used for gravity flow pipes if approved by the Engineer.

C. (DELETE) Corrugated Polyvinyl Chloride Pipe (PVC) 8 inch to 36 inch: and all subsections.

F. Reinforced Concrete Pipe (RCP) 18 inch to 144 inch:

1. General:

   c. (DELETE) Tongue and groove joints.

   d. (REPLACE) Rubber O-ring joint complying with ASTM C 443. Profile gasket flexible joints are not allowed on sanitary sewers.

2. Pipe Lining:
a. (ADD) High density polyethylene (HDPE) or polyvinyl chloride (PVC) lining can be used if approved by the Engineer.

H. (DELETE) Vitrified Clay Pipe (VCP) 8 inch to 42 inch: and all subsections.

I. (DELETE) Double Walled Polypropylene Pipe 12 inch to 30 inch: and all subsections.

J. (DELETE) Triple Walled Polypropylene Pipe 30 inch to 36 inch: and all subsections.

2.02 SANITARY SEWER FORCE MAINS

B. (REPLACE) Polyvinyl Chloride Pipe (PVC): Comply with AWWA C900 with gray iron pipe equivalent outside diameters.

1. Minimum Wall Thickness:
   a.  4 inch through 24 inch sizes: DR 18.
   b.  Sizes over 24 inch: As specified in the contract documents.

2. Joint Type: Use push-on joint type, except as otherwise specified in the contract documents or as authorized by the Engineer.
   b.  Integral Restrained Joint: AWWA C900 pipe with restraining system manufactured integrally into pipe end.
   c.  Mechanical Restrained Joint: Ductile iron mechanical device designed for joint restraint of AWWA C900 pipe complying with the requirements of ASTM F 1674.
   d.  Restained Joint on Trenchless Construction: Pipe shall be joined using a non-metallic spline-lock system. High-strength, flexible thermoplastic splines shall be inserted into mating, precision-machined grooves in the pipe and bell to provide full 360-degree restraint with evenly distributed loading. Integral bell joints shall incorporate an elastomeric sealing gasket meeting the requirements of ASTM F 477. Joints shall be designed to meet the leakage test requirements of ASTM D 3139.

   1) Approved Products and Manufacturers: CertaFlo GreenLine SDR 21, CertainTeed Corporation, Malvern, Pennsylvania; or approved equal.

3. Markings on Pipe:
   a. Name of manufacturer.
   b. Size and class.
   c. Spigot insertion depth gauge.
   d. National Sanitation Foundation (NSF) seal.

2.04 SANITARY SEWER SERVICES

A. Connection to Main:

   4. (DELETE) VCP Main: and all subsections.
3.02 GRAVITY SEWER INSTALLATION

B. Trenched:

3. (ADD) Monitor line and grade using installation laser level. Calibration of this equipment should be verified before its use in accordance with the equipment manufacturer’s recommendations.

3.04 GRAVITY MAIN PIPE JOINTING

C. Reinforced Concrete Pipe (RCP): (REPLACE)

1. Unlined pipe: Coat rubber gasket and joint with soap-based lubricant immediately prior to closing joint.

2. Lined pipe: Follow manufacturer’s recommendations.

F. Connections between Dissimilar Pipes:

1. (REPLACE) Couplings shall be 1000 or 5000 Series Strong Back (RC) as manufactured by Fernco or Engineer approved equal.

2. (DELETE) Where adapters or couplings are not available, the Engineer may authorize use of a Type PC-2 concrete collar as shown in Figure 4020.211.

3.05 FORCE MAIN INSTALLATION

C. (ADD) Sub-surface Utility Warning Tape: All sanitary sewer force mains shall be identified by a sub-surface utility warning tape placed at an elevation not less than six inches, nor more than twelve inches below the proposed finished grade. The utility warning tape shall be manufactured by Terra Tape or Engineer approved equal.

3.06 SANITARY SEWER SERVICE STUBS

C. (REPLACE) Install service stub, within the public right-of-way, from the sewer main to a point ten feet beyond the right-of-way line or the outer utility easement line, whichever is greater. This distance can be otherwise specified in the contract documents. Comply with Figure 4010.201.

1. Install according to Section 4010, 3.02.

2. Install service stub with a slope between 2% and 5% for 4 inch pipes, and between 1% and 5% for pipes 6 inches and greater.

3. Terminate end of service stub 10 to 12 feet below finished ground elevation or as specified in the contract documents.

4. If the depth of the sewer main causes the service to exceed a depth of 12 feet or a slope of 5%, install a service riser.

5. For undeveloped properties, place watertight stopper, cap, or plug in end of sanitary sewer service. Mark the end of the service line as required by the Jurisdiction or as specified in the contract documents.

6. For reconnection of new service pipe with existing service pipe, comply with the Jurisdiction’s plumbing code.
7. Multiple sanitary sewer service stubs shall not be constructed within the same trench.
8. Sanitary sewer service stubs must be separated from each other by six feet and separated from the nearest by three feet from the nearest manhole or structure.

FIGURES

Figure 4010.201 – Sanitary Sewer Service Stub

(REPLACE) 10-foot dimension to Location Point with “ten feet beyond the right-of-way line or the outer utility easement line, whichever is greater”

SECTION 4020 – STORM SEWERS

1.07 SPECIAL REQUIREMENTS

A. Lift holes in sewer pipes are not allowed.

1.08 MEASUREMENT AND PAYMENT

D. Removal of Storm Sewer:

3. Includes: (REPLACE) Unit price includes, but is not limited to, excavation; removal, disposal, and capping of pipe (if specified); and furnishing, placing, and compacting backfill material.

F. Storm Sewer Abandonment, Plug:

3. Includes: Unit price includes, but is not limited to, trench excavation (if necessary), cutting pipe (if required), furnishing and placing plug materials, and furnishing, placing, and compacting backfill material.

G. Storm Sewer Abandonment, Fill and Plug:

3. Includes: Unit price includes but is not limited to, trench excavation (if necessary); cutting pipe (if required); furnishing and placing pipe fill materials; furnishing and placing plug materials; and furnishing, placing, and compacting bedding and backfill material.

2.01 STORM SEWERS

A. Reinforced Concrete Pipe (RCP):

3. (REPLACE) Use rubber, confined, O-ring or profile gasket complying with ASTM C 443.
4. (ADD) 36 inch and smaller: use bell and spigot joints.
5. (ADD) Larger than 36 inch: may have tongue and groove joints.
6. (ADD) No mastic joints are allowed.

B. Reinforced Concrete Arch Pipe (RCAP):
3. (REPLACE) Use tongue and groove joints with butyl rope and wrapped with engineering fabric, unless a rubber O-ring or profile gasket complying with ASTM C 443 is specified and available.
   a) Engineering fabric shall be no less than 24 inches wide. Overlap engineering fabric 12 inches at the top of the pipe, on each side of the joint.

4. (ADD) No mastic joints are allowed.

C. Reinforced Concrete Elliptical Pipe (RCEP):

3. (REPLACE) Use rubber, confined, O-ring or profile gasket complying with ASTM C 443.

4. (ADD) **36 inch and smaller**: use bell and spigot joints.

5. (ADD) **Larger than 36 inch**: may have tongue and groove joints.

6. (ADD) No mastic joints are allowed.

D. Reinforced Concrete Low Head Pressure Pipe (RCPP):

2. (REPLACE) Use rubber, confined, O-ring or profile gasket complying with ASTM C 361.

3. (ADD) **36 inch and smaller**: use bell and spigot joints.

4. (ADD) **Larger than 36 inch**: may have tongue and groove joints.

M. Bituminous Joint Primer: (REPLACE) Only with the approval of the Engineer. Material intended for use in priming concrete joints. Comply with the requirements of ASTM D 41.

3.02 PIPE INSTALLATION

A. General:

3. (DELETE) Place pipe with lifting holes at the top of the pipe and fill lift hole with non-shrink grout or manufactured plugs.

3.05 PIPE JOINTING

A. General:

3. (ADD) The Engineer must authorize use of pipe joint wrapping.

E. Connections between Dissimilar Pipes:

1. (ADD) Couplings shall be 1000 or 5000 Series Strong Back (RC) as manufactured by Fernco or Engineer approved equal.

FIGURES

(REPLACE) Figure 4020.211 – Storm Sewer Pipe Connections
Lap ends of wire mesh a minimum of 6 inches.

Concrete collar is required when annular space between the outside of the pipe and the wall of the structure is 2 inches or greater.

Provide two #4 hoop bars in concrete collar. Lap bars a minimum of 6 inches.

Trowel concrete flush with inside wall of structure.

Waterstop per 6010, 2.08.C

Pipe Joint

Overlap fabric 12" at top of pipe.

Pipe to PIPE CONNECTION - ONLY FOR REINFORCED CONCRETE ARCH PIPE (RCA®)

Pipe Joint Wrapping

Wall of Precast Manhole or Intake Structure

4" min.

6" min.

Wall of Precast Manhole or Intake Structure

4" min.

6" min.

CONCRETE COLLAR FOR PIPES 12" AND SMALLER

CONCRETE COLLAR FOR PIPES GREATER THAN 12"

Pipe to Structure Connection
SECTION 4040 – SUBDRAINS AND FOOTING DRAIN COLLECTORS

1.08 MEASUREMENT AND PAYMENT

E. Storm Sewer Service Stub: (REPLACE) The storm sewer service stub is the portion of the storm sewer service, within the public right-of-way, from the footing drain collector or storm sewer to a point ten feet beyond the right-of-way line or the outer utility easement line, whichever is greater. This distance can be otherwise specified in the contract documents.

1. **Measurement:** Each type and size of pipe will be measured in linear feet along centerline of pipe from the centerline of storm sewer or footing drain collector to a point ten feet beyond the right-of-way line or the outer utility easement line, whichever is greater.

2. **Payment:** Payment will be made at the unit price per linear foot for each type and size of storm sewer service stub.

3. **Includes:** Unit price includes, but is not limited to, trench excavation, furnishing, placing, and compacting bedding and backfill material, tap, fittings, and plugs.

3.03 FOOTING DRAIN SERVICE STUBS

C. (REPLACE) Install footing drain service stub, within the public right-of-way, to a point ten feet beyond the right-of-way line or the outer utility easement line, whichever is greater. This distance can be otherwise specified in the contract documents.

1. For undeveloped properties, place a watertight stopper or plug in the end of the storm sewer service.

2. For reconnection of existing service pipe to new sewer service pipe, use a manufactured flexible connection.

SECTION 4050 – PIPE REHABILITATION

2.07 SEWER MAIN PIPE (FOR SPOT REPAIRS)

A. (REPLACE) Comply with Sections 4010 and 4020.

3.07 SPOT REPAIRS BY PIPE REPLACEMENT

C.

1. (REPLACE) Use the materials as specified in the contract documents that comply with Sections 4010 and 4020.

SECTION 4060 – CLEANING, INSPECTION, AND TESTING OF SEWERS

2.01 TESTING EQUIPMENT

B. Video Inspection:

1. Camera:

   f. (ADD) Capable of providing inclinometer readings with slope information displayed.
3.04 SANITARY SEWER LEAKAGE TESTING

A. Sanitary Sewer Infiltration Testing:

1. (REPLACE) Use only where ground water is more than 2 feet above the top of pipe at the highest point in section being tested. Testing shall not commence until ground water levels have returned to normal levels.
DIVISION 5 -
WATER MAINS AND APPURTENANCES
(ADD) ATTACHED: ACCEPTED PRODUCTS FOR WATER DISTRIBUTION MATERIALS

The document is attached to the end of this Division.

SECTION 5010 – PIPE AND FITTINGS

1.07 SPECIAL REQUIREMENTS

A. (ADD) PVC pipe shall only be used on water mains 10 inch diameter and less.

B. (ADD) Prestressed concrete cylinder pipe will not be permitted unless approved by the Engineer.

C. (ADD) Reuse of materials is not allowed unless approved by the Engineer. The Jurisdiction accepts no fault for any issues caused by, or related to, the reuse of any material.

D. (ADD) The City of Iowa City Water Division, Accepted Products for Water Distribution Materials, should be followed for all water mains and appurtenances. This document is attached at the end of this Division.

2.01 WATER MAIN

A. Polyvinyl Chloride Pipe (PVC) Pipe: Comply with AWWA C900 with gray iron pipe equivalent outside diameters.

   1. Minimum Wall Thickness:
      a. (REPLACE) 4 inch through 10 inch sizes: DR 18
      b. (DELETE) Sizes over 24 inch: As specified in the contract documents.

B. Ductile Iron Pipe (DIP):

   1. Minimum Thickness Class:
      c. (ADD) Restrained Joints: Special thickness Class 53 according to AWWA C151.

2.02 BOLTS FOR WATER MAIN AND FITTINGS

B. Other Bolts and Nuts:

   2. (DELETE) Ductile Iron
   3. (DELETE) Zinc, zinc chromate, or cadmium plated.

2.03 FITTINGS

A. For DIP and PVC Pipe: Comply with AWWA C110 (ductile iron or gray iron) or AWWA C153 (ductile iron).

   1. Joint Type:
a. (DELETE) For pipe sizes 16 inches and less, use mechanical joint complying with AWWA C111.

b. (REPLACE) For all pipe sizes, use restrained mechanical joint system. Provide follower gland using breakaway torque bolts to engage thrust restraint.

1) Minimum pressure rating same as connecting pipe. For fittings between dissimilar pipes, the minimum pressuring rating is the lesser of the two pipes.

2) Suitable for buried service.

3) Joint restraint system to be field installable, field removable, and re-installable.

D. Pipe Coupling:

4. **Bolts and Nuts:** (REPLACE) High Strength, low alloy corrosion resistant steel or stainless steel.

2.04 **CONCRETE THRUST BLOCKS**

C. (REPLACE) Use for all pipe sizes 12 inches in diameter or larger or when specified.

2.05 **PIPELINE ACCESSORIES**

B. Tracer System: (REPLACE) Comply with Figures 5010.102 to 5010.105

2. Ground Rod: (REPLACE) 3/8-inch diameter minimum, 60 inch steel rod uniformly coated with metallically bonded electrolytic copper.

4. Splice Kit: (REPLACE) See Tracer Wire Connector under the Accepted Products for Water Distribution Materials.

2.06 **SPECIAL GASKETS**

A. (REPLACE) For soils contaminated with gasoline, use nitrile gaskets.

B. (REPLACE) For soils contaminated with volatile organic compounds, contact Engineer for the required gaskets.

2.07 **WATER SERVICE PIPE AND APPURTEANCES**

A. **Controlling Standards:** (REPLACE) Jurisdictional policies and procedures, plumbing and fire codes.

3.01 **PIPE INSTALLATION**

A. General:

8. (REPLACE) Install concrete thrust blocks on all fittings 12 inches in diameter or larger (comply with Figure 5010.101). For all fittings, install restrained joints within length(s) designed by an engineer. When specified in the Contract Documents, install concrete thrust blocks and restrained joints as designed.
3.06 TRACER SYSTEM INSTALLATION

E. (REPLACE) Install ground rods adjacent to connections to existing pipe in native, undisturbed soil and at locations specified in the Contract Documents or as directed by the Engineer.

F. (REPLACE) Bring two wires to the surface at each fire hydrant location and terminate with a tracer wire station.

H. (ADD) A minimum of 18 inches of wire slack at every tracer wire terminal box lid shall be installed.

I. (ADD) Every splice along the tracer wire shall have a minimum of 18 inches of wire slack added to the line.

J. (ADD) No uninsulated wire shall be installed along any length of run or at splice points. All exposed wire shall be mended as directed by the Engineer, and all splices shall include dielectric grease.

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

3.07 CONFLICTS


3.10 WATER SERVICE STUB

B. (DELETE) Install 1 inch and small corporation valves tapped at 45 degrees above the horizontal at a minimum distance of 18 inches from pipe bell or other corporation. Install 1 ½ inch and 2 inch corporation valves tapped horizontal a minimum distance of 24 inches from pipe bell or other corporation.

C. (DELETE) Construct trench and place backfill material according to Section 3010.

FIGURES

(REPLACE) Figure 5010.102 – Tracer Wire Installation w/ Existing Locate Wire

(ADD) Figure 5010.103 – Tracer Wire Installation Without Existing Locate Wire

(ADD) Figure 5010.104 – Tracer Wire Installation Service Size 4” or Larger w/ Existing Locate Wire

(ADD) Figure 5010.105 – Tracer Wire Installation Service Size 4” or Larger without Existing Locate Wire
TYPICAL DETAIL
TRACER WIRE INSTALLATION w/ EXISTING LOCATE WIRE
SCALE: NOT TO SCALE
Figure 5010.102

1. Extend tracer wire up fire hydrant barrel to internal terminals of tracer wire terminal box and then down to ground rod.
2. Clamp tracer wire to ground rod at system termination points.
3. Place ground rods 6”-10” away from pipe and in contact with native soil.

NOTE: ADDITIONAL TRACER WIRE DETAILS MAY BE FOUND ON FIGURES 5010.103-5010.105.

REVISED 05/2018
1. Extend tracer wire up fire hydrant barrel to internal terminals of tracer wire terminal box and back down.
2. Clamp tracer wire to ground rod at system termination points.
3. Place ground rods 6"-10" away from pipe and in contact with native soil.

TYPICAL DETAIL
TRACER WIRE INSTALLATION WITHOUT EXISTING LOCATE WIRE
SCALE: NOT TO SCALE
Figure 5010.103
1. Extend tracer wire up to internal terminal of tracer wire terminal box.
2. Clamp tracer wire to ground rod at system termination points.
3. Install ground rod 6'-10' from pipe and in contact with native soil.

TYPICAL DETAIL
TRACER WIRE INSTALLATION SERVICE SIZE 4" OR LARGER
w/ EXISTING LOCATE WIRE
SCALE: NOT TO SCALE
Figure 5010.104
TYPICAL DETAIL
TRACER WIRE INSTALLATION SERVICE SIZE 4" OR LARGER
WITHOUT EXISTING LOCATE WIRE
SCALE: NOT TO SCALE
Figure 5010.105

1. EXTEND TRACER WIRE UP TO INTERNAL TERMINAL OF TRACER WIRE TERMINAL BOX.
2. CLAMP TRACER WIRE TO GROUND ROD AT SYSTEM TERMINATION POINTS.
3. INSTALL GROUND ROD 6"-10" FROM PIPE AND IN CONTACT WITH NATIVE SOIL.

EXISTING WATER MAIN
WITHOUT EXISTING TRACER WIRE

TRACER WIRE TERMINAL BOX
AT GROUND LEVEL

NEW SERVICE MAIN

GROUND ROD

TAPE WIRE AT MIDPOINT OF EACH PIPE LENGTH
SECTION 5020 – VALVES, FIRE HYDRANTS, AND APPURTENANCES

1.07 SPECIAL REQUIREMENTS

A. (ADD) The Jurisdiction maintains salvage rights to all fire hydrants designated as public.

B. (ADD) Samples of water main and its appurtenances may also be retained by the Jurisdiction for testing purposes.

C. (ADD) Reuse of materials is not allowed unless approved by the Engineer. The Jurisdiction accepts no fault for any issues caused by, or related to, the reuse of any material.

D. (ADD) Flushing devices (blowoffs) shall only be used on a temporary basis as approved by the Engineer.

E. (ADD) The City of Iowa City Water Division, Accepted Products for Water Distribution Materials, should be followed for all water mains and appurtenances. This document is attached at the end of this Division.

1.08 MEASUREMENT AND PAYMENT

C. Fire Hydrant Assembly:

3. Includes: (REPLACE) Unit price includes, but is not limited to, the fire hydrant, barrel extensions sufficient to achieve proper bury depth of anchoring pipe and height of fire hydrant above finished grade, and components to connect the fire hydrant to the water main, including anchoring pipe, fittings, thrust blocks, solid concrete block, porous backfill material, and fire hydrant gate valve and appurtenances, except tapping valve assembly if used.

E. Valve Box Adjustment, Minor: (REPLACE) Measurement and payment for minor adjustment of an existing valve box by centering, raising, or lowering the adjustable valve box is incidental.

2.01 VALVES

B. Gate Valves:

1. Standards: (REPLACE) Comply with AWWA C509 (gray iron or ductile iron) and NSF 61.

C. Butterfly Valves:

1. Standards: (REPLACE) Comply with AWWA C504 class 150B (gray iron or ductile iron) or class 250B and NSF 61.

D. Tapping Valve Assemblies:

1. Tapping Valve: (REPLACE) Gate valve complying with AWWA C509.

4. Gasket:
   c. (DELETE) Use nitrile rubber.
2.02   **FIRE HYDRANT ASSEMBLY**

**C. Features:**

4. **Hose Nozzles:** (REPLACE) Two, each 2 ½ inches in diameter, caps attached to hydrant with chains. This should be for all new hydrants within the Iowa City Water Distribution System installed after January 1, 2020.

5. **Direction of Opening:** (REPLACE) Clockwise, unless otherwise specified.

6. **Items to be Specified:** (REPLACE) The following items will be specified by the Jurisdiction or in the Contract Documents.
   a. Operating nut: 1 ½ inches, standard pentagon.
   b. Pumper nozzle: One 4 ½ inch Storz connection effective for all new hydrants installed within the limits of Iowa City Water Distribution System after January 1, 2020.
   d. Main valve nominal opening size: 4 ½ inches on mains smaller than 12 inches in diameter, 5 ¼ inches on main 12 inches and larger in diameter.

7. **Barrel Extensions:** (ADD) Solid barrel without threading; only one (single) extension installed per hydrant.

**D. Painting:**

2. (REPLACE) Above grade exterior coating type will be Safety Red unless otherwise specified by the Engineer.

2.03   **APPURTENANCES**

**B. Valve Box:**

3. **Type:**
   a. (REPLACE) Slip (slide) type
   b. (DELETE) In all other areas, use a screw extension type.

11. (ADD) Valve boxes shall be centered over the operating nut.

**C. Valve Stem Extension:** (REPLACE) Provide as necessary to raise 2 inch operating nut to within 5 or 6 feet of the finished grade. Stem diameter shall be according to valve manufacturer’s recommendations, but not less than 1 inch. It shall also be stainless steel.

**D. (ADD) 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.
3.04  **ADJUSTMENT OF EXISTING VALVE BOX OR FIRE HYDRANT**

A. **Minor Valve Box Adjustment:** (REPLACE) For existing adjustable boxes that have sufficient adjustment range to bring to finished grade, raise or lower valve box to finished grade. Valve boxes should be centered over valve operating nut and run straight (not angled).

3.05  **(ADD) TAPPED CONNECTIONS UNDER PRESSURE**

A. Follow manufacturer's installation instructions.

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

C. A new and site-specific Jurisdiction tapping application must be prepared for each tap regardless of size, and submitted to the Jurisdiction for approval.

3.06  **(ADD) 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 Jurisdiction.

B. An accurate and legible copy of the “as-built” drawings must be on file with the Jurisdiction prior to using the water supply.

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

**FIGURES**

(REPLACE) Figure 5020.201 – Typical Hydrant and Valve Assembly

(ADD) Figure 5020.202 – Deadend Hydrant Detail

(ADD) Figure 5020.203 – Hydrant Detail for Future Water Main Extension
TYPICAL HYDRANT AND VALVE ASSEMBLY
Figure 5020.201

TRACER WIRE TERMINAL BOX PLACE BETWEEN HYDRANT AND HYDRANT VALVE.
IN CONCRETE: PLACE 1' FROM HYDRANT.
IN GRASS: TAPE TO BARREL WITH 2X4 SCRAP OF WOOD INSTALLED BETWEEN BOX AND BARREL TO ENSURE METALS DO NOT TOUCH.

HYDRANT STORZ PUMPER NOZZLE

3'-0" RADIAL CLEAR SPACE

1'-6" MIN. 5'-0" MAX.

MAIN TRENCH

FINAL GRADE

SPlice TO MAIN TRACING WIRE OR SET ADDITIONAL GROUND ROD

WATER MAIN

THRUST BLOCK

SOLID CONCRETE BLOCK

GROUND ROD

SOLID CONCRETE BLOCK

SOLID CONCRETE BLOCK

TRENCH BACKFILL

BACKFILL WITH CLEAN 2-1/2" CRUSHED STONE TO 18" ABOVE BOTTOM OF HYDRANT BASE

HOLDING SPOOL ON MEGA LUG

AS REQ'D

ANCHOR OR SWIVEL TEE

REVISED 01/2020
DEADEND HYDRANT DETAIL
Figure 5020.202

- **Holding Spool or Mega Lug**
- **Gate Valve**
- **Thrust Block**
- **Plug**
- **Swivel or Anchor Tee**
- **Tracer Wire**
- **Tracer Wire Terminal Box**
  - Place between Hydrant and Hydrant Valve.
  - In Concrete: Place 1' from Hydrant.
  - In Grass: Tape to Hydrant Barrel with 2x4 scrap of wood installed between box and barrel to ensure metals do not touch.

- **SOLID Concrete Block**
- **Hydrant**
  - 4.5" for main smaller than 12"
  - 5.25" for 12" and larger main

- **Ground Rod (in contact with native soil)**

NOT TO SCALE
HYDRANT DETAIL FOR FUTURE WATER MAIN EXTENSION

Figure 5020.203

NOT TO SCALE

REVISED 11/2016
SECTION 5030 – TESTING AND DISINFECTION

1.02 DESCRIPTION OF WORK

(REPLACE) Test and disinfect water mains, valves, fire hydrants, appurtenances and private water services greater than 2 inches in diameter.

1.06 SCHEDULING AND CONFLICTS

C. (ADD) Testing shall not commence until all components are installed (including tracing system), and the as-built and material list are submitted to the Jurisdiction. Testing (including tracing) should be completed within two weeks.

1.07 SPECIAL REQUIREMENTS

A. (ADD) All testing and system operations will be performed by the Jurisdiction.

3.01 SEQUENCE OF TESTING AND DISINFECTION

(REPLACE) Perform operations according to AWWA C651 in the sequence below. Successfully complete each operation before continuing to the next operation. The Jurisdiction will provide reasonable quantities of water for flushing and testing. All main shall pass bacteriological sampling before pressuring testing. Testing segments shall be no longer than 1,200 feet. All legs or laterals shall be tested as separate segments. Water main must pass all testing before any main or service taps are made.

A. Continuous-Feed or Slug Method (After Water Main Installation): The sequence of testing and disinfection may be modified with approval of the Engineer.

4. (REPLACE) Perform bacteriological sampling.

5. (ADD) Perform pressure and leak testing.

B. Tablet Method (Concurrent with Water Main Installation): Use this method only if approved by the Engineer. Modify the procedure for flushing, disinfection, and pressure and leak testing as needed if tablet method is used.

3. (REPLACE) Perform bacteriological sampling.

4. (ADD) Perform pressure and leak testing.

3.03 DISINFECTION

B. Procedure:

5. (ADD) After 24 hours, a detectable free chlorine residual of:

a. greater than or equal to 0.2 mg/L for the tablet method or

b. greater than or equal to 10 mg/L for the continuous feed method shall be found at each sample point.
3.05 PRESSURE AND LEAK TESTING

A. (DELETE) Remove debris from within the pipe. Clean and swab out pipe if required.

G. (REPLACE) The addition of makeup water is not allowed.

H. (DELETE) Accurately measure the amount of water required to repressurize the system to the test pressure.

I. (DELETE) Maximum allowable leakage rate according to AWWA C600:

\[ L = \frac{(S)(D)(P)^{0.5}}{148,000} \]

Where:

- \( L \) = allowable leakage, in gallons per hour
- \( S \) = length of pipe tested, in feet
- \( D \) = nominal pipe diameter, in inches
- \( P \) = average test pressure, in pounds per square inch

The following table assumes an average test pressure \( P \) of 150 psi and 1,000 feet of test section.

<table>
<thead>
<tr>
<th>Pipe Diameter (inches)</th>
<th>Allowable Leakage Rate (gallons/hour/1,000 feet of pipe)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>0.33</td>
</tr>
<tr>
<td>6</td>
<td>0.50</td>
</tr>
<tr>
<td>8</td>
<td>0.66</td>
</tr>
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<td>10</td>
<td>0.83</td>
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<td>1.99</td>
</tr>
<tr>
<td>30</td>
<td>2.48</td>
</tr>
<tr>
<td>36</td>
<td>2.98</td>
</tr>
</tbody>
</table>

J. (DELETE) If the average measured leakage per hour exceeds the maximum allowable leakage rate, repair and retest the water main.

3.06 BACTERIA SAMPLING

(REPLACE) Test water mains according to AWWA C651. Repeated failures to produce satisfactory bacteriological results, or if other water quality is affected, will require corrective action up to and including repeating the disinfection procedure or physically cleaning the main as approved by the Engineer.
3.08 (ADD) SYSTEM TRACE

All tracer wire terminal boxes shall be to grade, located appropriate distance from hydrant or valve, and with tracer wire correctly attached. The Jurisdiction shall complete a trace to the new pipe(s), including connections to the existing main. Any tracing deficiencies noted by the Jurisdiction shall be corrected and retraced until the entire system traces correctly.

3.09 (ADD) SYSTEM 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.

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.
WATER PIPE: (Ductile) ANSI/AWWA – A21.51/C151
American, McWane, U.S. Pipe

WATER PIPE: (PVC) AWWA - C900 Pressure Class 150, DR 18
CertainTeed Certa-Lok C900/RJ or C900/RJIB for directionally bored or restrained joint piping

RESTRAINED JOINT PIPE GASKET: ANSI/AWWA C111/A21.11
American Fast-Grip, Amarillo Fast-Grip; McWane Sure Stop 350; SRP Barracuda; U.S. Pipe Field Lok 350

MECHANICAL JOINT RESTRAINT DEVICE: With NSS Cor-Blue Nuts & Bolts
EBAA 1100 and 2000 PV; Tyler Union TUFGrip 1000, 1000S, 1500, 2000, and 2000S

FITTING: ANSI/AWWA A21.10/C110 or C153, 350 psi
Romac Alpha (XL) End Cap, Sigma, Tyler Union, U.S. Pipe

TAPPING SLEEVE: (Full Body Ductile Iron) Stainless Steel and/or NSS Cor-Blue Nuts & Bolts
American Flow Control-Series 2800, Kennedy, Mueller-H615, Tyler Union

TAPPING SLEEVE: (Stainless Steel with 304* Stainless Steel Flange)
Ford FAST, JCM-432, Mueller H304, Romac SST, Smith-Blair 665, TPS Triple Tap Series TS

VALVE: (Resilient Seated Gate Valves) ANSI/AWWA C509, Open Counterclockwise
AVK Series 45, Clow 2640 F-6100, Kennedy 8571 SS, Mueller A-2362-20

VALVE: (Butterfly) ANSI/AWWA C504, Class 150B or Class 250B, Open Counterclockwise
Clow, DeZurik, GAV 800 Series, Kennedy, M & H, Mueller, Pratt Groundhog, Val-Matic

VALVE: (Tapping) ANSI/AWWA C509, Open Counterclockwise
Clow 2640 F-6114, Kennedy 8950 SS, Mueller T-2362-16

VALVE BOX: Slip Type, Heavy Duty
Sigma VB467-35 Top Section with Top Flange, Star Pipe VB-0007; Tyler Union Series 7126, Range 39”-60”

VALVE BOX CENTERING RING:
Adaptor, Inc Valve Box Adaptor II

FIRE HYDRANT: ANSI/AWWA C502, Open Clockwise, 4 ½” (Main Smaller than 12”) or 5 ½” (Main 12” and Larger), with Pumper Nozzle Storz Fitting
American Darling Mark 73-5, American Darling B-84-B-5, Clow F-2545 Medallion with all stainless-steel shaft, Mueller Super Centurion 250

STAINLESS STEEL REPAIR CLAMP: ANSI/AWWA C230, With Stainless Steel Nuts & Bolts
AY McDonald 425/435 Series Teck, Romac SS1, Smith-Blair 261
SLEEVE TYPE COUPLING: **AWWA C219, With Stainless Steel Nuts & Bolts**
Hymax Coupling, Romac Style 501, Romac Alpha (XL) Wide Range Restraint Coupling, Romac Macro HP Two-Bolt Coupling, Smith-Blair Top Bolt 421, Smith-Blair 441

**TRACER WIRE TERMINAL BOX:**
Copperhead SnakePit LD14BTP, CD14BTP, RB14BTP

**TRACER WIRE CONNECTOR: Blue in Color**
Copperhead Industries Snake Bite Locking Connector LSC1230B, Copperhead Industries Direct Bury Single Connector, Twister DB Plus Wire Connector Model 60

**TRACER WIRE: #12 AWG, Blue in Color**
Copperhead, Kris Tech

**FREEZELess YARD HYDRANT:**
Woodford Mfg Iowa Model Y34 and Y1

**SERVICE SADDLE: ANSI/AWWA C800**
AY McDonald 3845, Ford 202BS, Smith-Blair 325

**CORPORATION VALVE: ANSI/AWWA C800, Compression Ball Type**
AY McDonald 74701BQ, Mueller B-25008N

**BALL CURB VALVE: ANSI/AWWA C800, Compression Connection for CTS OD Tubing**
AY McDonald 76100Q, Mueller B25209N

**CURB BOX: ANSI/AWWA C800, Arch Pattern, 5-foot Length (Telescope 1-foot), Slide Style, with 42” Stainless Steel Rod & Cotter Pin**
AY McDonald 5601 and 5603 with 5660SS

**CURB BOX LID: “W” or “Water” Label on Lid**
Cement Applications: AY McDonald 5607L
All Other Applications: AY McDonald 5601L

**STRAIGHT 3-PART UNION: ANSI/AWWA C800**
AY McDonald 74758Q, Mueller H-15403N, Cambridge Coupling

**POLYETHYLENE WRAP: AWWA C105, 8 mil**
V-Bio Enhanced, approved equivalent
DIVISION 6 -
STRUCTURES FOR SANITARY AND
STORM SEWERS
SECTION 6010 – STRUCTURES FOR SANITARY AND STORM SEWERS

1.07 SPECIAL REQUIREMENTS

C. (ADD) Lift holes in sewer pipes are not allowed.

D. (ADD) Casting shall be placed above the outlet side of intakes.

1.08 MEASUREMENT AND PAYMENT

A. Manhole:

3. **Includes:** (REPLACE) Unit price includes, but is not limited to, excavation, furnishing and installing pipe; furnishing, placing, and compacting bedding and backfill material, compaction, base, structural concrete, reinforcing steel, precast units (if used), concrete fillets, pipe connections, infiltration barriers (required for both sanitary and storm sewer manholes), castings, and adjustment rings.

B. Intake:

3. **Includes:** (REPLACE) Unit price includes, but is not limited to, excavation; furnishing and installing pipe; furnishing, placing, and compacting bedding and backfill material; base; structural concrete; reinforcing steel; precast units (if used); concrete fillets; pipe connections; infiltration barriers; castings; and adjustment rings.

F. Manhole or Intake Adjustment Major:

3. **Includes:** (REPLACE) Unit price includes, but is not limited to, removal of existing casting, adjustment rings, top sections and risers, excavation, concrete and reinforcing steel or precast sections, adjustment or replacement of intake throat, furnishing and installing new casting, installing new infiltration barrier (required for both sanitary and storm sewer manholes), furnishing and placing backfill, and compaction.

G. Connection to Existing Manhole or Intake:

3. **Includes:** (REPLACE) Unit price includes, but is not limited to, coring or cutting into the existing manhole or intake, pipe connections, grout, and waterstop.

H. Remove Manhole or Intake:

3. **Includes:** (REPLACE) Unit price includes, but is not limited to, removal of casting, concrete, intake throat, and reinforcement; plugging pipes; filling remaining structure with flowable mortar; and furnishing, placing, and compacting backfill over structure to finished grade. The structure needs to be removed completely unless otherwise approved by the Engineer.

2.03 CAST-IN-PLACE

C. (ADD) All construction joints are to be water tight by use of water stop or other construction methods.
2.05 PRECAST RISER JOINTS

B. Joint Sealant:

1. Sanitary Sewers:
   a. **(REPLACE) Rubber O-ring**: Flexible Joint, complying with ASTM C 443. Profile gasket flexible joints are not allowed on sanitary sewers.

2. Storm Sewers:
   b. **(DELETE) Engineering Fabric Wrap**: If specified in the contract documents, supply engineering fabric wrap complying with Iowa DOT Article 4196.01, B.

2.08 PIPE CONNECTIONS (REPLACE)

A. Sanitary Sewer Manholes:

1. **Flexible, Watertight Seal**: Pipe penetrations into structures shall be a flexible watertight seal. Allowable premanufactured seals include Link-Seal, A-Lok, PSX-Direct Drive boots or engineer approved equal.

B. Storm Sewer Manholes and Intakes: All pipe connections used on sanitary sewers may also be used for storm sewers.

1. Waterstop: Provide elastomeric gasket that surrounds pipe and attaches with stainless steel bands and is designed to stop the movement of water along the interface between a pipe and a surrounding concrete collar. The concrete collar shall comply with Section 6010, 2.03.

2.09 MANHOLE OR INTAKE ADJUSTMENT RINGS (GRADE RINGS)

A. **(REPLACE) Use one of the following materials for grade adjustments of manhole or intake frame and cover assemblies**:

1. Reinforced Concrete Adjustment Rings: Comply with ASTM C 478. Provide rings free from cracks, voids or other defects.

2. High Density Polyethylene Adjustment Rings: Comply with ASTM D 1248 for recycled plastic.

   a. Test and certify material properties by the methods in the following table.

   **Table 6010.02: Test Methods**

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Acceptable Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melt Flow Index</td>
<td>ASTM D 1238</td>
<td>0.30 to 30 g/10 min.</td>
</tr>
<tr>
<td>Density</td>
<td>ASTM D 792</td>
<td>0.94 to 0.98 g/cm³</td>
</tr>
<tr>
<td>Tensile Strength</td>
<td>ASTM D 638</td>
<td>2,000 to 5,000 lb/in²</td>
</tr>
</tbody>
</table>

   b. Do not use polyethylene grade adjustment rings when they are exposed to HMA pavement or heat shrink infiltration barriers unless approved by the Engineer.

   c. When used in a single configuration, provide tapered adjustment ring with thickness that varies from 1/2 inch to 3 inches.
d. Install adjustment rings on clean, flat surfaces according to the manufacturer's recommendations with the proper butyl rubber sealant/adhesive.

3. Expanded Polypropylene Adjustment Rings: Comply with ASTM D 4819 for expanded polypropylene when tested according to ASTM D 2375.
   a. Use adhesive meeting ASTM C 920, Type S, Grade N5, Class 25.
   b. Provide finish rings with grooves on the lower surface and flat upper surface.

2.10 CASTINGS (RING, COVER, GRATE, AND EXTENSIONS)

D. Casting Types:

1. Manholes: (REPLACE) The following table lists the manhole casting types.

<table>
<thead>
<tr>
<th>Figure Number</th>
<th>Casting Type</th>
<th>Number of Pieces</th>
<th>Ring/Cover</th>
<th>Gasket</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sanitary Sewer</td>
<td>6010.601 SW-601 A</td>
<td>2</td>
<td>Fixed$^{2,3}$</td>
<td>Yes$^1$</td>
</tr>
<tr>
<td>6010.601 SW-601 C</td>
<td>2</td>
<td>Fixed$^{2,3}$</td>
<td>Yes$^1$</td>
<td></td>
</tr>
<tr>
<td>Storm Sewer</td>
<td>6010.602 SW-602 E</td>
<td>2</td>
<td>Fixed$^{2,3}$</td>
<td>Yes$^1$</td>
</tr>
<tr>
<td>6010.602 SW-602 G</td>
<td>2</td>
<td>Fixed$^{2,3}$</td>
<td>Yes$^1$</td>
<td></td>
</tr>
</tbody>
</table>

1 Machined bearing surfaces required.
2 Ring and Cover may be bolted as specified in the contract documents or as otherwise approved by the engineer.
3 Cover shall have the Iowa City standard logo and a minimum of one-concealed pick hole. Refer to Figures 6010.601 and 6010.602 for details.

2. Intakes:
   b. (REPLACE) Covers shall have the Iowa City Standard logo.

2.11 ADDITIONAL MATERIALS FOR SANITARY AND STORM SEWER MANHOLES

A. Infiltration Barrier:

1. External Chimney Seal:
   b. Compression Bands:

   3) (REPLACE) For standard two-piece castings, shape top band to lock sleeve to manhole frame’s base flange.

2. Internal Chimney Seal: (REPLACE) allowed only in slip form paving (see 7010 for details on slip form equipment and operations)

   a. Rubber Sleeve Extension:

      1) Double pleated, minimum thickness 1/8 inch thick, according to ASTM C 923.
      2) Minimum allowable vertical expansion of at least 2 inches.
      3) Integrally formed expansion band recess top and bottom with multiple sealing fins.
b. Expansion Bands:
   1) One-piece band assembly to compress sleeve or extension against manhole and casting surfaces to make a watertight seal.
   2) 16 gauge ASTM C 923, Type 304 stainless steel, minimum 1 inch width, minimum adjustment range of 2 inches more than the manhole inside diameter.
   3) Positive stainless steel locking mechanism permanently securing the band in its expanded position after tightening.

4. **(DELETE) Heat Shrink Sleeve**: and all subsections.

B. Riser Section Coating:
   1. Exterior: (REPLACE) When exterior waterproof coating is specified and approved by the Engineer, provide bituminous or coal tar coating.

C. **(ADD) Liner (For Sanitary Sewer Manholes Only):**
   1. High density polyethylene (HDPE) or polyvinyl chloride (PVC) lining can be used if approved by the Engineer.

3.01 **GENERAL REQUIREMENTS FOR INSTALLATION OF MANHOLES AND INTAKES**

E. Pipes:
   1. Cast-in-place Structures:
      a. Storm: (REPLACE) Form or core circular opening and install flexible, watertight gasket or waterstop according to Section 6010, 2.08.
   2. Precast Storm Sewer Manholes or Intakes: (REPLACE) Connect to structure with watertight gasket or waterstop according to section 6010, 2.08.

F. Joint Sealant:
   1. Sanitary Sewer Manholes:
      a. (REPLACE) Install rubber O-ring (precast structures). Profile gasket flexible joints are not allowed on sanitary sewers.
      b. (REPLACE) Apply butyl sealant wrap to exterior of all sanitary sewer manhole joints.
   2. Storm Sewer Manhole and Intakes:
      b. (DELETE) If indicated in the contract documents, apply engineering fabric wrap to joints.

I. Adjusting Ring(s):
   2. (REPLACE) Bed each expanded polypropylene ring with manufacturer’s approved product and according to manufacturer’s recommended installation procedure.
   5. (ADD) For PCC adjustment rings, shim material other than PCC is not allowed.

J. Casting:
2. (ADD) In non-paved areas, the top of the rim on the casting is to be 0.2 feet above the finish grade.

K. Infiltration Barrier: (REPLACE) Install on sanitary and storm sewer manholes. An infiltration barrier is not required for high density polyethylene (HDPE) adjustment rings when instructed by the manufacturer’s recommendations.

1. Internal or External Chimney Seal:
   a. Do not use external chimney seal if seal will be permanently exposed to sunlight.
   b. Extend seal 3 inches below the lowest adjustment ring.
   c. Extend seal to 2 inches above the flange of the casting for a standard two-piece casting.
   d. Use multiple seals, if necessary.
   e. Install compression bands (external chimney seal) or expansion bands (internal chimney seal) to lock the rubber sleeve or extension into place and to provide a positive watertight seal. Once tightened, lock the bands into place. Use only manufacturer recommended installation tools and sealants.

2. Molded Shield:
   a. Clean surface of structure cone section.
   b. Apply sealant to the top surface of the cone section. Use sufficient sealant to accommodate flaws in the surface of the cone section.
   c. Cut molded shield to height by adding the dimensions of the adjustment rings and casting height. Be sure not to interfere with seating of the lid into the casting frame.
   d. Seat the molded shield against the sealant on the cone section.
   e. Add adjustment rings and casting to meet final grade.

3.03 ADDITIONAL REQUIREMENTS FOR PRECAST CONCRETE STRUCTURES (CONTINUED)


3.04 ADJUSTMENT OF EXISTING MANHOLE OR INTAKE

B. Minor Adjustment (Adding or Removing Adjustment Rings):
   4. (REPLACE) Replace infiltration barrier for sanitary and storm sewer manhole using only new materials.

C. Major Adjustment (Adding, Removing, or Modifying Riser or Cone Section):
   5. (REPLACE) Replace infiltration barrier for sanitary and storm sewer manhole using only new materials.

3.05 CONNECTION TO EXISTING MANHOLE OR INTAKE

B. Concrete Collar:
   3. (ADD) Concrete collars must be approved by the Engineer.
C. Sanitary Sewer:

2. Cored Opening: (REPLACE)
   a. Install premanufactured watertight seal and new pipe into the cored opening within the existing manhole in accordance with the manufacturer’s recommendations.

3. (DELETE) Cut and Chipped Opening (knock-out): and all subsections.

D. Storm Sewer:

1. Cut and Chipped Opening:
   a. (REPLACE) Only as approved by the Engineer.
   f. (ADD) Install waterstop around new pipe centered within structure wall.
   g. (ADD) Fill opening between structure and pipe with non-shrink grout.
   h. (ADD) Construct concrete collar around pipe and exterior manhole opening.

2. Cored Opening: (REPLACE)
   a. Use for all pipe sizes unless approved by the Engineer.
   b. Core new opening in existing manhole or intake to accept new pipe and watertight seal or waterstop. Remove concrete and reinforcing steel.
   c. If utilizing waterstop, install around new pipe centered within structure wall. Fill opening between structure and pipe with non-shrink grout. Construct concrete collar around pipe and exterior manhole opening.
   d. If utilizing a premanufactured watertight seal, install in accordance with manufacturer’s recommendations.

3. Fill Opening: (REPLACE) Fill opening between manhole or intake wall and outside of pipe by constructing a concrete collar around the pipe according to Section 6010, 3.05, B.

3.06 DROP CONNECTION TO SANITARY SEWER MANHOLE

A. Internal:

10. (ADD) Internal drop connections should be used for all drop connections unless approved by the Engineer.

B. External:

6. (ADD) External drop connections must be approved by the Engineer.
FIGURES

Sanitary Sewer Manhole Figures

Figure 6010.301 – Circular Sanitary Sewer Manhole
(ADD) Infiltration barrier shown is for illustration purposes only. Approved products include: external chimney seal or molded shield.

Figure 6010.302 – Rectangular Sanitary Sewer Manhole
(ADD) Infiltration barrier shown is for illustration purposes only. Approved products include: external chimney seal or molded shield.

Figure 6010.303 – Sanitary Sewer Manhole Over Existing Sewer
(ADD) Infiltration barrier shown is for illustration purposes only. Approved products include: external chimney seal or molded shield.

Figure 6010.304 – Rectangular Base/Circular Top Sanitary Sewer Manhole
(ADD) Infiltration barrier shown is for illustration purposes only. Approved products include: external chimney seal or molded shield.

Figure 6010.305 – Tee Section Sanitary Sewer Manhole
(ADD) Infiltration barrier shown is for illustration purposes only. Approved products include: external chimney seal or molded shield.

Figure 6010.306 – Chimney Seals for Sanitary Sewer Manholes
(DELETE) Internal chimney seal detail for 2-piece casting.
(DELETE) Chimney seal details for 3-piece castings.
(REPLACE) Figure 6010.308 – Drop Connection for Sanitary Sewer Manhole

Storm Sewer Manhole Figures

Figure 6010.401 – Circular Storm Sewer Manhole
(ADD) Infiltration barrier shown is for illustration purposes only. Approved products include: external chimney seal or molded shield.

Figure 6010.402 – Rectangular Storm Sewer Manhole
(ADD) Infiltration barrier shown is for illustration purposes only. Approved products include: external chimney seal or molded shield.

Figure 6010.403 – Deep Well Rectangular Storm Sewer Manhole
(ADD) Infiltration barrier shown is for illustration purposes only. Approved products include: external chimney seal or molded shield.

Figure 6010.404 – Rectangular Base/Circular Top Storm Sewer Manhole
(ADD) Infiltration barrier shown is for illustration purposes only. Approved products include: external chimney seal or molded shield.
Figure 6010.405 – Tee Section Storm Sewer Manhole  
(ADD) Infiltration barrier shown is for illustration purposes only. Approved products include: external chimney seal or molded shield.

Figure 6010.507 – Single Open-Throat Curb Intake, Small Box  
(ADD) Manhole opening must be over the discharge side of the intake structure.

Figure 6010.508 – Single Open-Throat Curb Intake, Large Box  
(ADD) Manhole opening must be over the discharge side of the intake structure.

Figure 6010.509 – Double Open-Throat Curb Intake, Small Box  
(ADD) Manhole opening must be over the discharge side of the intake structure.

Figure 6010.510 – Double Open-Throat Curb Intake, Large Box  
(ADD) Manhole opening must be over the discharge side of the intake structure.

Figure 6010.545 – Single Open-Throat Curb Intake with Extended Opening  
(ADD) Manhole opening must be over the discharge side of the intake structure.

Castings Figures

(REPLACE) Figure 6010.601 – Castings for Sanitary Sewer Manholes

(REPLACE) Figure 6010.602 – Castings for Storm Sewer Manholes
1. Core drill openings at least 12 inches from existing manhole joints.

2. Install flexible pipe coupler or pipe joint on new sanitary sewer 18 to 24 inches from outside of manhole wall.

3. Align elbow so discharge is directed at outlet pipe or at 45 degrees to manhole flow.

4. Reshape fillet to provide a smooth transition and to direct flow to outlet.

5. If manhole is built new with drop-in connection, use A-LOK connector. If drop-in connection is attached to an existing manhole core hole as required to accept pipe. Install Link-Seal, PSX-Direct drive boot or engineer approved equal water tight connector.
TYPE A
Two-piece fixed casting

TYPE C
Two-piece fixed casting with bolt-down cover

Bolt-down Cover (Type C)

Anchor Bolt Hole

Flange (typ.)

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

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

1. If frame is required to be attached to structure, drill four ½" diameter holes or slots, equally spaced around frame.

2. If specified, furnish bolt down frame and cover with four ½" x 2½" stainless steel, hex head, recessed cap screws. Secure cover with screws, washers, and rubber gasket seals.

Gasket Seal

26" min. 1 1/2"

24" min. 7" min.

35 7/8" min.

TYPICAL SECTION
TYPE E
Two-piece fixed casting

Anchor Bolt Hole

Flange (typ.)

PLAN

TYPE G
Two-piece fixed casting

PLAN

Typical Section

Typical Section

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

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

If frame is required to be attached to structure, drill four 3/8" diameter holes or slots, equally spaced around frame.
SECTION 6020 – REHABILITATION OF EXISTING MANHOLES

1.08 MEASUREMENT AND PAYMENT

   A. Infiltration Barriers:

   2. (DELETE) Molded Shield: and all subsections.

   3. (DELETE) Urethane Chimney Seal: and all subsections.

   2.01 INFILTRATION BARRIER

   B. (DELETE) Molded Shield: Comply with Section 6010, 2.11 for molded shields.

   C. (DELETE) Heat Shrink Sleeve: Comply with Section 6010, 2.11 for heat shrink sleeves.

   D. (DELETE) Urethane Chimney Seal: and all subsections.

   3.01 INFILTRATION BARRIER

   B. (DELETE) Molded Shield: Comply with Section 6010, 3.01.

   C. (DELETE) Urethane Chimney Seal: and all subsections.
DIVISION 7 -
STREETS AND RELATED WORK
SECTION 7010 – PORTLAND CEMENT CONCRETE PAVEMENT

3.01 EQUIPMENT

A. Batching and Mixing Equipment:

3. Mixing:
   d. (ADD) Addition of Mixing Water:
      1) The addition of mixing water at the site of placement will not be allowed unless otherwise approved by the City Engineer. If approved, the batch shall be mixed at least an additional 30 revolutions of the drum at mixing speed.

3.02 PAVEMENT CONSTRUCTION

C. Surface Fixture Adjustment:

3. (REPLACE) Boxouts for adjustment of fixtures will not be allowed unless otherwise approved by the City Engineer.

3.04 PAVEMENT PROTECTION

A. Weather Conditions:

1. Cold Weather:
   c. (ADD) Payment: When cold weather protection is necessary, additional payment will be made as extra work at the rate of $1.00 per square yard of surface protected unless otherwise noted in the contract documents. Payment will be limited to protection necessary within the contract period. Protection necessary after November 15 will be paid for only when the Engineer authorizes work.

FIGURES

(REMOVE) Figure 7010.103 – Manhole Boxouts in PCC Pavement
SECTION 7030 – SIDEWALKS, SHARED USE PATHS, AND DRIVEWAYS

2.07 DETECTABLE WARNINGS

(REPLACE) Detectable warning panels shall be cast iron with brick red color. Comply with the proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way (also known as PROWAG) for contrast and dimension requirements.

3.04 PCC SIDEWALKS, SHARED USE PATHS, AND DRIVEWAYS

F. Jointing:

6. (ADD) Connections to existing sidewalks and shared use paths: comply with Figure 7030.301. All bars must be epoxy coated unless otherwise approved by the Engineer.

FIGURES

(REMOVE) Figure 7030.102 – Concrete Driveway, Type B

(ADD) Figure 7030.301 – Sidewalk Connection
EXISTING 4" CONCRETE SIDEWALK

NEW 6" CONCRETE SIDEWALK

DRILL AND EPOXY GROUT REBAR INTO EXISTING CONCRETE

EXISTING 4" CONCRETE SIDEWALK

NEW 4" CONCRETE SIDEWALK

DRILL AND EPOXY GROUT REBAR 6" INTO EXISTING CONCRETE

#4 EPOXY COATED REBAR X 12" @ 1' ON CENTER
SECTION 7040 – PAVEMENT REHABILITATION

1.07 SPECIAL REQUIREMENTS

(REPLACE) Composite pavements shall be replaced as composite pavement (e.g. 7" PCC and 3" HMA) unless approved by the Engineer.

3.01 GENERAL

G. (ADD) Pavement removal shall be full panels and extend into the nearest full panel at least three feet beyond the trench limits.
DIVISION 8 -
TRAFFIC CONTROL
SECTION 8010 – TRAFFIC SIGNALS

2.01 UNDERGROUND

A. Handhole:

1. General:
   a. **Cable Hooks:** (REPLACE) Provide four galvanized steel cable hooks with a minimum diameter of 3/8 inch and a minimum length of 5 inches. Provide with Type I handholes only.

   3. **Composite Handhole and Cover:** (REPLACE) Composed of mortar consisting of sand, gravel, and polyester resin reinforced by a woven glass fiber mat or of resin mortar and fiberglass. Provide a skid resistant surface on the cover. Provide two 3/8-16 UNC stainless steel hex head bolts with washers. The handholes shall have ANSI Tier 22 ratings and the covers shall have ANSI Tier 15 ratings. Covers shall be two-piece for Type III and Type IV handholes.

B. Conduit:

3. Plastic Conduit and Fittings:
   b. **HDPE:**
      1) (REPLACE) Comply with ASTM F 2160 (conduit) and ASTM D 3350 (HDPE material), SDR 11.
      5) (ADD) Conduit couplers for HDPE to HDPE connections shall be double e-loc couplers.
      6) (ADD) HDPE duct plugs shall be blank expandable duct plugs with elastomeric gaskets and rope loops.

C. Wiring and Cable:

4. **Communications Cable:** (REPLACE) Fiber optic cable as included in the plans, or as approved by the Engineer.

5. **(REPLACE) Category 5E (Cat5E), Category 6 (Cat6), and Category 6A (Cat6A) Cable:** Provide outdoor use rated cable as included in the plans, or as approved by the Engineer.

7. **(ADD) Pull Tape:** Flat polyester pull-tape with a minimum pulling strength of 1250 lbs. and permanent sequential footage markings.

2.02 DETECTION

B. Pedestrian Push Button Detectors:

2. **Accessible Pedestrian Signals (APS) Push Button Stations:**
   i. (ADD) Polara iNavigator 2-Wire Push Button Stations with 9” x 15” front plate adapters and 9”x15” R10-3e faceplates with braille. Button covers shall be black in color.

3. **Solid State Pedestrian Push Buttons (non-APS):**
   e. (ADD) Polara BullDog push buttons. Body color shall be black.
4. **Signs:** (REPLACE) Furnish R10-3e signs complying with MUTCD and with directional arrows as shown on the plans.

C. **Video Detection Camera System:**

3. (ADD) **Equipment:** Iteris Vantage Next video detection system, processors, and cameras.

E. **(ADD) Radar Detection System:**

1. **Equipment:** Wavetronix radar detection system.

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**2.04 CABINET AND CONTROLLER**

A. **NEMA Controller, Cabinet, and Auxiliary Equipment:**

1. **Controller:**
   
   h. (ADD) Siemens m60 Series ATC controller.

2. **Cabinet:**

   j. (ADD) The cabinet shall contain strong mounting shelves to accommodate the mounting of the controller and all auxiliary equipment. The mounting shelves shall permit the controller and all auxiliary equipment to be withdrawn from the cabinet for inspection or maintenance without breaking any electrical connections or interrupting operation of the controller.

   k. (ADD) The cabinet shall contain two thermostatically controlled duct fan units with a minimum rating of 100 CFM in free air shall be installed in the cabinet to provide forced air ventilation through the cabinet. The fan unit shall be mounted to the inside top of the cabinet and shall be easily removed and replaced without having to dismantle any part of the cabinet or exhaust duct system. The thermostat controlling the fans shall be manually adjustable to turn on between 90 degrees F and 150 degrees F with a differential of not more than 10 degrees F between automatic turn-on and turn-off. The fans shall intake air through filtered vents located near the bottom of the cabinet or cabinet door and exhaust it through a weather-proof, screened duct located near the top of the cabinet. Fiberglass type dry filters shall be used to cover the air intakes into the cabinet. These filters shall be easily removed and replaced and be of standard dimensions commercially available. The filters shall be provided with positive retention on all sides to prevent warpage and entry of foreign matter around the edges.

   l. (ADD) Provide a piggy back cabinet for the battery backup system.

B. **Uninterruptible Power Supply Battery Backup System:**

5. (ADD) Alpha Technologies battery backup system with an ethernet interface for remote monitoring.
2.05 POLES, HEADS, AND SIGNS

A. Vehicle Traffic Signal Head Assembly:

1. Housing:
   a. (REPLACE) Individual signal sections made of durable polycarbonate. Color shall be black and integral to the materials composition.

7. Mounting Hardware:
   c. (ADD) All traffic signal heads shall be side mounted when installed on a vertical pole. Post top mounting is not allowed. Factor side mounting and minimum mounting height requirements when determining pedestal pole shaft lengths.

8. LED Modules: (REPLACE) Comply with current ITE standards. LED modules shall be provided with a 15-year performance warranty.

B. Pedestrian Traffic Signal Head Assembly:

1. Housing:
   a. (REPLACE) Made of a durable polycarbonate. Color shall be black and integral to the materials composition.
   b. (REPLACE) Self-contained unit capable of separate mounting or inclusion in a signal face containing two signal sections rigidly and securely fastened together.

3. LED Module:
   c. (ADD) LED modules shall be provided with a 15-year performance warranty.

C. Traffic Signal Poles and Mast Arms:

1. General:
   c. (REPLACE) Use continuously tapered, round, steel poles of the anchor base type. Fabricate poles from low carbon (maximum carbon 0.30%) steel of U.S. standard gauge.
   i. (ADD) Luminaire mounting height shall be 30 feet unless otherwise specified.

E. Pedestrian Push Button Post:

1. Material: (REPLACE) Use Frey Manufacturing Corporation Crosswalk Pedestals that comply with Figure 8010.106, as revised. Materials shall be painted black, per manufacturer’s recommendations, when installed in the Downtown area.

3.01 UNDERGROUND

A. Handhole:

2. Excavation: (REPLACE) Excavate as necessary to accommodate the handhole and granular base. The Contractor is responsible for incidental sidewalk removal and replacement necessary to complete the signal construction. Whenever excavation is made across parkways, gravel driveways, sodded areas or other surfaces, the sod, topsoil,
crushed stone and gravel shall be replaced or restored as nearly as possible to its original condition and the whole area involved shall be left in a neat and presentable condition. Concrete sidewalk pavements, base courses, bituminous surfaces and other disturbed surfaces shall be replaced with new materials and the cost shall be incidental to the work. All waste material and debris shall be disposed of at a sanitary landfill, or other site approved by the Engineer, at the Contractor’s expense.

5. **Conduit:**
   
   d. (ADD) Cap unused conduits with duct plugs.

6. **Cable Hooks:** (REPLACE) Install cable hooks centered between the knockouts and the top of the handhole for Type I handholes only.

B. **Conduit:**

1. **General:**
   
   a. (REPLACE) Place conduit to a minimum depth of 30 inches and a maximum depth of 48 inches below the gutterline. When conduit is placed behind the curb, place to a minimum depth of 30 inches and a maximum depth of 48 inches below top of curb.

   e. (REPLACE) Install duct plugs in conduit ends. When duct plugs are not practical, pack conduit ends with conduit sealing compound.

   f. (ADD) Install pull tape in each conduit segment and secure to duct plugs at each end.

2. **Trenched Installation:**

   c. (ADD) The Contractor is responsible for incidental sidewalk removal and replacement necessary to complete the signal construction. Whenever excavation is made across parkways, gravel driveways, sodded areas or other surfaces, the sod, topsoil, crushed stone and gravel shall be replaced or restored as nearly as possible to its original condition and the whole area involved shall be left in a neat and presentable condition. Concrete sidewalk pavements, base courses, bituminous surfaces and other surfaces shall be replaced with new materials and the cost shall be incidental to the work.

C. **Wiring and Cable:**

1. (REPLACE) Where practical, follow color codes and ensure cables are properly labeled at the controller with durable labels, or other appropriate methods, attached to the cables. Label home runs for signal and video cables as follows: northeast corner is blue, southeast corner is orange, southwest corner is yellow, and northwest corner is green. Other Iowa City cable and color codes are as follows:

   - Left turn signals = 1 tape
   - Through signals = 2 tapes
   - Right turn signals = 3 tapes
<table>
<thead>
<tr>
<th>4 Conductor Cables</th>
<th>7 Conductor Cables</th>
<th>9 Conductor Cables – Pedestrian Signals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green ball = green</td>
<td>Green ball = green</td>
<td>Main street walk = green</td>
</tr>
<tr>
<td>Yellow ball = black</td>
<td>Yellow ball = orange</td>
<td>Main street don’t walk = red</td>
</tr>
<tr>
<td>Red ball = red</td>
<td>Red ball = red</td>
<td>Side street walk = green/black</td>
</tr>
<tr>
<td>Common = white</td>
<td>Green arrow = blue</td>
<td>Side street don’t walk = red/black</td>
</tr>
<tr>
<td></td>
<td>Yellow arrow = black</td>
<td>Common = white</td>
</tr>
<tr>
<td></td>
<td>Common = white and</td>
<td>Main street push button = orange</td>
</tr>
<tr>
<td></td>
<td>white/black</td>
<td>Side street push button = black</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Common = white/black</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Common = blue</td>
</tr>
</tbody>
</table>

D. **Footings and Foundations:**

1. **Excavation:** (ADD) The Contractor is responsible for incidental sidewalk removal and replacement necessary to complete the signal construction. Whenever excavation is made across parkways, gravel driveways, sodded areas or other surfaces, the sod, topsoil, crushed stone and gravel shall be replaced or restored as nearly as possible to its original condition and the whole area involved shall be left in a neat and presentable condition. Concrete sidewalk pavements, base courses, bituminous surfaces and other surfaces shall be replaced with new materials and the cost shall be incidental to the work.

4. **(ADD) Removal:** Where shown on the plans, the Contractor shall remove the top of the existing mast arm footings, anchor bolts, and conduits to 36 inches below the existing top of curb or edge of pavement elevation. Waste materials shall be removed from the site and disposed in accordance with local regulations. Backfilling for the removal shall be performed according to Section 3010. The upper 6 inches of the removal area, if outside the proposed pavement, shall be backfilled with topsoil.

3.02 **DETECTION**

D. **(ADD) Radar Detection System:** Install according to the manufacturer’s recommendations and as specified in the contract documents.

3.05 **POLES, HEADS, AND SIGNS**

A. **Vehicle and Pedestrian Traffic Signal Heads:**

5. **(ADD)** Pole mounted signal heads and pedestrian push buttons are shown on the plans and schematic drawings in schematic form only. Pole mounted signal heads are generally intended to be mounted on the face of pole with respect to oncoming traffic. Modifications to this are required when the view of the pole mounted signal indication is blocked. Pedestrian push buttons shall be located on the pole face so the arrow on the R10-3e sign directs pedestrians to the appropriate crosswalk.

The location of signal heads in which the view of the indications is blocked or partially blocked by utility poles, trees, other signal heads or any physical obstructions shall be adjusted to a location approved by the Engineer. Standard heights and locations shown on the plans are typical for unobstructed locations. Signal heads installed without approval of the Engineer, which in the opinion of the Engineer are obstructed, shall be relocated at the Contractor’s expense. Holes in the poles due to this signal relocation shall be plugged in a manner acceptable to the Engineer.
FIGURES

(REPLACE) Figure 8010.106 – Pedestrian Pole and Pedestrian Post Details

Figure 8010.302 – Traffic Signal Pole Foundation

(ADD) Only circular footing tops can be used.

(ADD) Top of footing should be 2 inches above finish grade.

(ADD) All types should have a 1” chamfer on the top of the foundation as shown on the Type B Foundation.
SECTION 8020 – PAVEMENT MARKINGS

3.01 EQUIPMENT

C. Pavement Marking Removal:

4. (ADD) Removing pavement markings should be done by water blasting unless grinding is approved by the Jurisdiction.

H. Removal of Pavement Markings:

2. Process:

   d. (ADD) Removing pavement markings should be done by water blasting unless grinding is approved by the Jurisdiction.

SECTION 8030 – TEMPORARY TRAFFIC CONTROL

1.07 SPECIAL REQUIREMENTS

D. (ADD) Only put up temporary traffic control when work is to occur. Temporary traffic control cannot stay up just for staging of equipment or storage materials.