



CITY OF IOWA CITY
UNESCO CITY OF LITERATURE

SUPPLEMENTAL SPECIFICATIONS

February 2025

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* Divisions listed above in *grey-italicized font* do not have supplemental specifications.

DIVISION 1 -
GENERAL PROVISIONS AND
COVENANTS

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(ADD) RECORD DOCUMENTATION REQUIREMENTS

The document is attached to the end of this Division.

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.

(ADD) CRITICAL CLOSURE. This closure involves no through traffic and will limit or remove local access. Critical closure is synonymous with full or complete closure. Such a closure will be specified. Critical closures will typically include an incentive/disincentive.

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

(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. cleanup or 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 Section [1090, 1.08 – Acceptance and Final Payment](#).

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

JURISDICTION. (REPLACE) City of Iowa City, Iowa, a municipal corporation. Authority Having Jurisdiction (AHJ) and Fire Code Official are specific departments, divisions, and people within the Jurisdiction. Consult with the Engineer for the appropriate contacts to be used.

(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 be bound in one

or more volumes, is contained in the table(s) of contents within the Project Manual. 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 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. cleanup or 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

B. (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.

1.12 SUBMISSION OF THE PROPOSAL

A. (REPLACE) The proposal shall be sealed in an envelope, properly identified as the proposal with the project title and the name and address of the bidder, and deposited with the Jurisdiction at or before the time and at the place provided in the Notice to Bidders and/or the Instructions to Bidders. It is the sole responsibility of the bidder to see its proposal is delivered to the Jurisdiction prior to the time for opening bids, along with the appropriate bid security sealed in the separate

envelope identified as bid security and attached to the outside of the bid proposal envelope. Any proposal received after the scheduled time for the receiving of proposals will be returned to the bidder unopened and will not be considered. If the Jurisdiction provides envelopes for proposals and bid security, bidders shall be required to utilize such envelopes in the submission of their bids.

1.14 OPENING OF PROPOSALS

(REPLACE) At the time and place set forth in the Project Manual, 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 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.

1.03 AWARD OF CONTRACT

A. **Contract Document Submittal:** (REPLACE) Within 10 calendar days after notification by the Engineer, unless otherwise provided in the contract documents, the Contractor shall present the signed and executed contract documents, including contract, performance, payment, and maintenance bond; certificate of insurance; and all other items required by the contract documents. The performance, payment, and maintenance bond and insurance certificate shall meet the requirements of Section 1070, [Part 3 - Bonds and Insurance](#) as required by the Jurisdiction. The Contractor must demonstrate an active subscription to Doc Express (program by Info Tech, Inc.) is maintained. The Jurisdiction will thereupon receive and file such documents and award the contract.

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. Contract
3. Addenda
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. The percentage markup to be allowed to the Contractor for extra work performed by a Subcontractor shall be in accordance with Section [1090, 1.04, C](#).

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.

C. (ADD) Change orders will be processed through Doc Express, a program by Info Tech, Inc.

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 1050 – CONTROL OF WORK

1.05 SHOP DRAWINGS, CERTIFICATES, AND EQUIPMENT LISTS

A. Submission of Drawings:

1. (REPLACE) The Contractor shall submit to the Engineer all shop drawings and equipment drawings or lists in Doc Express (a program by Info Tech, Inc.) or as requested by the Engineer. Drawings and listings shall be complete and shall contain all required detail information conveyed according to the latest recommended standards for detailing. Submitted materials shall be placed in the correct Doc Express Drawer and files named according to the most recent version of the Iowa DOT Doc Express Drawers, Document Types, and Naming Convention, which is found here: https://iowadot.gov/local_systems/Post-Letting-Resources/Doc-Express-and-Appia.

SECTION 1060 – CONTROL OF MATERIALS

1.08 BULK WATER USE

- A. The Contractor can use bulk water in a tanker truck, use a meter installed by the City of Iowa City, or provide water by another method approved by the Engineer. Utilize an approved double check backflow assembly or open gap.
1. Tanker Trucks Using Bulk Water Stations:
 - a. Tanker trucks can be filled at two bulk water stations in Iowa City. This water is not to be used for drinking or cooking, only for contractors. To use this service, tokens must be purchased during office hours at Iowa City Transit, 1200 South Riverside Drive, or from the Revenue Counter at City Hall, 410 East Washington Street. Tokens are 50 cents per 100 gallons of water.
 2. Bulk Water Station Locations:
 - a. Iowa City Transit, 1200 South Riverside Drive, available 24 hours per day and 7 days per week, except for winter months.

- b. East Side Recycling Center, 2401 South Scott Boulevard, during regular business hours.
3. Contact Neighborhood and Development Services (NDS), during regular business hours, for arranging a meter on an approved hydrant location.

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 age, color, creed, disability (unless such disability is related to job performance of such person or employee), gender identity, marital status, national origin, race, religion, sex, sexual orientation, or other class/category protected by federal, state, or local law.

To discharge from employment or refuse to hire any individual because of age, color, creed, disability (unless such disability is related to job performance of such person or employee), gender identity, marital status, national origin, race, religion, sex, sexual orientation, 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. (REPLACE) 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.

2.07 PROTECTION OF ABOVEGROUND AND UNDERGROUND FACILITIES

E. (ADD) Surface restoration for utility exploration (i.e. pavement replacement, seeding, sodding, and other vegetation) will be performed at no additional cost to the Jurisdiction.

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.

1.13 BREACH OF CONTRACT

A.

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;
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**1.02 SCOPE OF PAYMENT**

- D. (ADD) Tracking of quantities and payments will be processed through Appia, a program by Info Tech, Inc., based on the determination in [1090](#), 1.01.

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, not less than weekly, concurrent with Section [1040](#), 1.05 – Plans and Section [1080](#), 1.03 – Work Progress and Schedule.

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, including, but not limited to:
 - a) Northing, easting, and elevations. All submitted spatial data will meet the State of Iowa Minimum Standards for Land Surveying using the Iowa State Plane South Coordinate System – NAD83 and units in US Foot.
 - b) RTK Survey-Grade GPS Technology will be utilized.
 - c) Horizontal and vertical accuracy will be within two centimeters.
 - d) See attached Record Documentation Requirements.

- 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.

Record Documentation Requirements

Record documentation is required for all projects in accordance with Section [1F-1](#) – Plans of Record in the SUDAS Design Manual, Section [1090](#) of the SUDAS Standard Specifications and as amended by the City of Iowa City [Supplemental Specifications](#). All required record documentation is to be submitted to the City of Iowa City Engineering Division before the public improvements and work on a construction project will be accepted. Liquidated damages can be considered for failing to provide adequate record documentation.

For each project, these apply:

1. Markup up record sets (e.g. redlines) must be provided in a.pdf format file. The file must not have restrictions on its use (e.g. passwords).
2. Surveyed information will provide northing, easting, and elevations.
 - a. All submitted spatial data will meet the State of Iowa Minimum Standards for Land Surveying using the Iowa State Plane South Coordinate System – NAD83 and units in US Foot.
 - b. RTK Survey-Grade GPS Technology will be utilized.
 - c. Horizontal and vertical accuracy will be within two centimeters.
3. Surveyed information will be provided either in a format that is recognizable to:
 - a. AutoDesk AutoCAD and Civil 3D. Preferred file types are .dxf, .dwg, or .xml.
 - b. ESRI ArcGIS Pro with the applicable geodatabase, metadata, and shape files need to be provided.

While meeting the General Requirements above, surveyed record documentation includes **all of the information listed in Section 1F-1, B of the SUDAS Design Manual**, as well as the following:

3. Sewer Plans:

(ADD) Both sanitary and storm sewers.

- a. (ADD) All inverts will be measured straight vertically, not at an angle from the opening
- b. (ADD) Pipe segments are drawn from the center of the manhole or structure, not the center of the lid.

5. Water Main Plans:

- a. (ADD) Curb stop boxes.
- b. (ADD) All pipes are to be surveyed as needed to accurately draw the line and grade.
- g. (ADD) Structures including: rim and edges of the structure above and below grade.

7. Sidewalks and Curb Ramps:

- g. (ADD) Boundaries and slopes

DIVISION 2 -
EARTHWORK

SECTION 2010 – EARTHWORK, SUBGRADE, AND SUBBASE

1.08 MEASUREMENT AND PAYMENT

F. Below Grade Excavation (Core Out): If unsuitable or unstable soil is encountered below the 12 inches of subgrade, measurement and payment for removal and replacement of such materials is as follows:

- 3. Includes:** (REPLACE) Payment includes, but is not limited to, equipment, tools, labor, disposal of unsuitable materials, dewatering, drying, furnishing, and placement of foundation materials as required by the Engineer, compaction and finishing of the excavated area, and all incidental work as may be required. Foundation materials for this item shall be Macadam Stone Base (Iowa DOT Gradation #13) unless otherwise approved by the Engineer.

K. Removals:

- 1. Structures:**

- c. Includes:** (REPLACE) Unit price includes, but is not limited to, trench excavation, dewatering, removal of existing structure, furnishing, backfilling, and compacting backfill material in the resulting void, and proper disposal of existing structures. Backfill shall be Class II Material (see Section [3010](#), [2.03.A – Class II Material](#)). Backfill material will not be measured separately but shall be considered incidental.

3.03 EXCAVATION

B. Pavement Removal:

- 5. (ADD)** Pavement removal shall be full panels and extend into the nearest full panel at least three feet beyond the trench limits, unless approved by the Engineer.

DIVISION 3 -
TRENCH AND TRENCHLESS
CONSTRUCTION

SECTION 3010 – TRENCH EXCAVATION AND BACKFILL

1.03 SUBMITTALS

D. (ADD) Cellular Concrete:

1. Design mix, giving dry weights of cement, saturated surface-dry weights of aggregate, types, names and percent of admixtures, air content, and water used per cubic yard.
2. Initial and final set times of design mix as determined by ASTM C403.
3. Quality Control:
 - a. Experience of ready mix plants supplying cellular concrete.
 - b. Experience of specialty contractors supplying cellular concrete. Use skilled workers who are thoroughly trained, experienced and familiar with the specified requirements and the methods for proper performance of this work.
 - c. Laboratory test data on seven (7) and twenty-eight (28) day strengths.
4. Quality Assurance:
 - a. Ready mix plants and specialty contractors shall have a minimum of two years' experience producing cellular concrete of the type required. Submit list of projects including quantity, density and strength of cellular concrete supplied for similar projects in past two years as proof of experience.

1.08 MEASUREMENT AND PAYMENT

- A. General:** (REPLACE) The following items are incidental to the underground utility being installed or removed and will not be paid separately:
1. Standard trench excavation.
 2. Removal and disposal of unsuitable backfill material encountered during standard trench excavation.
 3. Removal and disposal of abandoned private utilities encountered during trench excavation.
 4. Furnishing and placing granular bedding material.
 5. Furnishing, placing, and compacting backfill material.
 6. Dewatering including, but not limited to, all equipment such as generators, pumps, rock for sump pits, discharge piping, and any extra excavation needed to facilitate dewatering according to stormwater regulations, as applicable.
 7. Sheet piling, shoring, and bracing.
 8. Adjusting the moisture content of excavated backfill material to the range specified for placement and compaction.
 9. Temporary support for existing water, sewer, gas, telephone, electric, and other utilities or services that cross the trench.

2.01 MATERIALS EXCAVATED FROM A TRENCH

- A. Standard Trench Excavation:** All materials encountered during trench excavation, except rock and over-excavation.

1. **Suitable Backfill Material:** (REPLACE) Class II, Class III, Class IVA, or Class IVB as defined in Section [3010](#), 2.02 and 2.03.
2. **Unsuitable Backfill Material:** Includes, but is not limited to, the following materials:
 - a. (REPLACE) Soils not classified as suitable backfill material, as defined in Section [3010](#), 2.02 and 2.03.

2.03 BACKFILL MATERIAL

(ADD) Under and within five feet of paved surfaces, including, but not limited to, streets, sidewalks, and driveways, Class II Backfill Material is to be used and 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.

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.

2.06 SPECIAL PIPE EMBEDMENT AND ENCASEMENT MATERIAL

E. (ADD) Cellular Concrete:

1. Materials:

- a. Cellular concrete shall consist of Portland Cement, aggregate, admixtures, and enough water to allow the material to flow freely. Cellular concrete shall be self-leveling and self-compacting.
- b. Unless otherwise noted, all materials shall comply with requirements of ACI 229R.
- c. Portland Cement – ASTM C150 – Type I or Type II.
- d. Foam Liquid Concentrate: Concentrate per ASTM C869 when tested in accordance with ASTM C796.
- e. Fine Aggregate: ASTM C33.
- f. Admixtures: Certified to be compatible with each other. Admixtures shall not contain calcium chloride. Fly ash shall not be used in mix that will be in direct contact with any soils.
- g. Water: Potable, clean and containing less than 100 parts per million (ppm) of chlorides. Free of any substances deleterious to lightweight cellular concrete foaming agent.

2. Mix Design:

- a. Consistency: The mixture of cement, aggregate, water and admixtures shall be proportioned to create a flowable slurry with a minimum flow of 8-inches when tested in accordance with ASTM D6103. The mix must be a homogenous slurry so the materials do not segregate upon deposition. Bleed water shall be no greater than 10 percent of the mixing water as measured by Method A of ASTM C232.
- b. Proportioning and Design of Mixes. Field experience test data or laboratory test batches prepared in accordance with ACI 211.1 and ACI 301.
- c. Cellular Concrete:
 - 1) Excavatable by machine.
 - 2) Low density, non-bleeding cellular concrete.

- 3) Portland Cement and water slurry blended with a high stability pre-generated foaming agent.
- 4) Fluid (10-inch slump), pumpable.
- 5) Wet Density: greater than 30 pounds per cubic foot (pcf).
- 6) Twenty-eight (28) day Compressive Strength: 100 pounds per square inch (psi) minimum.
- 7) If water is present in the structure being abandoned, the cellular concrete shall have a minimum density of 70 pcf.

3. Mixing:

- a. Sufficient mixing capacity shall be provided to permit the cellular concrete to be placed without interruption. The mixer drum shall be completely emptied prior to the initial batch of cellular concrete to make sure that no additional cement fines are incorporated into the mix.

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

- A. **General:** (ADD) Comply with [Figure 3010.201](#), which includes specific trench bedding and backfill requirements for typical pipe materials used within the City. The same requirements (detailed in this section) for backfilling during installation will apply to backfilling during removal of pipes and other utilities.

Under and within five feet of paved surfaces, including, but not limited to, streets, sidewalks, and driveways, Class II Backfill Material is to be used and 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.

D. Primary and Secondary Backfill:

2. Granular Material:

- b. (REPLACE) Compact Class I Backfill Material to at least 65% relative density. Compact Class II Backfill Material to at least 95% Standard Proctor Density.

3. Suitable Backfill Material:

- b. (REPLACE) Compact Class II Backfill Material to 95% Standard Proctor Density.

E. Final Trench Backfill:

3. Class I and Class II Backfill Material: (REPLACE)
 - a. Under and within five feet of paved surfaces, including, but not limited to, streets, sidewalks, and driveways, Class II 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. If not under pavement or within five feet of paved surfaces, backfill with Class II Backfill Material to within 12 inches of finished surface. Class II Backfill Material is to be compacted to at least 95% Standard Proctor Density.
 - c. If Class I Backfill Material is specified, compact to at least 65% relative density within right-of-way and at least 50% relative density outside right-of-way.
4. Class III and Class IVA Backfill Material: (REPLACE) these materials may not be used in any circumstance under and within five feet of paved surfaces, but not limited to, streets, sidewalks, and driveways.
 - a. Compact to at least 90% of Standard Proctor Density outside right-of-way.
 - b. Obtain required compaction within a soil moisture range of optimum moisture to 4% above optimum moisture content.
5. (REPLACE) In areas to remain unpaved and not within five feet of paved surfaces, terminate backfill material 12 inches below finished grade. Use Class V Material (e.g. topsoil) for the final 8 inches above trench backfill material. The remaining four inches will be compacted with the remainder of the backfill according to Section [3010](#), 3.05, E, 4.

FIGURES

(ADD) Figure 3010.201 – Specific Trench Bedding and Backfill Zones

NOTES:

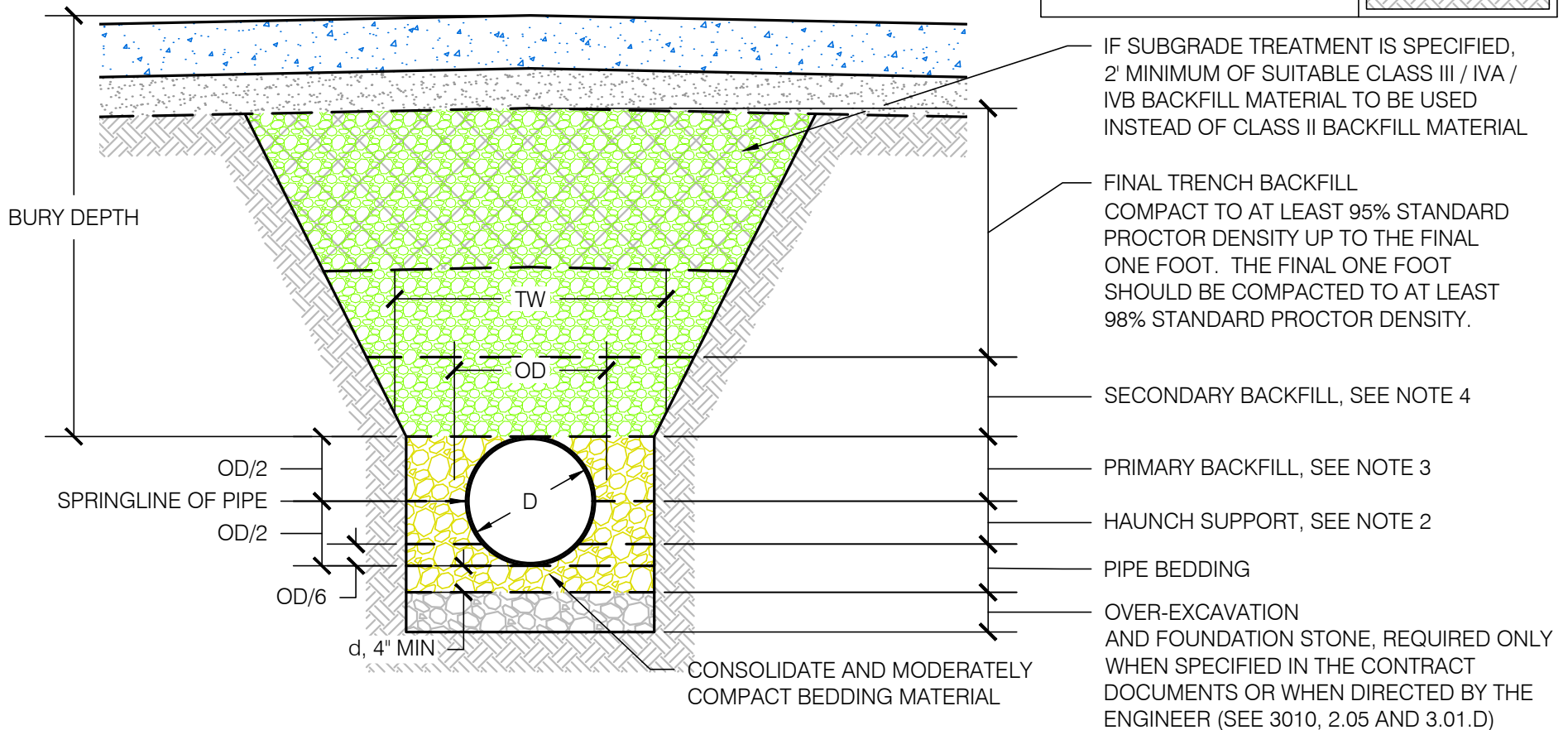
1. REFER TO THE CONTRACT DOCUMENTS FOR SPECIFIC MATERIAL AND PLACEMENT REQUIREMENTS.
2. CONSOLIDATE AND MODERATELY COMPACT BY SLICING WITH A SHOVEL OR USING OTHER APPROVED TECHNIQUES.
3. COMPACT TO AT LEAST 65% RELATIVE DENSITY.
4. COMPACT TO AT LEAST 95% STANDARD PROCTOR DENSITY.
5. PROTECT PIPE, ACCESSORIES, AND APPURTENANCES DURING PLACEMENT AND COMPACTION OF BEDDING AND BACKFILL MATERIALS.

KEY:

OD = OUTSIDE DIAMETER OF PIPE
 D = INSIDE DIAMETER OF PIPE

TW = MINIMUM TRENCH WIDTH AT TOP OF PIPE =
 OD + 18" OR 1.25XOD + 12" (WHICHEVER IS GREATER)
 d = DEPTH OF BEDDING MATERIAL BELOW PIPE

LEGEND	
CLASS I BEDDING MATERIAL	
CLASS II BACKFILL MATERIAL	
OVER-EXCAVATION AND FOUNDATION STONE	
PAVEMENT	
SUBBASE	
UNDISTURBED EARTH	



NOTES:

1. REFER TO THE CONTRACT DOCUMENTS FOR SPECIFIC MATERIAL AND PLACEMENT REQUIREMENTS.
2. CONSOLIDATE AND MODERATELY COMPACT BY SLICING WITH A SHOVEL OR USING OTHER APPROVED TECHNIQUES.
3. COMPACT TO AT LEAST 65% RELATIVE DENSITY.
4. COMPACT TO AT LEAST 95% STANDARD PROCTOR DENSITY. OBTAIN REQUIRED COMPACTION WITHIN A SOIL MOISTURE RANGE OF OPTIMUM MOISTURE TO 4% ABOVE OPTIMUM MOISTURE CONTENT.
5. PROTECT PIPE, ACCESSORIES, AND APPURTENANCES DURING PLACEMENT AND COMPACTION OF BEDDING AND BACKFILL MATERIALS.

KEY:

OD = OUTSIDE DIAMETER OF PIPE

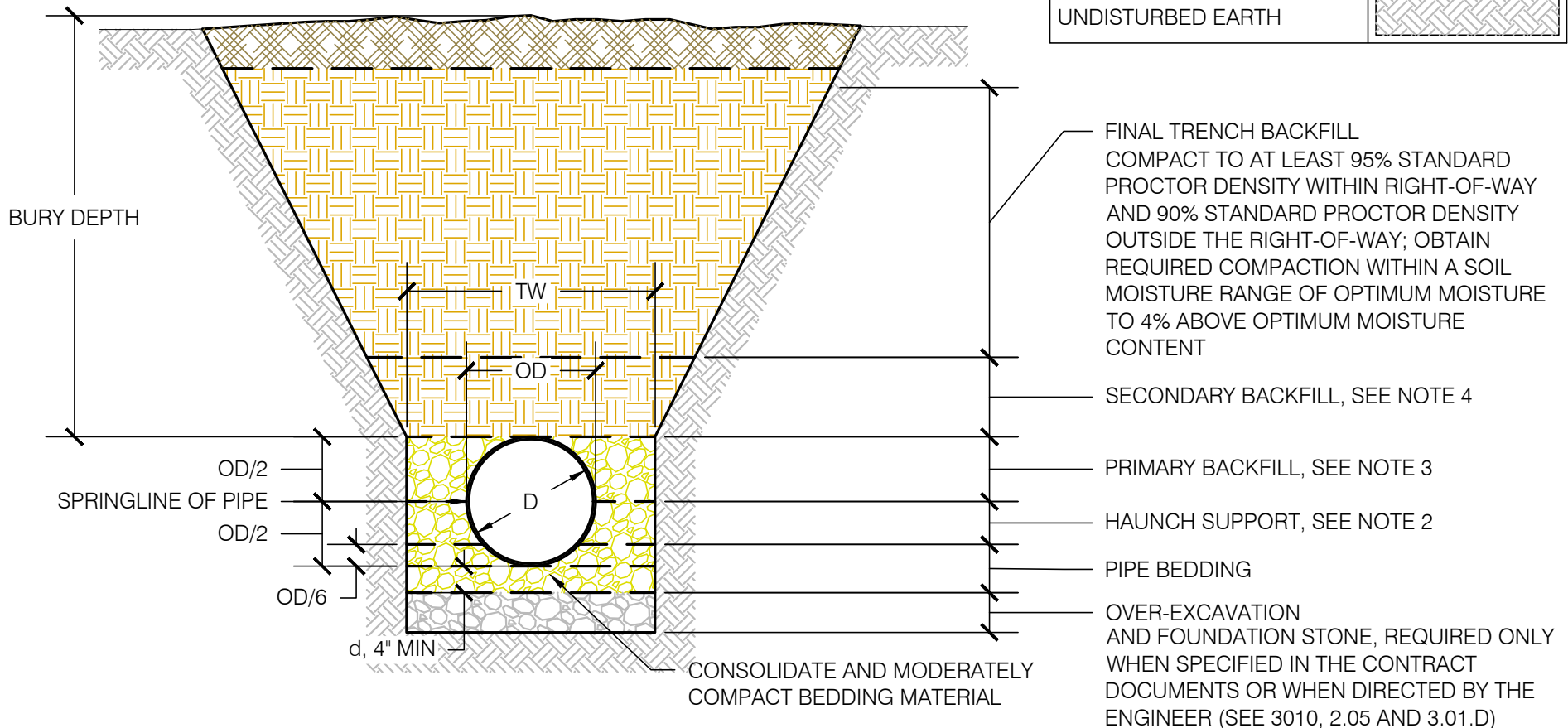
D = INSIDE DIAMETER OF PIPE

TW = MINIMUM TRENCH WIDTH AT TOP OF PIPE =

OD + 18" OR 1.25XOD + 12" (WHICHEVER IS GREATER)

d = DEPTH OF BEDDING MATERIAL BELOW PIPE

LEGEND	
CLASS I BEDDING MATERIAL	
CLASS II BACKFILL MATERIAL	
CLASS III / IVA / IVB SUITABLE BACKFILL MATERIAL	
OVER-EXCAVATION AND FOUNDATION STONE	
CLASS V BACKFILL MATERIAL (E.G. TOPSOIL)	
UNDISTURBED EARTH	



NOTES:

1. REFER TO THE CONTRACT DOCUMENTS FOR SPECIFIC MATERIAL AND PLACEMENT REQUIREMENTS.
2. CONSOLIDATE AND MODERATELY COMPACT BY SLICING WITH A SHOVEL OR USING OTHER APPROVED TECHNIQUES.
3. COMPACT TO AT LEAST 95% STANDARD PROCTOR DENSITY.
4. PROTECT PIPE, ACCESSORIES, AND APPURTENANCES DURING PLACEMENT AND COMPACTION OF BEDDING AND BACKFILL MATERIALS.

KEY:

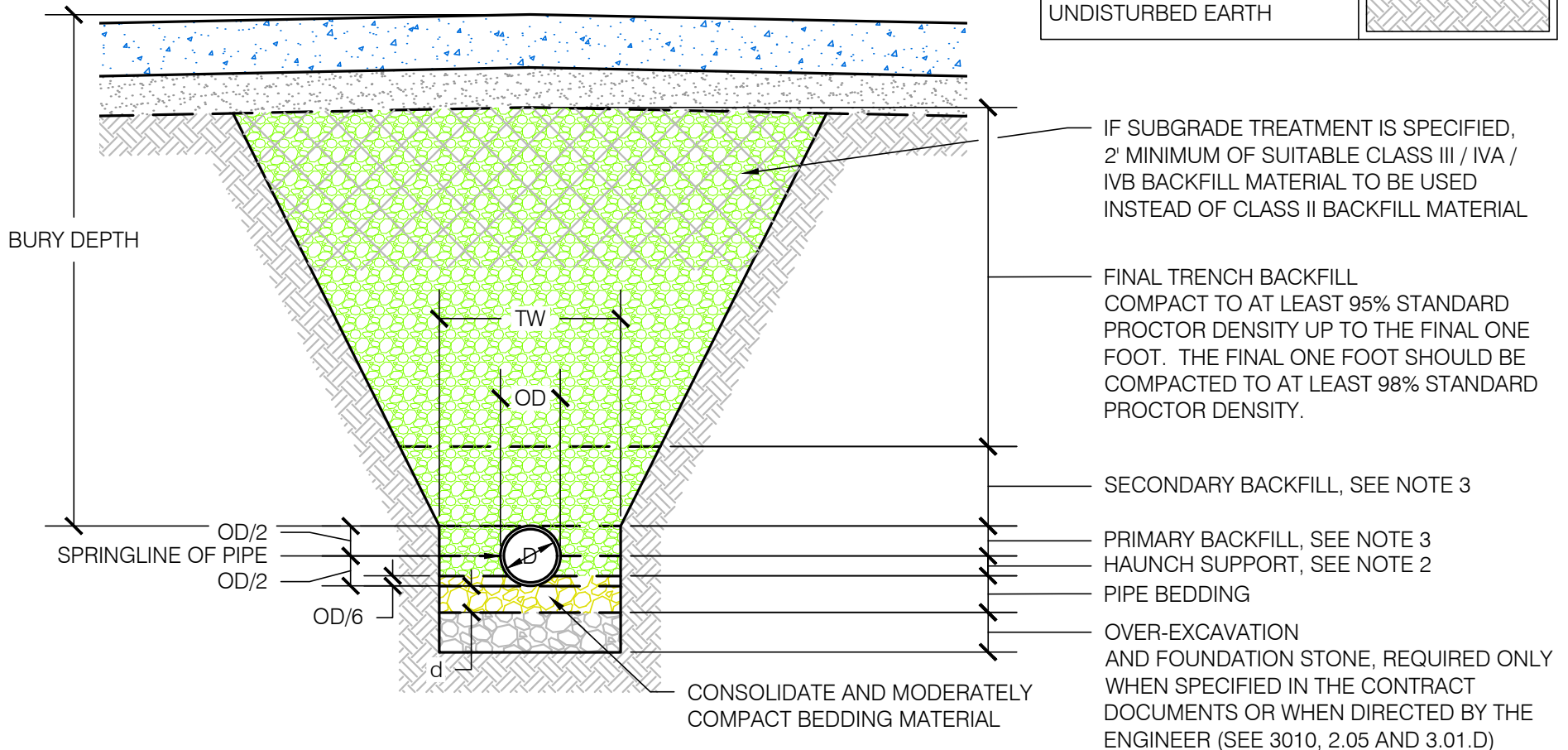
OD = OUTSIDE DIAMETER OF PIPE

D = INSIDE DIAMETER OF PIPE

TW = MINIMUM TRENCH WIDTH AT TOP OF PIPE = $OD + 18"$ OR $1.25 \times OD + 12"$ (WHICHEVER IS GREATER)

d = MINIMUM DEPTH OF BEDDING MATERIAL BELOW PIPE = $OD/8$ OR $4"$ (WHICHEVER IS GREATER)

LEGEND	
CLASS I BEDDING MATERIAL	
CLASS II BACKFILL MATERIAL	
OVER-EXCAVATION AND FOUNDATION STONE	
PAVEMENT	
SUBBASE	
UNDISTURBED EARTH	



NOTES:

1. REFER TO THE CONTRACT DOCUMENTS FOR SPECIFIC MATERIAL AND PLACEMENT REQUIREMENTS.
2. CONSOLIDATE AND MODERATELY COMPACT BY SLICING WITH A SHOVEL OR USING OTHER APPROVED TECHNIQUES.
3. COMPACT TO AT LEAST 95% STANDARD PROCTOR DENSITY.
4. PROTECT PIPE, ACCESSORIES, AND APPURTENANCES DURING PLACEMENT AND COMPACTION OF BEDDING AND BACKFILL MATERIALS.

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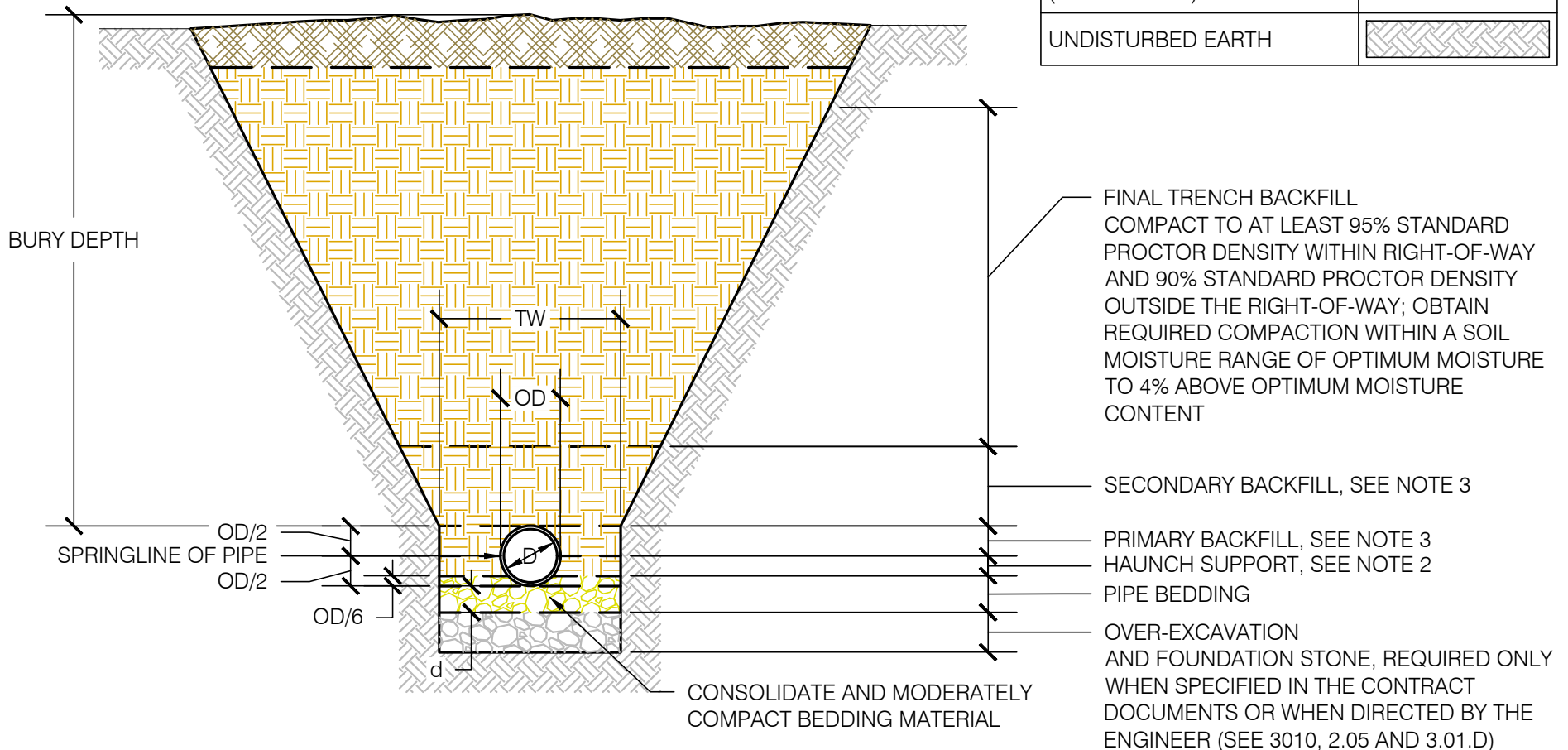
OD = OUTSIDE DIAMETER OF PIPE

D = INSIDE DIAMETER OF PIPE

TW = MINIMUM TRENCH WIDTH AT TOP OF PIPE = $OD + 18"$ OR $1.25 \times OD + 12"$ (WHICHEVER IS GREATER)

d = MINIMUM DEPTH OF BEDDING MATERIAL BELOW PIPE = $OD/8$ OR $4"$ (WHICHEVER IS GREATER)

LEGEND	
CLASS I BEDDING MATERIAL	
CLASS II BACKFILL MATERIAL	
CLASS III / IVA / IVB SUITABLE BACKFILL MATERIAL	
OVER-EXCAVATION AND FOUNDATION STONE	
CLASS V BACKFILL MATERIAL (E.G. TOPSOIL)	
UNDISTURBED EARTH	



NOTES:

1. REFER TO THE CONTRACT DOCUMENTS FOR SPECIFIC MATERIAL AND PLACEMENT REQUIREMENTS.
2. CONSOLIDATE AND MODERATELY COMPACT BY SLICING WITH A SHOVEL OR USING OTHER APPROVED TECHNIQUES.
3. COMPACT TO AT LEAST 65% RELATIVE DENSITY.
4. PROTECT PIPE, ACCESSORIES, AND APPURTENANCES DURING PLACEMENT AND COMPACTION OF BEDDING AND BACKFILL MATERIALS.

KEY:

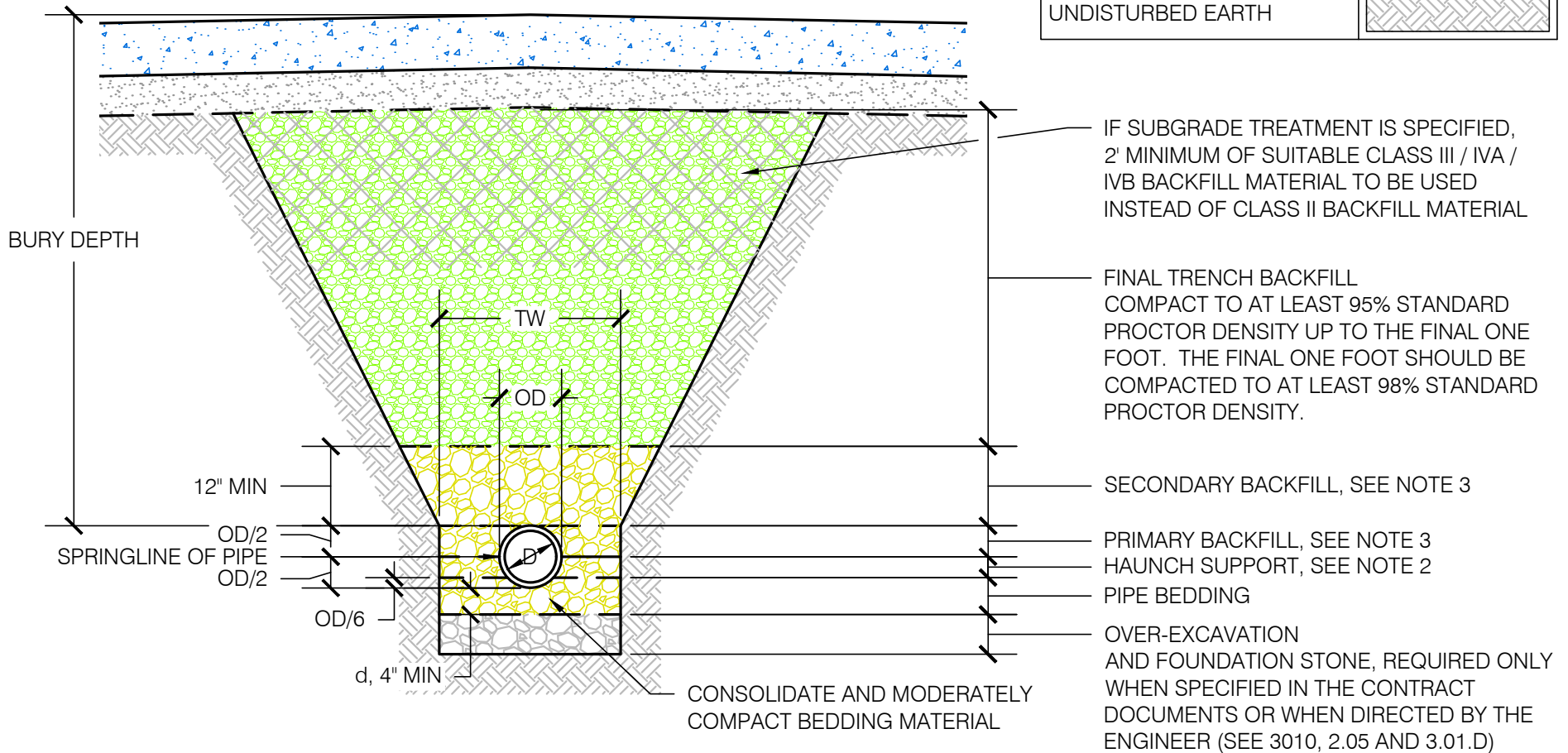
OD = OUTSIDE DIAMETER OF PIPE

D = INSIDE DIAMETER OF PIPE

TW = MINIMUM TRENCH WIDTH AT TOP OF PIPE = $OD + 18"$ OR $1.25XOD + 12"$ (WHICHEVER IS GREATER)

d = DEPTH OF BEDDING MATERIAL BELOW PIPE

LEGEND	
CLASS I BEDDING MATERIAL	
CLASS II BACKFILL MATERIAL	
OVER-EXCAVATION AND FOUNDATION STONE	
PAVEMENT	
SUBBASE	
UNDISTURBED EARTH	



NOTES:

1. REFER TO THE CONTRACT DOCUMENTS FOR SPECIFIC MATERIAL AND PLACEMENT REQUIREMENTS.
2. CONSOLIDATE AND MODERATELY COMPACT BY SLICING WITH A SHOVEL OR USING OTHER APPROVED TECHNIQUES.
3. COMPACT TO AT LEAST 65% RELATIVE DENSITY.
4. PROTECT PIPE, ACCESSORIES, AND APPURTENANCES DURING PLACEMENT AND COMPACTION OF BEDDING AND BACKFILL MATERIALS.

KEY:

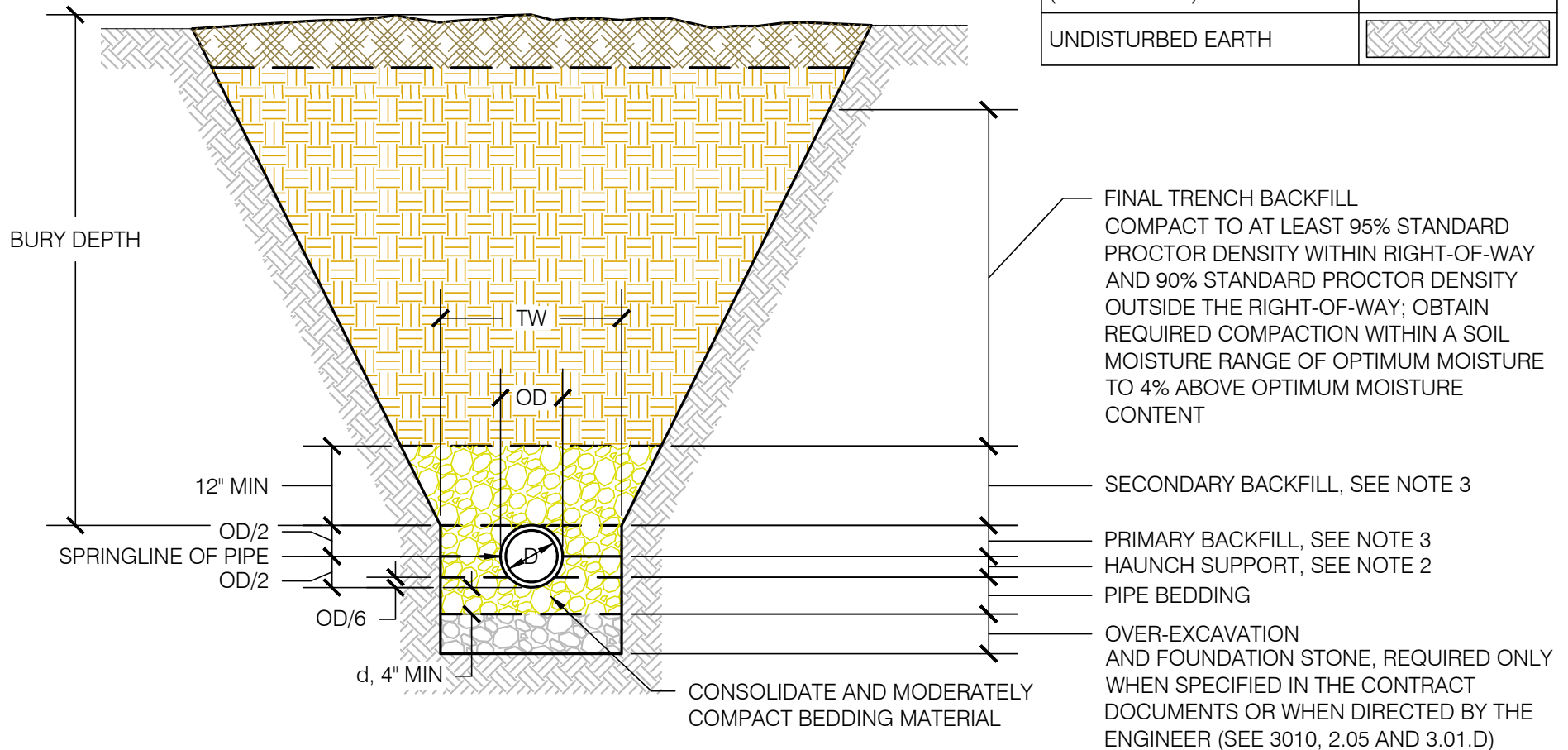
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D = INSIDE DIAMETER OF PIPE

TW = MINIMUM TRENCH WIDTH AT TOP OF PIPE = $OD + 18"$ OR $1.25 \times OD + 12"$ (WHICHEVER IS GREATER)

d = DEPTH OF BEDDING MATERIAL BELOW PIPE

LEGEND	
CLASS I BEDDING MATERIAL	
CLASS II BACKFILL MATERIAL	
CLASS III / IVA / IVB SUITABLE BACKFILL MATERIAL	
OVER-EXCAVATION AND FOUNDATION STONE	
CLASS V BACKFILL MATERIAL (E.G. TOPSOIL)	
UNDISTURBED EARTH	



NOTES:

1. REFER TO THE CONTRACT DOCUMENTS FOR SPECIFIC MATERIAL AND PLACEMENT REQUIREMENTS.
2. CONSOLIDATE AND MODERATELY COMPACT BY SLICING WITH A SHOVEL OR USING OTHER APPROVED TECHNIQUES.
3. COMPACT TO AT LEAST 95% STANDARD PROCTOR DENSITY.
4. PROTECT PIPE, ACCESSORIES, AND APPURTENANCES DURING PLACEMENT AND COMPACTION OF BEDDING AND BACKFILL MATERIALS.

KEY:

OD = OUTSIDE DIAMETER OF PIPE

OS = OUTSIDE SPAN OF PIPE

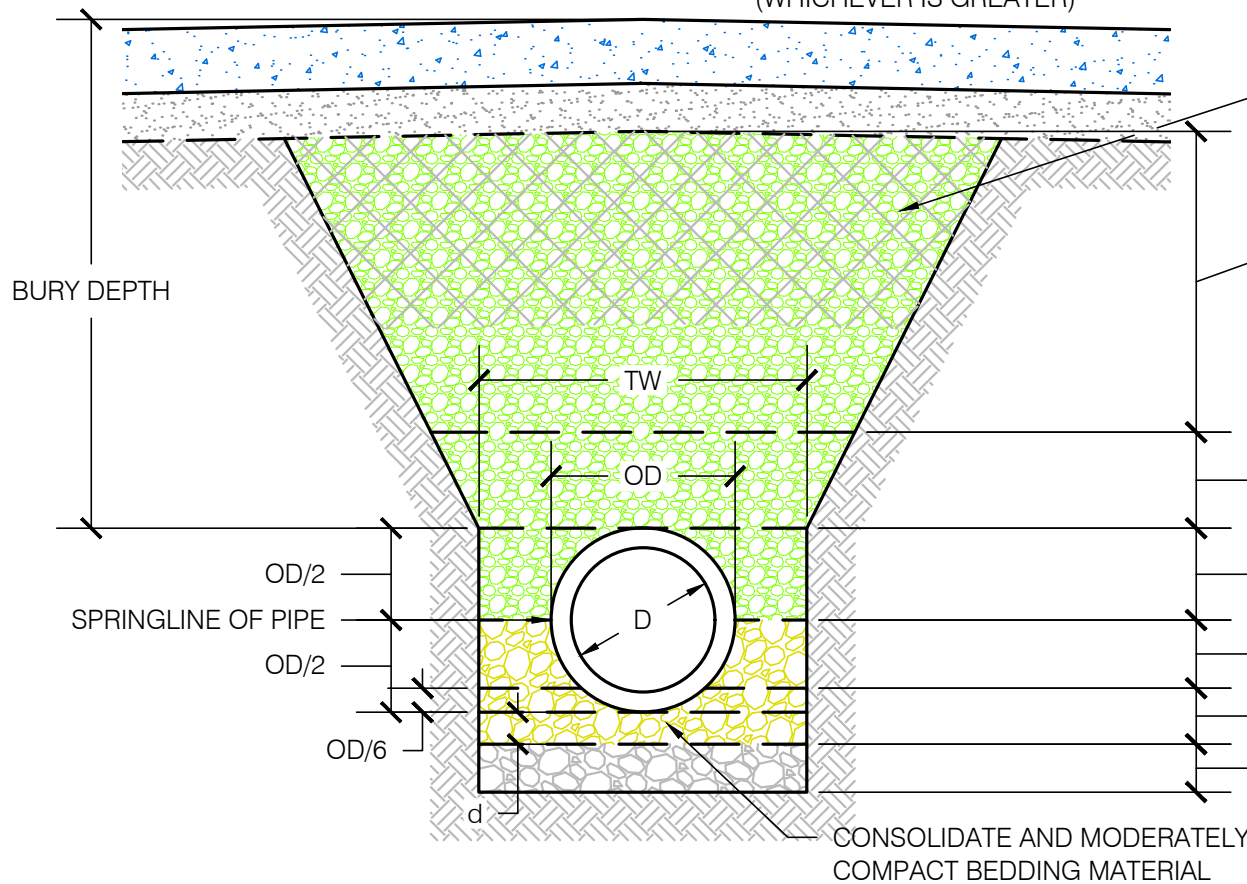
d = DEPTH OF BEDDING MATERIAL BELOW PIPE
 OD/8 OR OS/8 OR 4" (WHICHEVER IS GREATER)

D = INSIDE DIAMETER OF PIPE

TW = TRENCH WIDTH AT TOP OF PIPE

MINIMUM = OD + 18"

MAXIMUM = 1.25XOD + 12" OR 54"
 (WHICHEVER IS GREATER)



LEGEND	
CLASS I BEDDING MATERIAL	
CLASS II BACKFILL MATERIAL	
OVER-EXCAVATION AND FOUNDATION STONE	
PAVEMENT	
SUBBASE	
UNDISTURBED EARTH	

IF SUBGRADE TREATMENT IS SPECIFIED, 2' MINIMUM OF SUITABLE CLASS III / IVA / IVB BACKFILL MATERIAL TO BE USED INSTEAD OF CLASS II BACKFILL MATERIAL

FINAL TRENCH BACKFILL
 COMPACT 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.

SECONDARY BACKFILL, SEE NOTE 3

PRIMARY BACKFILL, SEE NOTE 3

HAUNCH SUPPORT, SEE NOTE 2

PIPE BEDDING

OVER-EXCAVATION AND FOUNDATION STONE, REQUIRED ONLY WHEN SPECIFIED IN THE CONTRACT DOCUMENTS OR WHEN DIRECTED BY THE ENGINEER (SEE 3010, 2.05 AND 3.01.D)

NOTES:

1. REFER TO THE CONTRACT DOCUMENTS FOR SPECIFIC MATERIAL AND PLACEMENT REQUIREMENTS.
2. CONSOLIDATE AND MODERATELY COMPACT BY SLICING WITH A SHOVEL OR USING OTHER APPROVED TECHNIQUES.
3. COMPACT TO AT LEAST 95% STANDARD PROCTOR DENSITY. OBTAIN REQUIRED COMPACTION WITHIN A SOIL MOISTURE RANGE OF OPTIMUM MOISTURE TO 4% ABOVE OPTIMUM MOISTURE CONTENT.
4. PROTECT PIPE, ACCESSORIES, AND APPURTENANCES DURING PLACEMENT AND COMPACTION OF BEDDING AND BACKFILL MATERIALS.

KEY:

OD = OUTSIDE DIAMETER OF PIPE

OS = OUTSIDE SPAN OF PIPE

d = DEPTH OF BEDDING MATERIAL BELOW PIPE
 OD/8 OR OS/8 OR 4" (WHICHEVER IS GREATER)

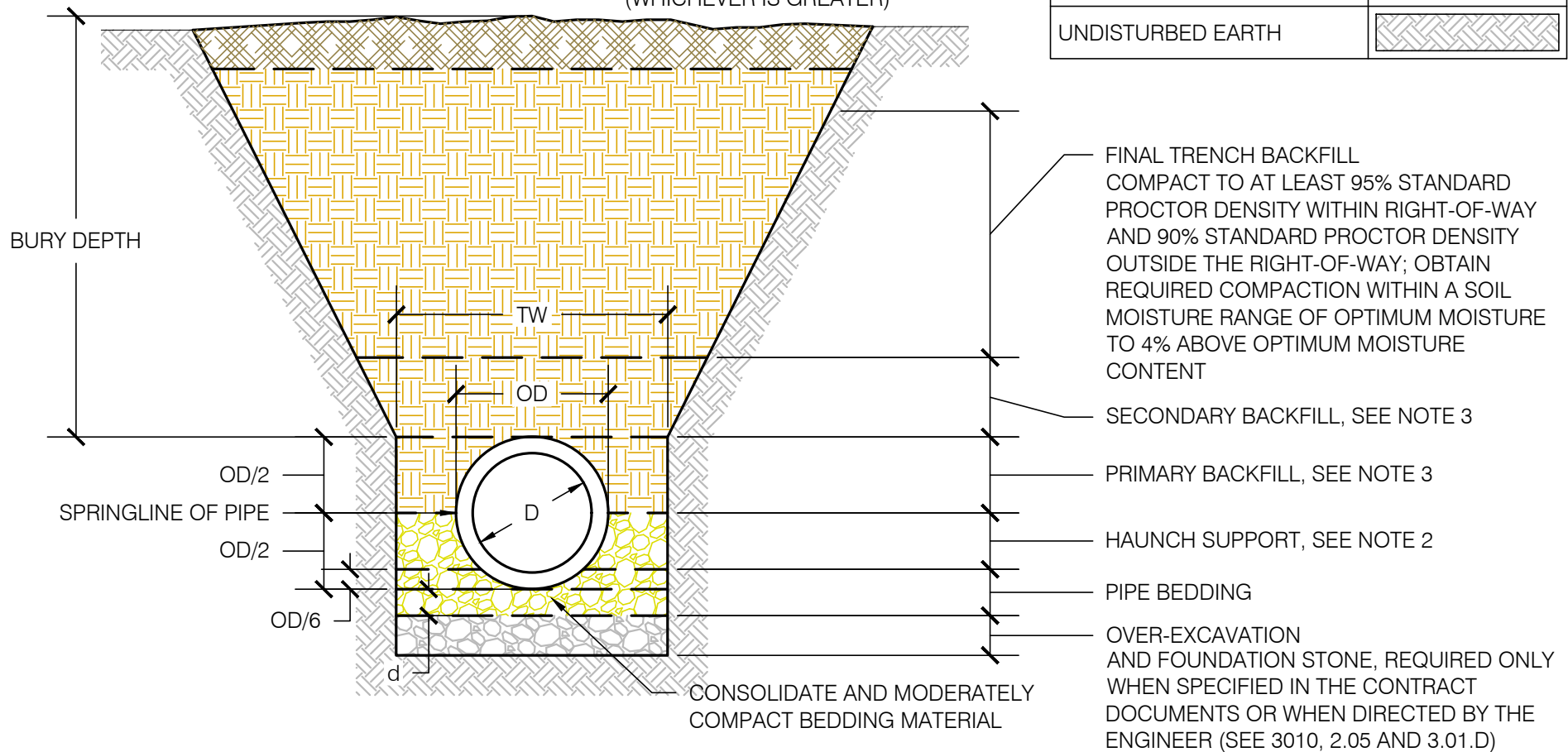
D = INSIDE DIAMETER OF PIPE

TW = TRENCH WIDTH AT TOP OF PIPE

MINIMUM = $OD + 18"$

MAXIMUM = $1.25 \times OD + 12"$ OR 54"
 (WHICHEVER IS GREATER)

LEGEND	
CLASS I BEDDING MATERIAL	
CLASS II BACKFILL MATERIAL	
CLASS III / IVA / IVB SUITABLE BACKFILL MATERIAL	
OVER-EXCAVATION AND FOUNDATION STONE	
CLASS V BACKFILL MATERIAL (E.G. TOPSOIL)	
UNDISTURBED EARTH	



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

1.07 SPECIAL REQUIREMENTS (REPLACE)

- A. Prior to start of work, notify all affected parties 24 hours in advance as to the length of time their service will be blocked.
- B. Establish a Public Information and Notification Program for contacting each home or business connected to the affected sanitary sewer, informing them of the work to be done and when the sewer will be off-line. The following specific steps are part of the Public Information and Notification Program.
 - 1. Provide written notice to be delivered to each affected home or business describing work, schedule, how the work affects them, and a local telephone number of the Contractor they can call to discuss the project or their problems.
 - 2. Personally contact each home or business on the day lateral verifications using closed circuit video inspection are to be performed. The homeowner or business will be asked to run water down their drain to verify each lateral. If the homeowner is unavailable, attempt other arrangements (cleanouts) to drain water through the lateral to verify each connection.
 - 3. Provide written notice and personally contact the home or business the day prior to beginning work on the section of sewer to which they are connected.
 - 4. Personally contact all homes or businesses that cannot be reconnected within the time stated in the written notice.
 - 5. Furnish and service portable toilets for use by the home or business occupants if so required by any affected served business or homeowner.
 - 6. Arranging access to backyards through gates and fences is to be coordinated by the Contractor as part of the Public Information and Notification Program.

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 – Sanitary Sewer Service Stub](#).
 - 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:**

1. (REPLACE) Comply with ASTM D 2241 for SDR 21, 17, and 13.5. SDR 26 and 35 are not allowable pipe materials for sanitary sewer gravity mains.
2. (REPLACE) Pipe stiffness per ASTM D 2412.
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: Certa-Flo PVC Gravity Flow, SDR 21, Westlake Pipe & Fittings, Westlake Corporation, Houston, Texas; or approved equal.
 - b. PVC Restrained Joint on Trenchless Construction can be used for gravity flow pipes if approved by the Engineer.

B. Solid Wall Polyvinyl Chloride Pipe (PVC) 18 inch to 27 inch:

2. (REPLACE) Pipe stiffness per ASTM D 2412.

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.

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.****2.04 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 an approved equal by the Engineer.

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 – Sanitary Sewer Service Stub](#).
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 by three feet from the nearest manhole or structure.

3.08 SANITARY SEWER ABANDONMENT**B. Fill: (REPLACE)**

1. Prior to filling the sewer, the Contractor will verify that the sewer line is not in use with the Engineer.
2. If specified in the contract documents, fill the line to be abandoned with flowable mortar, foamed cellular concrete, cellular concrete (comply with Section [3010](#)), or CLSM (comply with Section [3010](#)) by gravity flow or pumping.
3. **Cellular Concrete:**
 - a. Pipes to be abandoned shall have all liquids and solids removed before installation of watertight bulkheads. Ground water infiltration will not be allowed between the time of the bulkhead installation and filling of the pipes. The cost of the cleaning and maintaining a liquid-free space will be incidental to the abandonment item.
 - b. Construct water tight bulkheads consisting of at least two injection ports/vents at each end of the pipe. Injection ports and vents will be 2-inch pipes (with male NPT fittings) or per the requirements and recommendations of the contractor installing the cellular concrete. Make sure all voids are filled with flowable mortar and will withstand the pressure of the pipe filling operations.
 - c. Fill pipes labeled on the Plans with cellular concrete, by ready mix truck, pump, or other approved method by continuous discharging material in the space to be filled.
 - d. Cellular concrete shall not be placed on frozen ground. Batching, mixing and placing may begin only if the air temperature is at least 34°F and rising. At time of placement, cellular concrete shall have a temperature of at least 40°F. Mixing and placing shall stop when the air temperature is 40°F and falling.
 - e. Field Quality Control:
 - 1) Provide adequate facilities for safe storage and proper curing of cellular concrete test cylinders onsite for first 24 hours, and for additional time as may be required before transporting to test lab.
 - 2) Provide cellular concrete for making cylinders from the point of discharge into forms. When cellular concrete is pumped, samples used shall be taken from discharge end of pump hose.
 - f. Testing and Inspection:
 - 1) Coordinate with and schedule with Engineer testing services.
 - 2) Wet Density:
 - a) During placement of the initial batches, check the density and adjust the mix as required to obtain the specified cast density at the point of placement.
 - b) At hourly intervals during placing, monitor the density and adjust as necessary to maintain the specified cast density.
 - 3) Cylinders shall be made in field and tested in laboratory in accordance with ASTM D4832.
 - 4) One sample shall be collected for every 25 cubic yards of cellular concrete.
 - 5) Strength level of cellular concrete will be considered satisfactory if average 28 day strength test results are within the strength range specified and three (3) day strength is at least 20 psi.

3.12 CONFLICTS

(ADD) The vertical separation rules in this section also apply when a conflict exists between a main and a crossing service unless otherwise directed by the Engineer.

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 (REPLACE)

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) Use bell and spigot joints. If approved by the Engineer, may have tongue and groove joints.

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.

- 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.

C. Reinforced Concrete Elliptical Pipe (RCEP):

3. (REPLACE) Use rubber, confined, O-ring or profile gasket complying with ASTM C 443.
4. (ADD) Use bell and spigot joints. If approved by the Engineer, may have tongue and groove joints.

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

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:

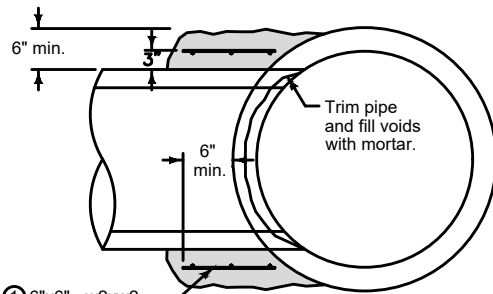
1. (ADD) Couplings shall be 1000 or 5000 Series Strong Back (RC) as manufactured by Fernco or Engineer approved equal.

3.08 CONFLICTS

(ADD) The vertical separation rules in this section also apply when a conflict exists between a main and a crossing service unless otherwise directed by the Engineer.

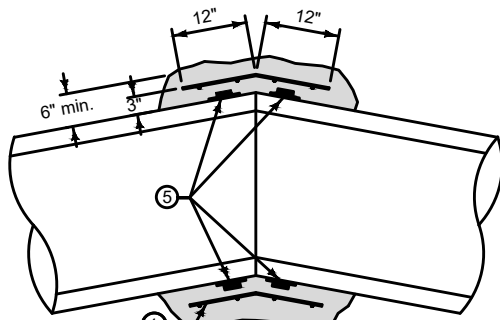
FIGURES

(REPLACE) Figure 4020.211 – Storm Sewer Pipe Connections



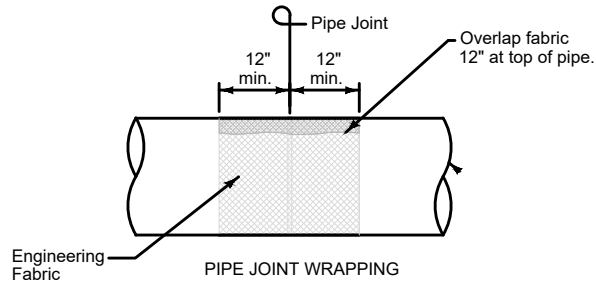
① 6"x6" - w2xw2 (8ga.) Wire Mesh

TYPE PC-1 CONCRETE COLLAR CONNECTION
(IF AUTHORIZED BY CITY ENGINEER)

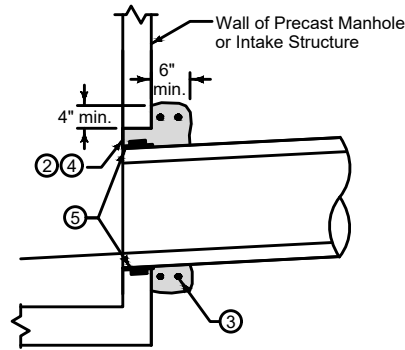


① 6"x6" - w2xw2 (8ga.) Wire Mesh

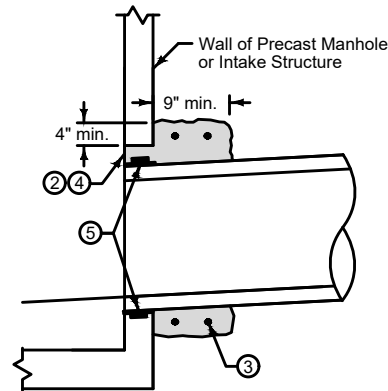
TYPE PC-2 CONCRETE COLLAR CONNECTION
(IF AUTHORIZED BY CITY ENGINEER)



PIPE JOINT WRAPPING
PIPE TO PIPE CONNECTION - ONLY FOR REINFORCED CONCRETE ARCH PIPE (RCAP)



CONCRETE COLLAR FOR PIPES 12" AND SMALLER



CONCRETE COLLAR FOR PIPES GREATER THAN 12"

PIPE TO STRUCTURE CONNECTION

- ① Lap ends of wire mesh a minimum of 6 inches.
- ② Concrete collar is required when annular space between the outside of the pipe and the wall of the structure is 2 inches or greater.
- ③ Provide two #4 hoop bars in concrete collar. Lap bars a minimum of 6 inches.
- ④ Trowel concrete flush with inside wall of structure.
- ⑤ Waterstop per 6010, 2.08.B

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.

2.01 FOOTING DRAIN COLLECTORS

(ADD) HDPE pipe, as listed in Section [4040](#), 2.01, C shall be used unless otherwise approved by the Engineer.

2.02 TYPE 1 SUBDRAINS (LONGITUDINAL SUBDRAIN)

(ADD) HDPE pipe, as listed in Section [4040](#), 2.01, C shall be used unless otherwise approved by the Engineer.

2.03 TYPE 2 SUBDRAINS (COMBINATION SUBDRAIN/FOOTING DRAIN COLLECTOR)

A. (REPLACE) HDPE pipe, as listed in Section [4040](#), 2.01, C shall be used unless otherwise approved by the Engineer.

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.

- For undeveloped properties, place a watertight stopper or plug in the end of the storm sewer service.
- For reconnection of existing service pipe to new sewer service pipe, use a manufactured flexible connection.

SECTION 4050 – PIPE REHABILITATION

1.07 SPECIAL REQUIREMENTS

B. (REPLACE) The Contractor will pay for the cost of the water used for cleaning and installation of cured-in-place pipe. The Contractor will let the Engineer know the means and methods for providing water prior to commencement of construction. Refer to Section [1060, 1.08 – Bulk Water Use](#), for approved means and methods.

C.

6. (ADD) Arranging access to backyards through gates and fences is to be coordinated by the Contractor as part of the Public Information and Notification Program.

1.08 MEASUREMENT AND PAYMENT

A. Pipe Cleaning and Inspection:

2. Pre-Rehabilitation Cleaning and Inspection:

- c. **Includes:** (REPLACE) Unit price includes, but is not limited to, pre-cleaning CCTV inspection, sewer cleaning, debris removal and transport, post cleaning CCTV inspection for Engineer review, identification of all pipe damages, identification and logging of active and inactive service taps, and identification of all protruding service taps. The unit price also includes disposal and associated costs for all debris removed from sewer.

H. Spot Repairs by Pipe Replacement:

1. Spot Repairs by Count:

- c. **Includes:** (REPLACE) Unit price includes, but is not limited to, trench excavation; dewatering; bypass pumping; uncovering and removing existing pipe; furnishing and installing the replacement pipe; pipe lining (if specified); furnishing, placing, and compacting bedding and backfill material for replacement pipe; wyes and other fittings; pipe joints; pipe connections; testing; and inspection.

2. Spot Repairs by Linear Foot:

- c. **Includes:** (REPLACE) Unit price includes, but is not limited to, trench excavation; dewatering; bypass pumping; uncovering and removing existing pipe; furnishing and installing the replacement pipe; pipe lining (if specified); furnishing, placing, and compacting bedding and backfill material for replacement pipe; wyes and other fittings; pipe joints; pipe connections; testing; and inspection.

2.01 CIPP MAIN LINING

- F. (ADD) Use products manufactured with a flame bonded seam. Do not use products that require tape on the seams.

2.07 SEWER MAIN PIPE (FOR SPOT REPAIRS)

- A. (REPLACE) Comply with Sections [4010](#) and [4020](#).

3.01 SEWER CLEANING AND INSPECTION FOR REHABILITATION

- B. **Pre-Cleaning Inspection:** (ADD) Complete inspection according to Section [4060](#) and the following:

3.07 SPOT REPAIRS BY PIPE REPLACEMENT

- C. Install replacement pipe of the same nominal size as the existing pipe.

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.

3.02 VIDEO INSPECTION

B. Inspection Procedure:

6. (ADD) If the speed or comprehensiveness of the pan and tilt provided in the video does not allow full inspection of a lateral connection, the Engineer can request the inspection to be conducted again and at the Contractor's expense.
7. (ADD) If the speed of the inspection exceeds the limitation in Section [4060](#), 3.02, B, 5, the Engineer can request the inspection to be conducted again and at the Contractor's expense.
8. (ADD) Full observation of the new or rehabilitated pipe is required in the video provided after the inspection. If the amount of water, debris within the pipe, equipment present in the pipe, or other circumstances during the inspection results in a video that does not permit the full observation of new or rehabilitated sewer pipe, the inspection will be performed again at the Contractor's expense. Circumstances leading to excessive amounts of water include, but are not limited to, residual water from cleaning, sags in the pipe, and/or debris or blockages.

3.03 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.

E. (ADD) Active Sewer Testing

1. Sanitary sewers with active service lines will be tested as specified and approved by the Engineer. Use of the tests listed in Section [4060](#), 3.03, A through C above may be appropriate in certain circumstances. The Contractor will provide documentation to the Engineer on the approach to be utilized and approve that approach in advance of any sewer installation. Segment testing is one example of an alternative approach that has been utilized and approved.

DIVISION 5 -
WATER MAINS AND APPURTENANCES

TABLE OF CONTENTS

(ADD) 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 (REPLACE)

- A. Prestressed concrete cylinder pipe will not be permitted, unless approved by the Engineer.
- B. 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.
- C. 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

D. (REPLACE) Water Service Stubs:

1. Water Service Stub, from Water Main to Stop Box, by Each:

- a. **Measurement:** Each type and size of water service stub from the water main to the stop box will be counted.
- b. **Payment:** Payment will be made at the unit price for each type and size of water service stub.
- c. **Includes:** Unit price includes, but is not limited to, water service corporation; service pipe; curb stop; stop box; trench excavation; dewatering; furnishing and installing pipe; furnishing, placing, and compacting bedding and backfill material; and installation of tracer wire system for non-metallic service pipe.

2. Water Service, from Water Main into Building, by Address:

- a. **Measurement:** Lump sum item; no measurement will be made; each address will have a separate item for the water service stub from the water main into the building.
- b. **Payment:** Payment will be made at the lump sum price for each address.
- c. **Includes:** Unit price includes, but is not limited to, water service corporation; service pipe; curb stop; stop box; building meter(s); piping inside the building associated with the meter; trench excavation; dewatering; furnishing and installing pipe; furnishing, placing, and compacting bedding and backfill material; installation of tracer wire system for non-metallic service pipe; and extra tracer wire as required in the figures in this section.

2.01 WATER MAIN

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

2. **Joint Type:** Use push-on joint type, except as otherwise specified in the contract documents or as authorized by the Engineer.

- d. **(ADD) Restrained Joint on Trenchless Construction on Sewer Force Mains:** 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:** Certa-Flo PVC Gravity Flow, SDR 21, Westlake Pipe & Fittings, Westlake Corporation, Houston, Texas; or approved equal.

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.

C. Pipe Coupling:

4. **Bolts and Nuts:** (REPLACE) stainless steel.

2.04 CONCRETE THRUST BLOCKS

- C. (DELETE) Use for all pipe sizes 16 inches in diameter or smaller or when specified.

2.05 PIPELINE ACCESSORIES

- B. Tracer System:** (REPLACE) Comply with [Figures 5010.102 to 5010.106](#)
4. **Splice Kit:** (REPLACE) See Tracer Wire Connector under the Accepted Products for Water Distribution Materials.
 5. **Tracer Wire Station:** (REPLACE) See Tracer Wire Terminal Box 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 the Engineer for the required gaskets.

2.07 WATER SERVICE PIPE AND APPURTENANCES

- A. **Controlling Standards:** (REPLACE) Jurisdictional policies and procedures, plumbing and fire codes.
- B. **Materials** (as allowed by Jurisdiction or specified in contract documents):
 1. **Copper Pipe:**
 - c. (ADD) Required for services 2 inches and smaller in diameter from the corporation to the curb box.
 3. PVC Pipe: As specified in Section [5010, 2.01](#).
 4. (DELETE) ~~**Brass Pipe:** Red, seamless, according to ASTM B 43.~~

3.01 PIPE INSTALLATION

- A. **General:**
 8. (REPLACE) 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.

3.05 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.
- 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.
- L. (ADD) Private water service line tracer wire system to be installed in accordance with [Figures 5010.104 to 5010.106](#) and remain electrically disconnected from the public water main tracer wire system.
- M. (ADD) Final inspection of the tracer system will be conducted at the completion of the project and prior to acceptance by the owner. Verify the electrical continuity of the system. Repair discontinuities.

3.06 CONFLICTS

(ADD) The vertical separation rules in this section also apply when a conflict exists between a main and a crossing service unless otherwise directed by the Engineer.

3.09 WATER SERVICE STUB (REPLACE)

Water service stub ([5010](#), 1.08, D and [5010](#), 1.08, E), water service, water service line, and water service tap can be used interchangeably in the following section.

- A. Install water service including pipe, corporations, stops, and stop boxes according to local Jurisdiction requirements.

B. Water Service Taps:

1. A “Right-of-Way Excavation Permit – Water” is required.
2. Approved taps will be scheduled by the Contractor with the Iowa City Water Division.
3. All taps will be performed by the Jurisdiction.
4. Taps equal to or greater than 4 inches in diameter require a tapping sleeve and valve.
5. Taps less than 4 inches in diameter require a tapping saddle, corporation valve, and curb stop.
6. Taps shall be made when all the following conditions are met:
 - a. Any existing services not reused are properly abandoned.
 - b. Permit is approved and fees paid.
 - c. Water main to be tapped is fully tested and in service.
 - d. Corresponding building foundation has been constructed.
 - e. An excavation meeting OSHA safety requirements is ready.
 - f. Main is cleaned, tapping material(s) meet accepted products and materials (i.e. saddle and corporation, or sleeve and valve) are appropriately installed.
 - g. If conditions are not met, then Water Division staff are expected to deny the applicant a tap until the conditions are satisfactory.
7. Taps shall be located on the main within two lines drawn parallel from not more than three feet off the building foundation extended to the main.

8. Taps less than or equal to 2 inches in diameter shall have the saddle installed with the corporation valve oriented about 45 degrees down from the top of the water main.
9. Reuse of a directly tapped corporation valve is not allowed. The old corporation shall be removed and replaced with a tapping saddle and new corporation valve.
10. Taps shall not be made on fire hydrant laterals.
11. Taps shall not be made within five feet of a hydrant tee or inline valve, nor within two feet of a pipe bell end or another tap as measured from nearest edge to nearest edge.
12. Taps on the backside or top of a water main shall only be main with the approval of the Iowa City Water Division.
13. Tee-fittings in lieu of a tap for a connection may be requested to the Water Division for customers with critical importance to the community (i.e. hospitals and schools).

C. Service Lines:

1. Available service line sizes are 1-inch, 1.5-inch, 2-inch, 4-inch, 6-inch, 8-inch, 10-inch, and 12-inch.
2. Service lines are to be run perpendicular to the main and run straight into the building served.
3. Service lines equal to or greater than 4 inches in diameter are required to meet all public water main standards and specifications including bacteriological, pressure, and tracer wire testing.
4. Service lines less than or equal to 2 inches in diameter shall be Type K Copper in the right-of-way to the curb stop and adhere to applicable codes and policies for material after the curb stop.
 - a. If the area is within 500 feet of a leaking underground storage tank (LUST), then Type K Copper will be required for the entire service line.
 - b. If the material from the curb stop to the home is nonconductive, then a tracer wire shall be installed.
5. Service lines used for fire suppression systems and tapped for domestic service shall have separate shutoff valves exterior to the building for the fire service and domestic service per [Figure 5010.106](#).
6. The reuse of lead or lead-contaminated service line materials is not allowed.

D. Curb Stops:

1. Curb stops are required for all service lines less than or equal to 2 inches in diameter.
2. Service lines greater than or equal to 4 inches in diameter shall have a tapping valve in lieu of a curb stop.
3. Curb stops shall be placed between the back-of-sidewalk and right-of-way line.
 - a. If unable to place the curb stop between back-of-sidewalk and right-of-way line then the following locations may be requested to the Water Division for approval. These locations are listed in order of preference.
 - 1) Between the back-of-curb and sidewalk (parking)
 - 2) In the sidewalk

- 3) In the street
4. Curb stops and service isolations shall not be placed within 5 feet of an aboveground structure.
5. Curb stops and service isolation shall be flush with the ground surface and use an appropriate curb box or valve box with lid.
6. Self-draining curb stops shall be requested and approved by the Water Division for any service line with a winter removal of the water meter.

E. Water Meters:

1. All City water meters are furnished by the City at cost to a Master Plumber or City-licensed sewer and water installer.
2. Water meters shall be plumbed horizontal with the use of meter tails at least one foot above the floor, supported, with inlet and outlet isolation valves.
3. Water meter access shall not be obstructed with at least 6 inches of clearance from any wall or other object such as water heaters, softeners, and furnaces.
4. Water meter registers shall not be more than 5 feet above the floor.
5. Multiple residential meters plumbed within a meter closet or utility room shall be spaced a minimum of 8 inches apart in the horizontal and vertical direction, and permanently marked with the dwelling unit served by each meter.
6. Multiple meters shall have a master valve in addition to individual meter inlet and outlet isolation valves.
7. Copper services shall have a grounding strap.
8. Deducting meters are not allowed.
9. Meter pits or vaults are not allowed.
10. Meter enclosures shall be designed to allow for ease of access to read and maintain the meter via a hinged door with applicable weather protection.
11. Meters greater than 2 inches in diameter may require the use of a strainer.
12. Building or other structures with multiple meters will be required by Building Inspection to have all water meters installed prior to Certificate of Occupancy.
13. Meters shall be installed per [Figures 5010.111 and 5010.112](#).

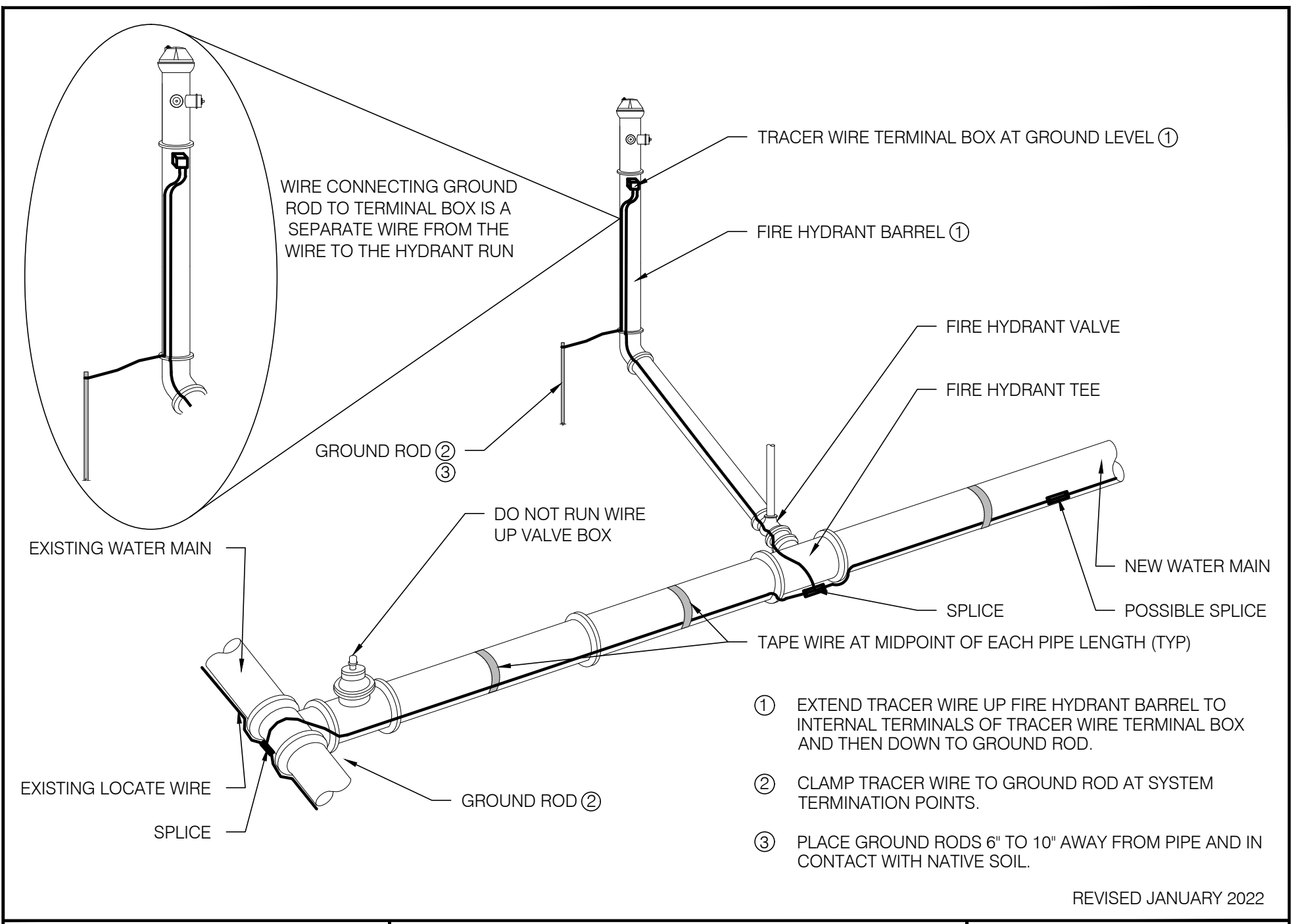
F. Service Line Abandonment:

1. Services lines equal to or greater than 4 inches in diameter to be abandoned on a water main to remain in service shall be abandoned by removal of the tapped section of water main and new water main installed with sleeves.
2. Service lines less than or equal to 2 inches in diameter to be abandoned on water main to remain in service shall be abandoned by removal of the corporation valve and/or saddle and the installation of a repair sleeve over the water main penetration.
3. Service lines to be abandoned on water main to be abandoned will be done in accordance with the contract documents.

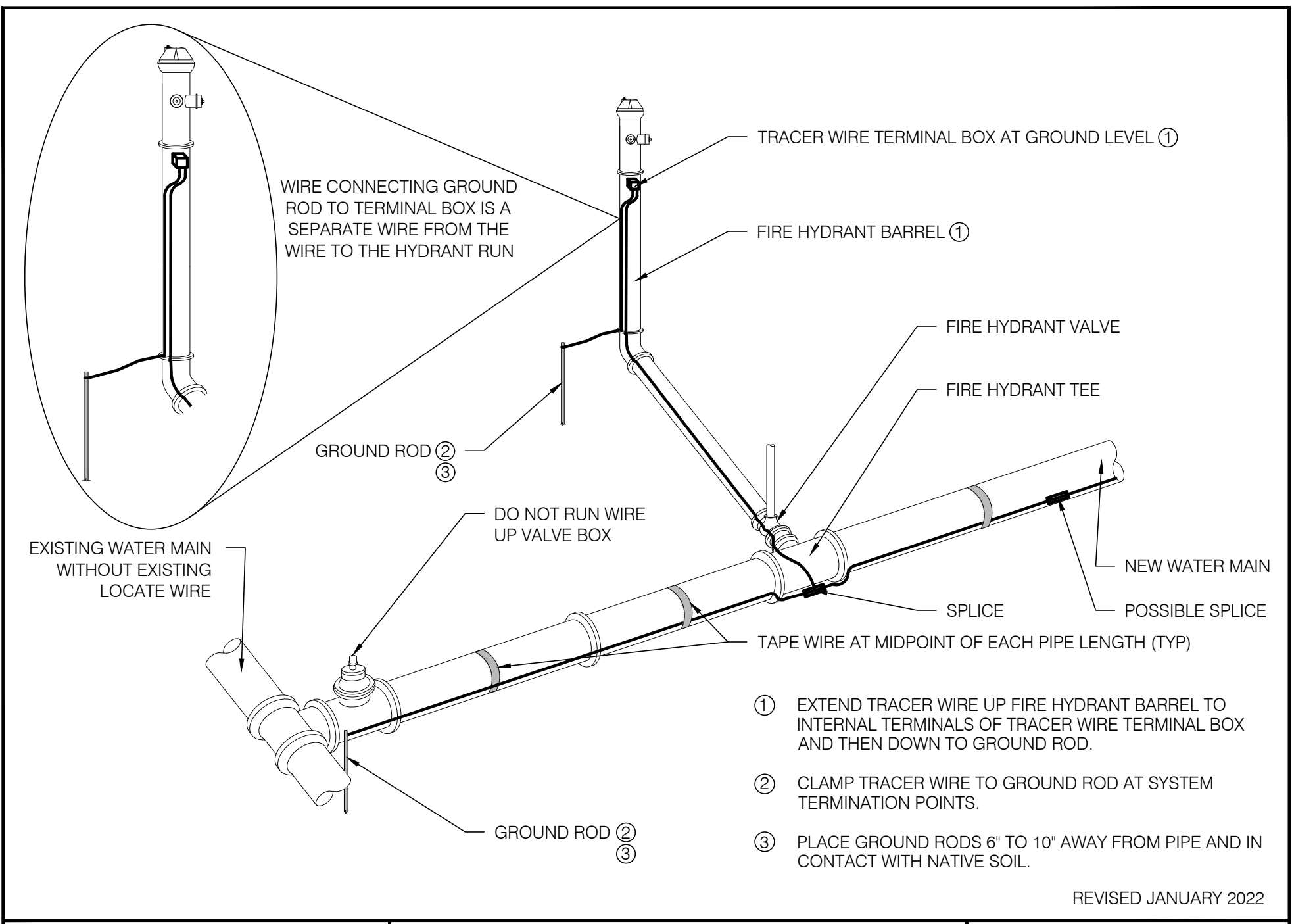
4. All service line shall be appropriately abandoned within one year from the date of service discontinuance.

FIGURES

- (REPLACE) Figure 5010.102 – Tracer Wire Installation with Existing Locate Wire
- (ADD) Figure 5010.103 – Tracer Wire Installation without Existing Locate Wire
- (ADD) Figure 5010.104 – Private Service Line Tracer Wire Installation Size 4” or Larger
- (ADD) Figure 5010.105 – Private Service Line Tracer Wire Installation with Private Hydrant Assembly
- (ADD) Figure 5010.106 – Private Service Line Tracer Wire Installation with Domestic and Fire Services
- (ADD) Figure 5010.107 – Typical Plan View of Residential Service Lines with Diameter Less than or Equal to 2 Inches
- (ADD) Figure 5010.108 – Typical Plan View of Multiresidential Service Lines with Diameter Less than 2 Inches
- (ADD) Figure 5010.109 – Typical Arrangement of Combined Fire and Domestic Water Service Line with Single Water Meter
- (ADD) Figure 5010.110 – Typical Arrangement of Combined Fire and Domestic Water Service Line with Multiple Water Meters
- (ADD) Figure 5010.111 – Arrangement of Installation for Residential Water Meters
- (ADD) Figure 5010.112 – Arrangement of Installation for Flanged Water Meters and Fire Risers with Detector Backflow Prevention



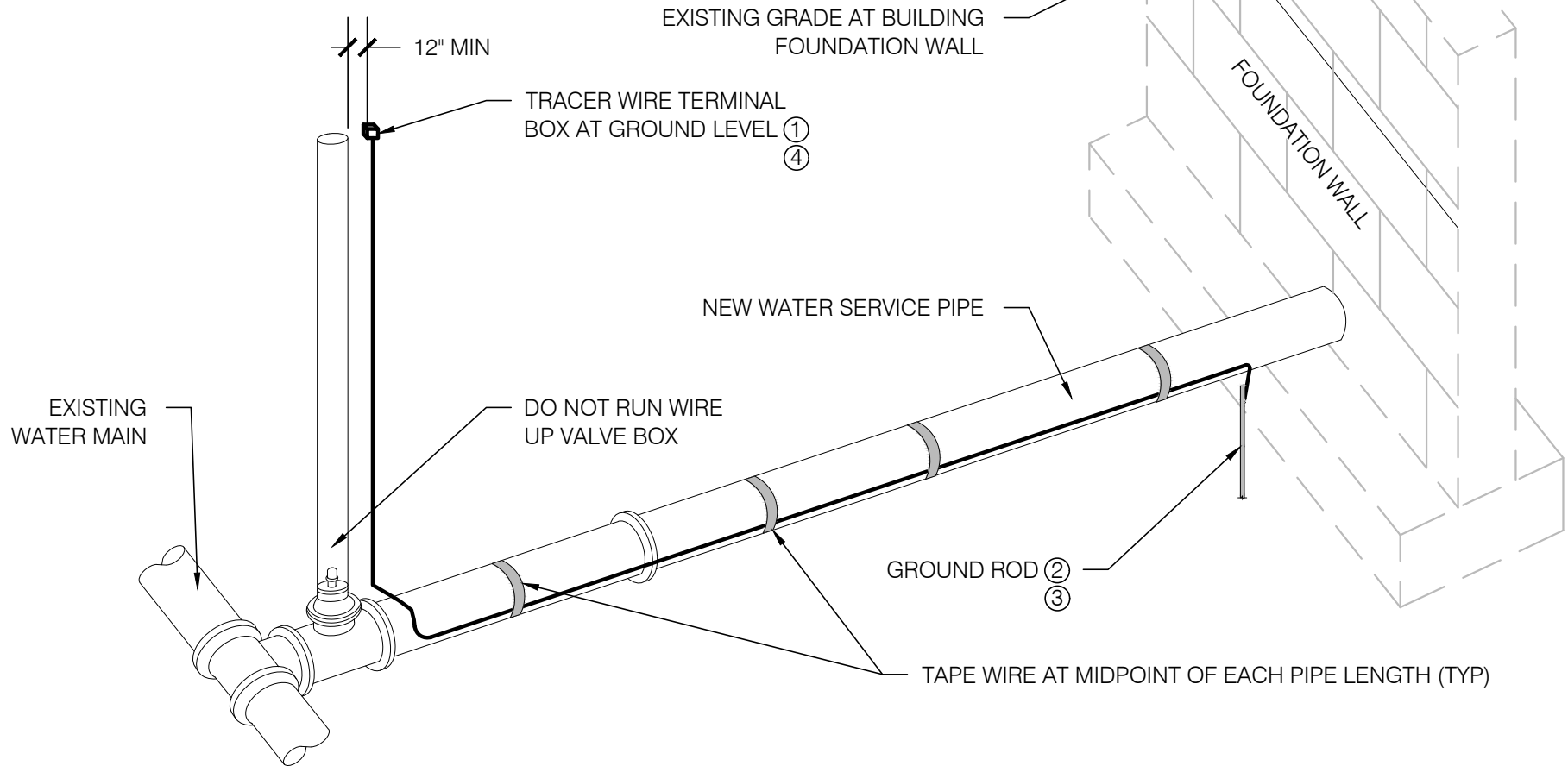
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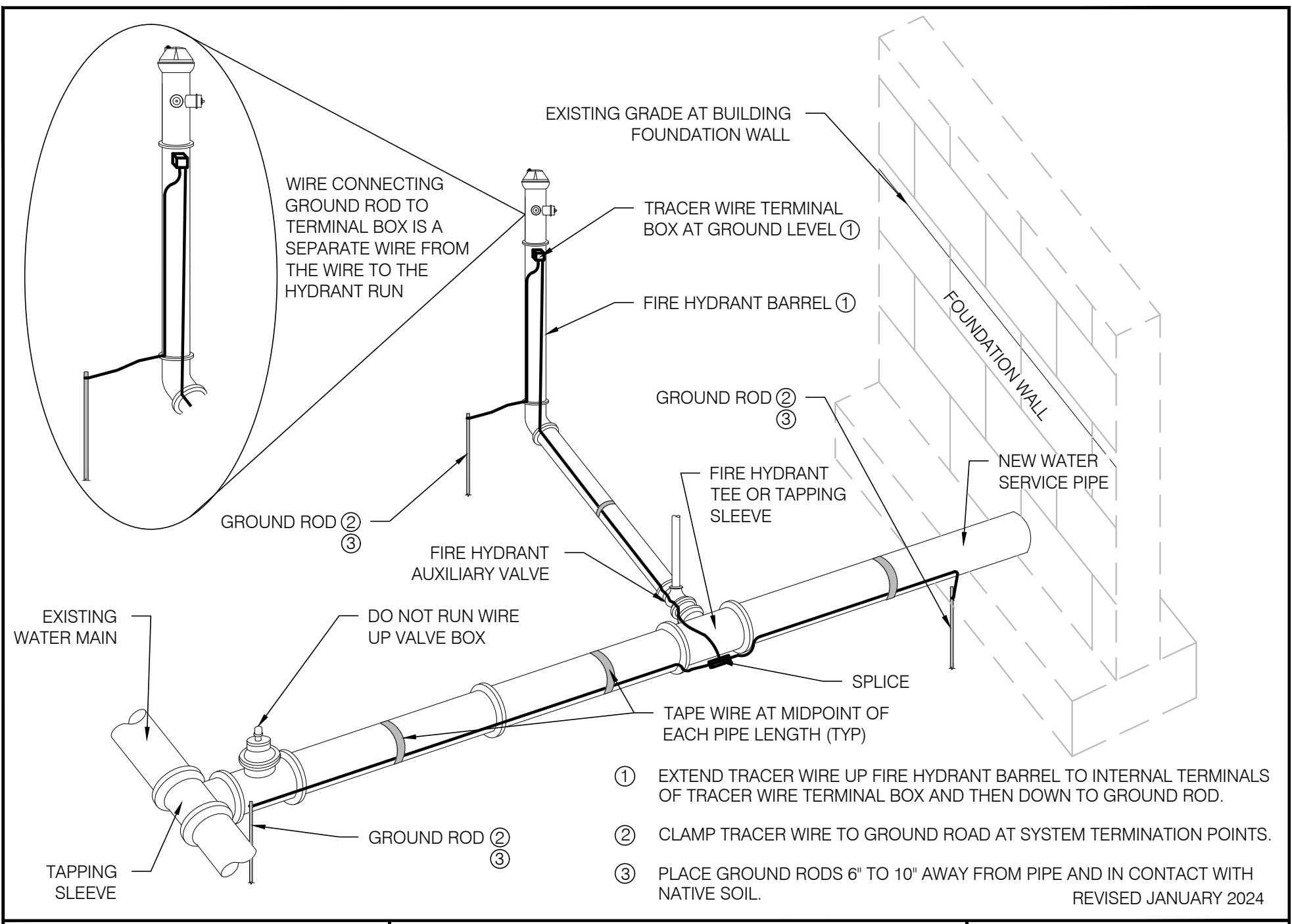
- ① EXTEND TRACER WIRE UP FIRE HYDRANT BARREL TO INTERNAL TERMINALS OF TRACER WIRE TERMINAL BOX AND THEN DOWN TO GROUND ROD.
- ② CLAMP TRACER WIRE TO GROUND ROD AT SYSTEM TERMINATION POINTS.
- ③ PLACE GROUND RODS 6" TO 10" AWAY FROM PIPE AND IN CONTACT WITH NATIVE SOIL.

REVISED JANUARY 2022

- ① EXTEND TRACER WIRE UP TO INTERNAL TERMINALS OF TRACER WIRE TERMINAL BOX.
- ② CLAMP TRACER WIRE TO GROUND ROD AT SYSTEM TERMINATION POINTS.
- ③ INSTALL PLACE GROUND ROD 6" TO 10" AWAY FROM PIPE AND IN CONTACT WITH NATIVE SOIL.
- ④ TRACER WIRE TERMINAL BOX SET IN PAVEMENT SHALL BE PLACED IN A DAYLIGHT BOX CONSISTING OF A VALVE BOX TOP WITH LID INDICATING PRIVATE WATER SYSTEM.



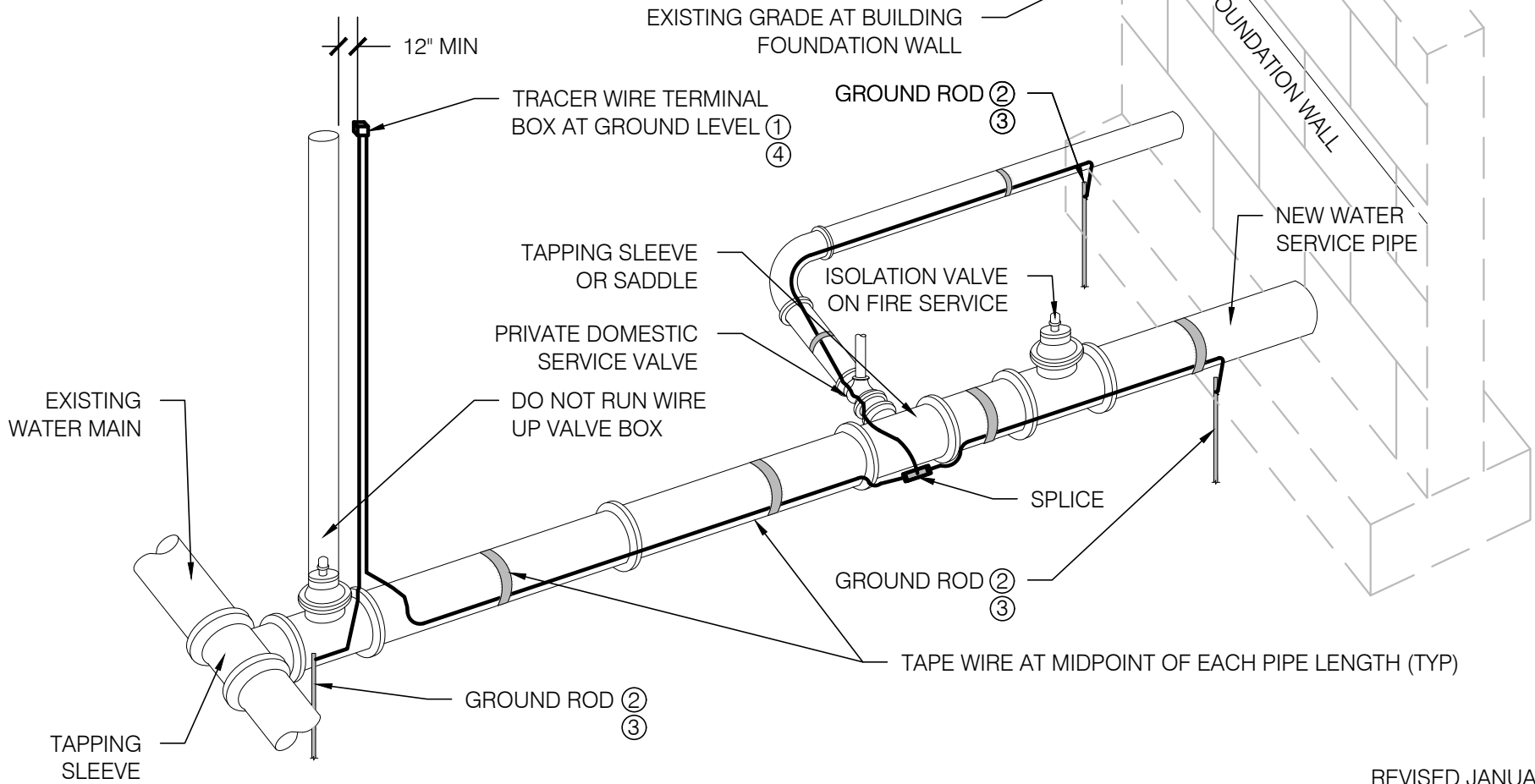
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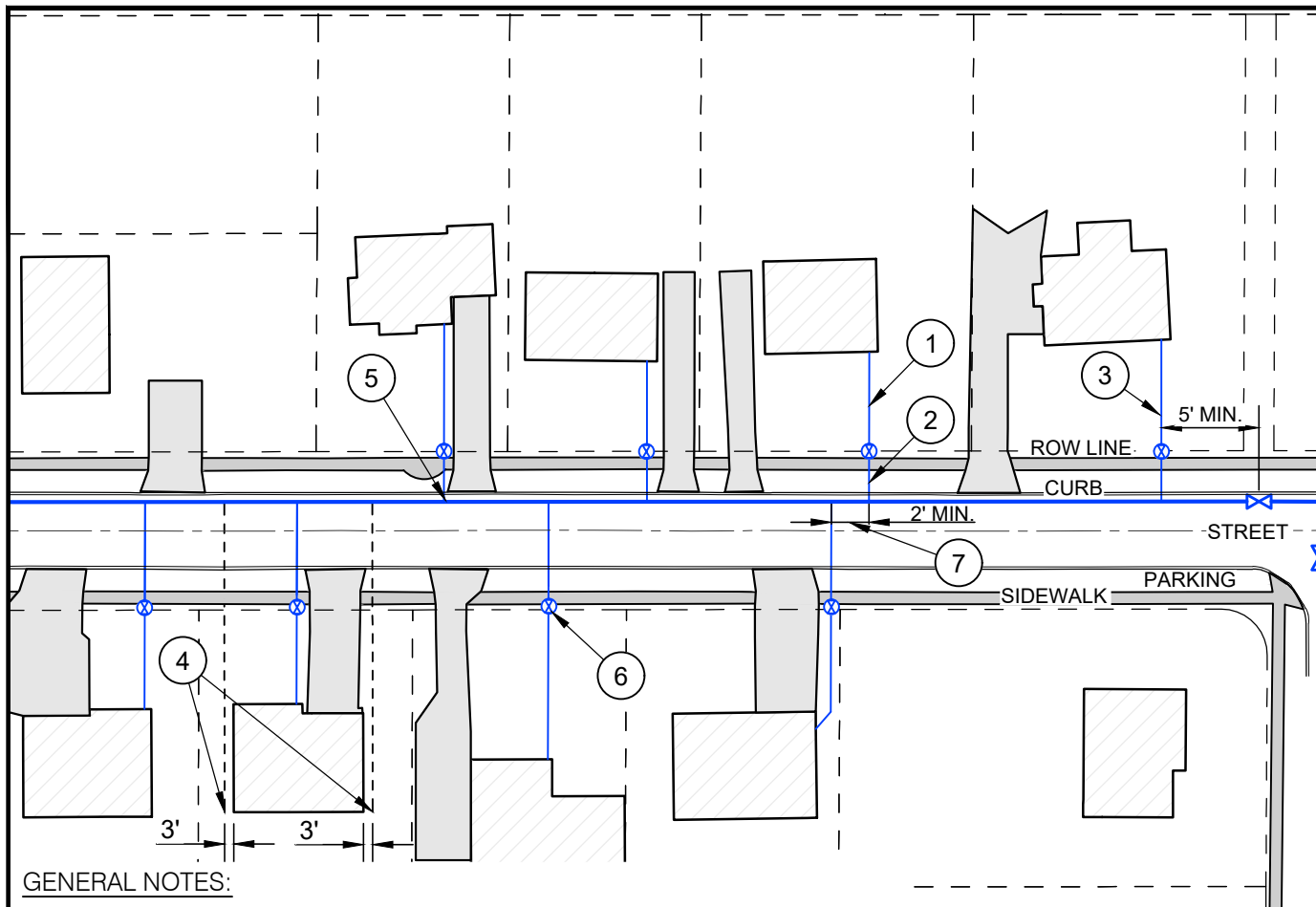
- ① EXTEND TRACER WIRE UP FIRE HYDRANT BARREL TO INTERNAL TERMINALS OF TRACER WIRE TERMINAL BOX AND THEN DOWN TO GROUND ROD.
- ② CLAMP TRACER WIRE TO GROUND ROAD AT SYSTEM TERMINATION POINTS.
- ③ PLACE GROUND RODS 6" TO 10" AWAY FROM PIPE AND IN CONTACT WITH NATIVE SOIL.

REVISED JANUARY 2024

- ① EXTEND TRACER WIRE UP TO INTERNAL TERMINALS OF TRACER WIRE TERMINAL BOX.
- ② CLAMP TRACER WIRE TO GROUND ROD AT SYSTEM TERMINATION POINTS.
- ③ INSTALL PLACE GROUND ROD 6" TO 10" AWAY FROM PIPE AND IN CONTACT WITH NATIVE SOIL.
- ④ TRACER WIRE TERMINAL BOX SET IN PAVEMENT SHALL BE PLACED IN A DAYLIGHT BOX CONSISTING OF A VALVE BOX TOP WITH LID INDICATING PRIVATE WATER SYSTEM.



REVISED JANUARY 2024



- ① SERVICE LINE MATERIAL SHALL CONFORM WITH JURISDICTION PLUMBING CODE BETWEEN THE CURB AND METER.
- ② SERVICE LINE MATERIAL SHALL BE TYPE K COPPER FROM THE WATER MAIN TO THE CURB STOP
- ③ TAPS SHALL BE MADE WITH A MINIMUM OF 5 FEET CLEARANCE NEAREST EDGE TO NEAREST EDGE WITH INLINE VALVES AND FITTINGS
- ④ TAPS SHALL BE LOCATED ON THE MAIN WITHIN TWO LINES DRAWN PARALLEL FROM NOT MORE THAN 3- FEET OFF THE BUILDING FOUNDATION EXTENDED TO THE MAIN. SERVICE LINE SHALL BE RUN STRAIGHT TO THE CURB STOP.
- ⑤ AVOID RUNNING SERVICE LINES UNDER DRIVEWAYS.
- ⑥ PLACE CURB STOP WITHIN THE ROW BETWEEN BACK OF SIDEWALK AND ROW LINE. ALTERNATIVE LOCATIONS SHALL BE SUBJECT TO JURISDICTION APPROVAL AND GIVEN PREFERENCE IN THE FOLLOWING ORDER:
 - BETWEEN BACK OF CURB & SIDEWALK
 - WITHIN THE SIDEWALK
 - BACKSIDE TAP TO AVOID PAVEMENT
 - WITHIN THE STREET
- ⑦ TAPS SHALL BE MADE WITH A MINIMUM OF 2- FEET CLEARANCE NEAREST EDGE TO NEAREST EDGE WITH OTHER TAP SADDLES, SLEEVES, OR PIPE JOINTS.

GENERAL NOTES:

WATER SERVICE WORK ON PRIVATE PROPERTY REQUIRES A PLUMBING PERMIT.

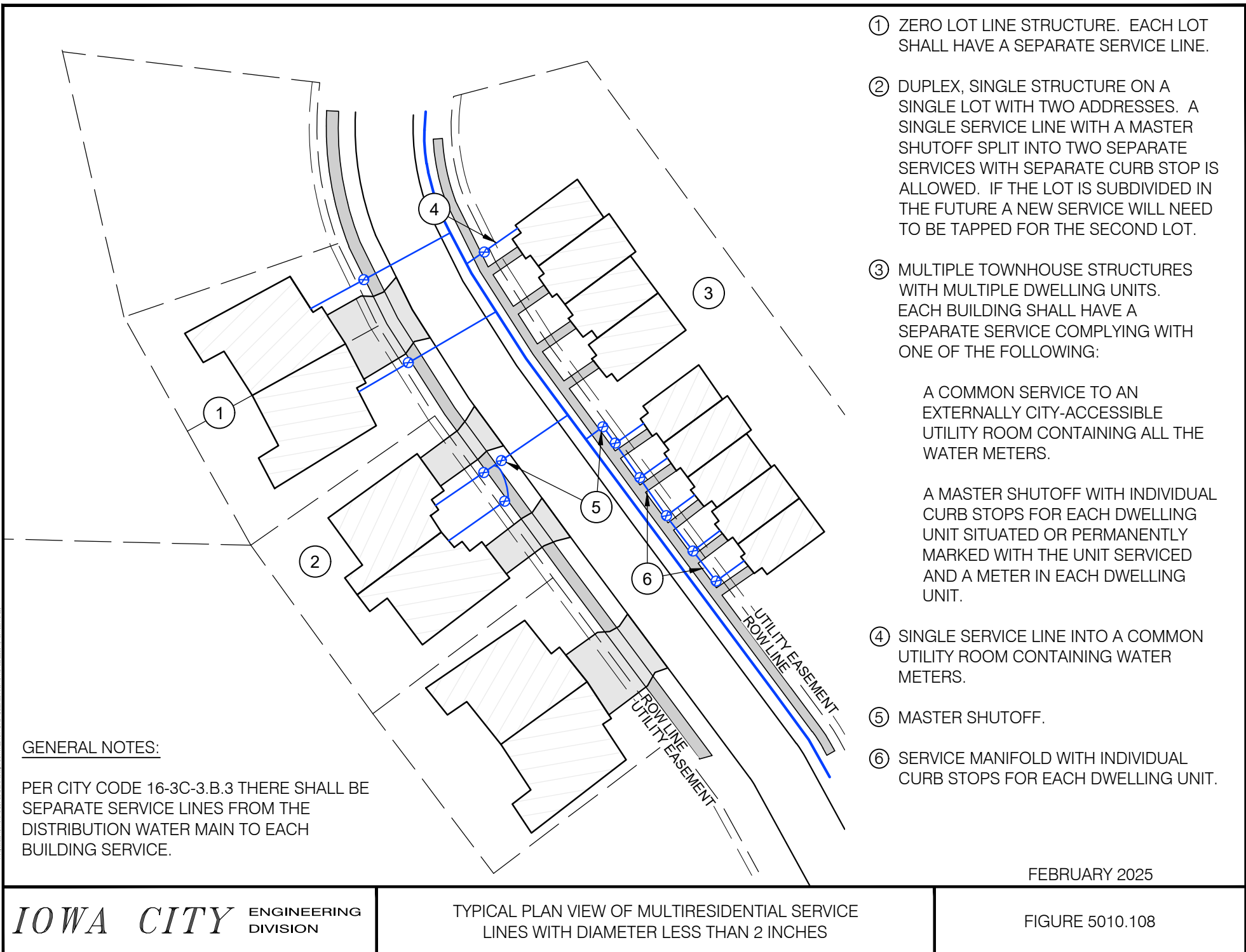
WATER SERVICE WORK IN THE ROW REQUIRES A ROW EXCAVATION PERMIT.

A WATER SERVICE TAP REQUIRES A ROW EXCAVATION-WATER PERMIT.

AVOID SETTING PROPERTY LINES THAT DO NOT HAVE ACCESS TO UTILITIES OUTSIDE OF ROAD PAVEMENT.

TAPS 2-INCH DIAMETER OR LESS SHALL USE A TAPPING SADDLE AND CORP.

FEBRUARY 2025

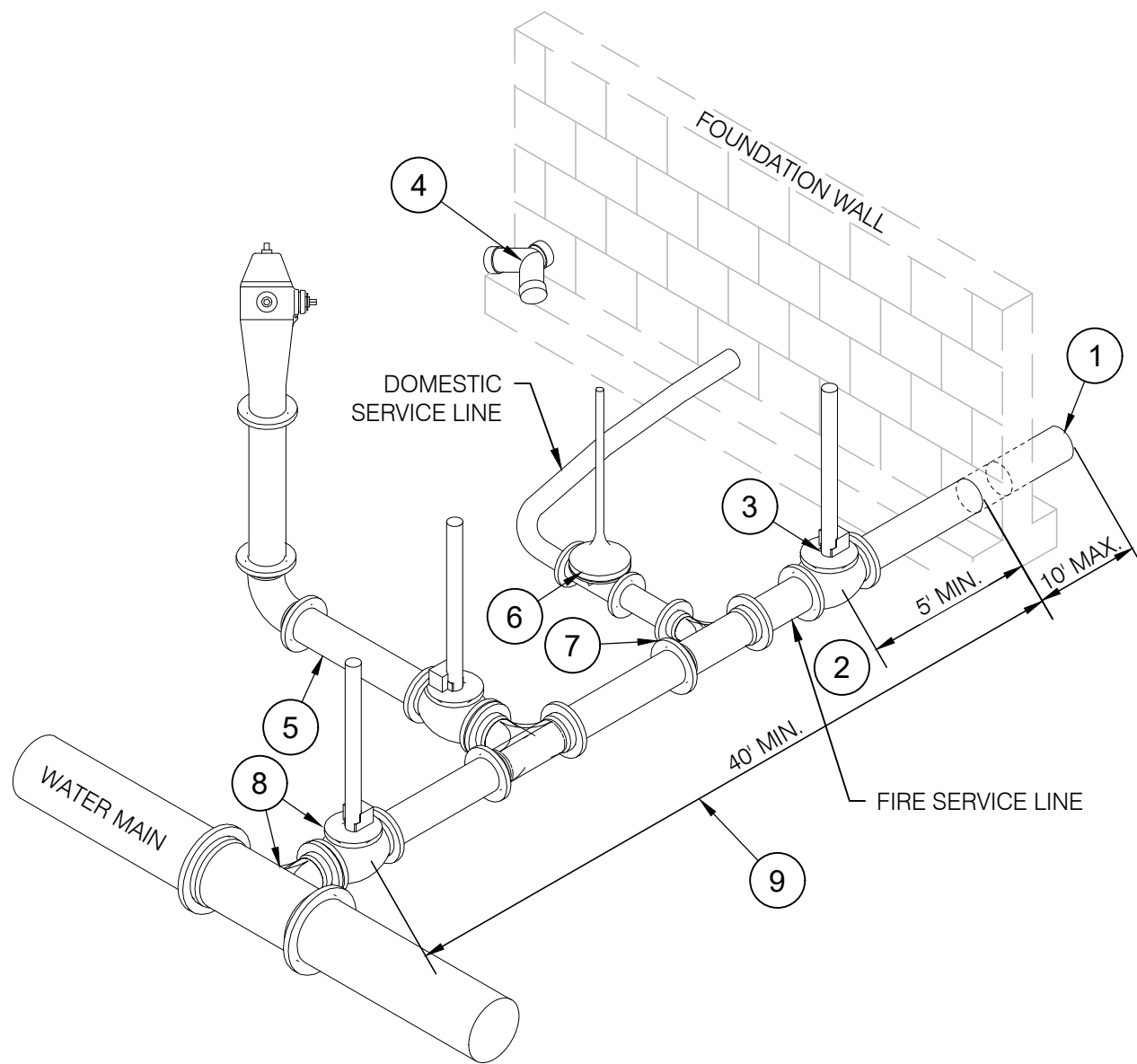


- ① ZERO LOT LINE STRUCTURE. EACH LOT SHALL HAVE A SEPARATE SERVICE LINE.
- ② DUPLEX, SINGLE STRUCTURE ON A SINGLE LOT WITH TWO ADDRESSES. A SINGLE SERVICE LINE WITH A MASTER SHUTOFF SPLIT INTO TWO SEPARATE SERVICES WITH SEPARATE CURB STOP IS ALLOWED. IF THE LOT IS SUBDIVIDED IN THE FUTURE A NEW SERVICE WILL NEED TO BE TAPPED FOR THE SECOND LOT.
- ③ MULTIPLE TOWNHOUSE STRUCTURES WITH MULTIPLE DWELLING UNITS. EACH BUILDING SHALL HAVE A SEPARATE SERVICE COMPLYING WITH ONE OF THE FOLLOWING:
 - A COMMON SERVICE TO AN EXTERNALLY CITY-ACCESSIBLE UTILITY ROOM CONTAINING ALL THE WATER METERS.
 - A MASTER SHUTOFF WITH INDIVIDUAL CURB STOPS FOR EACH DWELLING UNIT SITUATED OR PERMANENTLY MARKED WITH THE UNIT SERVICED AND A METER IN EACH DWELLING UNIT.
- ④ SINGLE SERVICE LINE INTO A COMMON UTILITY ROOM CONTAINING WATER METERS.
- ⑤ MASTER SHUTOFF.
- ⑥ SERVICE MANIFOLD WITH INDIVIDUAL CURB STOPS FOR EACH DWELLING UNIT.

GENERAL NOTES:

PER CITY CODE 16-3C-3.B.3 THERE SHALL BE SEPARATE SERVICE LINES FROM THE DISTRIBUTION WATER MAIN TO EACH BUILDING SERVICE.

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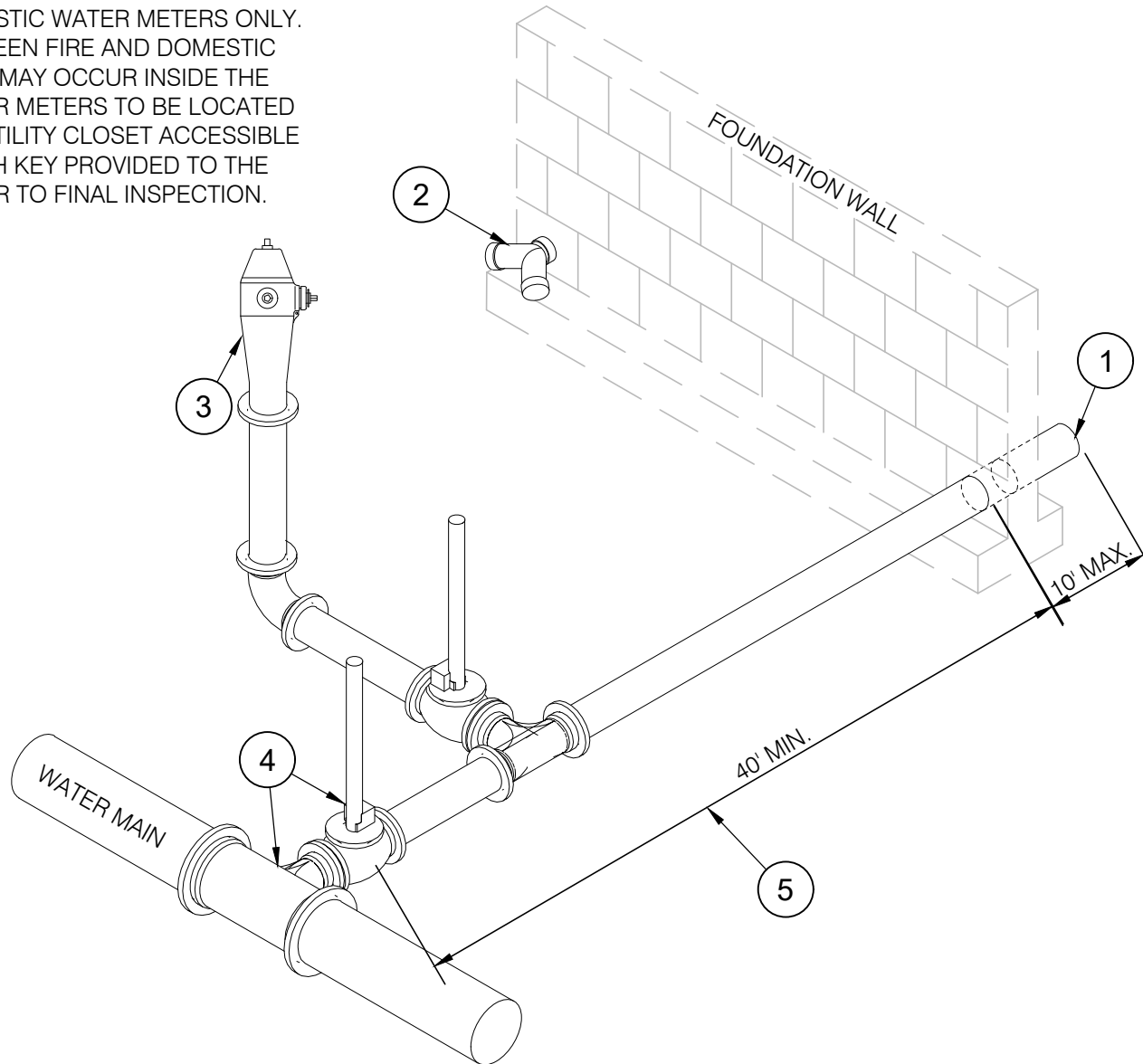


- ① FIRE LINE SHALL NOT EXTEND MORE THAN 10-FEET UNDER A BUILDING FOUNDATION.
- ② MAINTAIN FIRE AND DOMESTIC SERVICE ISOLATION VALVES A MINIMUM OF 5-FEET FROM BUILDING TO ALLOW FOR OPERATION.
- ③ FIRE LINE ISOLATION VALVE: POST INDICATING VALVES NOT ALLOWED.
- ④ FDC MUST BE WITHIN 100-FEET OF A FIRE HYDRANT UNLESS APPROVED BY THE AHJ AND NO CLOSER THAN 40- FEET.
- ⑤ IF REQUIRED BY FIRE CODE, PROVIDE VALVE AND HYDRANT ASSEMBLY AS SHOWN IN FIGURE 5020.201. SERVICE LINE DIAMETER TO THE FIRE HYDRANT SHALL BE AT LEAST 6-INCHES. POSITION HYDRANT TO ALLOW FIRE APPARATUS ACCESS IN THE EVENT OF A BUILDING FIRE.
- ⑥ CURB STOP.
- ⑦ FOR DOMESTIC SERVICE 2-INCHES OR LESS, PROVIDE TAPPING SADDLE AND CORP.
FOR DOMESTIC SERVICES 4-INCHES OR GREATER, PROVIDE A TAPPING SLEEVE; CURB STOP IS NOT REQUIRED.
- ⑧ SERVICES 4-INCHES OR GREATER SHALL HAVE A TAPPING SLEEVE AND TAPPING VALVE.
- ⑨ TAPPING VALVE SHALL BE A MINIMUM OF 40- FEET FROM NEAREST BUILDING WALL TO MEET NFPA 24 6.2.9 UNLESS AUTHORIZED BY FIRE CODE OFFICIAL.

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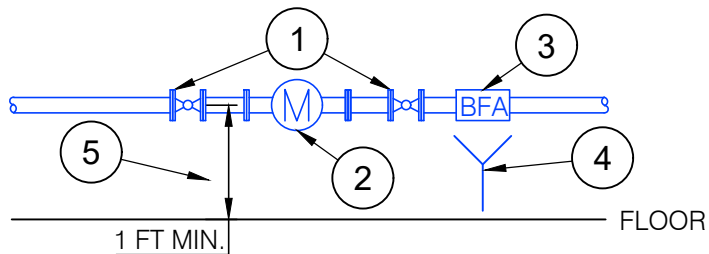
GENERAL NOTES:

FIGURE APPLICABLE TO PROPERTIES WITH MULTIPLE DOMESTIC WATER METERS ONLY. THE SPLIT BETWEEN FIRE AND DOMESTIC WATER SERVICE MAY OCCUR INSIDE THE BUILDING. WATER METERS TO BE LOCATED IN A COMMON UTILITY CLOSET ACCESSIBLE BY THE CITY WITH KEY PROVIDED TO THE CITY AT OR PRIOR TO FINAL INSPECTION.

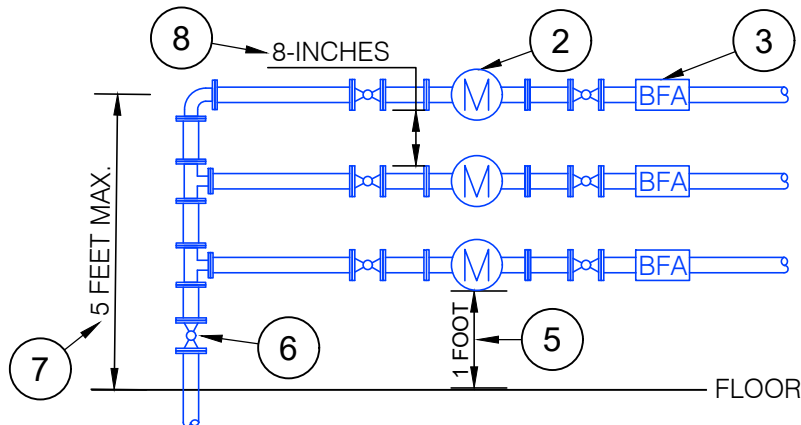


- ① FIRE LINE SHALL NOT EXTEND MORE THAN 10-FEET UNDER A BUILDING FOUNDATION.
- ② FDC MUST BE WITHIN 100-FEET OF A FIRE HYDRANT UNLESS APPROVED BY THE AHJ AND NO CLOSER THAN 40- FEET.
- ③ IF REQUIRED BY FIRE CODE, PROVIDE VALVE AND HYDRANT ASSEMBLY AS SHOWN IN FIGURE 5020.201. SERVICE LINE DIAMETER TO THE FIRE HYDRANT SHALL BE AT LEAST 6-INCHES. POSITION HYDRANT TO ALLOW FIRE APPARATUS ACCESS IN THE EVENT OF A BUILDING FIRE.
- ④ 4-INCHES OR GREATER DIAMETER SERVICES SHALL HAVE A TAPPING SLEEVE AND TAPPING VALVE.
- ⑤ TAPPING VALVE SHALL BE A MINIMUM OF 40- FEET FROM NEAREST BUILDING WALL TO MEET NFPA 24 6.2.9 UNLESS AUTHORIZED BY FIRE CODE OFFICIAL.

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DETAIL A SINGLE RESIDENTIAL WATER METER INSTALLATION DETAIL
NO SCALE



DETAIL B MULTIPLE RESIDENTIAL WATER METER COMMON UTILITY ROOM INSTALLATION DETAIL
NO SCALE

- ① METER ISOLATION VALVES.
- ② WATER METER.
- ③ BFA: BACKFLOW PREVENTOR ASSEMBLY PER CODE (TYP). INCLUDES ISOLATION VALVE AND REDUCED PRESSURE ZONE (RPZ) AS REQUIRED BY CODE.
- ④ OPTIONAL FUNNEL TO DIRECT RPZ RELIEF WATER TO A FLOOR DRAIN.
- ⑤ MOUNT METER AT LEAST 1-FOOT ABOVE FLOOR & 6-INCHES FROM WALL, WATER HEATER, FURNACE OR OTHER OBSTRUCTION.
- ⑥ MASTER SHUTOFF BALL VALVE.
- ⑦ DO NOT EXCEED 5-FEET ABOVE FLOOR TO THE TOP OF THE TOP METER.
- ⑧ MAINTAIN 8-INCHES VERTICAL SEPARATION BETWEEN METER TAILS.

GENERAL NOTES:

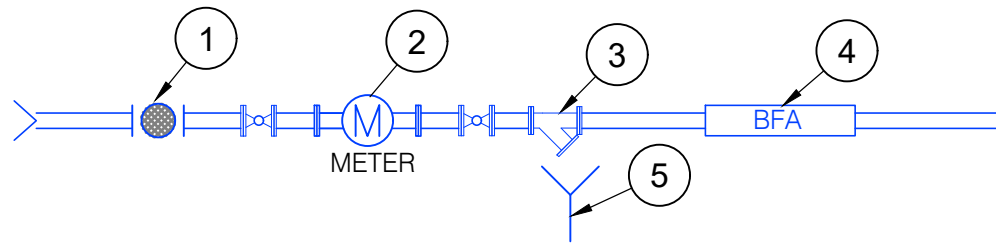
METERS MUST REMAIN ACCESSIBLE FOR FUTURE MAINTENANCE AND WATER SHUTOFF. DO NOT PLACE METERS BEHIND IMMOVABLE FIXTURES SUCH AS A FURNACE OR WATER HEATER OR WITHIN FINISHED WALLS

NO CONNECTIONS SHALL BE MADE UPSTREAM OF THE WATER METER OR FIRE SERVICE LINE BACKFLOW PREVENTOR.

PROVIDE PLUMBING SUPPORT PER CODE.

COMMON UTILITY ROOMS SHALL BE SIZED TO ACCOMMODATE PERSONNEL ACCESS TO METERS. FOR LARGE MULTI-LEVEL STRUCTURES MORE THAN ONE METER CLOSET MAY BE ALLOWED UPON REQUEST TO JURISDICTION.

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- ① AS REQUIRED: FLOW CONDITIONING STRAINER METER ISOLATION VALVES.
- ② WATER METER.
- ③ Y-STRAINER.
- ④ BFA BACKFLOW PREVENTOR ASSEMBLY PER CODE (TYP).
- ⑤ OPTIONAL FUNNEL TO DIRECT RPZ RELIEF WATER TO A FLOOR DRAIN.

- ⑥ IF REQUIREMENTS ARE MET FOR INTERNAL SPLIT OF FIRE AND DOMESTIC WATER SERVICE, A TEE MAY BE INSTALLED WITH A MASTER DOMESTIC WATER ISOLATION VALVE. SEE FIG 5010.111 DETAIL B.

- ⑦ DETECTOR BACKFLOW PREVENTOR ASSEMBLY. INSTALL WITH METER FACING UP.

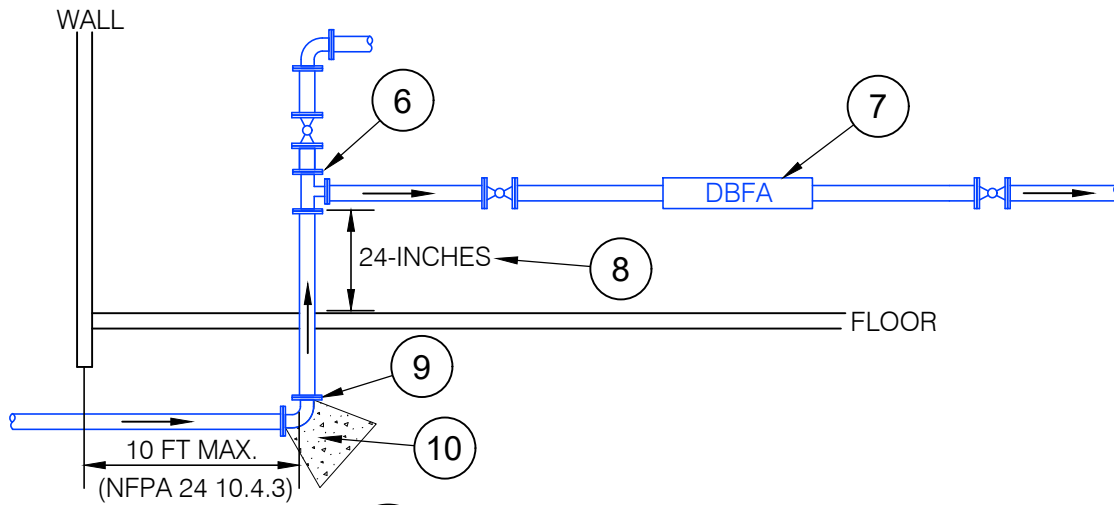
- ⑧ UNDERGROUND PIPING NOT ALLOWED TO EXTEND MORE THAN 24-INCHES INTO BUILDING (NFPA 24 10.1.4)

- ⑨ UNDERGROUND MJ FITTING WITH JOINT RESTRAINT.

- ⑩ THRUST BLOCK.

FLOOR

DETAIL A LARGE DIAMETER FLANGED WATER METER INSTALLATION DETAIL
NO SCALE



DETAIL B FIRE RISER INSTALLATION DETAIL
NO SCALE

GENERAL NOTES:

METERS MUST REMAIN ACCESSIBLE FOR FUTURE MAINTENANCE AND WATER SHUTOFF. DO NOT PLACE METERS BEHIND IMMOVABLE FIXTURES SUCH AS A FURNACE OR WATER HEATER OR WITHIN FINISHED WALLS

NO CONNECTIONS SHALL BE MADE UPSTREAM OF THE WATER METER OR FIRE SERVICE LINE BACKFLOW PREVENTOR.

PROVIDE PLUMBING SUPPORT PER CODE.

FEBRUARY 2025

SECTION 5011 – FUSIBLE PVC AND HDPE PIPE

1.07 SPECIAL REQUIREMENTS

(ADD) Fusible PVC or HDPE to be used only as directed by the Engineer or as specified in the contract documents.

2.01 WATER MAIN

A. Fusible PVC Pipe: Comply with AWWA C900 with ductile iron pipe equivalent outside diameters.

1. Minimum Wall Thickness:

- a. (REPLACE) **4 inch through 12 inch sizes:** DR 18
- b. (REPLACE) **Sizes over 12 inches:** As specified in the contract documents.

SECTION 5020 – VALVES, FIRE HYDRANTS, AND APPURTENANCES

1.07 SPECIAL REQUIREMENTS (REPLACE)

- A. The Jurisdiction maintains salvage rights to all fire hydrants, valve boxes, and valve box lids designated as public.
- B. Samples of water main and its appurtenances may also be retained by the Jurisdiction for testing purposes.
- C. 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. Flushing devices (blowoffs) shall only be used as approved by the Engineer.
- E. 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 (including tees on the main), thrust blocks, solid concrete block, porous backfill material, and fire hydrant gate valve and appurtenances, except tapping valve assembly if used.

D. (DELETE) ~~Alternative Fire Hydrant Assembly:~~

- ~~1. **Measurement:** Each alternate fire hydrant assembly will be counted.~~
- ~~2. **Payment:** Payment will be at the unit price for each alternate fire hydrant assembly.~~

~~3. **Includes:** 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 pipes, 90 degree bend, fittings, thrust blocks, pea gravel or porous backfill material, and fire hydrant gate valve and appurtenances, except tapping valve assembly if used.~~

F. 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.

J. Fire Hydrant Assembly Removal:

3. Includes: (REPLACE) The unit price includes, but is not limited to, excavation; removal of the fire hydrant; hydrant valve; thrust block; delivery of the fire hydrant assembly to the Jurisdiction; removal of the tee; restoration of the pipe; backfill; compaction; and surface restoration to match the surrounding grade.

L. Valve Box Removal:

3. Includes: (REPLACE) The unit price includes, but is not limited to, excavation, removal of each valve box and lid, delivery of the valve box and lid to the Jurisdiction, backfill, compaction, and surface restoration to match the surrounding area.

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.

2.02 FIRE HYDRANT ASSEMBLY

C. Features:

4. Hose Nozzles: (REPLACE) Two, each 2 ½ inches in diameter, caps attached to hydrant with chains.

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 integral Storz connection with 1 ½-inch pentagon nut and latch(es) and chains.

- c. Nozzle threads: National standard hose threads.
- 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. **(ADD) Barrel Extensions:** 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.

3.03 FIRE HYDRANT

- A. (ADD) Locate hydrants at a minimum three feet behind the back of curb and at least two feet from a sidewalk. Do not place hydrant auxiliary valves in the sidewalk or roadway unless approved by the Engineer.

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.

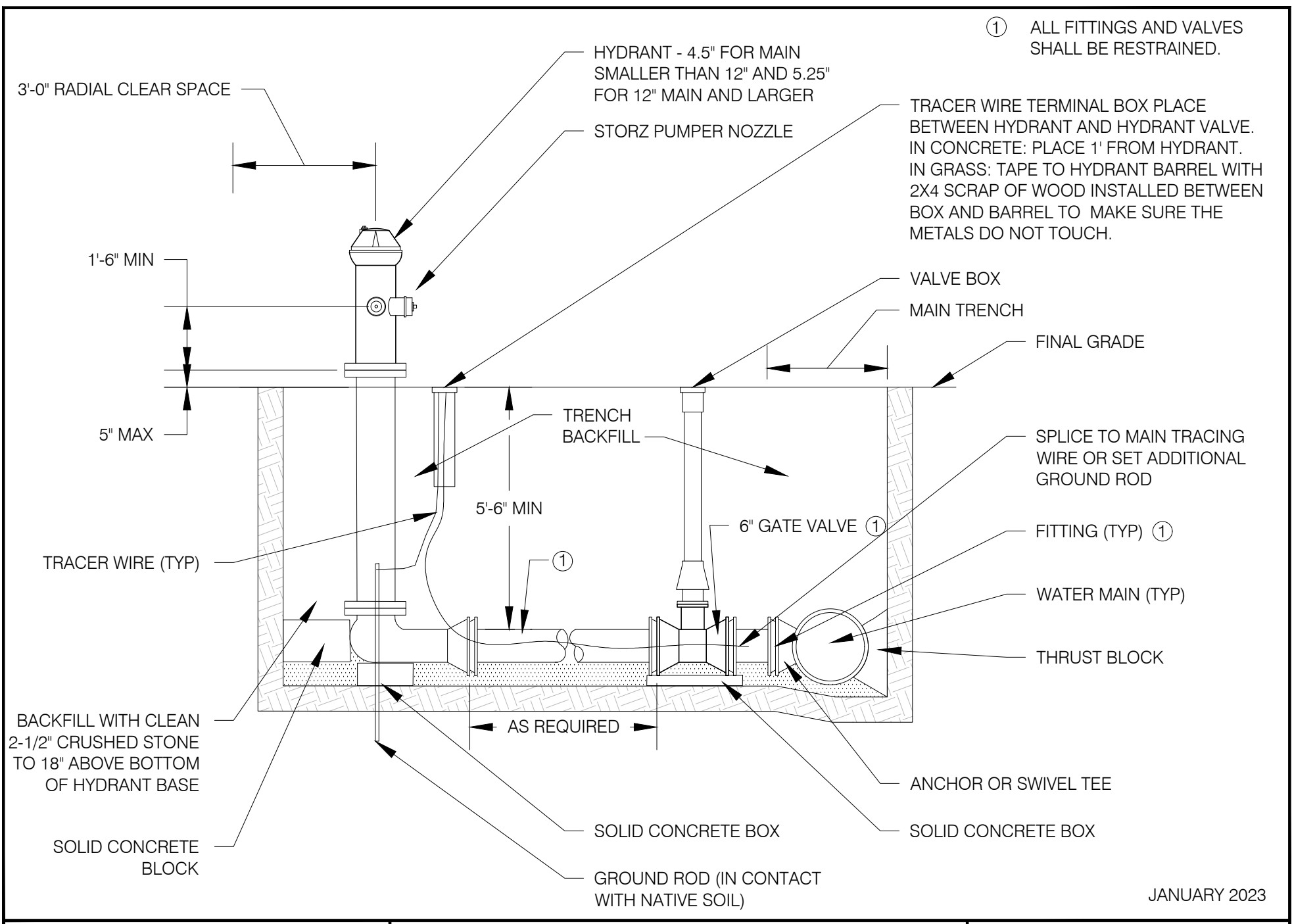
FIGURES

(REPLACE) Figure 5020.201 – Typical Hydrant and Valve Assembly

(ADD) Figure 5020.202 – Deadend Hydrant Detail

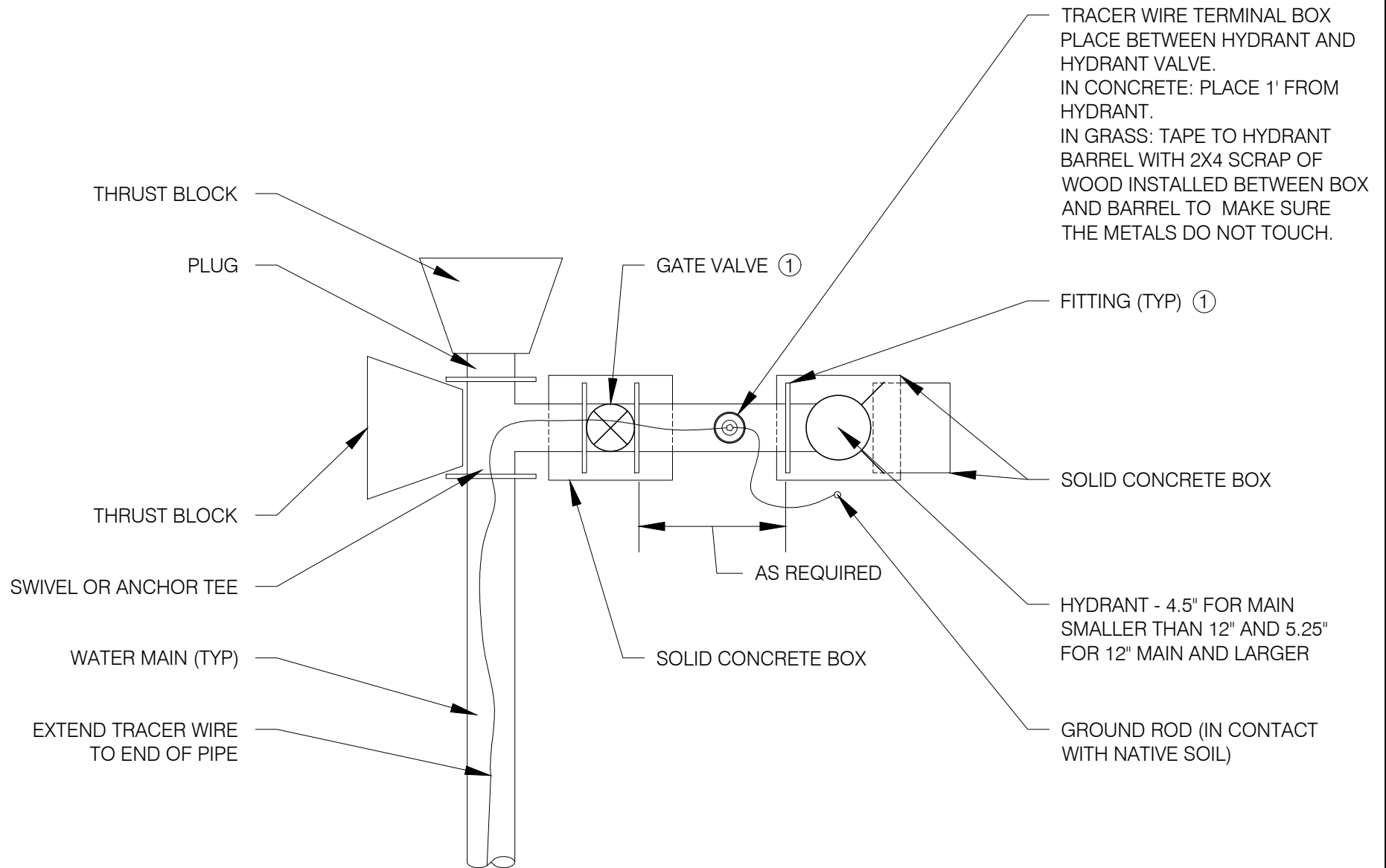
(ADD) Figure 5020.203 –Hydrant Detail for Future Water Main Extension

(ADD) Figure 5020.204 – Knock-off Hydrant Detail for Future Water Main Extension

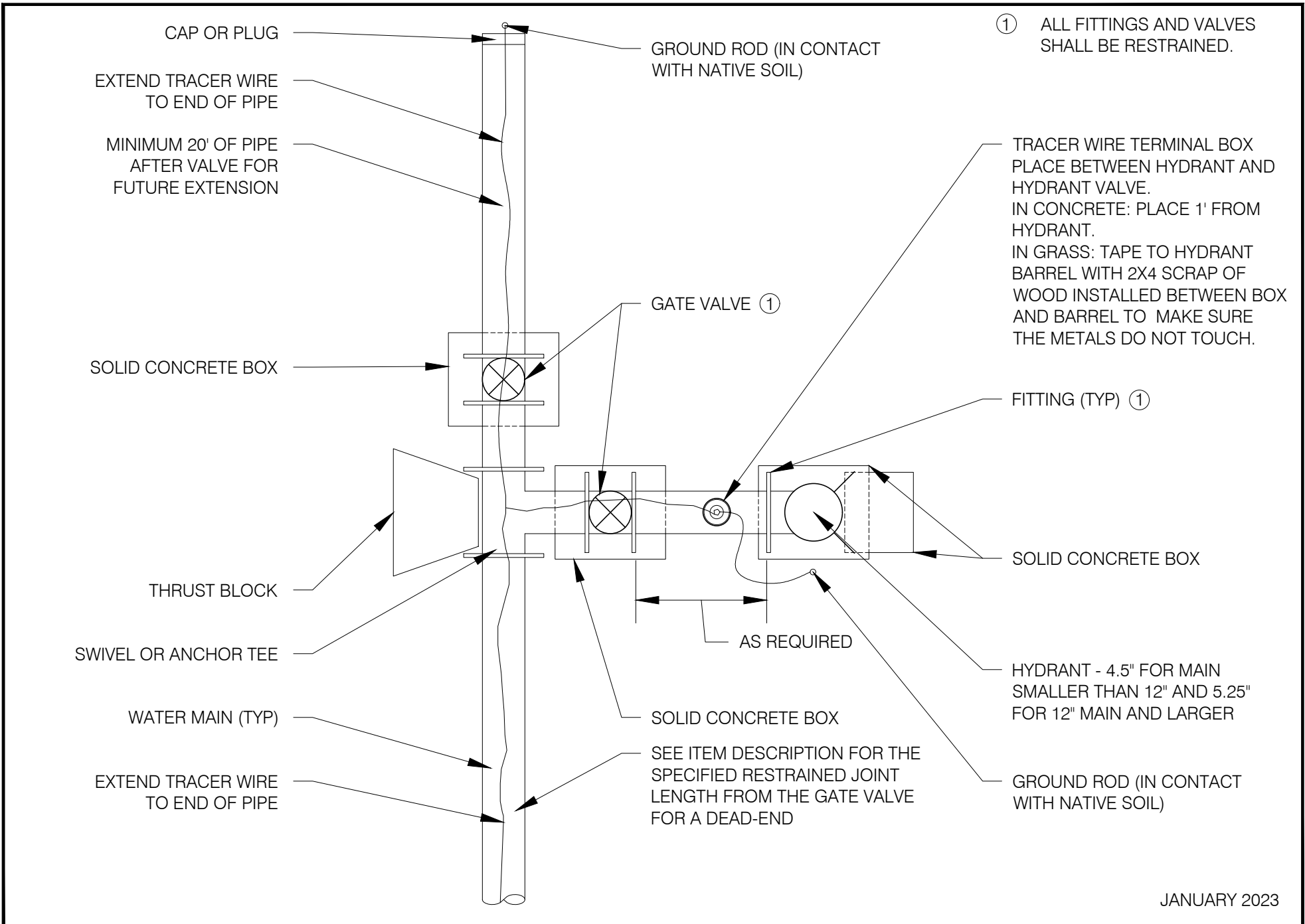


JANUARY 2023

① ALL FITTINGS AND VALVES SHALL BE RESTRAINED.



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HYDRANT - 4.5" FOR MAIN SMALLER THAN 12"
AND 5.25" FOR 12" MAIN AND LARGER

FITTING (TYP) ①

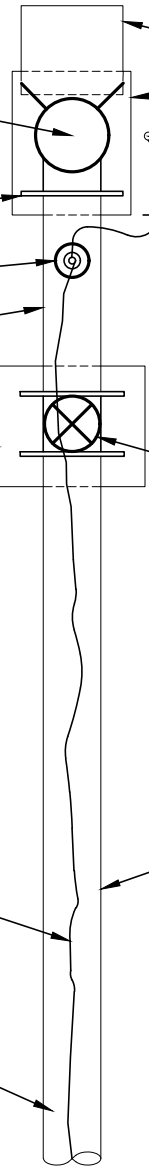
TRACER WIRE TERMINAL BOX ②

INSTALL NECESSARY REDUCER

SOLID CONCRETE BOX

EXTEND TRACER WIRE TO END OF PIPE

WATER MAIN (TYP)



SOLID CONCRETE BOX

GROUND ROD (IN CONTACT WITH
NATIVE SOIL)

5' MIN

GATE VALVE ①

SEE ITEM DESCRIPTION FOR THE SPECIFIED
RESTRAINED JOINT LENGTH FROM THE GATE
VALVE FOR A DEAD-END

- ① ALL FITTINGS AND VALVES SHALL BE RESTRAINED.
- ② 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 MAKE SURE THE METALS
DO NOT TOUCH.

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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 (REPLACE)

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

3.01 GENERAL

(REPLACE) Perform operations according to AWWA C651 in the sequence below. Successfully complete each operation specified in subsections 3.02 through 3.11 below 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.

3.02 SEQUENCE OF TESTING AND DISINFECTION

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

1. Perform initial flush.
2. Perform disinfection.
3. Flush after disinfection.
4. Perform bacteriological sampling.
5. 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.

3.04 PRESSURE AND LEAK TESTING

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

- G. (REPLACE) If during the test the pressure drops below 1.5 times the system working pressure or 150 psi, whichever is greater, the test has failed. If the test fails, repair and retest the water main. 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 5030.03: Maximum Allowable Leakage Rate

Pipe Diameter (inches)	Allowable Leakage Rate (gallons/hour/1,000 feet of pipe)
4	0.33
6	0.50
8	0.66
10	0.83
12	0.99
14	1.16
16	1.32
18	1.49
20	1.66
24	1.99
30	2.48
36	2.98

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

3.05 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.

3.07 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 (DELETE) RE-DISINFECTION

~~If the initial disinfection fails to produce satisfactory bacteriological samples, flush the main again and reinitiate the sampling process. If check samples show the presence of coliform organisms, re-chlorinate the main prior to flushing and sampling until satisfactory results are obtained.~~

3.09 (REPLACE) 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.

3.10 (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.

3.11 (ADD) PUTTING WATER MAIN IN SERVICE

Put the completed water system in service only after both sets of bacterial samples have passed, pressure test has passed, final system trace has passed, and obtaining permission from the Jurisdiction.

City of Iowa City Water Division
Accepted Products for Water Distribution Materials

(Revised February 2025)

WATER PIPE: (Ductile) ANSI/AWWA – A21.51/C151

American, McWane, U.S. Pipe/Griffin

WATER PIPE: (PVC) AWWA - C900 Pressure Class 150, DR 18

JM Eagle Blue Brute and Eagle Loc; Sanderson C900; Westlake Certa-Lok C900/RJ or C900/RJIB for directionally bored or restrained joint piping

RESTRAINED JOINT PIPE GASKET: ANSI/AWWA C111/A21.11

American Cast Iron Pipe Company, 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; Ford Meter Box, Uni-flange; Star Pipe Products, Stargrip; Tyler Union TUF Grip 1000, 1000S, 1500, 2000, and 2000S

FITTING: ANSI/AWWA A21.10/C110 or C153, 350 psi

Romac Alpha (XL) End Cap; Sigma; SIP; Star Pipe Products; 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 Meter Box, FAST; JCM-432; Mueller H304; Romac SST; Smith-Blair 665; Dresser Utility Solutions TPS

VALVE: (Resilient Seated Gate Valves) ANSI/AWWA C509, Open Counterclockwise

AVK Series 45; Clow 2639 and 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 2639 and 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 or equivalent

FIRE HYDRANT: AWWA C502, Open Clockwise, 4.5-inch main valve for pipes less than 12-inch or 5.25-inch main valve for pipes greater than or equal to 12-inch, and pumper nozzle integral Storz fitting with 1.5-inch pentagon nut, latches, and chains

Clow F-2545 Medallion with all stainless-steel shaft; Kennedy Guardian K81DD; Mueller Super Centurion 250

STAINLESS STEEL REPAIR CLAMP: 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

Dresser Utility Solutions TX3 Wide Range Coupling; Hymax 2 Wide Range 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:

Copperhead Industries Snake Bite Locking Connector LSC1230B; Copperhead Industries Direct Bury Single Connector; Ideal Industries Underground Wire Connector Model 60

TRACER WIRE: #12 AWG, Blue in Color

Copperhead, Kris Tech or equivalent

FREEZELESS YARD HYDRANT:

Woodford Mfg Iowa Model Y34 and YI

SERVICE SADDLE: ANSI/AWWA C800 NL (no lead)

AY McDonald 3845; Ford Meter Box 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 or 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; lining (if specified); furnishing, placing, and compacting bedding and backfill material, 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.

E. Manhole or Intake Adjustment, Minor:

1. Manhole Adjustment, Minor:

- c. **Includes:** (REPLACE) Unit price includes, but is not limited to, removing existing casting and existing adjustment rings, furnishing and installing adjustment rings, furnishing and installing new casting, and installing new infiltration barrier (sanitary and storm sewer manholes).

2. Intake Adjustment, Minor:

- c. **Includes:** (REPLACE) Unit price includes, but is not limited to, removing existing casting and existing adjustment rings, furnishing and installing adjustment rings, furnishing and installing new casting, and installing new infiltration barrier.

F. Manhole or Intake Adjustment Major:

1. Manhole Adjustment, Major:

- c. **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; furnishing and installing new casting; installing new infiltration barrier (required for both sanitary and storm sewer manholes); furnishing, placing, and compacting bedding and backfill material, and compaction.

2. Intake Adjustment, Major:

- c. **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 watertight seal; furnishing, placing, and compacting bedding and backfill material; and compaction.

G. Connection to Existing Manhole or Intake:

1. Connection to Existing Manhole:

- c. Includes:** (REPLACE) Unit price includes, but is not limited to, coring or cutting into the existing manhole, removal of existing fillet, pipe connections, replacement of fillet, grout, and waterstop.

2. Connection to Existing Intake:

- c. Includes:** (REPLACE) Unit price includes, but is not limited to, coring or cutting into the existing intake, removal of existing fillet, pipe connections, replacement of fillet, grout, and waterstop.

H. Remove Manhole or Intake:

1. Remove Manhole:

- c. Includes:** (REPLACE) Unit price includes, but is not limited to, excavation; removal of casting, concrete, and reinforcement; disposal; capping or 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. Remove Intake:

- c. Includes:** (REPLACE) Unit price includes, but is not limited to, excavation; removal of casting, concrete, intake throat, and reinforcement; disposal; capping or 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:

- 2. Storm Sewers:** All joint sealants used on sanitary sewers may also be used for storm sewers. The following may also be used.

- a. Rubber Rope Gasket Jointing Material:** Comply with ASTM C 990.

- b. (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. 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)

C. (DELETE) Composite: AASHTO M 306.

- ~~1. Hardware: Attach lid to frame with 316 stainless steel hardware.~~
- ~~2. Slip Resistance: Greater than 0.6 when tested according to ASTM C 1028.~~
- ~~3. Ultraviolet Resistance: Meet ASTM G 154 Cycle 1 for a minimum of 1,000 hours.~~
- ~~4. Detection: Must be detectable using standard detection equipment.~~

E. Casting Types:

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

Table 6010.03: Manhole Casting Types

	Figure Number	Casting Type	Number of Pieces	Ring/Cover	Bolted Frame	Bolted Cover (Floodable)	Gasket
Sanitary Sewer	6010.601	SW-601 A	2	Fixed ^{2,3}	Yes	No	Yes ¹
	6010.601	SW-601 C	2	Fixed ^{2,3}	Yes	Yes	Yes ¹

Storm Sewer	6010.602	SW-602 E	2	Fixed ^{2,3}	Yes	No	Yes ¹
	6010.602	SW-602 G	2	Fixed ^{2,3}	No	No	Yes ¹

- 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 [Figure 6010.601](#) and [Figure 6010.602](#) for details.

2. Intakes:

- b. (REPLACE) Covers shall have the Iowa City Standard logo. Cover will include environmental message, "Storm Sewer Drains to Stream" (see [Figure 6010.602](#)).

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 Section [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. HDPE or PVC lining can be used if approved by the Engineer. See Section [4010](#), 2.01, F, 2

3.01 GENERAL REQUIREMENTS FOR INSTALLATION OF MANHOLES AND INTAKES

E. Pipes: Install and bed pipes and connect to manhole or intake. Install pipe flush with inside wall of structure. Place bedding and pipe embedment material according to Section [3010](#).

1. Cast-in-place Structures:

- a. **Storm:** (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:

- 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. Adjustment 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 concrete adjustment rings, shim material other than concrete 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 expanded polypropylene adjustment rings when installed per the manufacturer's recommendations. The infiltration barrier needs to extend the full depth of the pavement and encompass the entirety of the chimney between the top of the casting to beyond the top of the concrete on the last riser section.

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.

M. (ADD) Intake Throat Expansion Joints:

1. Expansion joints to be sealed according to [7010](#), 3.02, L, 3.
2. All intake expansion joints are to be sealed for the entirety of the joint to the back of curb.

3.03 ADDITIONAL REQUIREMENTS FOR PRECAST CONCRETE STRUCTURES (CONTINUED)

E. (DELETE) Lift Holes: ~~Install rubber plug in lift holes. Cover plug and hole with non-shrink grout.~~

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): When adjustment is greater than can be accomplished through adding or removing adjustment rings, a major adjustment will be required.

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.
- e. Cored openings shall be perpendicular to manhole or intake walls, unless approved by the Engineer.
- f. Opening to be no greater than 2 inches larger than the outside diameter of the pipe.
- g. Leave a minimum of 6 inches of manhole or intake wall above and on the sides of the pipe.

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

Install infiltration barrier (ADD) Approved products include: external chimney seal or molded shield.

Figure 6010.302 – Rectangular Sanitary Sewer Manhole

Install infiltration barrier (ADD) Approved products include: external chimney seal or molded shield.

Figure 6010.303 – Sanitary Sewer Manhole Over Existing Sewer

Install infiltration barrier (ADD) Approved products include: external chimney seal or molded shield.

Figure 6010.304 – Rectangular Base/Circular Top Sanitary Sewer Manhole

Install infiltration barrier (ADD) Approved products include: external chimney seal or molded shield.

Figure 6010.305 – Tee Section Sanitary Sewer Manhole

Install infiltration barrier (ADD) Approved products include: external chimney seal or molded shield.

(REPLACE) Figure 6010.308 – Internal Drop Connection for Sanitary Sewer Manhole**Storm Sewer Manhole Figures****Figure 6010.401 – Circular Storm Sewer Manhole**

(ADD) Install infiltration barrier. Approved products include: external chimney seal or molded shield.

Figure 6010.402 – Rectangular Storm Sewer Manhole

(ADD) Install infiltration barrier. Approved products include: external chimney seal or molded shield.

Figure 6010.403 – Deep Well Rectangular Storm Sewer Manhole

(ADD) Install infiltration barrier. Approved products include: external chimney seal or molded shield.

Figure 6010.404 – Rectangular Base/Circular Top Storm Sewer Manhole

(ADD) Install infiltration barrier. Approved products include: external chimney seal or molded shield.

Figure 6010.405 – Tee Section Storm Sewer Manhole

(ADD) Install infiltration barrier. 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.

(ADD) All intake expansion joints are to be sealed for the entirety of the joint to the back of curb.

Figure 6010.508 – Single Open-Throat Curb Intake, Large Box

(ADD) Manhole opening must be over the discharge side of the intake structure.

(ADD) All intake expansion joints are to be sealed for the entirety of the joint to the back of curb.

Figure 6010.509 – Double Open-Throat Curb Intake, Small Box

(ADD) Manhole opening must be over the discharge side of the intake structure.

(ADD) All intake expansion joints are to be sealed for the entirety of the joint to the back of curb.

Figure 6010.510 – Double Open-Throat Curb Intake, Large Box

(ADD) Manhole opening must be over the discharge side of the intake structure.

(ADD) All intake expansion joints are to be sealed for the entirety of the joint to the back of curb.

Figure 6010.541 – Open-Throat Curb Intake under Pavement

(ADD) All intake expansion joints are to be sealed for the entirety of the joint to the back of curb.

Figure 6010.542 – Extension Unit for Open-Throat Curb Intake under Pavement

(ADD) All intake expansion joints are to be sealed for the entirety of the joint to the back of curb.

(DELETE) Remove all transverse ‘B’ Joints immediately in front of throat and adjacent to the manhole cover panel.

Figure 6010.545 – Single Open-Throat Curb Intake with Extended Opening

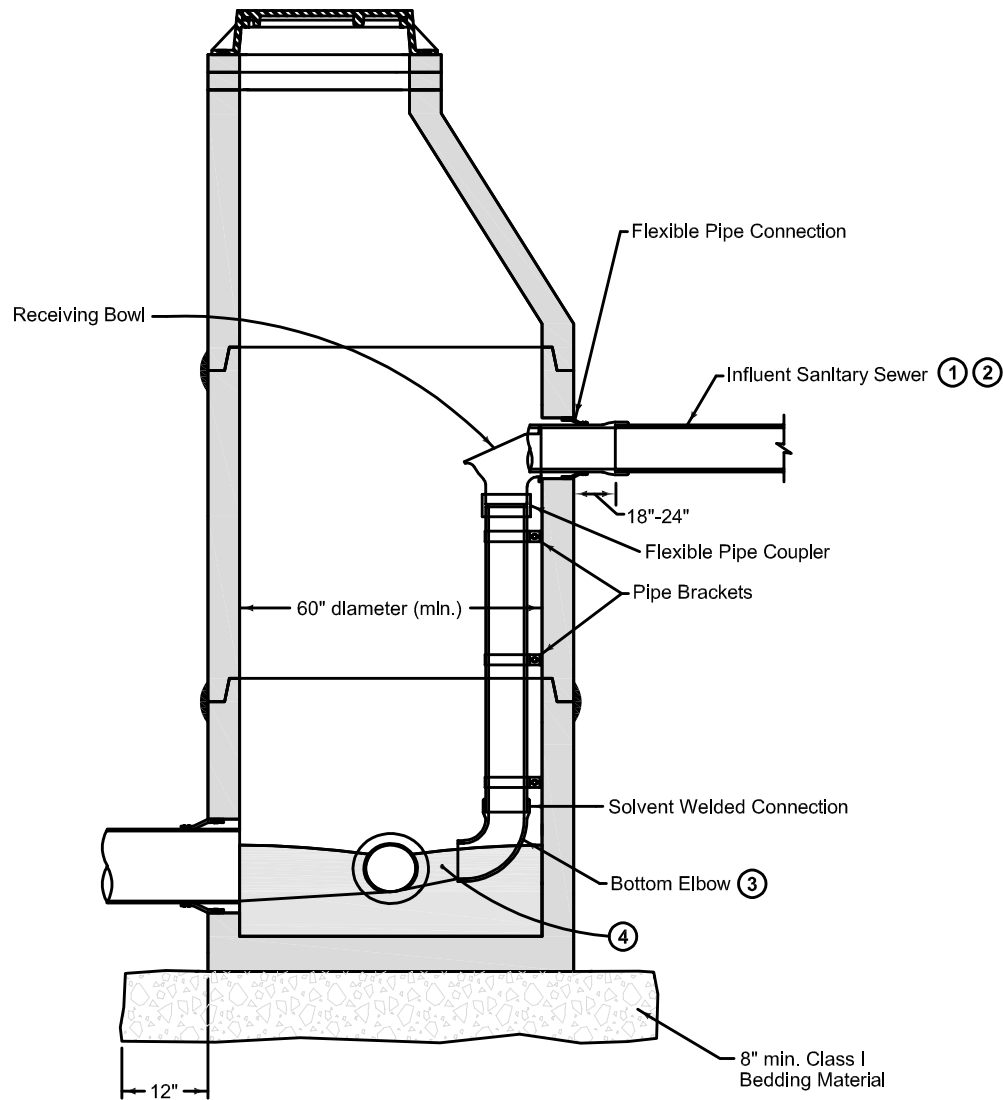
(ADD) Manhole opening must be over the discharge side of the intake structure.

(ADD) All intake expansion joints are to be sealed for the entirety of the joint to the back of curb.

Castings Figures

(REPLACE) Figure 6010.601 – Castings for Sanitary Sewer Manholes

(REPLACE) Figure 6010.602 – Castings for Storm Sewer Manholes



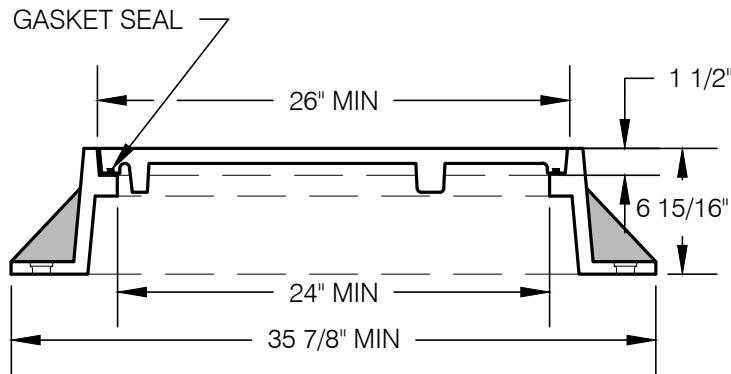
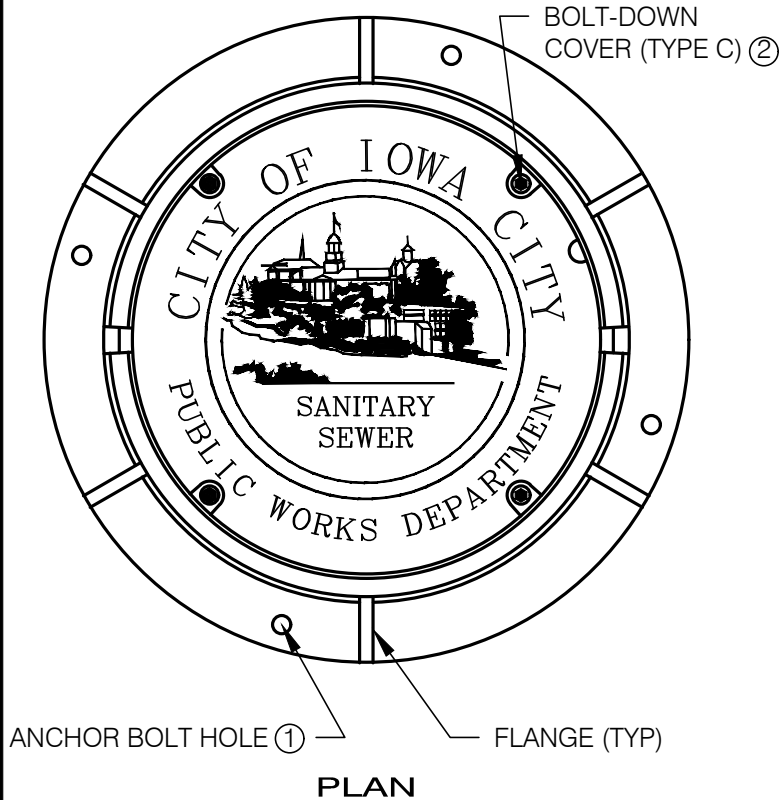
- ① Core drill openings at least 12 inches from existing manhole joints.
- ② Install flexible pipe coupler or pipe joint on new sanitary sewer 18 to 24 inches from outside of manhole wall.
- ③ Align elbow so discharge is directed at outlet pipe or at 45 degrees to manhole flow.
- ④ Reshape fillet to 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 ②



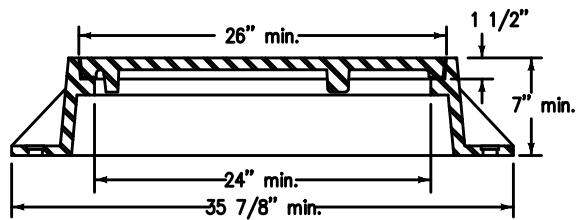
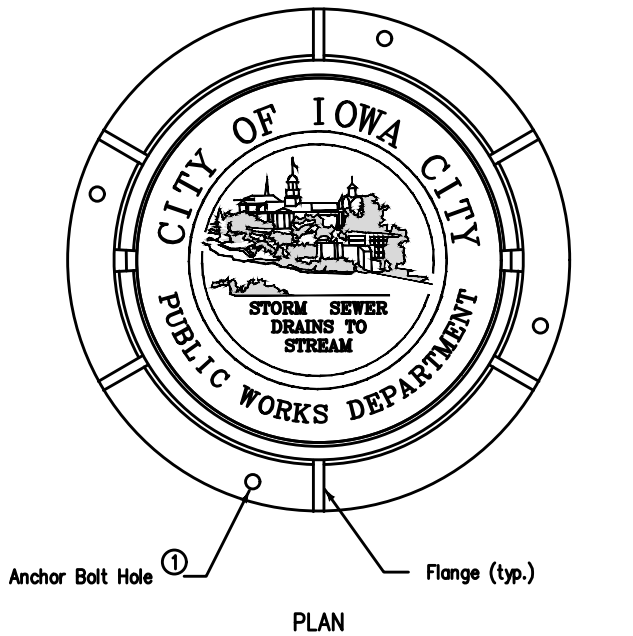
TYPICAL SECTION

FRAME NOTES:
SIZE, SPACING, AND NUMBER OF LUGS AND FLANGES
MAY VARY.

COVER NOTES:
ROUGHNESS PATTERN AND TEXT STYLES MAY VARY.
MINIMUM ONE CONCEALED PICKHOLE.

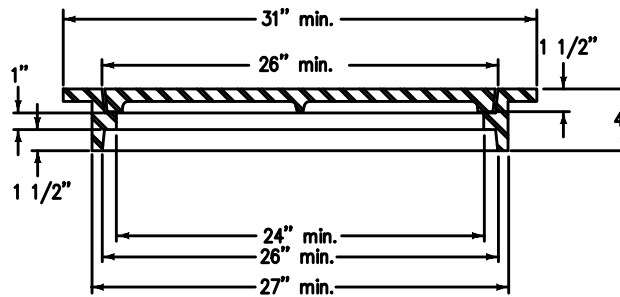
- ① ANCHOR THE LOWER FRAME OF ALL THREE-PIECE CASTINGS TO THE MANHOLE STRUCTURE. WHEN SPECIFIED IN THE CONTRACT DOCUMENTS, ANCHOR THE FRAME OF TWO-PIECE CASTINGS TO THE MANHOLE STRUCTURE. IF CASTING FRAME DOES NOT INCLUDE ANCHOR HOLES OR SLOTS, DRILL FOUR 7/8 INCH DIAMETER HOLES, EQUALLY SPACED AROUND THE FRAME.
- ② IF SPECIFIED, FURNISH BOLT DOWN FRAME AND COVER WITH FOUR 1/2 INCH MINIMUM DIAMETER STAINLESS STEEL, HEX NUT, RECESSED CAP SCREWS. SECURE COVER WITH SCREWS, WASHERS, AND RUBBER GASKET SEALS.

TYPE E
Two-piece fixed casting



TYPICAL SECTION

TYPE G
Two-piece fixed casting



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.

- ① If frame is required to be attached to structure, drill four 1/8" 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:**

~~a. **Measurement:** Each molded shield installed on an existing manhole will be counted.~~

~~b. **Payment:** Payment will be made at the unit price for each molded shield.~~

~~c. **Includes:** Unit price includes, but is not limited to, sealant.~~

3. (DELETE) Urethane Chimney Seal:

~~a. **Measurement:** Each urethane chimney seal installed on an existing manhole will be counted.~~

~~b. **Payment:** Payment will be at the unit price for each urethane chimney seal.~~

~~c. **Includes:** Unit price includes, but is not limited to, preparing the surface of the manhole and furnishing and applying primer and urethane chimney seal according to the manufacturer's requirements.~~

B. In-Situ Manhole Replacement, Cast-in-place Concrete:

- 3. Includes:** Unit price includes, but is not limited to, handling of sewer flows as required to properly complete the installation, invert overlay as recommended by the manufacturer, replacement of existing casting with a new casting, and testing the manhole upon completion.

C. In-Situ Manhole Replacement, Cast-in-place Concrete with Plastic Liner:

- 3. Includes:** Unit price includes, but is not limited to, handling of sewer flows as required to properly complete the installation, invert overlay as recommended by the manufacturer, replacement of existing casting with a new casting, sealing at the frame and cover, sealing pipe penetrations as recommended by the manufacturer, and testing the manhole upon completion.

D. Manhole Lining with Centrifugally Cast Cementitious Mortar Liner with Epoxy Seal:

- 3. Includes:** Unit price includes, but is not limited to, the handling of sewer flows during lining operations as required to properly complete the installation, and replacement of existing casting with a new casting.

E. (ADD) Abandonment of Manhole for Future Abandonment of Sewer Pipes:

- 1. Measurement:** Each type and size of manhole will be counted.
- 2. Payment:** Payment will be at the unit price for each type and size of manhole.
- 3. Includes:** Unit price includes, but is not limited to, the handling of sewer flows during installation as required to properly complete the installation; excavation; removal and disposal of riser sections and casting (unless salvaged to the Jurisdiction); furnishing and installing plug materials; furnishing and installing riser pipes into adjacent sewer pipes;

concrete for filling the base riser section(s) of the manhole; and furnishing, placing, and compacting bedding and backfill material.

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.~~

2.04 (ADD) ABANDONMENT OF MANHOLE

1. **Flowable Mortar:** Comply with [Iowa DOT Article 2506.02](#).
2. **Riser Pipes:** 2" Schedule 40 PVC pipes will be used unless otherwise specified or determined during submittal review. In the case of a substitution request, the riser pipes will use the materials (e.g. Schedule 40, Schedule 80, SDR 23.5, etc.) and sizes consistent with the equipment requirements of the contractor performing the sewer pipe abandonment work or as directed by the Engineer. Material requirements for sanitary sewer service pipes in Section [4010](#) should be followed.

3.01 INFILTRATION BARRIER

- B. ~~(DELETE) Molded Shield: Comply with Section [6010](#), 3.01.~~
- C. ~~(DELETE) Urethane Chimney Seal: and all subsections.~~

3.05 (ADD) ABANDONMENT OF MANHOLE

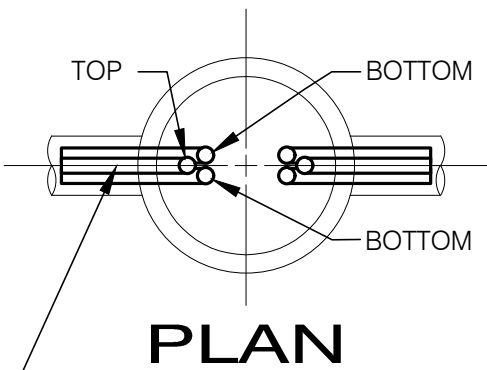
- A. **General:** Comply with [Figure 6020.101](#).
- B. **Excavation:** Excavate according to Section [3010](#) and as supplemented in this document.
- C. **Manhole Casting and Risers:**
 1. Remove the top cone and riser section(s) of the manhole as specified. If unspecified, remove all sections except the base, bottom riser section.
 2. If the casting and lid follows the standards specified in this document, Section [6010](#), [2.10](#), salvage the casting and lid to the Jurisdiction. Otherwise, dispose of the casting and lid.
- D. **Riser Pipes:**
 1. **General:** Comply with Section [4010](#), 3.06.
 2. Install plugs, fillets, or other means to protect live sewer pipes.
 3. Sewer pipes to be abandoned in the future will have at least three riser pipes installed with two pipes at the invert and one at the crown. Riser pipes will be extended to the surface or just below grade (as specified) and capped.
- E. **Flowable Mortar:** Comply with Section [4010](#), 3.08.

- F. Backfill:** any remaining portion of the manhole not filled with concrete as well as the surrounding excavation will be backfilled according to Section [3010](#) and as supplemented in this document. This includes Class II Material if under and within five feet of paved surfaces.

FIGURES

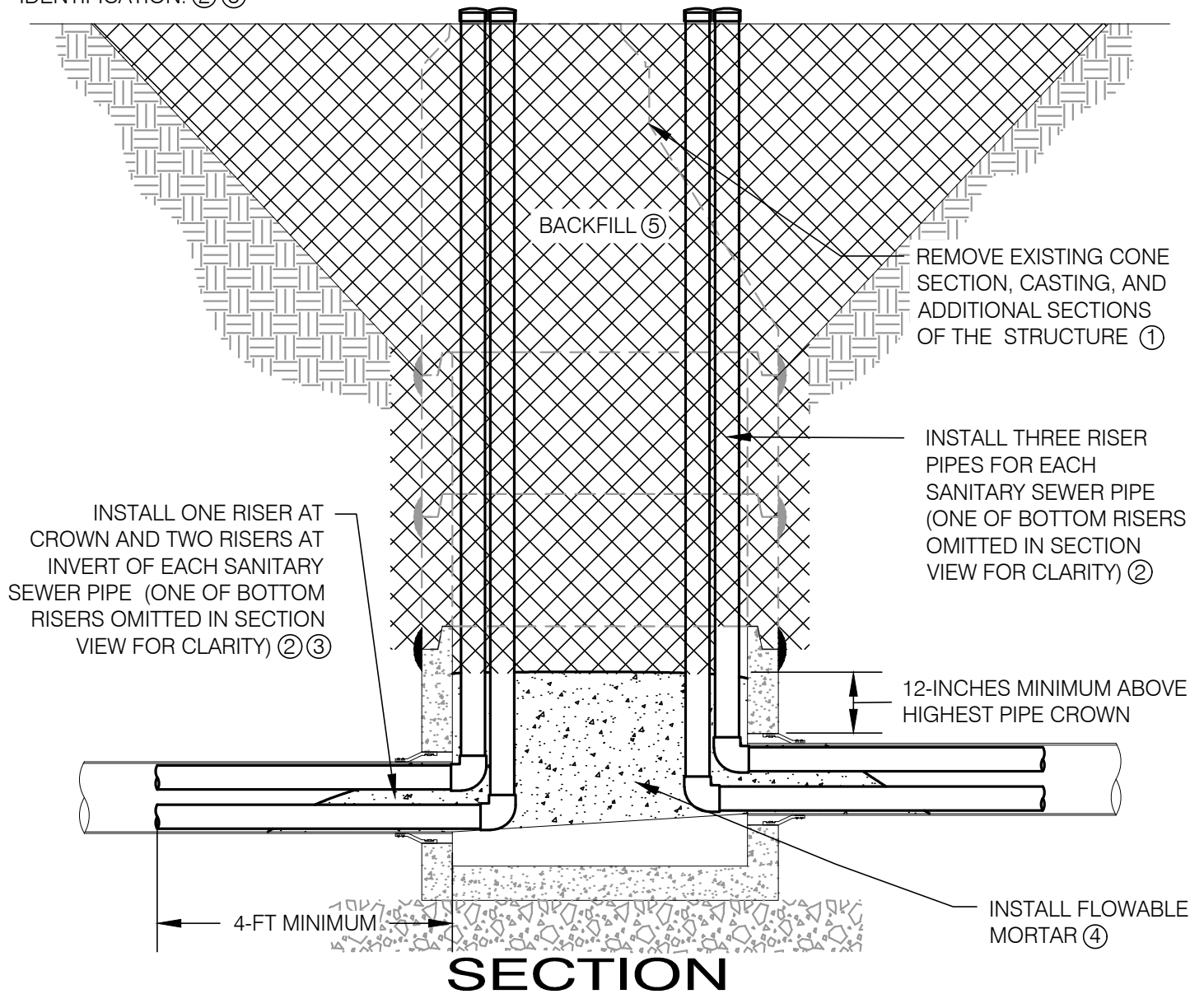
Manhole Abandonment Figure

(ADD) Figure 6020.101 – Abandonment of Manhole for Future Abandonment of Sewer Pipes



INSTALL THREE RISERS FOR EACH SANITARY SEWER PIPE. PLACE TOP RISER IN MIDDLE AS SHOWN. LABEL EACH CAP WITH "TOP" OR "BOTTOM" ACCORDINGLY WITH MARKER FOR FUTURE IDENTIFICATION. ② ③

1. REMOVE THE EXISTING CONE SECTION AND CASTING. SALVAGE THE CASTING TO THE CITY. REMOVE ADDITIONAL STRUCTURE SECTIONS EXCEPT THE BOTTOM SECTION.
2. PVC RISER PIPES ARE INSTALLED INSIDE STRUCTURE WITH A REMOVABLE CAP ON TOP OF RISER PIPE. THE TOP OF THE RISER PIPE WILL BE EXTENDED TO GRADE OR THE TOP OF REMAINING STRUCTURE DEPENDING ON THE TIMING OF THE FUTURE PIPE ABANDONMENT. INSTALL A 90-DEGREE ELBOW FITTING AT THE BOTTOM OF EACH RISER PIPE AND EXTEND THESE PIPES HORIZONTALLY INTO EACH SANITARY SEWER PIPE AT LEAST FOUR FEET FROM INSIDE OF STRUCTURE WALL.
3. FOR EACH SANITARY SEWER PIPE, TWO RISER PIPES SHALL BE INSTALLED AT BOTTOM OF INSIDE PIPE (AT INVERT). ONE RISER PIPE SHALL BE INSTALLED AT TOP OF INSIDE PIPE (AT CROWN).
4. FLOWABLE MORTAR IS TO BE PLACED IN THE BOTTOM OF THE STRUCTURE TO A DEPTH OF AT LEAST 12 INCHES ABOVE THE HIGHEST CROWN OF THE SANITARY SEWER PIPES REMAINING IN THE STRUCTURE.
5. THE REMAINING BACKFILL SHALL BE ACCORDING TO SECTION 3010 AS AMENDED BY THE SUPPLEMENTAL SPECIFICATIONS.



NOT TO SCALE

JANUARY 2024

**DIVISION 7 -
STREETS AND RELATED WORK**

SECTION 7010 – PORTLAND CEMENT CONCRETE PAVEMENT

1.07 SPECIAL REQUIREMENTS (REPLACE)

- A. Permanent pavement will not be installed between 16th November and 31st March each year without approval of the Engineer.
- B. Pavement removal and replacement shall be full panels and extend into the nearest full panel at least three feet beyond the trench limits, unless approved by the Engineer.
- C. A C-SUD mixture will be used unless otherwise specified or approved by the Engineer.
- D. A pre-pour meeting will be coordinated with the Engineer at least 48 hours in advance of planned installation. Additional advanced notice and coordination is preferred.

1.08 MEASUREMENT AND PAYMENT

A. PCC Pavement:

- 3. **Includes:** (REPLACE) Unit price includes, but is not limited to, final trimming of subgrade or subbase, integral curb, bars and reinforcement, joints and sealing, surface curing and pavement protection (cold weather protection according to Section [7010](#), 1.08, N), safety fencing, concrete for rigid headers, boxouts for fixtures, pavement smoothness testing, and quality control for stringless paving.

E. Curb and Gutter

- 3. **Includes:** (REPLACE) Unit price includes, but is not limited to, final subgrade/subbase preparation, bars and reinforcement, joints and sealing, surface curing and pavement protection (cold weather protection according to Section [7010](#), 1.08, N), and boxouts for fixtures.

F. Beam Curb:

- 3. **Includes:** (REPLACE) Unit price includes, but is not limited to, final subgrade/subbase preparation, bars and reinforcement, joints and sealing, surface curing and pavement protection (cold weather protection according to Section [7010](#), 1.08, N), and boxouts for fixtures.

G. Concrete Median:

- 3. **Includes:** (REPLACE) Unit price includes, but is not limited to, final subgrade/subbase preparation, bars and reinforcement, joints and sealing, surface curing and pavement protection (cold weather protection according to Section [7010](#), 1.08, N), and boxouts for fixtures.

K. PCC Pavement Widening:

- 3. **Includes:** (REPLACE) Unit price includes, but is not limited to, final subgrade/subbase preparation, integral curb, bars and reinforcement, joints and sealing, surface curing and pavement protection (cold weather protection according to Section [7010](#), 1.08, N), safety fencing, concrete for rigid headers, boxouts for fixtures, and pavement smoothness.

N. PCC Cold Weather Protection:

2. **Payment:** (ADD) Protection necessary after November 15 and before April 1 will be paid for only when the Engineer authorizes work.
3. **Includes:** (ADD) Hot water and heated materials are incidental. Cold weather protection is incidental to pavement item unless otherwise included in the contract documents as a separate item or approved by the Engineer.

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 Engineer. If approved, the batch shall be mixed at least an additional 30 revolutions of the drum at mixing speed.

C. Concrete Placement Equipment:**1. Consolidating and Finishing Equipment:**

- b. (ADD) For full street width paving, hand placement will not be permitted for a centerline length less than 300 feet unless approved by the Engineer.

3.02 PAVEMENT CONSTRUCTION**C. Surface Fixture Adjustment:**

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

L. Joint Sealing:**3. Sealing:**

- f. (ADD) All expansion joints for intake throats are to be sealed for the entirety of the joint to the back of curb as described in [7010](#), 3.02, L, 3, a through 3.02, L, 3, e.

3.04 PAVEMENT PROTECTION**A. Weather Conditions:** Do not place concrete when stormy or inclement weather or temperature prevents good workmanship. Temperature restrictions and protection requirements may be modified by the Engineer under unusual conditions.

1. **Cold Weather:** (ADD) Cold weather protection is incidental to pavement item unless otherwise included in the contract documents as a separate item or approved by the Engineer. Cold weather protection is described in [7010](#), 1.08, N.

FIGURES

Figure 7010.101 – Joints

Sheet 5 of 8, Section B-B:

(ADD) All intake expansion joints are to be sealed for the entirety of the joint to the back of curb.

'E' JOINT IN CURB (View at Back of Curb):

(ADD) All intake expansion joints are to be sealed for the entirety of the joint to the back of curb.

(ADD) 'EE' JOINT IN CURB (View at Back of Curb):

(ADD) All intake expansion joints are to be sealed for the entirety of the joint to the back of curb.

(REMOVE) Figure 7010.103 – Manhole Boxouts in PCC Pavement

Figure 7010.901 – PCC Pavement Jointing

(ADD) If the roadway width differs from the dimensions shown, the jointing should be according to the plans or otherwise approved by the Engineer.

SECTION 7011 – PORTLAND CEMENT CONCRETE OVERLAYS

1.07 SPECIAL REQUIREMENTS (REPLACE)

- A. Permanent pavement will not be installed between 16th November and 31st March each year without approval of the Engineer.
- B. A pre-pour meeting will be coordinated with the Engineer at least 48 hours in advance of planned installation. Additional advanced notice and coordination is preferred.

SECTION 7020 – ASPHALT PAVEMENT

1.07 SPECIAL REQUIREMENTS (REPLACE)

- A. Permanent pavement will not be installed between 16th November and 31st March each year without approval of the Engineer.
- B. A pre-pour meeting will be coordinated with the Engineer at least 48 hours in advance of planned installation. Additional advanced notice and coordination is preferred.

1.08 MEASUREMENT AND PAYMENT

M. Asphalt Cold Weather Paving:

- 3. **Includes:** (ADD) Hot water and heated materials are incidental. Cold weather protection is incidental to pavement item unless otherwise included in the contract documents as a separate item or approved by the Engineer.

SECTION 7021 – ASPHALT OVERLAYS

1.07 SPECIAL REQUIREMENTS (REPLACE)

- A. Permanent pavement will not be installed between 16th November and 31st March each year without approval of the Engineer.
- B. A pre-pour meeting will be coordinated with the Engineer at least 48 hours in advance of planned installation. Additional advanced notice and coordination is preferred.

2.01 ASPHALT OVERLAY MATERIALS

(ADD) Unless otherwise approved, use high traffic (HT), 1/2", no friction mix (PG58-28H). The base and surface courses should be minimum lift thickness of 1.5 inches.

SECTION 7030 – SIDEWALKS, SHARED USE PATHS, AND DRIVEWAYS

1.07 SPECIAL REQUIREMENTS (REPLACE)

- A. Permanent pavement will not be installed between 16th November and 31st March each year without approval of the Engineer.
- B. Pavement removal and replacement shall be full panels and extend into the nearest full panel at least three feet beyond the trench limits, unless approved by the Engineer.
- C. A C-SUD mixture will be used unless otherwise specified or approved by the Engineer.
- D. A pre-pour meeting will be coordinated with the Engineer at least 48 hours in advance of planned installation. Additional advanced notice and coordination is preferred.

1.08 MEASUREMENT AND PAYMENT

C. Shared Use Paths:

- 3. **Includes:** (REPLACE) Unit price includes, but is not limited to, subgrade preparation, bars and reinforcement, jointing, sampling, slope and smoothness testing and correction, and testing.

E. PCC Sidewalk:

- 3. **Includes:** (REPLACE) price includes, but is not limited to, minor grade adjustments at driveways and other intersections, subgrade preparation, formwork, additional thickness at thickened edges, bars and reinforcement, jointing, sampling, slope and smoothness testing and correction, and testing.

H. Driveways:

1. Paved Driveways:

- c. **Includes:** (REPLACE) Unit price includes, but is not limited to, excavation, subgrade preparation, bars and reinforcement, jointing, sampling, and testing.

2.01 PORTLAND CEMENT CONCRETE

A. (REPLACE) Class C for sidewalks, shared use paths, and driveways with materials complying with Section [7010](#). Use coarse aggregate of Class 2 durability or better.

C. (ADD) **Bars and Reinforcement:** comply with Section [7010](#), 2.01, H.

2.07 DETECTABLE WARNINGS (REPLACE)

Detectable warning panels shall be cast iron or galvanized steel with brick red color with a non-slip surface and raised truncated domes. Comply with the Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way (also known as PROWAG) for contrast and dimension requirements. Also comply with [Iowa DOT Materials I.M. 411](#).

3.01 REMOVALS

G. (ADD) Pavement removal shall be full panels and extend into the nearest full panel at least three feet beyond the trench limits, unless approved by the Engineer.

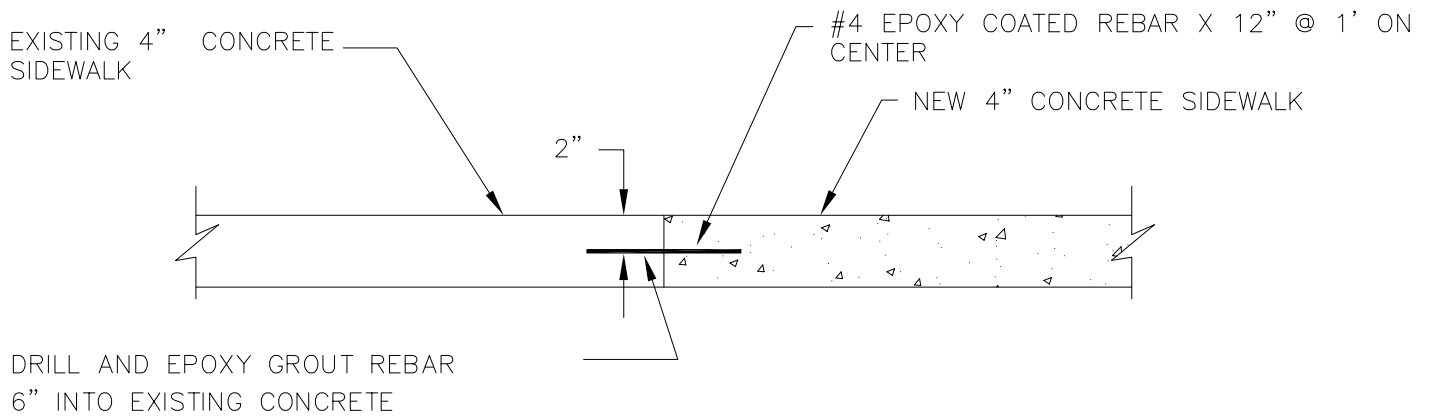
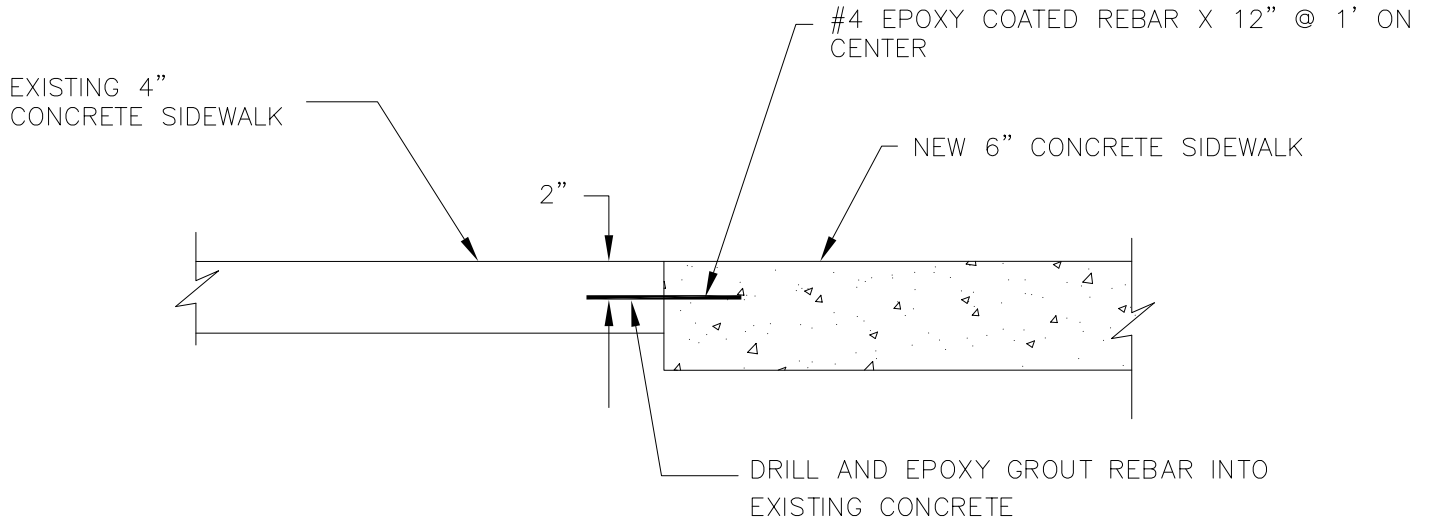
3.04 PCC SIDEWALKS, SHARED USE PATHS, AND DRIVEWAYS**F. Jointing:**

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



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SECTION 7040 – PAVEMENT REHABILITATION**1.01 SECTION INCLUDES**

I. ~~(DELETE) Core Hole Cutting and Replacement~~

1.02 DESCRIPTION OF WORK

H. ~~(DELETE) Cutting and replacement of pavement cores.~~

1.07 SPECIAL REQUIREMENTS (REPLACE)

- A. Composite pavements shall be replaced as composite pavement (e.g. 8" PCC and 3" HMA), unless approved by the Engineer.
- B. Permanent pavement will not be installed between 16th November and 31st March each year without approval of the Engineer.
- C. A pre-pour meeting will be coordinated with the Engineer at least 48 hours in advance of planned installation. Additional advanced notice and coordination is preferred.

1.08 MEASUREMENT AND PAYMENT**K. ~~(DELETE) Core Hole Cutting and Replacement:~~**

- ~~1. **Measurement:** Measurement will be by count of the number of core holes replaced.~~
- ~~2. **Payment:** Payment will be made at the contract unit price per core hole replaced.~~
- ~~3. **Includes:** Unit price includes but is not limited to, cutting the core hole, vacuum excavation, furnishing and placing backfill material and pavement, or replacing the pavement core using waterproof bonding material, if specified.~~

2.01 MATERIALS

O. ~~(DELETE) Rapid Set Patch Material:~~ and all subsections.

3.01 GENERAL

H. (ADD) Pavement removal shall be full panels and extend into the nearest full panel at least three feet beyond the trench limits, unless approved by the Engineer.

3.02 FULL DEPTH PATCHING**A. Pavement Removal:**

- 3. (ADD) Only wet sawing is allowed for pavement removals unless otherwise approved by the Engineer.

3.11 ~~(DELETE) CORE HOLE CUTTING AND REPLACEMENT~~

and all subsections.

FIGURES

(REMOVE) Figure 7040.107 – Utility Core Hole Repair

SECTION 7060 – BITUMINOUS SEAL COAT**1.07 SPECIAL REQUIREMENTS (REPLACE)**

- A. Permanent pavement will not be installed between 16th November and 31st March each year without approval of the Engineer.
- B. A pre-pour meeting will be coordinated with the Engineer at least 48 hours in advance of planned installation. Additional advanced notice and coordination is preferred.

SECTION 7090 – COLD-IN-PLACE PAVEMENT RECYLCING**1.07 SPECIAL REQUIREMENTS (REPLACE)**

- A. Permanent pavement will not be installed between 16th November and 31st March each year without approval of the Engineer.
- B. A pre-pour meeting will be coordinated with the Engineer at least 48 hours in advance of planned installation. Additional advanced notice and coordination is preferred.

SECTION 7091 – FULL DEPTH RECLAMATION**1.07 SPECIAL REQUIREMENTS (REPLACE)**

- A. Permanent pavement will not be installed between 16th November and 31st March each year without approval of the Engineer.
- B. A pre-pour meeting will be coordinated with the Engineer at least 48 hours in advance of planned installation. Additional advanced notice and coordination is preferred.

SECTION 7092 – CRACK AND SEAT EXISTING PCC PAVEMENT**1.07 SPECIAL REQUIREMENTS (REPLACE)**

- A. Permanent pavement will not be installed between 16th November and 31st March each year without approval of the Engineer.
- B. A pre-pour meeting will be coordinated with the Engineer at least 48 hours in advance of planned installation. Additional advanced notice and coordination is preferred.

**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. The handholes shall have ANSI Tier 22 ratings and the covers shall have ANSI/SCTE 77 2017 Tier 15 ratings. Covers shall be two-piece for Type III and Type IV handholes. Provide a skid resistant surface on the cover. Provide two 3/8-16 UNC stainless steel hex head bolts with washers.

4. **(DELETE) HDPE Handhole and Cover:** and all subsections

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

6. **(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 iNS 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. The mounting system shall be the deep mounting cups, not the shallow ones.

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.

F. (ADD) Radar Detection System:

1. **Equipment:** Wavetronix radar detection system.
2. Use of radar detection instead of video detection camera system must be approved by the Engineer.

2.04 CABINET AND CONTROLLER

- A. Controller, Cabinet, and Auxiliary Equipment:** Comply with the latest edition of NEMA TS1, CalTrans model 2070, or ITE advanced transportation controller (ATC) standards.

1. Controller:

- h. (ADD) Siemens m60 Series ATC controller using NEMA ECOM for communication.

2. Cabinet:

k. (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.

l. (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.

- m. (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:** Comply with current MUTCD and ITE standards.**1. Housing:**

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

6. Backplate:

- c. (REPLACE) Provide high visibility reflective tape with a minimum width of 2 inches.

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 and consistent with cabinet voltage requirements. LED modules shall be provided with a 15-year performance warranty.**B. Pedestrian Traffic Signal Head Assembly:** Comply with current MUTCD and ITE standards.**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:

- d. (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.
- j. (ADD) Luminaire mounting height shall be 30 feet unless otherwise specified.
- k. (ADD) Orient luminaire on mainline mast arm at 350 degrees to light cross street signing.

D. Traffic Signal Pedestal Poles:

- 1. **Materials:** (ADD) Unless approved by the Engineer, follow [8010.2.05.F](#) and [Figure 8010.108](#), for Pedestrian Push Button Posts.

F. (ADD) Pedestrian Push Button Post:

1. **Material:** (REPLACE) Use Frey Manufacturing Corporation Crosswalk Pedestals that comply with [Figure 8010.108](#), 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:**
 - a. (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 gutter line, unless utility conflicts require deeper placement. 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.
- g. (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 make sure 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

5 Conductor Cables	7 Conductor Cables	9 Conductor Cables – Pedestrian Signals
Green ball = green Yellow ball = black Red ball = red Common = white Spare = orange	Green ball = green Yellow ball = black Red ball = red Green arrow = blue Yellow arrow = orange Commons = white and white/black	Main street walk = green Main street don't walk = red Side street walk = green/black Side street don't walk = red/black Common = white Main street push button = orange Side street push button = black Common = white/black Common = blue

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 8 inches of the removal area, if outside the proposed pavement, shall be backfilled with topsoil.

3.02 DETECTION

- E. **(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

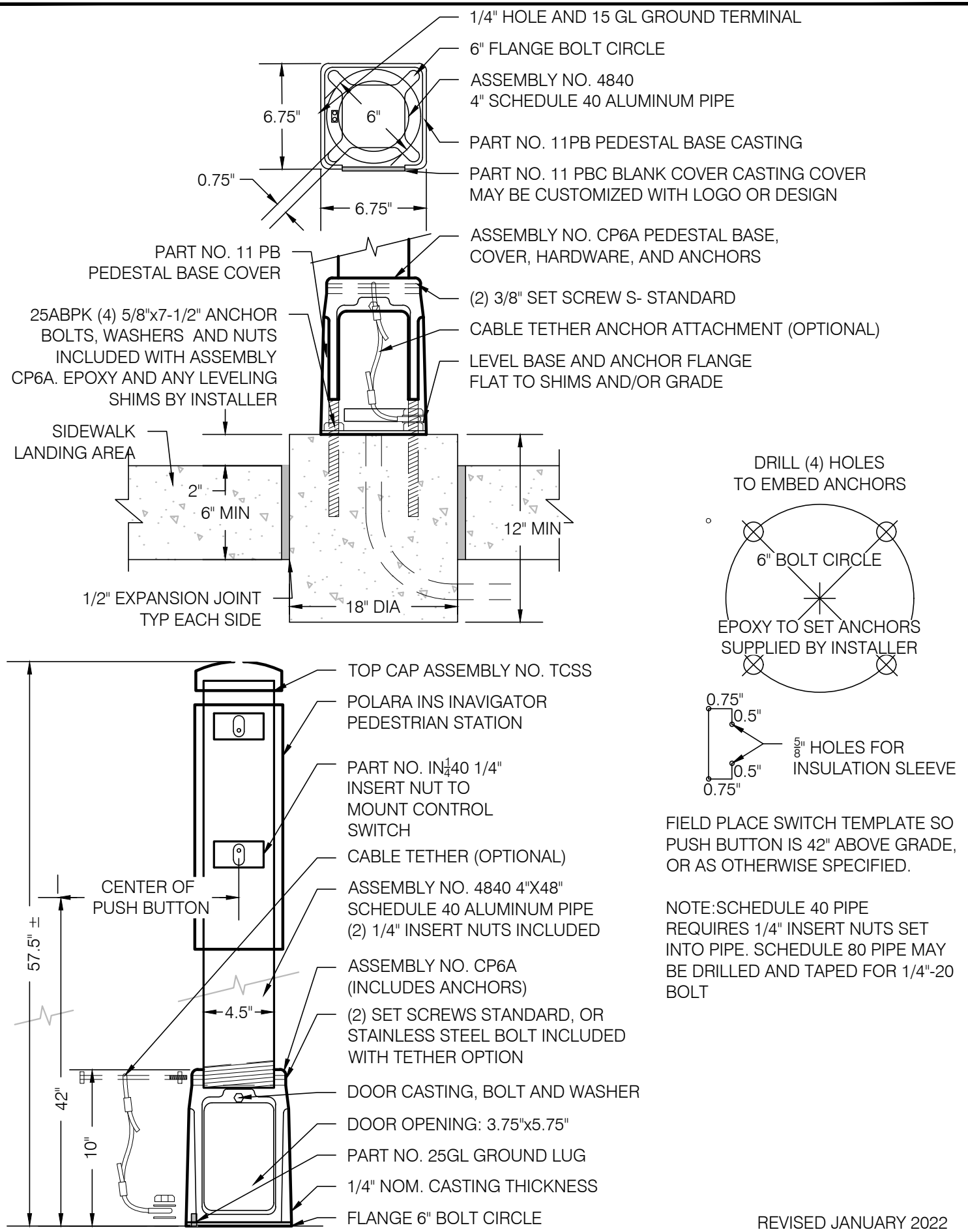
Figure 8010.102 – Traffic Signal Pole Foundation

(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.

(ADD) Figure 8010.108 – Pedestrian Pole and Pedestrian Post Details



REVISED JANUARY 2022

SECTION 8020 – PAVEMENT MARKINGS

1.07 SPECIAL REQUIREMENTS

- A. A pre-paint meeting will be coordinated with the Engineer at least 48 hours in advance of planned installation. Additional advanced notice and coordination is preferred.
- B. The standard width of pavement markings is four inches unless otherwise noted or approved by the Engineer.

2.01 MATERIALS

- B. Pavement marking materials include:
 - 2. Painted Pavement Markings: (ADD) High-build waterborne paint pavement markings complying with [Iowa DOT 2527](#) shall be used unless otherwise approved by the Engineer.

3.01 EQUIPMENT

C. Pavement Marking Removal:

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

3.02 CONSTRUCTION

A. General:

- 3. (ADD) Comply with the current version of the MUTCD as well as [Figure 8020.101](#) for paint lines, symbols, and other markings.

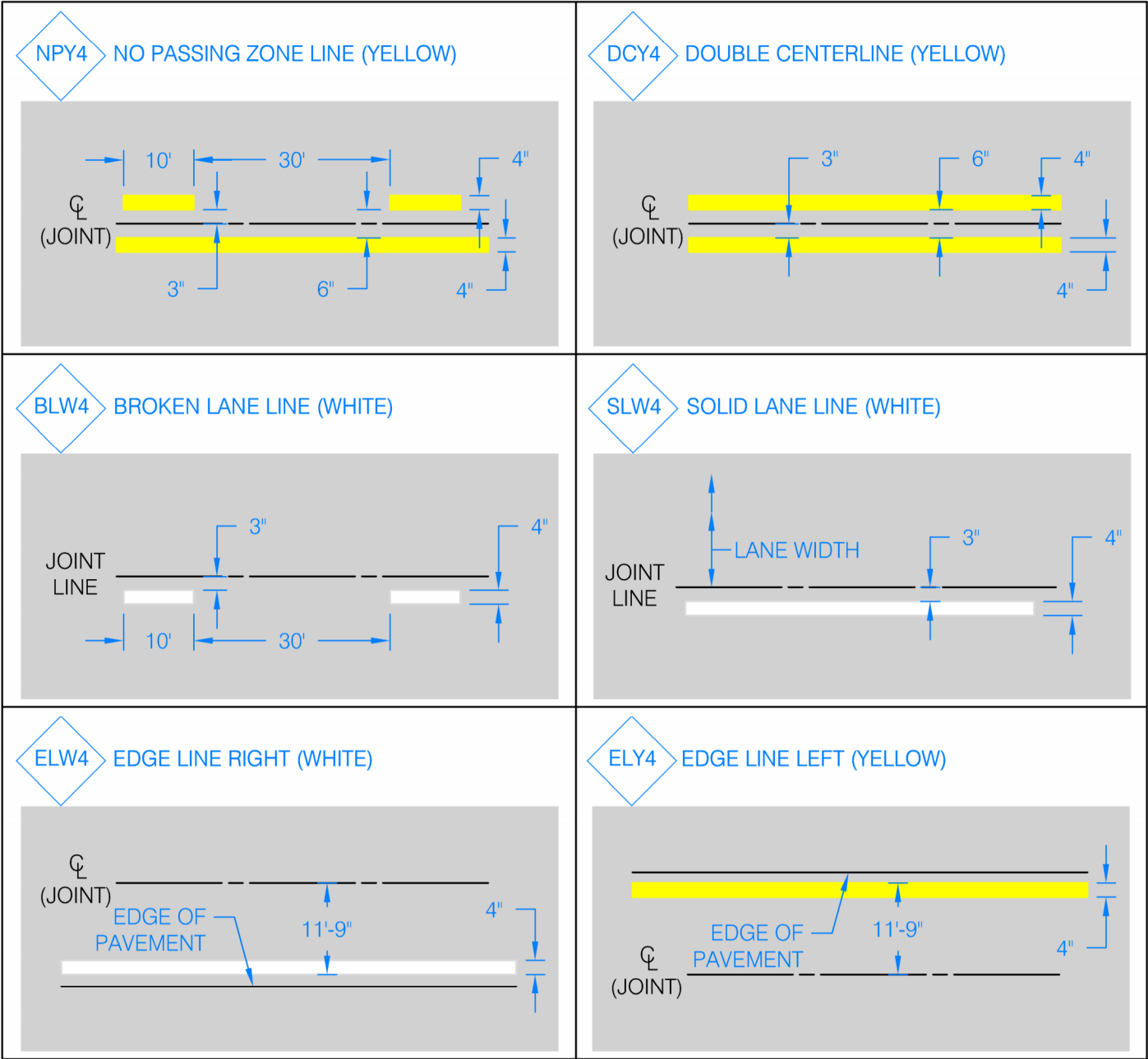
H. Removal of Pavement Markings:

2. Process:

- d. (REPLACE) Removing pavement markings shall be done by water blasting unless grinding or another method is approved by the Engineer. Open abrasive blasting or dry grinding without containment is not allowed.

FIGURES

(ADD) Figure 8010.101 – Line Types

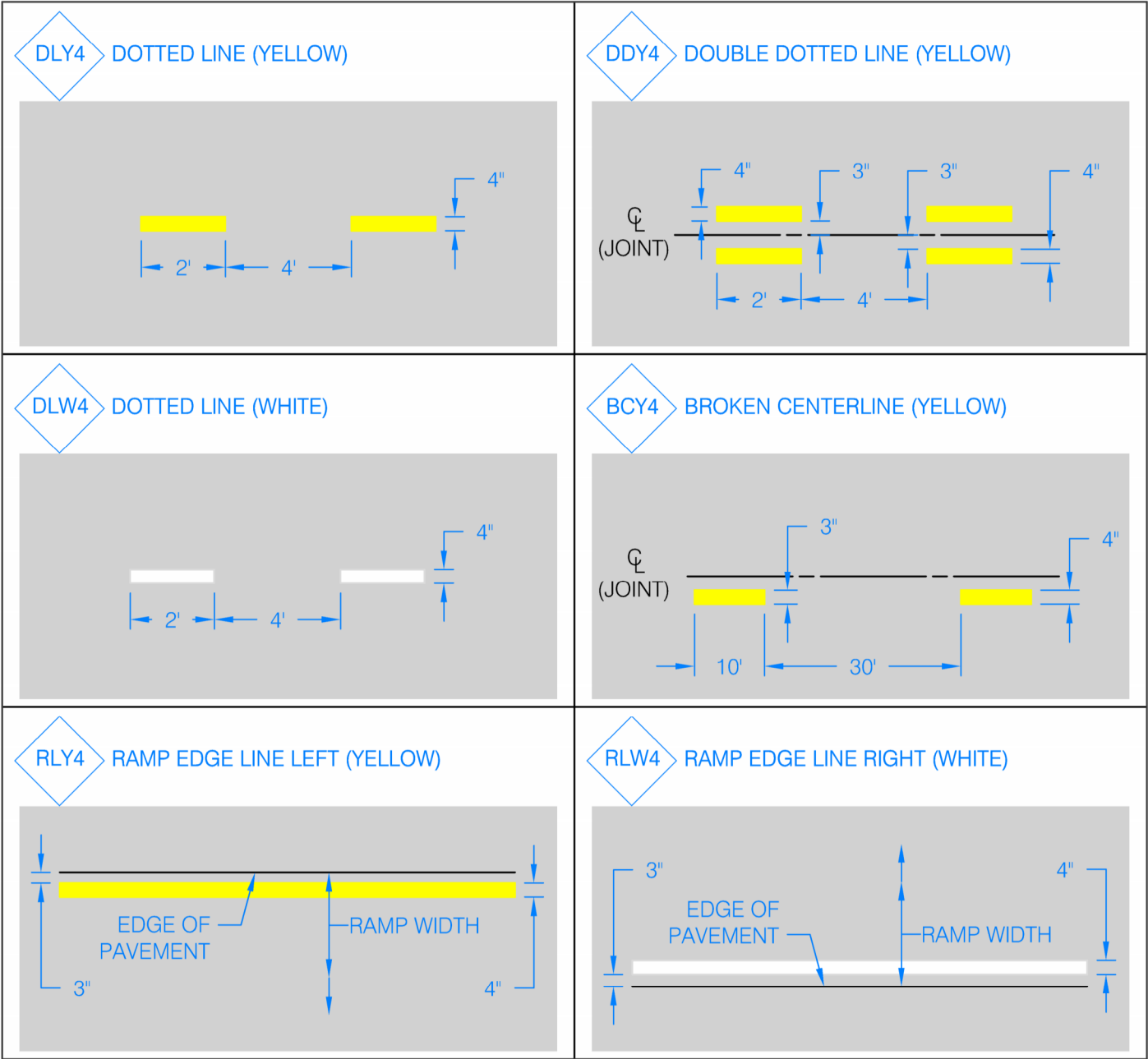


DETAIL NOTES

1. LANE LAYOUTS SHOWN ARE TYPICAL
2. CENTERLINES AND LANE LINES MAY BE PAINTED EITHER SIDE OF THE CENTERLINE.
3. DETAILS ARE ORIENTATED TO REPRESENT DIRECTION OF TRAFFIC MOVING FROM LEFT TO RIGHT
4. DETAILS ADAPTED FROM THE IOWA DEPARTMENT OF TRANSPORTATION STANDARD ROAD PLAN PM-110 REVISION 4 DATED 04-16-24
5. DETAILS NOT TO SCALE

REVISED JANUARY 2024

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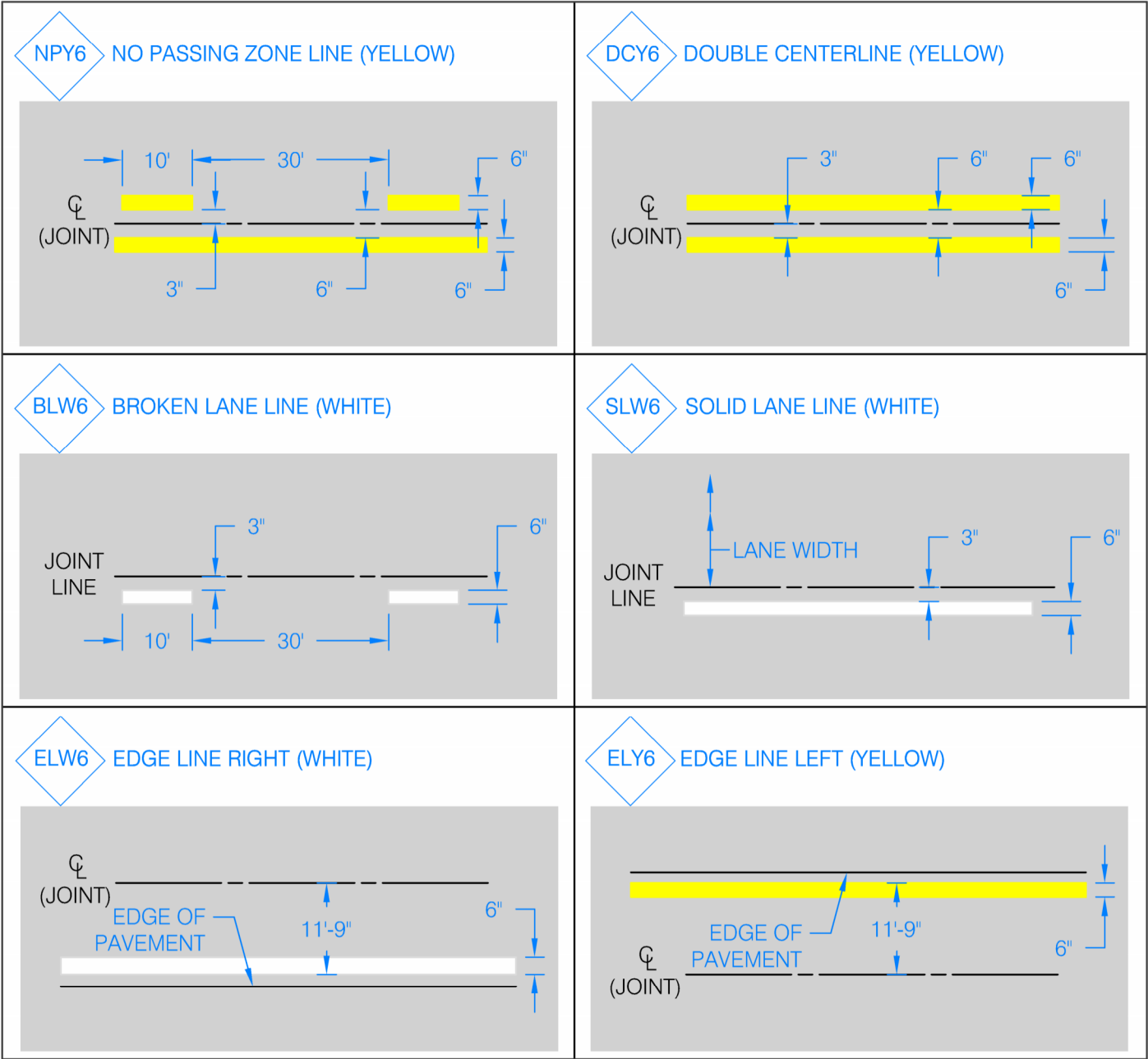


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REVISED JANUARY 2024

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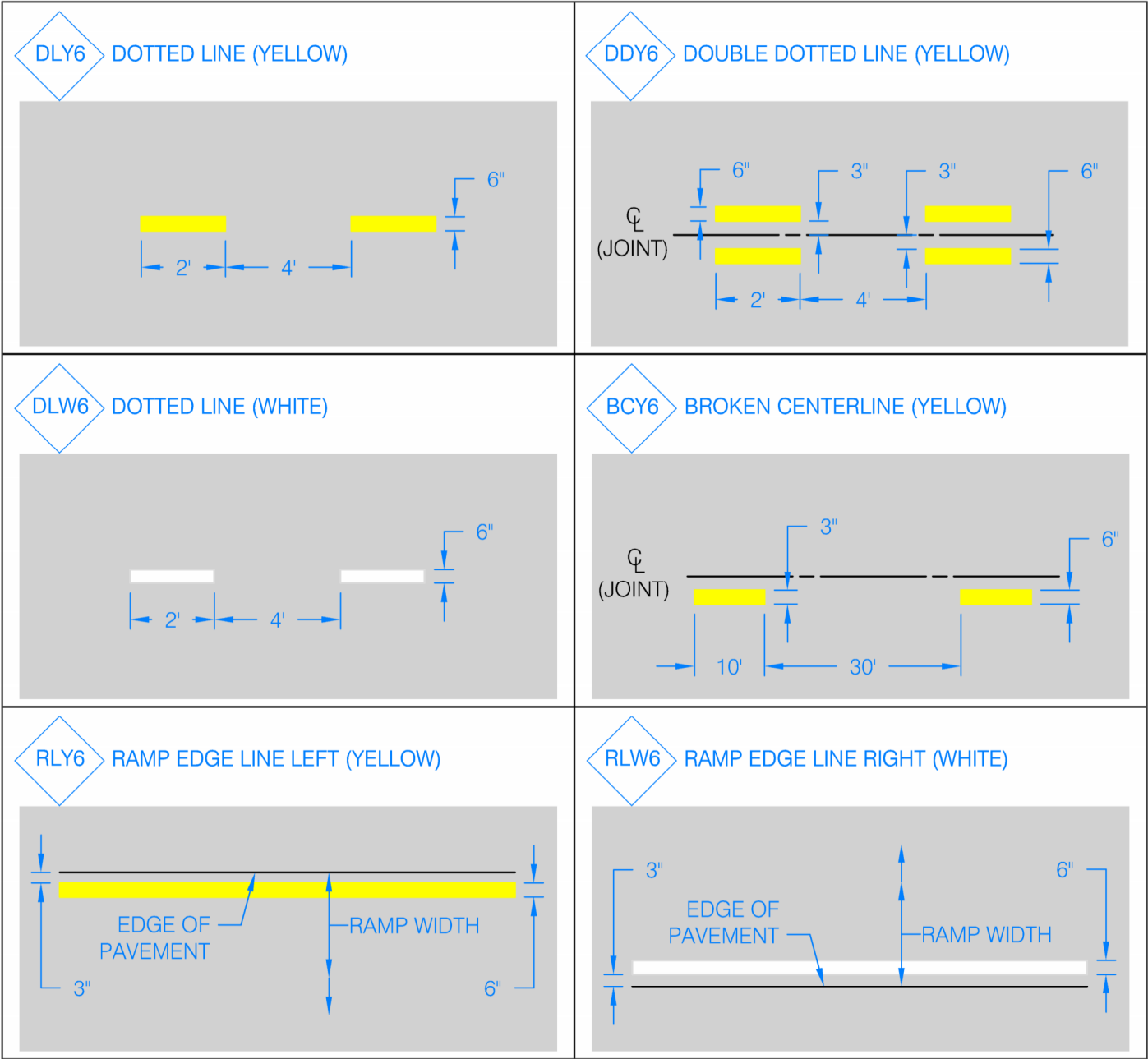


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4. DETAILS ADAPTED FROM THE IOWA DEPARTMENT OF TRANSPORTATION STANDARD ROAD PLAN PM-110 REVISION 4 DATED 04-16-24
5. DETAILS NOT TO SCALE

REVISED JANUARY 2024

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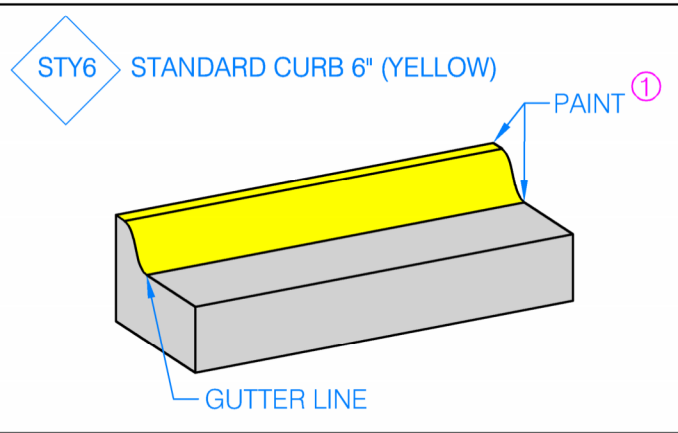
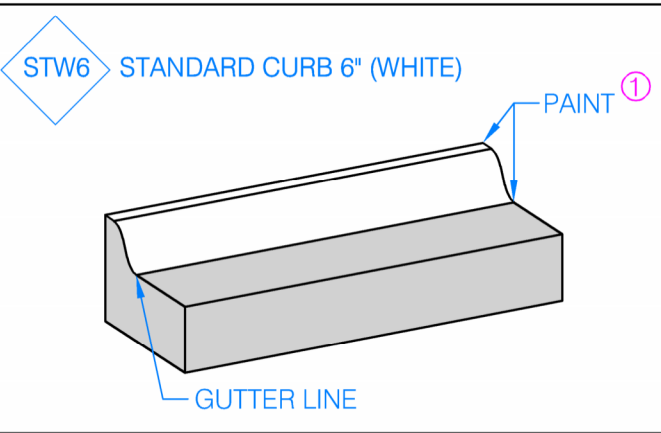
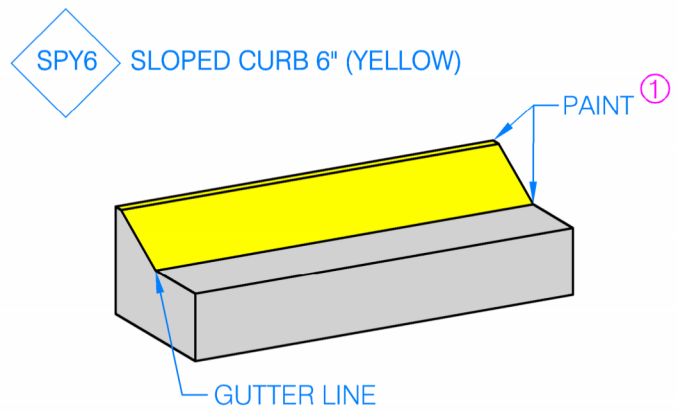
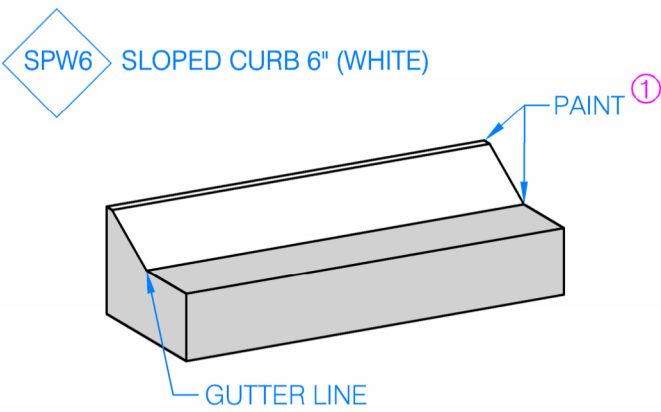
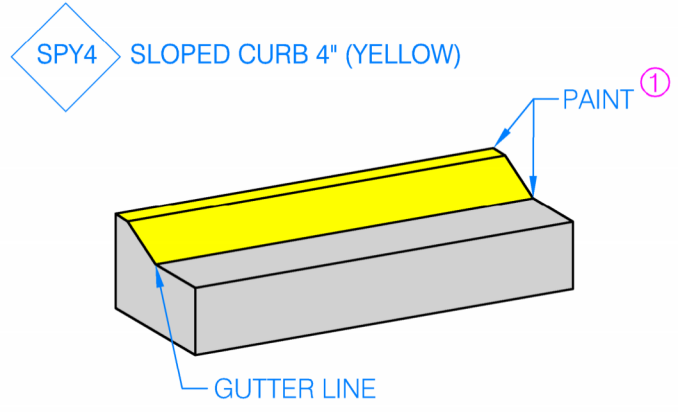
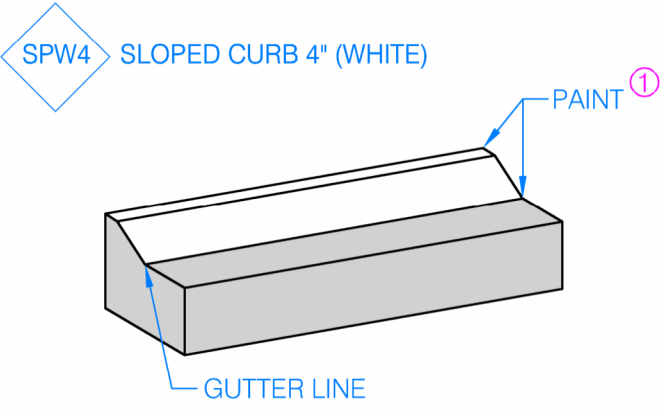


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2. CENTERLINES AND LANE LINES MAY BE PAINTED EITHER SIDE OF THE CENTERLINE.
3. DETAILS ARE ORIENTATED TO REPRESENT DIRECTION OF TRAFFIC MOVING FROM LEFT TO RIGHT
4. DETAILS ADAPTED FROM THE IOWA DEPARTMENT OF TRANSPORTATION STANDARD ROAD PLAN PM-110 REVISION 4 DATED 04-16-24
5. DETAILS NOT TO SCALE

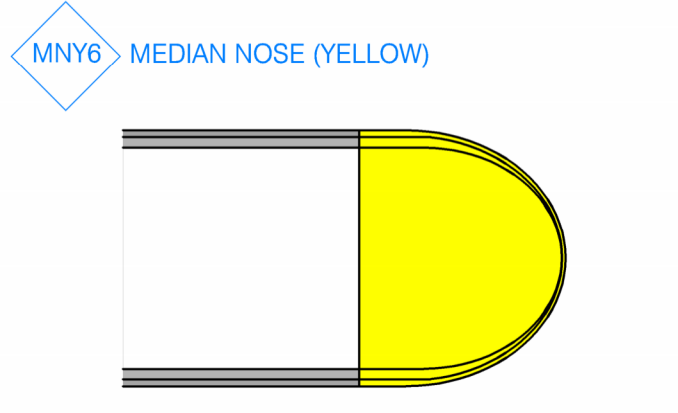
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REVISED JANUARY 2024



DETAIL NOTES

1. APPLY PAINT FROM THE BACK OF CURB TO GUTTER LINE
2. CURB LAYOUTS SHOWN ARE TYPICAL
3. DETAILS ADAPTED FROM THE IOWA DEPARTMENT OF TRANSPORTATION STANDARD ROAD PLAN PM-110 REVISION 4 DATED 04-16-24
4. DETAILS NOT TO SCALE



REVISED JANUARY 2024

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SECTION 8030 – TEMPORARY TRAFFIC CONTROL**1.07 SPECIAL REQUIREMENTS**

- C. (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.

2.06 FLAGGERS

- E. (ADD) Flaggers are required on arterials, where at least one lane in each direction cannot be maintained, and in other circumstances as required by the Engineer.

SECTION 8040 – TRAFFIC SIGNS AND POSTS**1.07 SPECIAL REQUIREMENTS**

- C. (ADD) Permanent signs will use only materials approved by the Jurisdiction. Prohibited materials for use on permanent signs within the right-of-way include, but are not limited to: round steel posts, u-shaped rail steel posts, and wood posts.

**DIVISION 9 -
SITE WORK AND LANDSCAPING**

SECTION 9010 – SEEDING

2.02 SEED MIXTURES AND SEEDING DATES

- A. **Type 1 (Permanent Lawn Mixture):** Used for residential and commercial turf site, fertilized, and typically mowed. (REPLACE) Use between March 1 and May 31 and between August 10 and October 15.
- B. **Type 2 (Permanent Cool Season Mixture for Slopes and Ditches):** Not typically mowed. Reaches a maximum height of 2 to 3 feet, low fertility requirements, grows in the spring and fall, and can go dormant in the summer. (REPLACE) Use between March 1 and May 31 and between August 10 and October 15.
- F. **Type 6 (Salt-resistant Mixture):** Use for grass medians and areas immediately back of curb on streets subject to regular salt applications for winter de-icing. Apply between March 1 and May 31 and between August 10 and October 15.

3.10 ACCEPTANCE AND WARRANTY

A. Acceptance: (REPLACE)

1. Acceptance will occur, provided seeded areas are in a live, healthy, growing, and well-established condition without eroded areas, bare spots, weeds, undesirable grasses, disease, or insects. Additionally, the seeded areas will meet the definition of final stabilization found in Part VIII of the Iowa National Pollutant Discharge Elimination (NPDES) General Permit No. 2.
 - a. Projects without a separately-bid warranty will be accepted no sooner than 60 days from the date that all activities were completed.
 - b. When a warranty is established as a bid item and the warranty period exceeds 60 days, projects may be accepted after all specified work, excluding the warranty, is satisfactorily completed.

B. Warranty:

1. (ADD) The warranty period begins 60 days after completion of work or acceptance of the public improvements, whichever occurs sooner.

SECTION 9030 – PLANT MATERIAL AND PLANTING

2.06 TREE PROTECTION

(REPLACE) 4-inch diameter Leonard Rigid Plastic Mesh Tree Guard or otherwise approved by the Engineer.

3.01 ALLOWABLE PLANTING DATES

- B. **Deciduous Plants (Balled and Burlapped and Container):** (REPLACE) September 1 to November 30 and in the spring prior to June 1.

3.06 PLANTING**B. Balled and Burlapped and Container Plants:**

4. Balled and Burlapped Plants:
 - b. (REPLACE) After plant placement, cut and remove entire twine, burlap, and wire baskets from root ball prior to placing backfill material.

3.09 TREE PROTECTION

- A. (REPLACE) Place tree protection mesh around the trees immediately after planting. Mesh should be as specified in Section [9030, 2.06 – Tree Wrapping Material for Winter Protection](#).
- C. (REPLACE) Make sure the protection mesh reaches from the ground line to the height of the first branch. If plant has multiple stems, cover each stem separately. Secure wrapping mesh to itself once placed around the tree to secure the void space with enough ties to prevent exposure of the trunk to damages from animals or other hazards.
- D. (DELETE) ~~Remove tree protection by April 1 of the next spring.~~

3.10 STAKING AND GUYING

- C. (DELETE) ~~Guying: and all subsections.~~

FIGURES

Figure 9030.102 – Tree Staking, Guying, and Wrapping

(DELETE) Sheet 2 of 2

SECTION 9040 – EROSION AND SEDIMENT CONTROL**1.08 MEASUREMENT AND PAYMENT****Y. (ADD) Additional Erosion Control Mobilization**

1. **Measurement:** Each mobilization approved by the Engineer will be counted; no measurement will be made.
2. **Payment:** Payment will be at the unit price for each mobilization authorized by the Engineer.
3. **Includes:** Unit price includes, but is not limited to, movement of personnel, equipment, and supplies to and from the project site; adjustment of erosion controls, sedimentation controls, stabilization practices, and best management practices in the contract documents or the storm water pollution prevention plan; removal of accumulated sediment from erosion controls, sedimentation controls, stabilization practices, and best management practices in the contract documents or the storm water pollution prevention plan; maintenance of seeding or sodding.

3.26 (ADD) EROSION CONTROL MOBILIZATION**A. General:**

1. Additional movement due to weather delays or at the option of the Contractor will not be counted as a mobilization.
2. Separate mobilizations needed for different crews performing work such as silt fence, seeding, or ditch checks will be counted, however, multiple mobilizations will not be paid for a single crew performing different items of erosion control work.
3. Each mobilization needs to be approved by the Engineer.
4. Payment for mobilization to correct items not properly installed will not be approved. Payment for mobilization will also not be approved if labor, equipment, and materials to perform erosion control are used for other non-erosion control work onsite.
5. Mobilize within 72 hours of a written order with sufficient labor, equipment, and materials to perform work or as ordered or approved by Engineer. Complete work within seven calendar days of a written order.
6. Failure to mobilize and complete work within such time period, will result in a deduction per calendar day equal to the liquidated damages specified for the project, except when Engineer extends such time period.

SECTION 9072 – COMBINED CONCRETE SIDEWALK AND RETAINING WALL

1.01 SECTION INCLUDES

(ADD) Combined Concrete Curb and Sidewalk

1.02 DESCRIPTION OF WORK

(ADD) Constructing combined concrete curb and sidewalk.

1.08 MEASUREMENT AND PAYMENT

D. (ADD) Combined Concrete Curb and Sidewalk:

1. **Measurement:** Measurement will be in square yards of sidewalk.
2. **Payment:** Payment will be at the unit price of square yards of the sidewalk.
3. **Includes:** Unit price includes, but is not limited to, excavation; foundation preparation; furnishing and placing concrete and reinforcing steel; joint material; subdrain; porous backfill material; suitable backfill material; finishing disturbed areas; and shoring as necessary.

2.01 MATERIALS

H. (ADD) Combined Concrete Curb and Sidewalk:

1. **Portland Cement Concrete:** Comply with Section [7030](#), 2.01.
2. **Reinforcing Steel:** Comply with [Iowa DOT Section 4151](#).
3. **Expansion Joint:** Comply with [Iowa DOT Article 4136.02](#). Use resilient filler when the type is not specified.

3.02 INSTALLATION**A. General:**

1. (REPLACE) Comply with Section [6010](#) for combined concrete sidewalk and retaining wall.
Comply with Sections [6010](#), [7010](#), and [7030](#) for combined concrete curb and sidewalk.

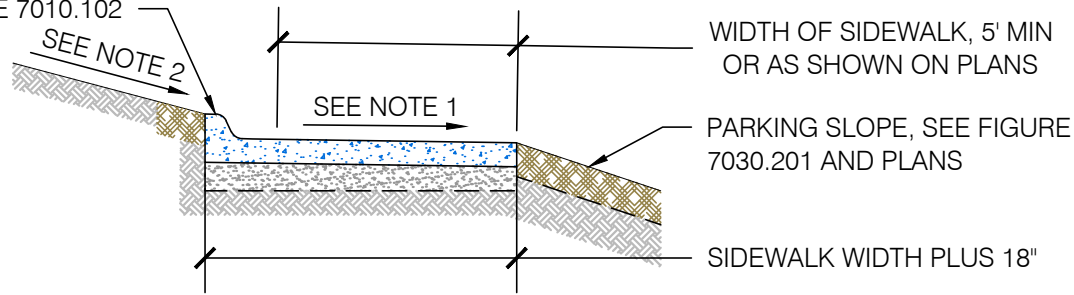
E. (ADD) Combined Concrete Curb and Sidewalk:

1. **Sidewalk:** Comply with Section [7030](#), 3.04.
2. **Integral Curbs:** Comply with Section [7010](#), 3.02.G.

FIGURES

(ADD) Figure 9072.301 – Combined Concrete Curb and Sidewalk

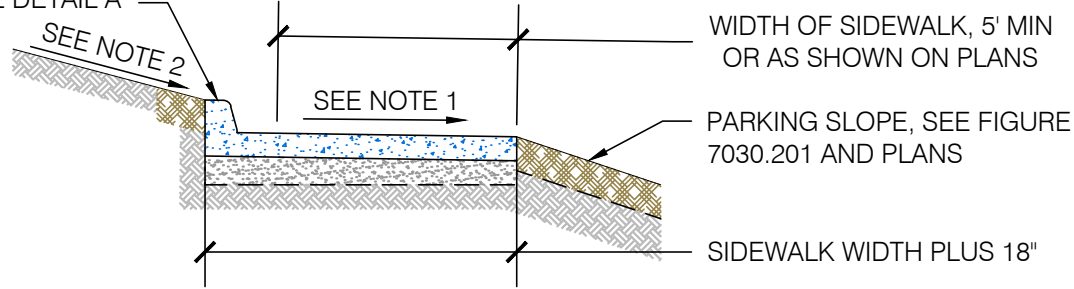
6" STANDARD CURB,
SEE FIGURE 7010.102



6" STANDARD CURB

LEGEND	
PAVEMENT	
SUBBASE	
CLASS V BACKFILL MATERIAL (E.G. TOPSOIL)	
UNDISTURBED EARTH	

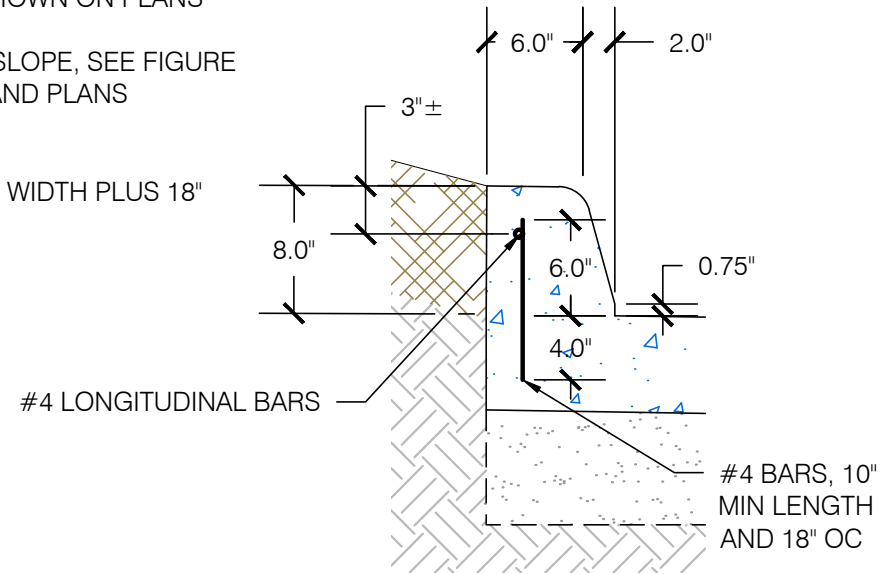
8" CURB, SEE DETAIL A



8" CURB

FIGURE NOTES:

- TARGET CROSS SLOPE OF 1.5% WITH A MAXIMUM CROSS SLOPE OF 2.0%.
- SEE PLANS FOR SLOPES. 6H:1V OR FLATTER.



DETAIL A, 8" CURB

DETAIL NOTES:

- ALL BARS MUST BE EPOXY COATED.

END OF SUPPLEMENTAL SPECIFICATIONS