WATER MAIN DESIGN AND CONSTRUCTION STANDARDS

TOWN OF CHANDLER, INDIANA

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Water Main Design and Construction Standards

Adopted October 13, 2022

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TABLE OF CONTENTS

TABLE OF FIGURES

SECTION 1: ABBREVIATIONS AND DEFINITIONS

1.1 Abbreviations and Definitions

For the purposes of this manual, Abbreviations and Definitions shall be interpreted as outlined in this section.

1.1.1 Abbreviations

AHJ	Authority Having Jurisdiction
ANSI	American National Standards Institute ASTM
ASTM	American Society for Testing and Materials
FM	Associated Factory Mutual Laboratories
IDEM	Indiana Department of Environmental ManagementIDNR
INDOT	Indiana Department of TransportationNFPA
OSHA	Occupational Safety and Health Act of 1970SPECS
UL	Underwriter's Laboratories, Inc.

1.1.2 Definitions

Acceptance The formal written acceptance by the Town of Chandler (Town) of an entire project which has been completed in all respects in accordance with the approved Plans, Specifications, and these Standards including any previously approved modifications thereof.

Adequate Public Facilities Facilities determined to be capable of supporting and servicing the physical area and designated intensity of the proposed subdivision as determined by the Town Council based upon specific levels of service.

Backfill Earth and/or other material used to replace material removed from trenches during construction which is above the pipe bedding.

Bedding That portion of the trench backfill which encases the sewer or water pipe to a minimum depth above and below the bell/barrel of the pipe for the purpose of properly supporting the pipe.

Blowoff Assembly An apparatus consisting of a gate valve and restrained section of pipe (same size as the main) brought to the surface and installed at a water main terminus or low point in the line to facilitate line draining and to allow the removal of sediments which accumulate in low areas of the pipeline. Design engineers are encouraged to avoid blowoffs by utilizing fire hydrants.

Building Sewer (lateral) The conduit for transporting waste discharged from the building to the public sewer. The sewer later is considered to be privately owned beginning at the wye or tee fitting at the connection to the public sewer main.

Contractor Any Contractor who meets the Town's requirements and is licensed to enter into contracts for and to perform the work of installing potable water facilities and appurtenances.

Construction Plan The maps or drawings accompanying a subdivision plat, commercial development, or other use showing the specific location and design of improvements to be installed in accordance with the requirements of the Town Council as a condition of the approval of the plat. The construction plans are typically signed and sealed engineering drawings and are included in the contract documents.

County The County of Warrick, State of Indiana

Culvert A closed conduit used for the passage of surface drainage water under a roadway, railroad, canal or other impediment.

Design Criteria Standards that set specific improvement requirements.

Drainage Surface water runoff and the removal of water from land by drains, grading or other means during and after construction or development.

Easement Easements are areas along the line of all public sanitary sewers, storm sewers, and water lines which are outside of dedicated utility or road easements or rights-of-way, and are recorded and dedicated to the Town granting rights along the water line. Easements shall be exclusively for the new water lines. No other easements shall be constructed or encroach upon the easement except with the expressed written approval of the Town.

Elevation A vertical distance above or below a fixed reference level, usually mean sea level. Typically, elevation is reported in feet using the North American Vertical Datum of 1988 (NAVD 88).

Erosion The detachment and movement of soil, sediment or rock fragments usually by water, wind, ice or gravity.

Excavation Removal by any means whatsoever of soil, rock, minerals, mineral substances or organic substances other than vegetation, from water or land on or beneath the land surface thereof, whether exposed or submerged.

Existing Grade or Elevation The vertical location of the ground surface prior to excavating, filling, and other construction operations.

Final Completion The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of the Engineer or the Town, the Work (or a specified part thereof) is fully completed, in accordance with the project plans and specifications, all punch list and inspection items have been addressed, surface restoration is complete, and temporary erosion control devices have been removed so that the Town may release final payment, performance bonds, or other securities that remain.

Grade The average level of the finished surface of the ground adjacent to a referenced structure or facility (may also refer to the slope of a roadway along the centerline).

Haunching The area in the trench from the bottom to the spring line of the pipe.

Horizontal Directional Drilling (HDD) Trenchless construction method for installing water main pipe and service lines.

INDOT SS Indiana Department of Transportation Standard Specifications, and applicable supplements, current at the time of construction.

Initial Backfill Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.

Inspector An agent of the Utility assigned to make detailed inspections of any or all portions of the work and materials. The inspector has full authority to reject materials and/or any portion of the work not supplied and installed in accordance with these Standards or the approved plans and specifications.

Land Disturbing Activity Any manmade change of the land surface including removing vegetative cover, excavating, filling, transporting, and grading.

Local Government The Town Council of the Town of Chandler, the Warrick County Commissioners, Area Planning Commission, County Council, and/or other departments.

Main Extension Extension of the Distribution System that will serve new customers.

Maintenance Guarantee Any security that may be required and accepted by the Town Council to assure that necessary improvements will function as required for a specific period of time.

Manhole A storm or sanitary sewer structure, through which a person may enter to gain access to a storm or sanitary sewer or other enclosed structure. A manhole may also be an inlet for the storm sewer system.

Manufacturer The producer of those materials required by these Standards having direct responsibility and authority for the satisfaction of those minimum material specifications set forth herein.

Monument A permanent marker conforming to the requirements of this Ordinance used to identify the location of a property corner or other survey information.

Non-Residential Subdivision A subdivision whose intended use is other than residential, such as commercial or industrial.

Official Zoning Map The map established by the local government, pursuant to law, showing the streets, highways, parks, drainage systems and setback lines laid out, adopted, and established by law, and any amendments or additions resulting from the approval of subdivision plats by the local government and the subsequent filing of the approved plats.

Off-Site Any premises not located within the area of the property to be subdivided, whether or not in the common ownership of the applicant for subdivision approval.

Other Specifications and Materials Wherever in these Standards other specifications or regulations are mentioned, it shall be understood that the materials and methods mentioned therewith shall conform to all requirements of the latest revision of the specifications so mentioned.

Owner Any individual, partnership, firm, corporation or other entity who, as property owner, is initiating the work.

Pavement That part of a street having an improved surface or brick, paving stone, concrete, or asphalt placed on the surface of the land.

Plans Construction plans, including system maps, sewer plans, and profiles, cross sections, utility plans, detailed drawings, etc., or reproductions thereof, approved or to be approved by the Town Engineer which show location, character, dimensions and details of the work to be done.

Primary Plat The primary drawing or drawings, indicating the proposed layout of the subdivision to be submitted to a town or county Planning Commission for approval.

Products Items purchased for incorporating into the Work. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

Professional Engineer A person registered as a professional engineer by the Indiana State Board of Registration for Professional Engineers under IC 25-31.

Project All work to be completed under the Town's permit in accordance with the approved plans, specifications, these Standards and the permit conditions.

Record Drawings (As-Builts) Plans certified, signed and dated by a professional engineer or professional surveyor registered in the State of Indiana, indicating that the Plans have been reviewed and revised, if necessary, to accurately show all as-built construction and installation details including, but not limited to, key elevations, locations, and distances.

Registered Engineer See "Professional Engineer"

Right-of-Way A strip of land occupied or intended to be occupied by a street, crosswalk, railroad, road, electric transmission line, oil or gas pipeline, water main, sanitary or storm sewer main, shade trees, or for any other special use. The usage of the term "right-of-way" for land platting purposes shall mean that every right-of-way hereafter established and shown on a secondary plat is to be separate and distinct from the lots or parcels adjoining such right-of-way and not included within the dimensions or areas of such lots or parcels. Rights-of-way intended for streets, crosswalks, water mains, sanitary sewers, storm drains, shade trees, or any other use involving maintenance by a public agency shall be dedicated to public use by the maker of the plat on which such right-of- way is established.

Sewer A pipe or conduit for carrying wastewater (sanitary sewer) or storm water (storm sewer).

Sidewalk A paved, surfaced, or leveled area, usually parallel to and separate from the street, used as a pedestrian walkway.

Specification A detailed instruction that designates the quality and quantity of materials and workmanship expected in the construction of the project.

Standard Details The drawings of structures, water mains, water service lines, fire hydrants, valves or other devices commonly used and referred to on the Plans and in these Standards.

Standards The Water Main Design and Construction Standards for the Town of Chandler, Indiana as contained herein and all subsequent additions, deletions, or revisions.

Structure Anything constructed or erected which requires permanent location on/in the ground as part of the facilities installed.

Substantial Completion The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of the Engineer or the Town, the Work (or a specified part thereof) is sufficiently complete, in accordance with the project plans and

specifications, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.

Subsurface Drain A tile drain installed for the purpose of lowering the ground water table.

Ten State Standards (Water Works) Recommended Standards for Water Works, latest edition, developed by the Committee of the Great Lakes – Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers.

Town The Town of Chandler, Indiana

Town Engineer Authorized Agent by the Town of Chandler.

Utility The Town of Chandler Utilities Department.

Water Distribution System The collection of water mains interconnected to form a system of pipes, valves, hydrants, and appurtenances that can safely transport potable water from the Town’s treatment facilities to the individual customers’ plumbing throughout the service area.

Work All the work to be done, in accordance with the approved Plans, Specifications, these Standards and permit conditions necessary for the successful completion of the project.

SECTION 2: THE DEVELOPMENT REVIEW PROCESS FOR WATER MAIN CONSTRUCTION

2.1 Goals and Objectives

The Town of Chandler and Chandler Utilities are dedicated to encouraging growth and development. This review process has been implemented in effort to provide clear and concise instructions to builders and investors that do business within the Town of Chandler and the service area of Chandler Utilities.

The goals and objectives of this document are listed below.

- Encourage a stronger local economy.
- Clearly define and streamline a review and permitting process.
- Establish expectations of contractors, builders, and developers.
- Provide standard forms, documents, and details for use by developers, contractors, and engineers.
- Outline the preferred brands, models, and configurations of water mains and water main appurtenances of Chandler Utilities.
- Outline typical construction procedures.

Deviations from these standards may be approved by Chandler Utilities when proper justification is provided and approved.

Chandler Utilities is committed to unparalleled customer service through compliance with these standards, short project review timeframes, and consistent communication. All developers and contractors that construct water mains within the Town of Chandler or service area of Chandler Utilities are expected to follow the procedures and processes of this manual.

2.2 General

The Town of Chandler and Chandler Utilities are responsible for providing safe, clear, odorless, and tasteless drinking water to their residents and customers. To provide this service, Chandler Utilities must ensure proper installation and testing of all potable water distribution facilities constructed in or connected to existing facilities within the water service area. All facilities shall be designed and constructed in accordance with these Standards as well as applicable State / Federal regulations. The ordinances for water distribution systems

governing these Standards are available for review at the Town of Chandler Utility Maintenance Facility.

The purpose of these Standards is to define a development review process, clearly communicate the Utility's expectations to potential customers, and establish minimum criteria for the design, installation, and testing of potable water infrastructure. This manual and the associated documents are intended to promote and encourage development within the Chandler Utilities service area. These water main Design and Construction Standards shall have jurisdiction over the entire Chandler Utilities service area, excluding water storage tanks and booster stations, from the point of discharge from the water treatment facility to the point of connection with the building plumbing or meter pit.

Addenda and/or revisions to these Standards may be issued periodically and will be distributed and made available to the public and Contractor at the Utilities Office. Users shall be responsible to keep apprised of any changes and revisions to these Standards.

Any conflicts between these Standards and any applicable State laws shall be superseded by such law. If any conflict arises between these Standards and applicable Town or County Ordinances, the most recently adopted of the two shall prevail. These Standards are approved and adopted by the Town Council, Town of Chandler.

It is the Developer's responsibility to comply with all requirements of the Utility or other authority having jurisdiction (AHJ) if such authority imposes greater requirements. Furthermore, the Developer shall be responsible for procuring all necessary permits and licenses, bonds, pay all charges and fees for acquiring and recording required easements, and giving all notices necessary and incidental to the work.

2.3 Development Review Process Description

Water main construction within the Chandler Utilities service area is typically permitted through a review process directly with the utility. This process is illustrated in the flow chart shown in Figure 2-1.

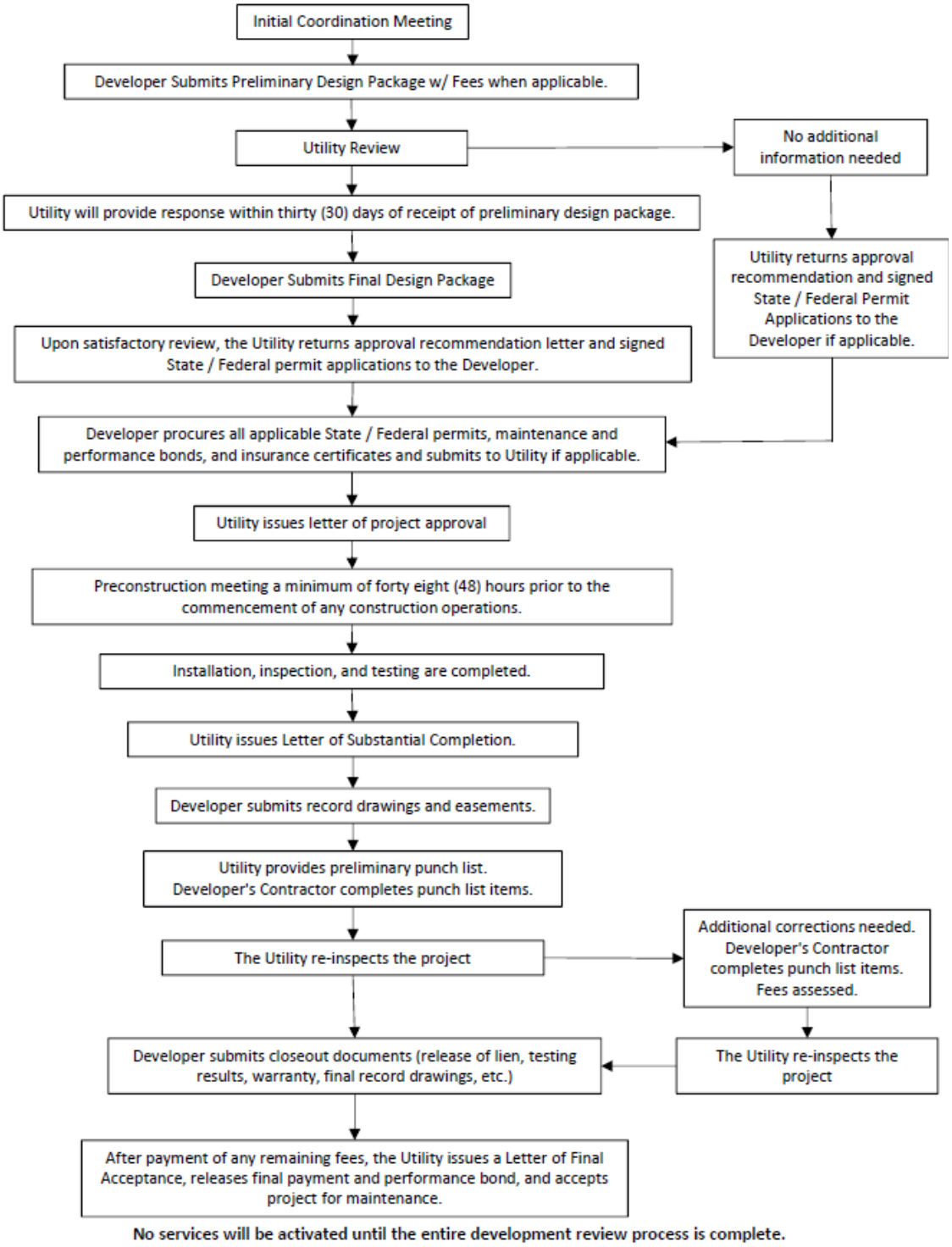


Figure 2- 1 Development Review Flow Chart

2.3.1 Preliminary Design Package, Technical Review, and Comments

The Developer shall submit preliminary design submittal to the Utility for review. This submittal shall include two (2) twenty-four (24) inch by thirty-six (36) inch plan sets signed and sealed by a professional engineer licensed in the State of Indiana, preliminary flow demand calculations, preliminary cost estimate, and all applicable state / federal permit applications.

The Utility shall review the documentation and provide written comments within thirty (30) days of receipt. Written comments shall include, but are not limited to, a letter describing required revisions, a red-lined plan set, and a list of additional items required for submittal with the final design package.

2.3.2 Final Design Package, Technical Review, and Final Plan Approval

The Developer shall address all concerns and comments from the Utility. The Developer shall resubmit final design package to the Utility for review, comment, and approval. This submittal shall include two (2) twenty-four (24) inch by thirty-six (36) inch plan sets signed and sealed by a professional engineer licensed in the State of Indiana, the plan sets in an electronic copy in AutoCAD format, final flow demand calculations, final cost estimate, and any revised state / federal permit applications.

The Utility shall review the documentation for completeness and compliance within thirty (30) days of receipt. Satisfactory submittals shall be approved, and signed state / federal permit applications returned to the Developer. The Utility may elect to issue an additional request for revisions only if initial comments and concerns are not fully addressed.

2.3.3 State and Federal Permits

The Developer shall provide copies of all applicable approved state / federal permits to the Utility prior to construction commencement. These permits may include, but are not limited to, Indiana Department of Environmental Management (IDEM) construction permit, IDEM Section 401, United Stated Army Corps of Engineers (USACE) Section 404, and IDEM Construction General Permit.

2.3.4 Posting of Bond

The Developer may be required to post a performance bond and maintenance bond issued by a company licensed by the State of Indiana to provide such surety. Each bond shall be

equal to 100% of the contract amount or an amount established by the Utility to provide surety for the satisfactory completion of the improvements. The bonds shall name the Town of Chandler as a party who can enforce the obligations included. The duration of each bond shall be one (1) year.

The Utility may, as an alternative to the posting of such bond, accept other appropriate security such as a properly conditioned irrevocable letter of credit which meets the same objective as the bonds described in this section, subject to approval of any other department or agency whose interests are protected by the same bonding requirement. The bank issuing the letter of credit must be a bank situated in Indiana and must be an FDIC insured institution.

If the surety on any bond furnished to the Utility becomes a party to a supervision, liquidation, rehabilitation action pursuant to IC 27-9 et. seq. or its right to do business in the State of Indiana is terminated, it shall be required that, within 30-days thereafter, a substitute bond and surety be provided, both of which must be acceptable to the Utility. Failure to obtain a substitute bond within the stated time frame shall be cause for revocation or suspension of the project approval until such time that the bond is furnished to the Utility.

2.3.5 Pre-Construction Coordination

The Developer shall schedule a preconstruction meeting a minimum of forty-eight (48) hours prior to construction commencement of any water distribution systems. A Utility representative, engineering representative, and contractor are required to attend. At or before this meeting, the Developer shall provide the Utility with two (2) copies of the approved construction plans.

2.3.6 Construction Inspection and Observation

Chandler Utilities provides inspection, observation, and witnessing services for all public water main construction and testing. Basic inspection, observation, and witnessing services include the following:

- Coordination of water service, water meter, and fire hydrant locations.
- Coordination of taps and valves.
- Main line taps (hot taps and cut ins)
- Hydrostatic pressure testing of mains and fire lines up to the building.
- Haunching and backfilling.

Inspection services not listed may result in additional fees required from the Developer. These fees will be assessed at the current hourly rate for Chandler Utilities staff. The Developer's Contractor is expected to be able to install the water mains and appurtenances in accordance with the approved contract documents with only basic inspection services. No action with regard to the Letter of Final Acceptance and release of the performance bond shall be taken until the Developer has reimbursed the Utility in full for any inspection services above and beyond the items listed above. All construction of public works facilities intended for dedication to the Utility shall be observed and certified pursuant to the Permit.

2.3.7 Project Acceptance and Dedication

Water distribution facilities will not be accepted, and final pay request (if needed) will not be issued until all documents, as required by the Utility, are submitted to and approved by the Utility, including the following:

- As-built record drawings showing State Plane Coordinates and elevations to 0.1 foot on all valves and fittings. The Developer's Contractor shall submit two (2) copies of the record drawings and an electronic copy in AutoCAD format to the Utility. Record drawings shall show actual locations (northings and eastings) and depths of water mains, valves/valve boxes, fire hydrants, service taps, curb stops, meter pits and any other underground facilities installed as part of the project, including service line locations and depths.
- Letter of Substantial Completion (if required)
- Preliminary Inspection Report or Punch List (if required)
- Final Inspection Report
- Certified results of all testing that was performed including, but not limited to, hydrostatic pressure testing and bacteriological testing. Testing procedures are detailed in the Water Distribution Facility Design Standards section of this manual and shall be strictly followed. All testing results shall be forwarded to the Chandler Utilities department.
- One (1) Year Warranty
- Release of Lien (if required)
- Recorded Covenant and Easement Documents
- Operating and Maintenance manuals, parts lists, tools, list of products, etc. as applicable.

Upon approval by Chandler Utilities, the final pay request will be authorized, and performance bond released if needed.

SECTION 3: STANDARD DEVELOPMENT REVIEW FORMS

3.1 Development Procedures for Water Main Construction Checklist

CHANDLER UTILITIES

TOWN OF CHANDLER, INDIANA

PROCEDURES FOR WATERMAIN CONSTRUCTION

(CHECK LIST)

Date Received/ Requested	Date Appr./ Sent	
		PROJECT NO.:_____
		PROJECT NAME:_____

_____	_____	1. Initial Coordination meeting including Developer and Utility Representative(s).
_____	_____	2. Developer submits preliminary design package to Utility including application, two (2) 24-inch by 36-inch plan sets, preliminary flow demand calculations, preliminary cost estimate, application fees, and all applicable State / Federalpermit applications.
_____	_____	3. The Utility will review the plans for completeness, conformancewith the Town's standards, and evaluate whether the existing water distribution system can supply the domestic and fire flows needed by this project. The Utility will identify necessary changes to the plans or specifications.
_____	_____	4. The Utility will provide a review letter, red-lined plan set, andlist of additional items required for approval within thirty (30)days of receipt of initial design package.
_____	_____	5. Developer submits final design package to Utility addressing all concerns and comments including two (2) 24-inch by 36-inch plan sets, final flow demand calculations, final cost estimate, and all applicable State / Federal permit applications.
_____	_____	6. The Utility will review the plans for completeness, conformancewith the Town's standards. Upon satisfactory review, the Utilitywill issue recommendation of approval and return signed State / Federal permits to the Developer within thirty (30) days of receipt of final design package.
_____	_____	7. Developer procures all applicable State / Federal permits and transmits to Utility.
_____	_____	8. Developer procures maintenance bond, performance bond (letter of credit or certified check may be accepted on a case bycase basis) and insurance certificates and transmits to Utility.

_____	_____	9. After payment of any additional required fees, the Utility will issue a letter of project approval.
_____	_____	10. Developer schedules and conducts an onsite preconstruction meeting with Contractor, Utility Representative, and Engineer a minimum of twenty-four (24) hours prior to the commencementof any construction operations.
_____	_____	11. Developer completes construction in accordance with the contract documents.
_____	_____	12. Following installation of the water mains, the Developer's Contractor conducts pressure tests and disinfection tests on the new mains. A copy of all test results must be provided to the Town within 2 business days of the completion of the test.
_____	_____	13. The Utility issues a Letter of Substantial Completion.
_____	_____	14. The Developer submits two (2) sets of record drawings (as- builts) drawings (prints and digital) and any easements required for review. Utility will review the easements for approval. The easements must be recorded prior to submittaland based on as-built conditions. Record drawings (as-builts)drawings shall be certified by Surveyor licensed in the State ofIndiana.
_____	_____	15. The Utility's representative prepares a punch list for the project.
_____	_____	16. The Developer's Contractor completes punch list items.
_____	_____	17. The Utility's representative re-inspects the project.
_____	_____	18. Developer submits One Year Warranty, Release of Lien, and Certified Testing Results to the Utility.
_____	_____	19. The Utility accepts maintenance of the project when service is started.
_____	_____	20. After payment of any remaining fees or reimbursable expenses, the Utility issues a Letter of Final Acceptance to theDeveloper.

3.2 Chandler Utilities Plan and Specification Review Checklist

TOWN OF CHANDLER, INDIANA
PLAN & SPECIFICATION REVIEW CHECKLIST

NAME OF PROJECT:_____

DESIGN ENGINEER:_____

I. **Completeness and Conformance with Town Standards**

A. Watermain Pipe & Fittings
1. Sizes _____
2. All Watermains Plan and Profile _____
3. Depth 3' Min to Top of Pipe _____
4. Pipe Materials _____
5. Pipe Bedding & Backfill Materials & Construction _____
6. Jack and Bore _____
7. Horizontal Directional Drill _____
8. Details Complete _____
9. Specs Complete _____
10. Separation, Horizontal and Vertical

B. Water Service Connections
1. Sizes _____
2. Tapping Saddle Type _____
3. Corporation Stop Type _____
4. Pipe Materials _____
5. Curb Stop Type _____
6. Water Meter Box and Meter Setter _____
7. Check Valves _____
8. Details Complete _____
9. Specs Complete _____

C. Valves _____
1. Types _____
2. Spacing
3. Materials _____
4. Valve Boxes _____
5. Air/Vacuum Release Stations _____
6. Details Complete _____
7. Specs Complete _____

D. Connections to Existing Water Mains
1. Details of Connections _____
2. Existing Water Main Sizes & Materials Indicated _____
3. Compare Existing Water Mains to Town Water Map _____

E. Other Utility Conflicts
1. Horizontal Separation of 10' Min to Sewer Lines _____
2. Vertical Separation of 18" to Sewer Lines _____
3. Horizontal & Vertical Separation Between Other Utilities _____

F. Miscellaneous
1. Min. Easement Width 15' _____
2. Engineer's Seal & Signature _____

3. Page Numbers, Set Complete _____
4. Specs Complete _____
5. North Arrow on Each Street _____
6. Benchmark Indicated on Plans _____
7. Scale Indicated on Plans _____
8. Roads Labeled _____
9. Contours Labeled _____
10. Existing & Final Grade Shown on Profiles _____
11. Check Additional Notes, Details, Spec. Sections _____

II. **Calculations**

A. Design Flow

1. Fire flow conditions _____
2. Max. Day conditions without fire flow _____
3. Average Daily Flow _____

III. Cost Estimate

A. Preliminary and Final

1. Quantities _____
2. Unit Prices _____

PLAN REVIEW DATE: _____

LETTERS SENT: _____

PLANS RESUBMITTED: _____

APPROVAL DATE: _____

3.3 Application for Water Main Construction

APPLICATION FOR POTABLE WATER CONSTRUCTION

Please submit this completed form to Chandler Utilities – 101 Constitution Court, Chandler, Indiana 47610 or maintenance@townofchandler.org with the preliminary design submittal.

* Please be sure to include a .pdf of the construction plans and a copy of the Engineer'sOpinionofProbable Construction Cost.

Date: _____

Project Name: _____

Parcel Number(s): _____

Location: _____

_____

Project Description: Choose all that apply.

Services Potable Water Distribution System Water Main Extension Fire Lines Hydrants

Type of Use:	Number Of Units:	Flow Per Unit	Flow
S/F Residential (Individually Metered Homes/Units)			
M/F Residential (Master-Metered - More than 1 Home/Unit per meter)			
Commercial (Describe on page 2)			
Industrial (Describe on page 2)			
Other (Describe on page 2)			

APPLICATION FOR POTABLE WATER CONSTRUCTION

PROJECT NAME:_____

Further instructions for Commercial, Industrial, Other:

Show a detailed description of water consumption for commercial, industrial, or any other type of developmentby using 327 IAC 3-6-11 guidelines for each meter. Note, the total of these flows should be equal to the Total Average Daily Flow included on the Indiana Department of Environmental Management construction permit applications.

List number and sizes of water meters required for this development. Please include what each meter will serve.

* Please be sure to include a .pdf of the construction plans and a copy of the Engineer's Probable Cost Opinion.

APPLICATION FOR POTABLE WATER CONSTRUCTION

PROJECT NAME: _____

Developer Information:

Name of Developer &/or Owner: _____

Name and Title of Representative: _____

Mailing Address: _____

City, State & Zip: _____

Telephone Number: _____

E-mail Address: _____

Engineer Information:

Name of Engineering Firm: _____

Name of Project Engineer: _____

E-mail Address: _____

Alternate Contact Person: _____

E-mail Address: _____

Mailing Address: _____

City, State & Zip: _____

Telephone Number: _____

3.4 Substantial Completion Field Inspection Checklist

TOWN OF CHANDLER, INDIANA SUBSTANTIAL COMPLETION FIELD CHECKLIST

NAME OF PROJECT: _____

INSPECTOR NAME: _____

CONTRACTOR REPRESENTATIVE: _____

A. Water Main Pipe

1. Size matches plans _____
2. Material matches plans _____
3. 36 inches of cover to top of pipe _____
4. 6 inches of bedding underneath the pipe _____
5. Crushed stone bedding for PVC pipe _____
6. Sand or crushed stone bedding for DIP _____
7. 6 inches of compacted backfill above pipe _____
8. Crushed stone backfill for PVC pipe _____
9. Class I or II backfill for DI pipe _____
10. Granular backfill under and adjacent to roadways _____
11. No stones larger than 3 inches in backfill _____
12. Compaction tests submitted _____
13. Pressure tests submitted _____
14. Chlorination and Bacteriological test submitted _____
15. Adequate vertical separation at crossing _____
16. Adequate horizontal separation from other utilities _____
17. Restrained joints at tees, bends, plugs, etc. _____

B. Valves

1. Valve boxes installed at grade _____
2. Valves open _____
3. Valve keys provided _____
4. Tracer wire brought to surface _____
5. Air release valves at high points _____
6. Blowoff assemblies are size on size _____
7. Blowoff assemblies 2’ above grade _____

C. Services

1. Copper or polyethylene _____
2. Corp Stop at 22 degrees _____
3. Meter pit at grade _____

F. Miscellaneous

1. Fire Hydrant location acceptable _____
2. Fire Hydrant valve open _____
3. Granular bedding below hydrant _____
4. Restrained joints or thrust blocks at hydrant _____
5. _____
6. _____
7. _____
8. _____
9. _____

3.5 Letter of Substantial Completion

TOWN OF CHANDLER, INDIANA

LETTER OF SUBSTANTIAL COMPLETION

OWNER's Project No.: _____ **CONTRACTOR's Project No.:** _____

Project: _____

CONTRACTOR: _____

OWNER: _____

Contract Date: _____

The Work performed under this Contract has been reviewed and found, to the best knowledge of the Town of Chandler or the Town representative to be substantially complete. Substantial Completion is the stage in the progress of the Work when the Work or designated portion is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. The date of Substantial Completion of the Project or portion designated above is the date of issuance established by this Certificate, which is also the date of commencement of applicablewarranties required by the Contract Documents, except as stated below:

_____

ENGINEER BY DATE

A list of items to be completed or corrected is attached hereto. The failure to include any items on suchlist does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. Unless otherwise agreed to in writing, the date of commencement of warranties for items on the attached list will be the date of issuance of the final Certificate of Payment or the date of final payment.

Cost estimate of Work that is incomplete or defective: $ _____

The Contractor will complete or correct the Work on the list of items attached hereto within( ) days from the above date of Substantial Completion.

The responsibilities of the Owner and Contractor for operation, safety, maintenance, insurance, warranties, guarantees, and damage to the Work shall be as follows:

RESPONSIBILITIES:

OWNER: _____

CONTRACTOR: _____

_____

CONTRACTOR BY DATE

The Contractor accepts this Letter of Substantial Completion.

_____

OWNER BY DATE

The Owner accepts this Letter of Substantially Completion and will assume full possession at (time) on (date).

3.6 Letter of Final Acceptance

TOWN OF CHANDLER, INDIANA
LETTER OF FINAL ACCEPTANCE

OWNER's Project No.:_____ **CONTRACTOR's Project No.:**_____

Project:_____

CONTRACTOR:_____

OWNER:_____

Contract Date:_____

The Work performed under this Contract has been reviewed and found to be complete in accordance with the terms and conditions of the contract documents. The entire remaining balance of the contractis due and payable. The following items have been completed and accepted.

- ☐ Contractor's Final Pay Request Form is attached.
- ☐ All Punch List Items are complete and accepted.
- ☐ Letter of Substantial Completion has been issued by the Engineer.
- ☐ Record Drawings (as-builts) have been received, reviewed, and approved by theOwner.
- ☐ One-Year Warranty has been received by the Owner.
- ☐ Release of Lien has been received by the Owner.
- ☐ Certified pressure testing results have been received by the Owner.
- ☐ Certified bacteriological testing results have been received by the Owner.
- ☐ Required easements have been accepted by the Owner and recorded.
- ☐ Operating Manual, Parts List, Lists of Products, Maintenance Manuals, Operating Tools and Devices, Maintenance Materials, Extra Parts, etc. as required under thecontract, have been accomplished.

CONTRACTOR BY DATE

The Contractor accepts this Letter of Final Acceptance.

OWNER BY DATE

The Owner accepts this Letter of Final Acceptance and agrees to release final payment and performance bond.

3.7 Water and Sewer Utility Easement

Deed Cross Reference:

Parcel No:

CHANDLER UTILITIES
TOWN OF CHANDLER, INDIANA

WATER & SEWER UTILITY EASEMENT (PERMANENT)

THIS INDENTURE WITNESSETH, that_____(whether one or more, "Grantor"), for and in consideration of the sum of_____Dollars ($), and other valuable consideration, the receipt of which is hereby acknowledged, does hereby GRANT and CONVEY UNTO **THE TOWN OF CHANDLER, INDIANA, FOR THE USE AND BENEFIT OF CHANDLER UTILITIES** ("Utility") whose principal place of business is 401 E. Lincoln Avenue, Chandler, Indiana, its successors, assigns, and lessees, a permanent and perpetual water and sewer utility easement and right-of-way over, under, along, across, within, upon and through the Easement Area defined below and described herein, for the purpose of granting and facilitating the right to lay, construct, reconstruct, inspect, maintain, operate, repair, alter, relocate, enlarge, rebuild, remove, and/or abandon in place one or more pipe lines, transmission media, and all appurtenant and related equipment and structures, whether above or below the surface of the lands of Grantor, convenient or necessary to transport and otherwise handle water and sewerage, and perform and facilitate such utility services over, under, along, across, within, upon and through the Easement Area, together with the right of uninterrupted ingress and egress upon, over, and across the the lands of Grantor to and from said Easement Area, in the exercise of the rights herein granted.

The real estate of Grantor under, along, across, within, upon and through which said easement and right-of-way shall be laid out and located is more particularly described in the attached **Exhibit "A"** and depicted upon the Right of Way Parcel Plat attached hereto in the attached **Exhibit "B"**, both of which exhibits are made a part hereof ("Easement Area").

Grantor for the same consideration further grants to the Utility the right to trim or remove any trees, brush, undergrowth or other obstructions from said easement and right-of-way, if necessary, in the exercise of the rights and privileges herein granted.

Subject to the rights herein granted to the Utility, Grantor reserves the right to use and enjoy the land included with the easement and right-of-way in any way that is not inconsistent with the easement granted hereby, but (i) no buildings, structures, fences, or any other type of improvement or property, either of a permanent or temporary nature, shall be located or maintained on or about the Easement Area, (ii) no excavating or grading shall be done within said Easement Area, which would reduce the coverage of soil over said pipe line or increase the coverage more than three (3)

feet, and (iii) no lake or pond shall be constructed within fifteen (15) feet of either side of said Easement Area measured from the top edge of the bank of any such lake or pond.

Grantor represents and warrants that Grantor is the fee owner of the real estate burdened by the easement granted herein. The easement herein granted is subject to all prior grants, reservations and restrictions of record. The covenants and agreements herein contained and set forth as pertains to this easement as granted herein shall for all purposes be construed and considered as covenants and agreements running with the title to the real estate upon which the Easement Area is situated in favor of the Utility, its successors and assigns, and shall be binding upon the parties hereto and their respective successors and assigns. Grantor acknowledges and agrees that the Utility may freely assign its rights under this instrument without the prior consent of or notice to Grantor and the easement created hereby shall not be affected by any such assignment or any subsequent reassignment.

No failure by the Utility to insist upon strict performance of any term, provision, covenant, or agreement contained in this instrument, nor failure by the Utility to exercise any right or remedy under this instrument shall constitute a waiver of any such term, provision, covenant, or agreement, or a waiver of any such right or remedy, or a waiver of any such default.

From time to time after execution of this instrument, upon the reasonable request of the Utility, Grantor shall execute and deliver or cause to be executed and delivered such further instruments and agreements and take such further actions, as the Utility reasonably request in order to more effectively carry out the terms and conditions of this instrument.

In the event that any of the provisions of this instrument shall be held by a court or other tribunal of competent jurisdiction to be unenforceable, such provision shall be enforced to the fullest extent permissible and the remaining portion of this instrument shall remain in full force and effect. This instrument represents a compromise between the parties and is a product of arms-length negotiations. The parties have read this instrument completely and have had the opportunity to seek the advice and assistance of competent legal counsel. In the event that ambiguity exists or is deemed to exist in any provisions of this instrument, said ambiguity is not to be construed by reference to any doctrine calling for such ambiguity to be construed against the drafter of this instrument. This instrument shall be governed by and construed in accordance with the laws of the State of Indiana, not including the choice of law rules thereof, and each party hereto by execution of this instrument, consents to the exercise of jurisdiction over any matter arising in connection with this instrument in the Superior Court of Warrick County, State of Indiana. As used in this instrument, the plural shall be substituted for the singular, and the singular for the plural, where appropriate; and words and pronouns of any gender shall include any other gender. THIS PROVISION, AND EACH AND EVERY OTHER PROVISION OF THIS INSTRUMENT MAY NOT UNDER ANY CIRCUMSTANCES BE MODIFIED, CHANGED, AMENDED OR PROVISIONS HEREUNDER WAIVED VERBALLY, BUT MAY ONLY BE MODIFIED, CHANGED, AMENDED OR WAIVED BY AN INSTRUMENT IN WRITING EXECUTED BY ALL PARTIES HERETO.

This is a public utility easement and is therefore exempt from the sale disclosure requirement pursuant to I.C. 6-1.1-5.5, et seq.

The above described permanent sewer utility easement is a part of Grantor's property as described in the Office of the Recorder of Warrick County, Indiana.

IN WITNESS WHEREOF, Grantor has executed this Easement as of the_____day of_____, 2021.

By:_____
(signature)

_____
(printed name and title)

STATE OF_____)
) SS:
COUNTY OF_____)

BEFORE ME, a Notary Public in and for said County and State, personally appeared _____, as the_____of_____, who acknowledged the execution of the foregoing instrument and who, having been duly sworn, stated that any representations therein contained are true.

IN WITNESS WHEREOF, the parties have duly executed this instrument, and I have hereunto set my hand and official seal as of the_____day of_____, 2021.

_____
Notary Public

_____
Printed Name

My Commission Expires:
_____

My County of Residence:
_____

This instrument was prepared by Joshua A. Claybourn, **JACKSON KELLY PLLC,** 221 N.W. Fifth Street, P.O. Box 1507, Evansville, IN 47706, Telephone (812) 422-9444

I affirm, under the penalties for perjury, that I have taken reasonable care to redact each Social Security number in this document, unless required by law.

Joshua A. Claybourn

RETURN TO: _____
_____
_____

Exhibit “A”

SECTION 4: WATER DISTRIBUTION FACILITY DESIGN STANDARDS

4.1 General Requirements

All water mains shall be designed in accordance with IDEM, Recommended Standards for Water Works (commonly known as the 'Ten States Standards'), and 327 Indiana Administrative Code (IAC) and these standards. Any variances from these standards must be approved in writing by the Utility prior to the final design submittal. All design drawings used for permit applications, bidding, and construction shall be signed, dated, and sealed by a professional engineer licensed in the State of Indiana.

4.1.1 Specifications

Technical specifications shall be in accordance with IDEM, Recommended Standards for Water Works (commonly known as the 'Ten States Standards'), and 327 Indiana Administrative Code (IAC) and these standards. These specifications shall be prepared using an industry standard naming and number protocol such as the Engineers Joint Contract Documents Committee (EJCDC) or the American Institute of Architecture (AIA). Chandler Utilities does not provide a review of the project specifications. It is the responsibility of the Developer's Engineer to ensure that the specifications match the approved plans and meet regulatory code.

4.1.2 Permits

The Developer shall be responsible for obtaining all permits which relate to the design of the completed facilities. A copy of all permits shall be filed with the Town upon receipt and prior to beginning any work. Permits obtained by the Developer include, but are not limited to, permits from the following:

- Indiana Department of Environmental Management (IDEM)
- Indiana Department of Fire Prevention and Building Safety
- Indiana Department of Natural Resources (IDNR)
- U.S. Army Corps of Engineers
- IDEM Construction Stormwater General Permit (CSGP)
- Applicable County and local permits

4.1.3 Drafting Standards

Design drawings shall be twenty-four (24) inch by thirty-six (36) inch. The scale for plan and profile sheets shall not exceed 1" =30' Horizontal and 1" =5' Vertical. Each sheet shall contain a north arrow and bar scale. Each set of drawings shall also include the applicable detail sheets and construction notes. The design drawings shall be prepared in the current version of AutoCAD software. All design drawings should include the plat and approved addresses.

4.2 Water Mains

4.2.1 General Configuration

The water main configuration shall be designed to provide service to the front of each lot in the development and to the edge of the site being developed where it is likely that future developments will occur, as determined by the Town. In general, the layout of the water mains shall form a grid (sometimes called a looped system) with connections at each street intersection and wherever practical.

All water mains shall be located in a dedicated Water Facility Easement or within the public street right-of-way. Preferably the water main shall be located on the opposite side of the street from the sanitary and storm sewers. Water mains which cross roadways (i.e. streets, highways, etc.), railroads, and other utilities shall preferably do so at ninety (90) degrees whenever practical. The pipe should be designed so that the angle of intersection with the roadway is not to be less than forty-five (45) degrees.

Water mains shall be constructed with joint restraints at all taps, crosses, tees, bends, reducers, and fittings installed per manufacturer's specifications and Chandler Utility details. Thrust blocks are generally not permitted but may be allowed on a case-by-case basis as determined by the Utility.

Water mains and services shall have a minimum cover of thirty-six (36) inches per 327 IAC 8-3.2-17. Generally, water mains shall be eight (8) inches in diameter minimum although smaller sizes may be permitted by Chandler Utilities on a case-by-case basis.

4.2.2 Cul-De-Sac Water Mains

Water mains in cul-de-sacs shall be extended to the end with a fire hydrant at the farthest property line. Cul-de-sac mains shall be a minimum of six inches.

4.2.3 Dead-End Water Mains

In general, dead-end water mains are not permitted. In the event that a dead-end water main is necessary or unavoidable, such as at a future extension of a street, the water main shall terminate with a gate valve downstream of the last potential service line connection (such that closing the valve does not put any customer out of service). This valve shall normally be closed when the water system is in use. Therefore, there must be either sufficient pipe installed downstream of said valve to provide the necessary thrust restraint or a concrete thrust block around the circumference of the pipe making a collar (sometimes called a dead-man restraint or straddle block) and individual joint restraints as needed for the particular situation. Whichever method of thrust restraint is used it shall allow for the connection to the very end of the dead-end water main for future extension without jeopardizing the thrust restraint at the valve in any way or put any customer out of service. Furthermore, a fire hydrant or same size blow off shall be installed at the end of the pipe to facilitate manual flushing when needed. The blow off valve shall consist of a gate valve and box with joint restraint fittings. The blow off piping shall have perforated ¼" openings total area of openings to be not more than one square inch with washed number 5 stone base 18'' around the pip. In the case of a future street extension, the Town of Chandler reserves the right to require the installation of a valve and the same size blow off.

4.2.4 Easements

The minimum width for water facility easements shall be fifteen (15) feet, unless otherwise authorized by the Utility. All water lines shall be centered in the easement unless a sewer (either storm or sanitary) is also present. In that case, a minimum of ten (10) feet separation must be maintained between the water line and the sewer line, and additional easement widths may be required as determined by the Utility.

The easements shall be exclusively under the discretion and control of the Utility. Ingress and egress shall be available to the Utility's crew at all times. No other utility companies are allowed to use the easements for installation of their utility lines without the expressed written permission of Chandler Utilities. All plans' sheets shall clearly identify the existing and proposed easement and the location of all other proposed utilities.

4.2.5 Separation of Water Mains and Sewers

Separation requirements shall comply with 327 IAC 8-3.2-9. Generally, water mains and service lines shall be installed at least ten (10) feet horizontally from any existing or

proposed sewer or lateral. The distance shall be measured edge to edge. In cases where it is not practical to maintain a ten (10) foot separation, the appropriate reviewing agency may allow deviation on a case-by-case basis, if supported by data from the design engineer.

Such deviation may allow installation of the water main or service line closer to a sewer or lateral, provided the water main is in a separate trench or on an undisturbed earth shelf located on one side of the sewer or lateral and at an elevation so the bottom of the water main is at least eighteen (18) inches above the top of the sewer or lateral.

Water main and service lines crossing sewers and laterals shall be installed to provide a minimum vertical distance of eighteen (18) inches between the outside of the water main or service line and the outside of the sewer or lateral. This shall be the case where the water main or service line is either above or below the sewer or lateral. The crossing shall be arranged so that the joints of the water main or service line will be equidistant and as far as possible from the sewer or lateral joints (the pipe shall be centered on the crossing). Generally, the water main shall cross over the sewer pipe. Where a water main or service line crosses under a sewer or lateral, adequate structural support shall be provided for the sewer or lateral to maintain line and grade.

When it is impossible to obtain proper horizontal and vertical separation as stipulated above, one of the following methods must be specified:

- Both the water main and sewer or lateral shall be constructed of ductile iron CL350 mechanical joint pipe complying with public water supply design standards of the agency and be pressure tested to 150 psi to assure water tightness before backfilling.
- The sewer or lateral shall be designed and constructed equal to water pipe and shall be pressure-tested at 150 psi to assure water tightness prior to backfilling.
- Either the water main or service line or the sewer or lateral line may be encased in a watertight carrier pipe which extends ten (10) feet on both sides of the crossing, measured perpendicular to the sewer or lateral. The carrier pipe shall be of materials approved by the regulatory agency for use in water main construction.

Water mains shall not be located closer than ten (10) feet from any existing building structure or foundation or any building set back limit for future building structures.

4.2.6 Design Flows & Pressures

The Utility will provide current flow test(s) information as near to the point(s) of connection between the proposed site and the existing water distribution system as deemed practical

and useful. The Developer's Engineer may rely on this information to design the water mains for the proposed site taking into account the portion(s) of the existing water distribution system between the location of the flow test(s) and the proposed site. The C factor used in the hydraulic calculations (using Hazen-Williams equation) for ductile iron pipes up to five years old shall be 120 and for pipes five to ten years old shall be 115. Ductile (or cast) iron pipes older than ten years shall use a C value of 100.

All water mains shall be sized & looped to provide a min. of thirty-five (35) psi, measured at ground level at the highest proposed elevation within the site, under peak hour flow conditions and a min. of twenty-five (25) psi, same measurement method, under fire flow conditions. If at any point during construction, the water main pressure drops below twenty (20) psi, the Developer's Contractor must immediately contact Chandler Utilities.

Water quantity and the peak hour flow condition shall be determined based on 327 IAC 8-3.3-2.

Commercial and industrial properties shall compute required fire flow in accordance with the ISO Guide for Determination of Needed Fire Flow latest edition.

If these design criteria cannot be met with connections to the existing water distribution, the Utility will use their hydraulic model of the existing distribution system to confirm that assertion and, if valid, the Utility will use the hydraulic model to identify water distribution system reinforcements (i.e. additional pipes, upsizing of existing pipes, etc.) needed to meet these design criteria. The Developer will then be required to design those water distribution system improvements. Those designs must also comply with these standards and in the event, there are issues with such design which are not sufficiently addressed the Utility will provide additional design standards to address the issues at hand.

Furthermore, the Town may require the upsizing of certain sections of the water main to provide sufficient flow to future or existing sites within the Town's water service area. The responsibility for the cost to upsize the water mains shall be negotiated during permitting.

4.2.7 Testing

The required testing for any water main extension is as follows:

- Hydrostatic Pressure Testing
- Bacteriological Testing

4.2.7.1 Hydrostatic Pressure Testing

A. Test procedures shall meet the requirements of ANSI/AWWA C600.

B. Hydrostatic tests shall be performed on all water mains installed. The Contractor shall make arrangements with the Utility for scheduling each test. Each test shall be performed on the day mutually agreed upon and in the presence of the Utility.

C. The Contractor shall furnish any and all equipment, temporary piping, pumps, fittings, gauges and operating personnel necessary to conduct the tests. Water for testing shall be obtained by the Developer or his/her Contractor at no cost to the Utility.

D. The water mains may be tested in sections between valves when there is one or more intermediary valves in a water main.

E. Expel all air from the water main test section during the filling of the main and prior to the application of test pressure. Tap the water main at high points, if necessary, to release all air from the water main. Plug taps after the test is successfully completed. Plugs shall be watertight. Water should be introduced into the main at the lowest point in the line in order to facilitate the expulsion of air from the line.

F. Test water mains at a static pressure of 150 psi over a period of not less than two (2) consecutive hours. The test will be considered successful when the pressure in the water line is maintained within 5 psi of the test pressure throughout the test duration. If the test fails, repair the leaks and repeat the test. Repair leaks and repeat the test until there is no pressure drop. Leakage shall be measured as the quantity of water that must be supplied into the newly laid pipe section to main pressure within 5 psi of the testing pressure.

   a. Allowable leakage for ductile iron pipe shall not be greater than:
      $L = SD * P/133,200$
      Where:
      L = allowable leakage, in gallons per hour
      S = length of pipe tested, in feet
      D = nominal diameter of the pipe, in inches
      P = average test pressure during the leakage test, in psi

   b. Allowable leakage for PVC pipe shall not be greater than:
      $L = ND * P/7,400$
      Where:
      L = allowable leakage, in gallons per hour
      N = number of joints in length tested
      D = nominal diameter of the pipe, in inches
      P = average test pressure during the leakage test, in psi

4.2.7.2 Bacteriological Testing

A. The water main shall be tested for bacteriological quality after disinfection and final flushing. Two or more successive sets of bacteriologically satisfactory samples taken at 24-hour intervals must be recorded before the facilities are released for use. Bacteriological testing shall meet the requirements of the applicable regulatory agency. Disinfection shall be repeated if the piping is not bacteriologically acceptable. Repeat disinfection and testing until the mains are approved for service by the applicable regulatory agency.

4.2.8 Special Crossings

Railroads, streams, rivers, etc. are considered special crossings. Special crossings shall be installed in accordance with the AHJ permit such as the USACE, IDNR, IDEM, or the railroad company. The preferred installation method for stream crossings is by horizontal directional drill (HDD) using fusible PVC pipe. HDD installation of restrained joint PVC pipe or High-Density Polyethylene (HDPE) pipe under streams may be permitted in some cases. Special crossings are subject to the separation requirements of Section 4.2.5. Isolation valves shall be located on either side of the crossing outside of the one hundred (100) year floodplain.

In channel disturbance and open cut installation methods through stream, creeks, and rivers is prohibited. Aerial crossings are also prohibited.

4.2.9 Valves

Valves shall be located at the three (3) branches of a tee and at the four (4) branches of a cross fitting. The maximum length of a section of water main to be shutdown is six hundred (600) feet in residential areas and commercial areas per 327 IAC 8-3.2-14. A water main valve shall also be located on the main at fire hydrants on the side of the water main that has the greatest distance to the next in line isolation valve. The spacing in industrial areas will be evaluated, by the Utility, on a case-by-case basis. Air release valves shall be provided at all isolated high points within the system. The contractor shall provide, but not install, a location marker with all valves installed on the project. The location marker shall be a flexible utility marker with two terminal test access points for tracer wire in blue model and shall be installed at a maximum spacing of 1000 feet.

4.2.10 Fire Hydrants

In general, fire hydrants should be located within two hundred (200) feet of a commercial or industrial building and within fifty (50) feet of the Fire Department Connection (FDC). Fire

hydrants should be located at major intersections and shall not exceed average spacing intervals of 500 feet (500') in residential areas, 400 feet (400') in commercial areas, and 350 feet (350') in industrial or other higher risk areas. A fire hydrant shall be provided at all cul-de-sacs. Fire hydrants shall not be connected to a main less than six (6) inches diameter and will maintain three (3) feet of separation from any existing utility. Every fire hydrant shall be installed with a drainage pit of at least one half (1/2) cubic yard of open graded crushed stone.

4.3 Water Service Lines

4.3.1 General Configuration

The water service configuration shall be designed to provide service to the front of each lot in the development with meter box located and centered on the right-of-way line.

Water service line ownership is separated at the meter. Chandler Utilities maintains ownership and maintenance from the water main tap up to and including the double check valve assembly to a point approximately ten inches outside the meter box or the first connection outside the meter box. The property owner is responsible for owning and maintaining the water service line from the downstream side of the double check valve to the structure. Services shall be constructed in manner that minimizes bends, deflections, and excessive depths.

Chandler Utilities may require the developer to install casings / conduits for future water services during the development review process.

4.3.2 Design Flows and Pressures

Design flows for single family homes shall be determined in accordance with 327 IAC 8-3.3-2 which states that the average daily consumer demand for residential service connections is five hundred (500) gallons per day. A peaking factor of two and a half (2.5) shall be used to determine peak demand. Design flow for commercial and industrial developments shall be determined in accordance with Table 2-1 of 327 IAC 8-3.3-2 available online.

Water service lines will be sized to deliver water service at a minimum thirty-five (35) psi. The minimum water service line size shall be three quarters (3/4) of an inch. Bypass lines may be required as determined by the Utility.

4.3.3 Valves

The Developer shall provide valves sufficient to construct, modify, and maintain the water service without disrupting the main or adjacent services. Typical water service lines shall have a corporation stop at the tapping saddle, curb stop at the water meter, shut off or setter, and double check valve on the downstream side of the meter.

Larger residential water services may require additional valves as determined by Chandler Utilities.

4.3.4 Meters

Chandler Utilities will provide and install new water services up to two (2) inches. Namely Chandler Utilities will provide and install the tapping saddle, corporation stop, service line, meter box, meter setter, and meter for these new services. Chandler Utilities will provide meters greater than two (2) inches for new water services. Meters greater than two (2) inches will be installed by the Developer's Contractor. Meters that are three (3) inches or larger require a valve vault upon installation. Chandler Utilities or the Developer's Contractor have the authority to choose when to set new water services. Water services are typically installed to the right-of-way line with the top of the meter box flush with adjacent grade. No meter box is permitted more than three (3) inches above adjacent grade. Water meters shall have 1" to 2" of rock at the bottom of the meter pit. Water service connections that are ¾" or 1" shall have a meter with 16" minimum of cover, and water service connections that are 2" shall have a meter with 36" minimum of cover.

It is the responsibility of the Developer's General Contractor to maintain the integrity of the meter, meter pit, and all adjacent appurtenances once installation is complete. Any damages incurred by these devices shall be the financial responsibility of the Developer's General Contractor. Homeowners are responsible for the integrity of the meter once the project is complete.

4.3.4.1 Bypass Requirements

A bypass around all new meter installations shall be required under any of the following circumstances, where:

- The service line on the outlet side of the meter is two inches (2") or larger. The by-pass for a two (2") meter shall be part of the supplied meter setter. The by-pass for larger services shall be constructed with the vault.

- The water service must not, for any other reason, be interrupted while the meter is being repaired or replaced.

The bypass around the meter shall be furnished and installed by the utility customer according to the Utility's specifications.

Where existing piping not containing a by-pass is altered to meet any of the above conditions, the alteration shall also include the installation of a by-pass.

A bypass around irrigation lines shall not be permitted.

4.3.5 Backflow Prevention

Backflow prevention, also known as cross connection control, shall be provided in accordance with 327 IAC 8-10.Chandler Utilities requires the use of a double check valve assembly on the downstream side of the water meterfor residential applications. Commercial and industrial cross connection control shall be in accordance with Indiana building and plumbing code.

SECTION 5: MATERIAL STANDARDS FOR WATER MAINS

5.1 General

This section provides a list of the materials acceptable for the construction of water distribution facilities. Additional materials and brands may be permitted by the Utility on a case-by-case basis. Hardware for appurtenances and fitting shall be stainless steel or bronze. Galvanized materials are not permitted.

The Town of Chandler and Chandler Utilities prefers the use of domestically manufactured products. All materials provided by developers or contractors must be purchased from a local approved, authorized dealer when possible, refer to the Director of Utilities for approved dealers. Chandler reserves the right to request any information pertaining to the dealers or venders providing the materials. Chandler has the right to refuse any material or equipment submitted for a project.

Projects funded by state and federal grants or loans shall conform to all material manufacturing requirements of the funding agency.

5.1.1 Water Mains

The following materials are acceptable for water mains:

1. Polyvinyl Chloride (PVC)
    a. IPS OD: Pipe sizes shall be from 3” to 12” confirm to ASTM D2241, SDR-21 or SDR-17.
    b. DI OD: Pipes shall conform to AWWA C-900, DR 21 or DR 18.
    c. Typical Accepted Manufacturers
        i. JM Eagle
        ii. Pipelife
        iii. North American Pipe
        iv. Northern
    d. Pipe joints for open cut or boring and jacking shall be push-on flexible gasket compression type conforming to ASTM F477. Pipe joints for horizontal directional drill applications shall be restrained boltless flexible type conforming to ASTM F477 with performance in accordance with ASTM D3139.
2. Ductile Iron (DI) – Pipe shall conform to AWWA C151, Pressure Class 350 in conformance with AWWA C150.

a. Typical Accepted Manufacturers
    i. U.S. Pipe
    ii. McWane
b. Pipe joints for open cut or boring and jacking shall be push-on joints conforming to AWWA C111 or mechanical joints in accordance with AWWA C110 and AWWA C111. Pipe joints for horizontal directional drill applications shall be restrained boltless flexible type.
c. Encasement: Install blue polyethylene encasement on all buried DI pipe and fittings in accordance with AWWA C105.

5.1.2 Water Main Fittings

The following manufacturers and materials are acceptable for water main fittings:

1. DI fittings meeting the requirements of AWWA C110 standard pattern or AWWA C153 compact pattern.
2. Joint Restraints
    a. Typical Accepted Manufacturers
        i. EBAA Iron Series 2000PV
        ii. Ford / Uni-Flange

5.1.3 Tapping and Line Stop Sleeves

The following manufacturers and materials are acceptable for tapping and line stop sleeves:

1. Tapping and line stop sleeves shall be stainless steel and shall be sized to accept full size cutter with an AWWA C207 Class D ANSI 150 lb. drilling flange, corrosion resistant coating and recessed for tapping valve. Sleeve shall include a full circumferential gasket and the entire assembly shall be rated at 150 psi. ¾" of crushed aggregate shall be placed below and around sleeve and should be compacted to 95% of its max density as determined by ASSHTO T-180. Tapping shall be no closer than 18" from the nearest joint.
    a. Typical Accepted Manufacturers
        i. Romac Industries Stainless Steel
        ii. JCM Industries Stainless Steel
2. Tapping valves shall be resilient seated type in conformance with AWWA C509. The tapping sleeve end shall be ANSI B16.1 flanged with centering ring, the outlet side shall be mechanical joint per AWWA C111.

3. Line stops shall utilize the stainless-steel sleeve described in this section. Temporary lines stops shall be Hydro-Stop or equivalent. Completion plug shall be DI per ASTM A536. Cover plate shall be A36 steel with synthetic rubber O-rings and gaskets.
4. Slot-milled inline insertion valves (e.g. EZ Valves or equivalent) may not be used.

5.1.4 Trenchless Installation

Trenchless sections shall have a location marker at each receiving or boring pit.

5.1.4.1 Horizontal Directional Drilling

1. Drilling fluid shall be composed of clean water and appropriate additives such as bentonite clay and polymer admixtures specifically blended for use in drilling.
2. A rig of sufficient capacity to perform the bore and pull back the pipe. The rig shall be hydraulically powered, anchored to the ground, and shall have a system to monitor and record maximum pull-back pressure.
3. A drilling and mixing delivery system of sufficient capacity to successfully complete the drilling and pulling.
4. A steerable drill head with cutting surfaces and drilling fluid jest suitable for each boring application.
5. Dill pipe constructed of high quality 4130 seamless tubing (Grade D or better) with threaded box and pins.
6. A guidance system to accurately guide boring operations.
7. Pipe rollers (if necessary) of sufficient size to fully support the pipe while being hydro-tested.
8. Hydraulic or pneumatic pipe rammers shall not be used.

5.1.4.2 Jack and Bore

1. Casing pipe shall be bituminous coated steel pipe with a minimum wall thickness of 0.375 inches and shall be capable of withstanding traffic or the loads of pavement, subgrade and traffic, where applicable. The casing pipe and joints shall be constructed to prevent leakage of any matter from the casing or conduit throughout its entire length. The casing shall have constant angles around the entire circumference of the pipe with the number of spacers per the manufacturer's specifications.
2. Casing pipe used for railroad crossings shall meet the minimum standards set forth by the railroad involved.

5.1.5 Water Services

The following manufacturers and materials are acceptable for water services:

1. Copper Tubing, Type K or M
    a. Typical Accepted Manufacturers
        i. Mueller Industries
        ii. JB Industries
        iii. Weiland Copper Products
2. Polyethylene (PE) – SDR 9
    a. Typical Accepted Manufacturers
        i. Uponor
        ii. Endot Industries
3. Meter Setters
   Meter setters shall be twelve (12) inches tall with ball valve and double check cartridge.
    a. Typical Accepted Manufacturers
        i. AY McDonald
        ii. Ford
4. Tapping Saddles
   Tapping saddles shall be all brass hinge type.
    a. Typical Accepted Manufacturers
        i. AY McDonald
        ii. Ford

5.1.6 Valves

5.1.6.1 Gate Valves

Gate valves shall be AWWA approved resilient seated, cast iron or ductile iron, with stainless steel stems.

a. Typical Accepted Manufacturer
    i. Mueller
    ii. Clow
    iii. East Jordan

5.1.6.2 Air/Vacuum Release Valves

Air/vacuum release valves shall be automatic hydromechanical, cast iron, and AWWA approved.

a. Typical Accepted Manufacturers

i. Val Matic
ii. Apco

5.1.6.3 Corporation Stops and Curb Stops

Corporation Stops and Cub Stops shall be tapered thread ball valve style and AWWA approved.

a. Typical Accepted Manufacturers
   i. Mueller
   ii. Ford
   iii. AY McDonald

5.1.7 Hydrants

1. Hydrants

Fire Hydrants shall be domestically produced, dry-barrel, compression shut off, traffic model design and shall comply with ANSI/AWWA C502.

Inlets shall be a minimum 6” mechanical joint. Each hydrant shall have two 2-1/2-inch nozzles and one 5-inch Storz connection fitting. The hydrant shall have a positive, non-corrodible type bronzed lined drain valve. When the hydrant is open the drip valve will close the drain and when the hydrant is closed the drain will open. The operating nut and the two 2-1/2-inch caps shall have a 1-1/2 inch pentagon nut. The two 2-1/2 inch caps shall not have chains attached. The 5-inch Storz cap shall have a jacketed stainless-steel cable attaching the cap to the main body of the hydrant.

All hydrants shall open left. Each hydrant shall be buried at the proper depth for the water main to which the hydrant is connected. Hydrants shall be furnished with mechanical joint accessories including bolts, glands, and gaskets. Hydrants shall be placed upon a 4” solid concrete square block at a minimum of 15” by 15”.

All hydrants shall have stainless steel hardware above and below grade including the upper and lower stems. Fire hydrant coatings hall meet the requirements of ANSI/AWWA C502 Fire hydrant coating shall be red.

a. Typical Accepted Manufacturers
   i. Mueller
   ii. Clow
   iii. East Jordan

5.1.8 Appurtenances

5.1.8.1 Tracer Wire

Tracer wire shall be installed on the top of all PVC water mains. Wire shall be minimum of #10 solid copper wire with thermoplastic insulation capable of carrying thirty (30) volts. Two (2) wires shall be used for horizontal directional drill applications.

a. Typical Accepted Manufacturers
    i. Copperhead, or equivalent

5.1.8.2 Valve Boxes

Valve boxes shall be a six (6) inch plastic pipe with a cast iron lid. Valve boxes shall be encased in concrete if it is not in a paved area.

a. Typical Accepted Manufacturers
    i. Carson
    ii. Oldcastle
    iii. Tyler Union
    iv. Sigma

5.1.8.3 Meter Box Lid and Frame

Composite frames and lids shall be manufactured from fiber reinforced polymer (FRP). The frame shall have clear open dimension of 11-3/8-inches and a frame height of 4-inches. The lid shall have a diameter of 12-5/16-inches and a seat thickness of 11/16-inches. The lid shall be blue in color. The lettering on lid shall state “WATER METER.”

a. Typical Accepted Manufacturers
    i. East Jordan

5.1.8.4 Valve Vaults

Valve vaults shall be precast construction and include the following:

1. 4,500 PSI concrete in accordance with ASTM C-913
2. U.S. Foundry (or equal) aluminum hatch 30” x 36”
3. Kor-N-Seal Connectors
4. Cast iron floor drain cast into structure
5. Waterproof butyl mastic sealant on the outside of structure

SECTION 6: INSTALLATION AND CONSTRUCTION OF WATER MAINS

6.1 General

This section shall provide general, minimum requirements for the installation and construction for Chandler Utilities water distribution projects. This installation guidelines can be modified as approved during permitting and construction by Chandler Utilities.

6.1.1 Safety

Neither the Utility, Town, nor its representatives are responsible for safety on the job site. All codes, statutes and regulations relating to safety on the job site shall be followed by the Owner, Developer and Contractor. Direction by the Utility's representative is not designed to assure safety on the job, only that the water distribution system is built according to these standards and the drawings.

6.1.2 Excavation

6.1.2.1 Dewatering and Control of Surface Water

The Developer's Contractor shall make every effort necessary to secure a dry trench bottom before laying pipe. The Contractor shall provide, install and operate sufficient trenches, pumps, hoses, piping, well points, etc. necessary to lower and maintain the groundwater level below the base of the excavation. If the Contractor is unable to remove the standing water in the trench, the Contractor shall over-excavate the proposed bottom grade of the sewer bedding, and place not less than 3 inches of Class No. 8 crushed stone (per INDOT aggregate classification) in the over-excavated area. The Contractor shall make every effort to maintain a work site free of surface water shall install drainage ditches, berms, pumps and perform other work necessary to divert runoff away from excavations. Any water discharged from dewatering operations shall be treated for sediment removal prior to discharge to surface waters. Under no circumstances shall surface water and/or groundwater be discharge to, disposed of, or allowed to flow into the Town's Sanitary Sewer System.

6.1.2.2 Site Preparation

Before the commencement of any excavation, adequate protection shall be provided for all lawns, trees, landscape work, shrubs, fences, utilities, sidewalks, and other objects

that are to remain in place. Such protection shall be maintained for as long as necessary to prevent damage from the Contractor operations.

Moveable items such as mailboxes and roadway signs may be temporarily relocated during construction. Place moveable items in their original location immediately after backfilling is complete. Moveable items damaged during construction shall be replaced with new items at the Contractor's expense.

Strip topsoil and vegetation from the excavated areas. Clean topsoil may be stockpiled for re-use as the upper 6- inches of the area to be seeded. Do not intermix grass, weeds, roots, brush, and stones larger than 1 inch with stockpiled topsoil. Legally dispose of root contaminated topsoil.

Clear and remove logs, stumps, brush, vegetation, rubbish and other perishable matter from the job site. Do not remove or damage trees that do not interfere with the work. Completely remove trees including stumps and roots that are required to be removed.

Remove existing pavement and walks from the areas to be excavated and dispose in a legal manner. Use methods, such as saw cutting, to remove pavement and concrete walks that will assure the breaking or cutting along straight and vertical lines. Remove walks completely where excavation is along the length of a walk to existing joints.

6.1.2.3 Excavating

Excavated materials suitable and necessary for backfilling shall be stored in a neat pile adjacent to the excavation and protected by erosion control measures. Such materials shall not be placed with at a height or proximity to excavation that may endanger the trench sidewalls due to earth slides or cave-ins.

Excavated material not suitable for backfilling and excess suitable material shall be removed from the job site and legally disposed of in a spoil area secured by the Contractor and approved by the Town.

Provide dewatering in accordance with section 6.1.2.1.

6.1.2.4 Trenching

Excavate trenches to a depth and width as required by the pipe manufacturer for proper installation of the pipe and appurtenances. Excavations below the required grade shall be filled with compacted bedding or granular material.

Trenches shall be made as narrow and straight as possible. Sides of trenches shall be kept as near vertical as possible and shall be properly sheeted and/or braced, if

required. The Contractor shall provide adequate sheeting and bracing in open cut trenches to protect life, property and the work. All sheeting, planking, timbering, shoring, bracing, and bridging shall be placed, renewed and maintained, and shall not be removed until sufficient backfill has been placed to protect the pipe. Benching is permitting where sufficient space is available. Benching shall be installed no steeper than two (H) to one (V).

Provide a continuous, uniform bearing support for the pipe on solid undisturbed soil or compact granular fill with trench dished to provide circumferential support to the lower third of each pipe along the entire length of the pipe, including pipe bells.

Rock excavation encountered in the trench and soft material which, in the opinion of the Town is incapable of providing adequate bearing to support the pipe, shall be removed to a depth of 4-inches below the required elevation and filled with compacted No. 8 aggregate.

Do not open more than fifty (50) feet of trench in advance of the installed pipe. Excavate the trench within six.

(6) inches of full depth for a distance of at least thirty (30) feet in advance of the pipe installation.

Maintain one lane of traffic at all streets and service drives during construction. Streets and drives may be closed, and traffic detoured if permission is obtained by the Contractor from the AHJ.

Any sewer, gas, water, or other pipes or conduits crossing the trench shall be supported without damage and without interrupting service. The manner of supporting such pipes or conduits shall be subject to the approval of the Town and/or the utility involved.

Where rock is encountered during trenching operations, the Contractor may remove the rock by mechanical means. The use of a hoe ram breaker is the preferred method of removal. Rock trenchers are also acceptable. Blasting will not be permitted.

No farm fences shall be cut when gates are available within a reasonable distance to move equipment from one field to another.

Provide dewatering in accordance with section 6.1.2.1.

6.1.3 Bedding and Backfill

6.1.3.1 General

All trenches or excavations shall be backfilled to the original surface of the ground or such other grades as required or directed. In general, the backfilling shall be carried along as speedily as possible in order to avoidopen excavation.

6.1.3.2 Bedding and Backfill Materials

Bedding and Backfill material classes referenced within this section shall be defined as follows:

Class I	Angular, 6- to 12.5-millimeters (¼- to ½-inch) graded stone such as crushed stone. A No. 11 gravel possessing a minimum 50% mechanical crush count and meeting the following nominal sizes and percent passing will be considered an equivalent Class I material (100% passing ½-inch sieve; 75-95% passing a ⅜-inch sieve; 10-30% passing No. 4 sieve; and 0-10% passing No. 8 sieve.
Class II	Coarse sands and gravel-sand mixtures with a maximum particle size of 40-millimeters (1½-inches), including variously graded sands and gravels containing small percentages of fine, granular and non-cohesive, either wet or dry. Soil types GW, GP, SW and SP are included in this class (INDOT Classification for Structural Backfill). These materials will not be accepted as pipe bedding.
Class III	This class is defined as fine sand and clay gravels, including fine sands, sand-clay mixtures and gravel-clay mixtures. Soil types GM, GC, SM and SC (ASTM D2487) are included in this class. These materials will not be accepted as pipe bedding.

6.1.3.3 Backfill of Trench Excavations for Pipes and Conduits

Bedding and Backfill materials samples shall be submitted to the Town prior to start of construction.

6.1.3.4 Bedding

1. Plastic PVC Pipe

   Plastic PVC pipe shall be provided with No. 11 crushed stone or approved Class I granular bedding material shovel sliced or otherwise carefully placed and “walked” or hand tamped into place from four (4) to eight (8) inches (based in the diameter of the pipe) below the pipe barrel, to a minimum of twelve (12) inches above the crown of the pipe.

Bedding and initial backfill material shall be hand placed around the haunch and sides of the plastic pipe, to ensure proper compaction filling of all voids. Bedding shall be placed in 6-inch to 8-inch balanced lifts.

2. Ductile Iron Pipe (DI)
   Ductile Iron Pipe (DI) shall be provided with Class I granular bedding material. Class I material shall be shovel sliced or otherwise carefully placed and "walked" or hand tamped into place from three (3) to six (6) inches below the pipe barrel, to three (3) inches above the crown of the pipe.

6.1.3.5 Backfill Around Pipe

Do not backfill trenches until the piping system conforms to the contract documents, this manual, special permit conditions, and are approved by the Utility.

Backfill all trenches within State Highway Right-of-Way in accordance with INDOT SS. Backfill trenches in rights-of-way in accordance with the requirements of the AHJ.

Initial backfill material shall be hand placed around the haunch and sides of PVC or DIP pipe to ensure proper compaction filling of all voids. Initial backfill shall be placed in six (6) to eight (8) inch balanced lifts.

Backfill trenches under and within five (5) feet of all paved roads, drives, paved alleys, sidewalks, curb and gutter with full depth granular Class I or Class II material placed in eight (8) inch layers and mechanically compacted to 95% Standard Proctor Density. Prepare upper portion of the trench for surface restoration or pavement replacement.

Backfill trenches at unpaved driveways and alleys with suitable excavated material up to the last twelve (12) inches which shall be the same material as the original surface. Place backfill in eight (8) inch layers and mechanically compact to 95% Standard Proctor Density. Backfill material shall be Class I or II for PVC pipe. Class I, II, or III backfill is acceptable for DI pipe.

Backfill trenches under sidewalks greater than five (5) feet from roadways with suitable excavated material placed in eight (8) inch layers and compacted to 95% Standard Proctor Density. Backfill material shall be Class I or II for PVC pipe. Class I, II, or III backfill is acceptable for DI pipe.

Backfill trenches in areas not requiring granular fill with suitable excavated material compacted to produce an adequate foundation for seeding. The top four (4) inches of backfill shall not contain stones or other objects larger than one (1) inch. Backfill should be mounded above the finished grade to allow for settlement. Place six (6) inches of

clean topsoil over the area to be seeded. Area to be restored shall be graded subsequent to settlement and immediately before restoration.

Maintain backfilled trenches in a smooth and uniform condition until paving or seeding operations are completed. Contractor shall refill and restore to the original grade any settlement in the backfill which takes place within the one (1) year warranty period at no additional cost to the Town.

Perform compaction tests at all road crossings and at locations of the trench backfill in accordance with the INDOT SS. The Contractor shall be responsible for payment of all compaction tests.

6.1.4 Installation of Water Mains

6.1.4.1 General

The Contractor shall provide all tools, labor and equipment necessary for the safe and expeditious installation of all water mains, water services, and appurtenances.

Inspect water pipe, valves, hydrants, and appurtenances prior to installation and promptly replace damaged or unsuitable materials with new and unused materials.

6.1.4.2 Installation of Water Mains

Water mains shall be constructed in accordance with the contract documents. Generally, water mains shall be laid uniformly to line and grade. The contractor shall set line and grade for all water main construction based on the contract documents. DI and PVC pipe water mains shall be laid progressively upgrade with bell upstream in a manner to construct concentric joints with smooth bottom inverts.

Piping systems shall be temporarily plugged in a watertight manner at the end of each day's work, or other interruption of construction, to prevent entry of animals, fluids, or deleterious material.

Bedding material shall be placed along each side of the installed pipe maintain proper alignment. Bedding shall be in accordance with section 6.1.3 of this manual and any permitted conditions.

Tracer wire shall be installed above newly constructed water mains and appurtenances in accordance with the Utility standard details. All new mains must include tracer wire for use in record drawing preparation.

Installed pipe shall not be backfilled without prior inspection by the Utility. Visual line and ownership indicators may be required.

6.1.4.3 Installation of Valves, Valve Boxes, and Structures

Excavations for valves, vaults, meters, hydrants, and other appurtenances shall be kept free of water during construction. Over excavation below the required depth of the structure shall be backfilled in accordance with section 6.1.3 of this manual and the contract documents. Pipe shall be fully bedded, restrained, and supported prior to installation of valves or structures. Install valves per manufacturer specifications. Unless otherwise noted, castings and covers shall be set at finish grade level in accordance with Utility standard details. The Contractor is responsible for adjusting the casting and cover to the satisfaction of the Chandler Utilities and for ensuring that the valve top is centered.

Remove all debris and excess soil from the structures and boxes after construction and prior to testing and inspection.

6.1.5 Erosion Control

6.1.5.1 General

The Contractor shall be responsible for all temporary and permanent control measures to reduce water pollution, soil erosion, and siltation through the use of berms, dikes, dams, sediment basins, fiber mats, gravel, mulches, grasses, slope drains, and other erosion control devices or methods.

An IDEM Construction Stormwater General Permit (CSGP) must be obtained for projects that disturb one (1) acre or more and provided to Chandler Utilities prior to construction commencement. The Contractor shall comply with all requirements of IDEM CSGP – Storm Water Run-Off Associated with Construction Activity. The Contractor shall be responsible for notifying all agencies and posting all public notices necessary to comply with the CSGP. The following information shall be posted at the project site: Notice of Intent (NOI) letter and NPDES permit number; the name, address, and phone number of the local contact person; and the location of a copy of the construction plans.

Material handling and storage associated with construction activity shall meet the spill prevention and spill response requirements in Indiana Administrative Code 327 IAC 2-6.1.

All erosion control measures shall be maintained throughout the project and until such time as the disturbed area has been completely stabilized or other provisions have altered the need for these measures. All maintenance shall be provided at the Contractor’s expense.

The Utility shall be notified when land disturbing activities have been completed, the entire site has been stabilized and all temporary erosion control measures have been removed. The Developer shall submit a Notice of Termination (NOT) letter to regulating authorities and the Town.

6.1.6 Horizontal Directional Drilling

6.1.6.1 General

1. Notify Utility and Engineer 48 hours prior to drilling operations.
2. Grade or fill work site to provide a level surface only as needed within the designate work areas.
3. Survey entire drill path. Contact all property owner regarding location of service lines, water wells, septic tanks, etc. Contact all utilities for the location of all existing underground lines, cables, pipes, vaults, etc. Excavate and confirm location and elevation of existing utilities in or near drill path.
4. Maintain continuous grade; avoid high spots between air relief valve locations.
5. Maintain erosion control and drilling fluid containment measures throughout the drilling operation.
6. Drilling depths below 8’ shall only be allowed with permission from the Utility.

6.1.6.2 Installation

1. Pilot hole shall be drilled on bore path with not deviations greater than 5% of depth over a length of 100’. Notify Utility and Engineer of drilling fluid fracture or returns loss. Measure the location and depth of the pilot hole and record readings at intervals of no more than 10 feet.
2. Upon successful completion of pilot hole, Contractor shall ream bore hole to a minimum of 25% greater and a maximum of 50% greater than the OD of the pipe or bell. Use hole opener or back reamer suitable for the subsurface conditions. Drilling fluid shall remain in the tunnel during reaming. Deflection limits of the drill pipe shall not exceed the deflection limits of the carrier pipe.
3. Place pipe on rollers before pulling into bore hole. Rollers shall be spaced close enough to prevent sagging. Pipe may be pre-testing prior to pulling, but acceptance testing is still required even if pre-tested. Interior of pipe, fitting, and valves shall be cleaned before being joined.
4. Provide two tracer wires on the crown of all pipe and tubing. Securely fasten with tape at intervals no more than 20 feet.
5. Commence pullback after successfully reaming the hole. Pullback operations must continue without interruption until pipe is completely pulled into bore

hole. If pipe becomes stuck, cease pulling operations to allow potential hydro-lock to subside. Notify Utility and Engineer if pipe remains stuck.

6.1.7 Boring and Jacking Pipe Installations

6.1.7.1 General

1. Field verify utility locations and depths prior to layout.
2. Where not provided by Utility, obtain permits from agencies having jurisdiction over boring and jacking work. Comply with all applicable permit conditions.

6.1.7.2 Installation

1. Provide bore and receiving pits on either end of the casing pipe or where indicated on the Drawings. Pits located in right of way shall be in accordance with the requirements of the agency controlling the right of way.
2. Make surface elevation checks at each established surface elevation point from the bore head to the bore pit each 20’ of progress during the installation. Correct procedure to eliminate surface movement of 0.5 inches or more.
3. Boring shall be performed in a manner that will avoid removal or loss of any earth material from the boring operation which is greater in diameter than the outside diameter of the casing pipe. Do not use water or other liquids to facilitate casing placement or spoil removal.
4. Use a positive stop boring arrangement that will prevent the auger from leading the casing pipe so there will be no unsupported excavation ahead of the pipe.
5. Weld joints of casing pipe as they are installed. Welds shall be watertight and without voids, cracks or other imperfections.
6. Install carrier pipe with spacers/skids at intervals to ensure the pipe does not sag. Pipe bells shall clear the casing by at least ½-inch.
7. Upon completion of jacking operations, pressure grout around outside face of the conduit to fill voids.
8. Seal the ends of the casing pipe with a bulkhead or band. Seals should be adequate to prevent entry of earth into casing pipe due to backfill pressure.

SECTION 7: STANDARD DETAILS

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE CHANDLER UTILITIES RULES AND REGULATIONS.
2. CONTRACTOR SHALL PROVIDE DETAILED SHOP DRAWINGS OF ALL MATERIALS AND PRODUCTS TO CHANDLER UTILITIES PRIOR TO AUTHORIZING SHIPMENT TO THE PROJECT SITE.
3. WATER MAIN TO BE INSTALLED THE WITH MINIMUM COVER OF 36 INCHES..
4. MAINTAIN 18" VERTICAL SEPARATION AND 10' HORIZONTAL SEPARATION FROM EXISTING SEWERS, UNLESS OTHERWISE SHOWN ON THE PLANS.
5. CONTRACTOR IS RESPONSIBLE TO OBTAIN AND VERIFY FIELD LOCATIONS OF ALL KNOWN EXISTING BURIED UTILITIES.
6. CONTRACTOR SHALL NOT ALLOW THE USE OF THE PROPOSED WATER MAINS UNTIL ALL CHLORINATION IS COMPLETE AND MAIN IS ACCEPTED BY UTILITY.
7. CONTRACTOR SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL CODES, ORDINANCES, RULES, REGULATIONS, ORDERS, AND OTHER LEGAL REQUIREMENTS OF MUNICIPAL AUTHORITIES WHICH BEAR ON THE PERFORMANCE OF THE WORK.
8. PVC PIPE MAY BE BENT NO MORE THAN 12.3 INCHES OVER A 20" JOINT. USE FITTINGS AS NECESSARY TO PREVENT OVER-DEFLECTION OF PIPE.
9. ALL RESTRAINED JOINTS PER CHANDLER UTILITIES SPECIFICATIONS.
10. ALL FIRE HYDRANTS TO BE LOCATED SO THAT THEY DO NOT INTERFERE WITH THE SIDEWALK. (WHERE APPLICABLE)
11. THE CONTRACTOR IS CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CONTACT THE APPROPRIATE UTILITY COMPANY AT LEAST 48 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF ESTABLISH ELEVATIONS AND CLEARANCES WITH PROPOSED IMPROVEMENTS PRIOR TO INITIATING CONSTRUCTION.
    INDIANA UNDERGROUND UTILITY LOCATE SERVICE (I.U.P.P.S.)
    PHONE: 811
12. ALL SHORT NIPPLES (16" OR LESS) BETWEEN FITTINGS AND VALVES TO BE DUCTILE IRON PIPE.
13. CONTRACTOR SHALL COORDINATE LOCATION OF TAPS, SERVICE TRANSFERS, CORPORATION STOPS, CURB STOPS, VALVES, AND FIRE HYDRANTS WITH CHANDLER UTILITIES.
14. REQUIRED FITTINGS AND APPURTENANCES MAY NOT BE SHOWN ON DRAWINGS. ALL FITTINGS AND APPURTENANCES REQUIRED TO COMPLETE THE PROJECT ARE TO BE INCLUDED IN THE BID PRICE.
15. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO MAINTAIN THE INTEGRITY OF THE METER PIT AND ALL ADJACENT APPURTENANCES ONCE INSTALLATION IS COMPLETE. ANY DAMAGES INCURRED BY THESE DEVICES SHALL BE THE FINANCIAL RESPONSIBILITY OF THE DEVELOPER'S GENERAL CONTRACTOR. ONCE CONSTRUCTION IS COMPLETE THE INTEGRITY OF THE METER PIT SHALL BE THE RESPONSIBILITY OF THE HOMEOWNER
16. EXISTING UTILITY POLES MAY REQUIRE SUPPORTING DURING CONSTRUCTION. CONTRACTOR SHALL COORDINATE WITH UTILITY RESPONSIBLE FOR POLES TO PROVIDE ADEQUATE SUPPORTING DURING CONSTRUCTION.
17. CONTRACTOR SHALL FIELD VERIFY THE DEPTH OF EXISTING WATER MAINS WHERE THEY WILL BE CROSSED BY NEW WATER MAINS. A MINIMUM OF 12 INCHES OF CLEARANCE SHALL BE MAINTAINED BETWEEN NEW AND EXISTING WATER MAINS WHERE THEY CROSS.

TOWN OF CHANDLER

101 CONSTITUTION COURT. CHANDLER, IN 47610

STANDARD PLAN NOTES

Approved: 07/18/2022	Adopted: 07/18/22	Figure 1A
Approved By: RDC	Scale: N.T.S.	

18. CONTRACTOR SHALL BE RESPONSIBLE FOR STAKING RIGHT-OF-WAY BY REGISTERED LAND SURVEYOR.
19. TWENTY FOUR (24) HOURS PRIOR TO STARTING ANY OF THE WORK, THE CONTRACTOR SHALL MAKE ARRANGEMENTS WITH CHANDLER UTILITIES TO PROVIDE INSPECTION FOR THE WORK.
20. CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH CHANDLER UTILITIES AND THE DESIGN ENGINEER A MINIMUM OF FORTY-EIGHT (48) HOURS PRIOR TO STARTING ANY WORK.
21. CONTRACTOR IS RESPONSIBLE FOR OBTAINING A CONSTRUCTION STORMWATER GENERAL PERMIT WHERE PROJECT LAND DISTURBANCE EXCEEDS ONE (1) ACRE.
22. CONTRACTOR TO PROTECT AND REPAIR ALL DAMAGED DRAINAGE TILE ENCOUNTERED DURING CONSTRUCTION.
23. CONTRACTOR SHALL HAVE A COPY OF THE CONTRACT DOCUMENTS AND CONSTRUCTION PERMITS ONSITE AT ALL TIMES.
24. WHEN GRADING OPERATION ARE COMPLETE OR SUSPENDED FOR MORE THAN 14 DAYS, PERMANENT GRASS MUST BE ESTABLISHED AT SUFFICIENT DENSITY TO PROVIDE EROSION CONTROL ON SITE. BETWEEN PERMANENT GRASS SEEDING PERIODS, TEMPORARY COVER SHALL BE PROVIDED.
25. ALL FINISHED GRADES IN EXCESS OF 20% SLOPES (5:1) SHALL BE MULCHED AND TACKED AT A RATE OF 100 POUNDS PER 1000 SQUARE FEET WHEN SEEDED.
26. ALL TRENCH BACK FILLS UNDER OR WITHIN 5 FEET OF PAVED AREAS SHALL BE GRANULAR BACK FILL, AND COMPACTED MECHANICALLY. ALL OTHER TRENCH BACK FILLS MAY BE EARTH MATERIAL (FREE OF LARGE CLODS, OR STONES) AND COMPACTED.
27. CONTRACTOR SHALL BE RESPONSIBLE FOR FINAL SITE GRADING, EXCESS SOIL AND SPOIL MATERIAL SHALL BE DISPOSED OF BY THE CONTRACTOR OFF-SITE, AT NO ADDITIONAL COST TO THE OWNER.
28. CONTRACTOR TO REGRADE AREAS AS NECESSARY WITHIN THE CONSTRUCTION LIMITS TO ALLOW PROPER DRAINAGE TO EXISTING AND PROPOSED STORM SEWER STRUCTURES AND DRAINAGE OUTLETS.
29. FINAL GRADES REQUIRE APPROVAL FROM CHANDLER UTILITIES.
30. EXISTING WATER MAIN AND SERVICES SHALL BE PRESERVED AND PROTECTED DURING CONSTRUCTION. SERVICES SHALL REMAIN IN SERVICE UNTIL THE PROPOSED WATER MAIN CONSTRUCTION AND TESTING IS COMPLETE, AT WHICH TIME SERVICES SHALL BE TRANSFERRED. ONCE EXISTING SERVICES ARE TRANSFERRED, EXISTING WATER MAIN MAY BE RETIRED AS APPLICABLE.

EXAMPLE UTILITY CONTACTS:

CHANDLER UTILITIES
101 CONSTITUTION COURT
CHANDLER, IN 47610
(812) 925-6213

TEXAS GAS TRANSMISSION
7935 INDIANA 56
HAZELTON, INDIANA 47640
(812) 354-8836

TIME WARNER - NEWBURGH
PO BOX 21798
OWENSBORO, KENTUCKY 42301
(270) 685-2991

AT&T
5858 NORTH COLLEGE AVENUE
INDIANAPOLIS, INDIANA 46220
(317) 252-4007

BOONEVILLE / CHANDLER NATURAL GAS
1425 NORTH ROCKPORT ROAD
BOONEVILLE, INDIANA 47601
(812) 897-2260

INSIGHT COMMUNICATIONS
1900 NORTH FARES AVENUE
EVANSVILLE, INDIANA 47711
(812) 428-2477

ZAYO BANDWIDTH
625 EAST 11TH STREET
INDIANAPOLIS, INDIANA 46202
(317) 524-5711

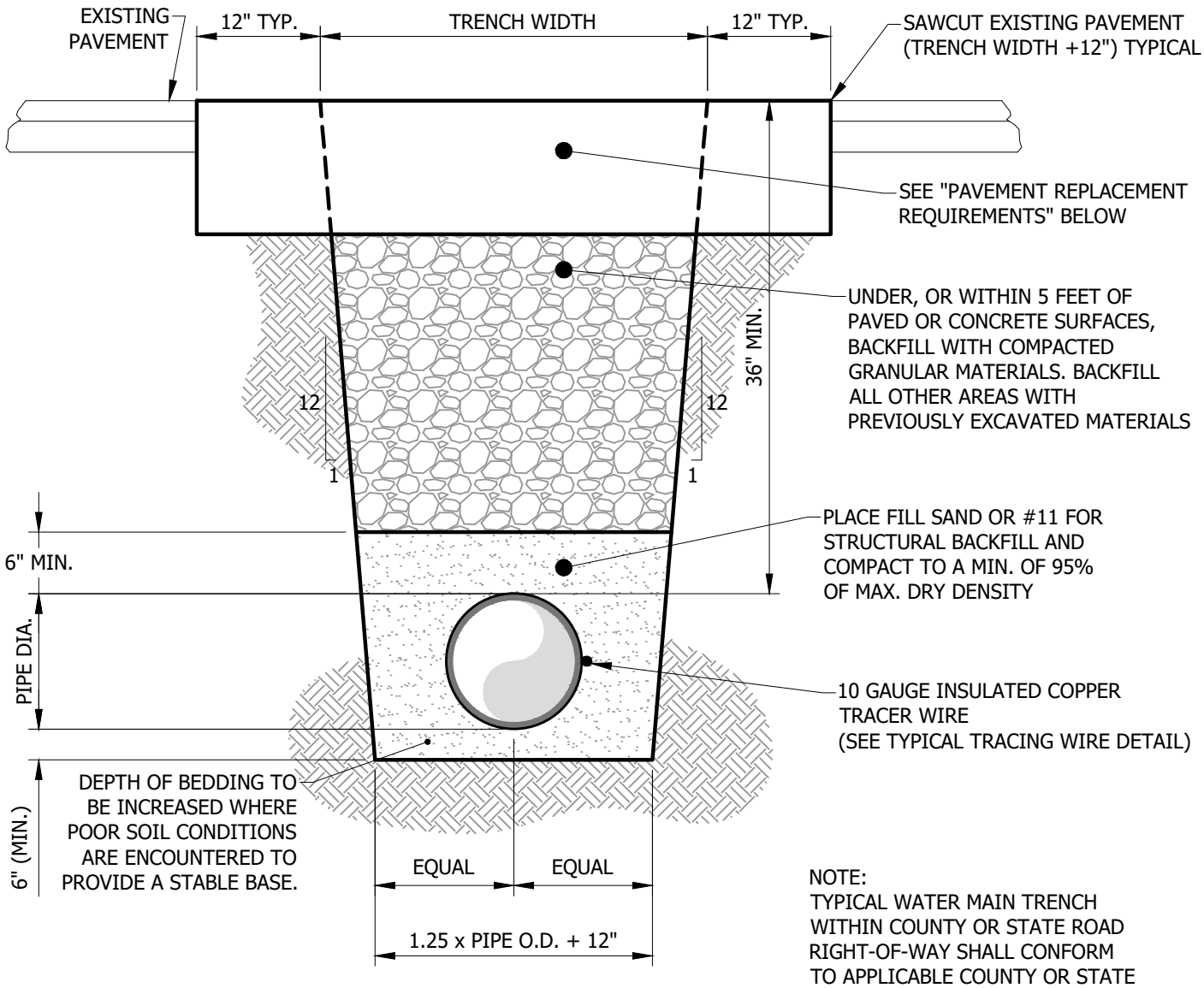
VECTREN GAS
1 NORTH MAIN STREET
EVANSVILLE, INDIANA 47702
(812) 491-4607

TOWN OF CHANDLER

101 CONSTITUTION COURT. CHANDLER, IN 47610

STANDARD PLAN NOTES

Approved: 07/18/22	Adopted: 07/18/22	Figure 1B
Approved By: RDC	Scale: N.T.S.	



NOTE:
TYPICAL WATER MAIN TRENCH WITHIN COUNTY OR STATE ROAD RIGHT-OF-WAY SHALL CONFORM TO APPLICABLE COUNTY OR STATE SPECIFICATION

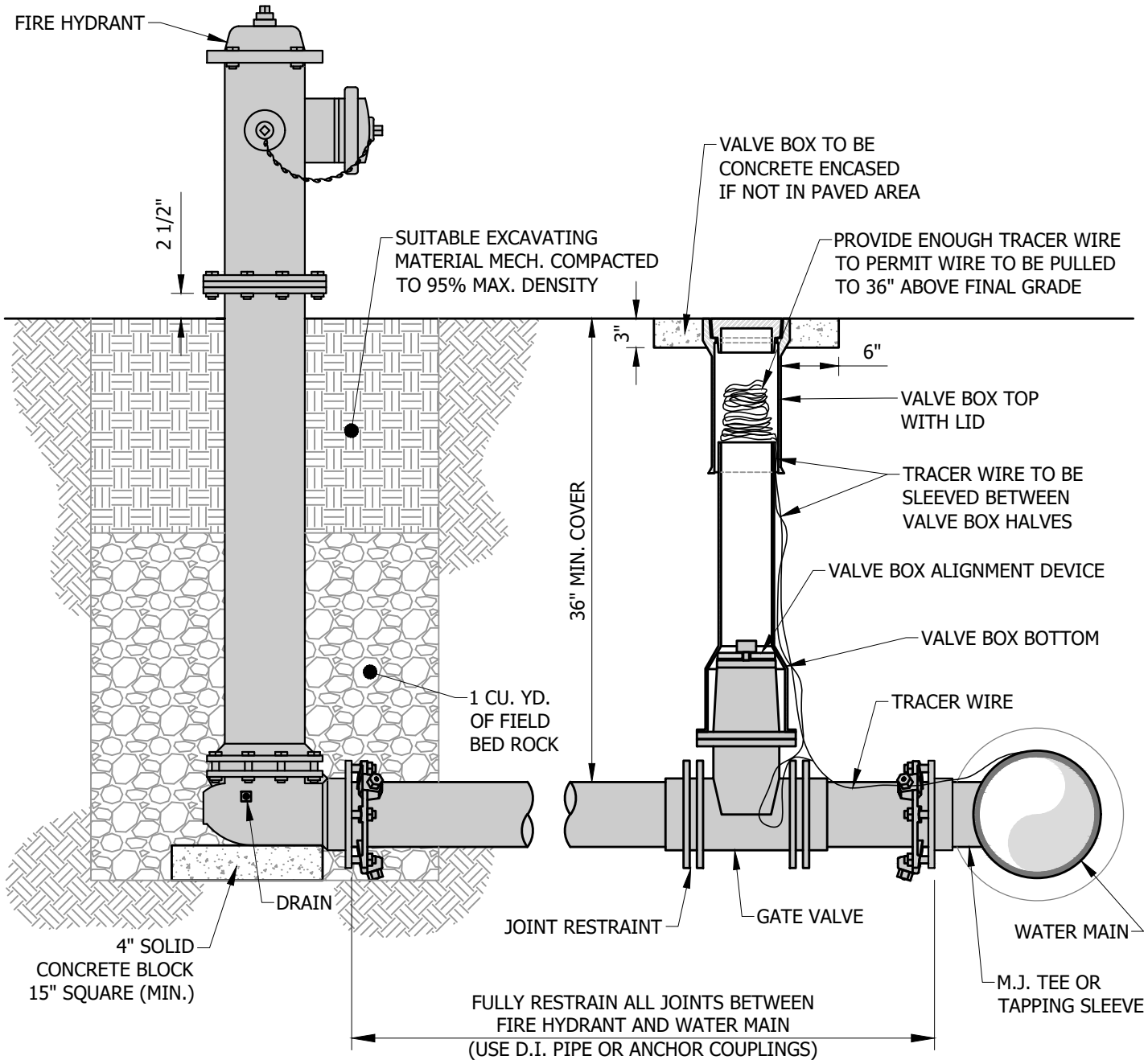
PAVEMENT REPLACEMENT REQUIREMENTS	
ASPHALT STREETS (RESIDENTIAL)	660#/SY HMA FOR BASE AND SURFACE
ASPHALT STREETS (COLLECTOR)	880#/SY HMA FOR BASE AND SURFACE
CONCRETE STREETS (RESIDENTIAL)	6" PCCP WITH EXPANSION AND JOINTS TO MATCH EXISTING STREET
CONCRETE STREETS (COLLECTOR)	10" PCCP WITH DOWELS AND EXPANSION AND JOINTS TO MATCH EXISTING STREET

TOWN OF CHANDLER

101 CONSTITUTION COURT. CHANDLER, IN 47610

TYPICAL WATER MAIN TRENCH

Approved: 07/18/22	Adopted: 07/18/22	Figure 2
Approved By: RDC	Scale: N.T.S.	



APPROVED HYDRANTS:

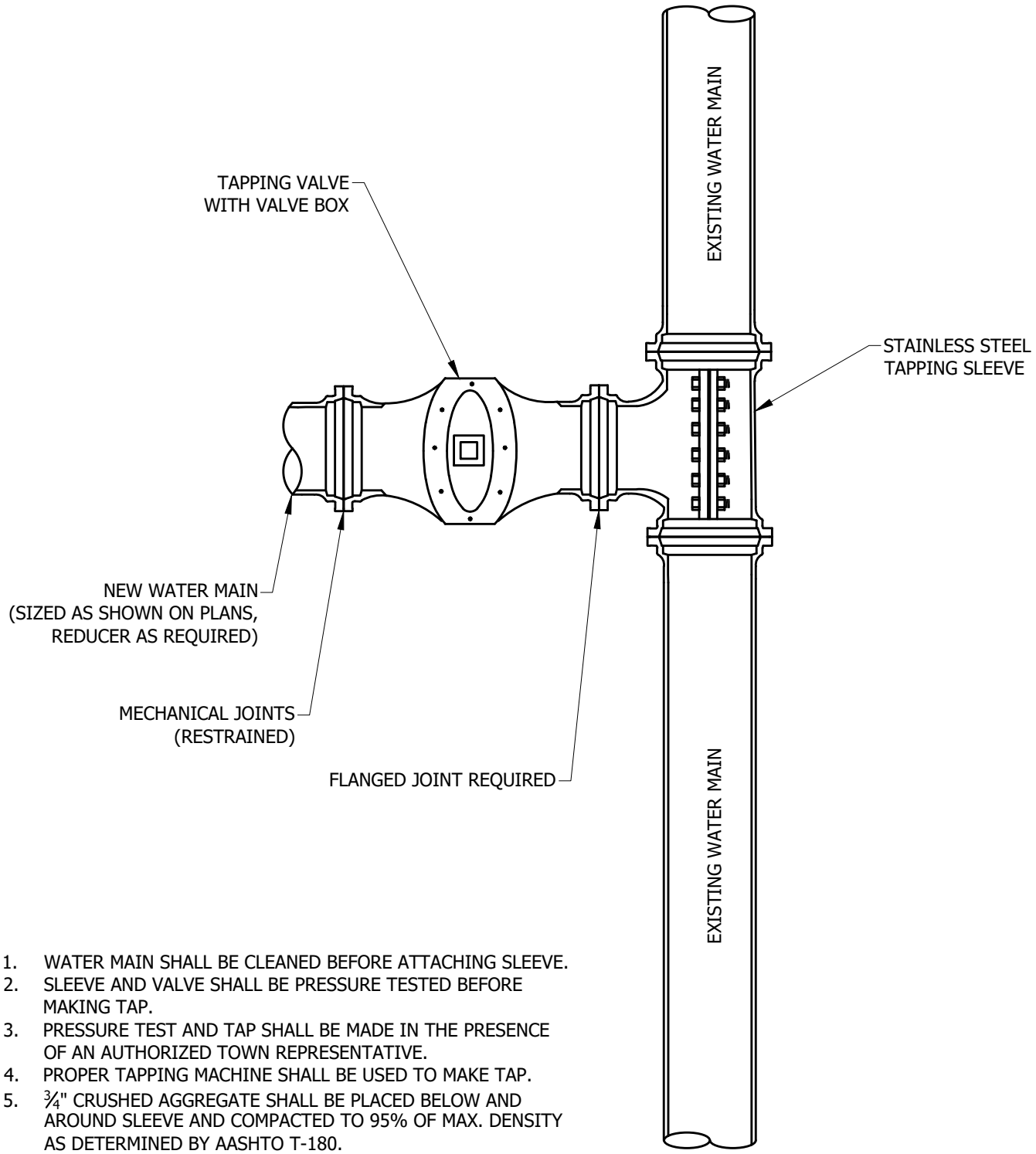
- MUELLER
- CLOW
- EAST JORDAN

TOWN OF CHANDLER

101 CONSTITUTION COURT. CHANDLER, IN 47610

FIRE HYDRANT ASSEMBLY

Approved: 07/18/22	Adopted: 07/18/22	Figure 3
Approved By: RDC	Scale: N.T.S.	



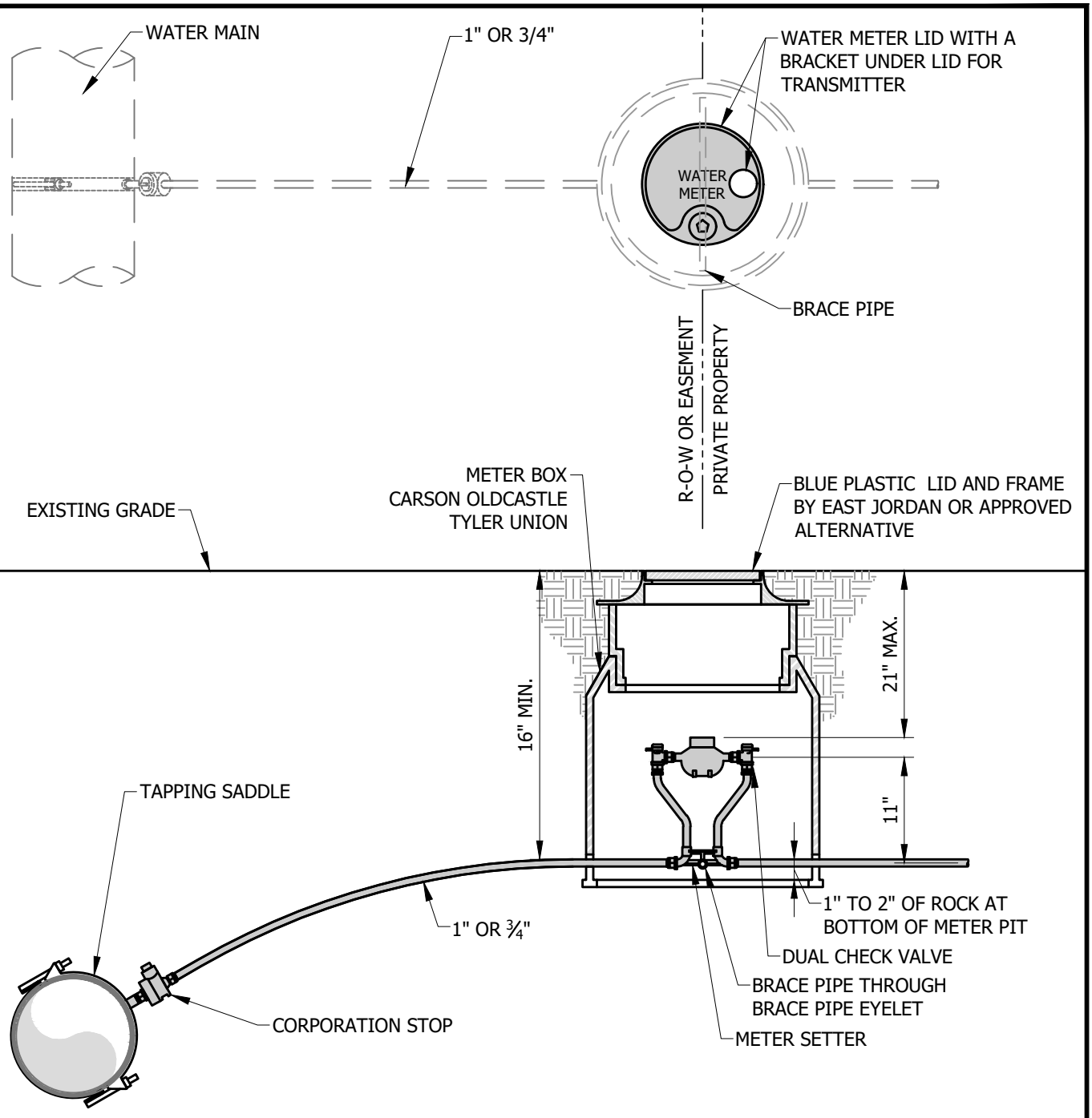
1. WATER MAIN SHALL BE CLEANED BEFORE ATTACHING SLEEVE.
2. SLEEVE AND VALVE SHALL BE PRESSURE TESTED BEFORE MAKING TAP.
3. PRESSURE TEST AND TAP SHALL BE MADE IN THE PRESENCE OF AN AUTHORIZED TOWN REPRESENTATIVE.
4. PROPER TAPPING MACHINE SHALL BE USED TO MAKE TAP.
5. ¾" CRUSHED AGGREGATE SHALL BE PLACED BELOW AND AROUND SLEEVE AND COMPACTED TO 95% OF MAX. DENSITY AS DETERMINED BY AASHTO T-180.
6. TAP SHALL BE MADE NO CLOSER THAN 18" FROM THE NEAREST JOINT.
7. TRENCH TAPPING SLEEVE TO MAIN SHALL BE PLACED

TOWN OF CHANDLER

101 CONSTITUTION COURT. CHANDLER, IN 47610

PRESSURE TAPPING DETAIL

Approved: 07/18/22	Adopted: 07/18/22	Figure 4
Approved By: RDC	Scale: N.T.S.	



NOTE:

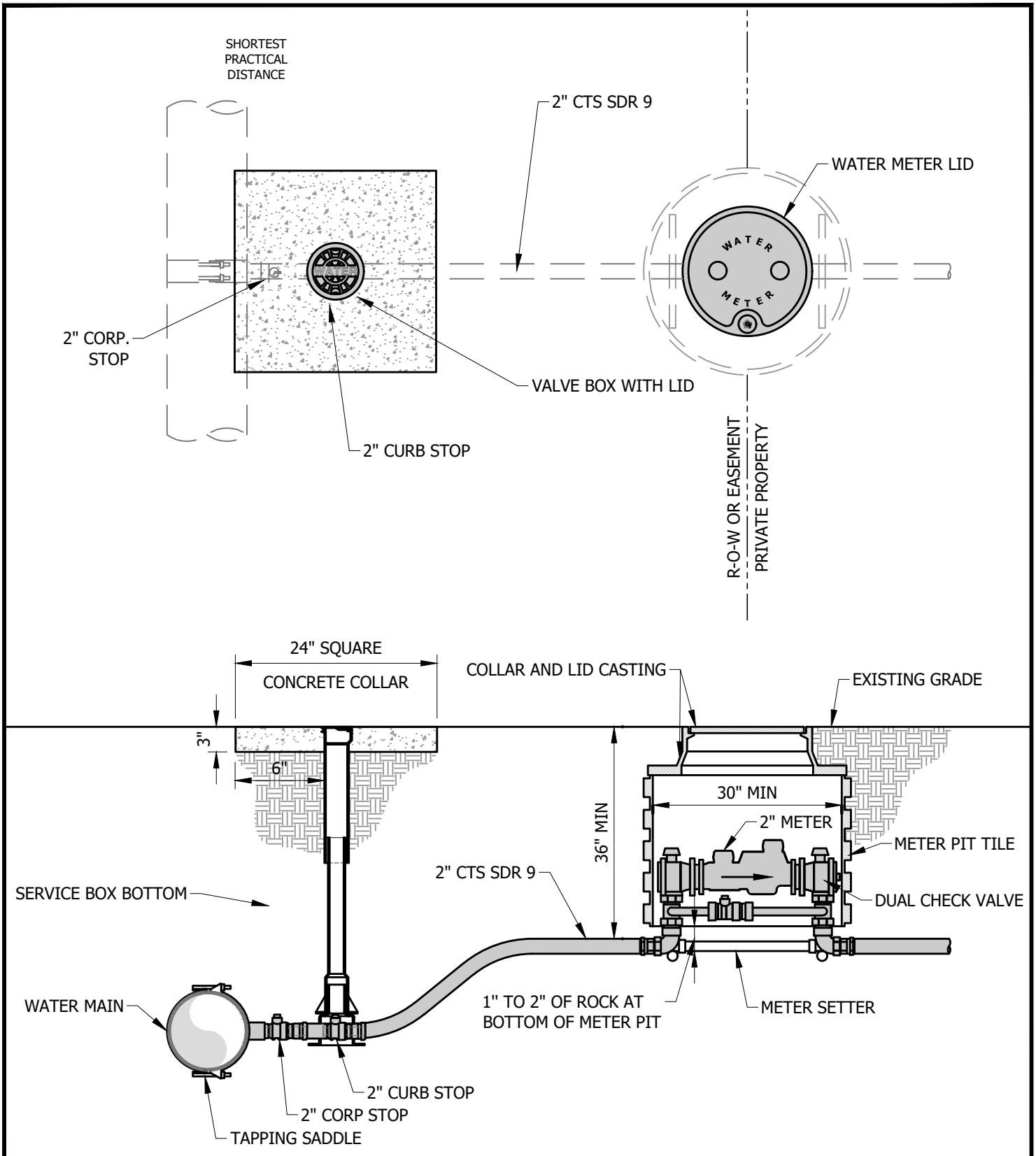
1. USE 1" MATERIAL AND FITTINGS FOR 1" SERVICES.
2. USE ¾" MATERIAL AND FITTINGS FOR ¾" SERVICES.
3. SUBSTITUTES FOR ANY MATERIALS SHOWN SHALL BE APPROVED BY THE CITY UTILITIES
4. ALL PIPE AND STRUCTURE ZONES SHALL BE BACKFILLED USING ¾" MINUS CRUSHED AGG. AND COMPACTED TO 95? MAX. DENS. AS DETERMINED BY AASHTO T-180.
5. METER BOX SHALL BE CENTERED OVER THE COMPLETED METER ASSEMBLY

TOWN OF CHANDLER

101 CONSTITUTION COURT. CHANDLER, IN 47610

3/4" OR 1" WATER SERVICE CONNECTION

Approved: 07/18/22	Adopted: 07/18/22	Figure 5
Approved By: RDC	Scale: N.T.S.	

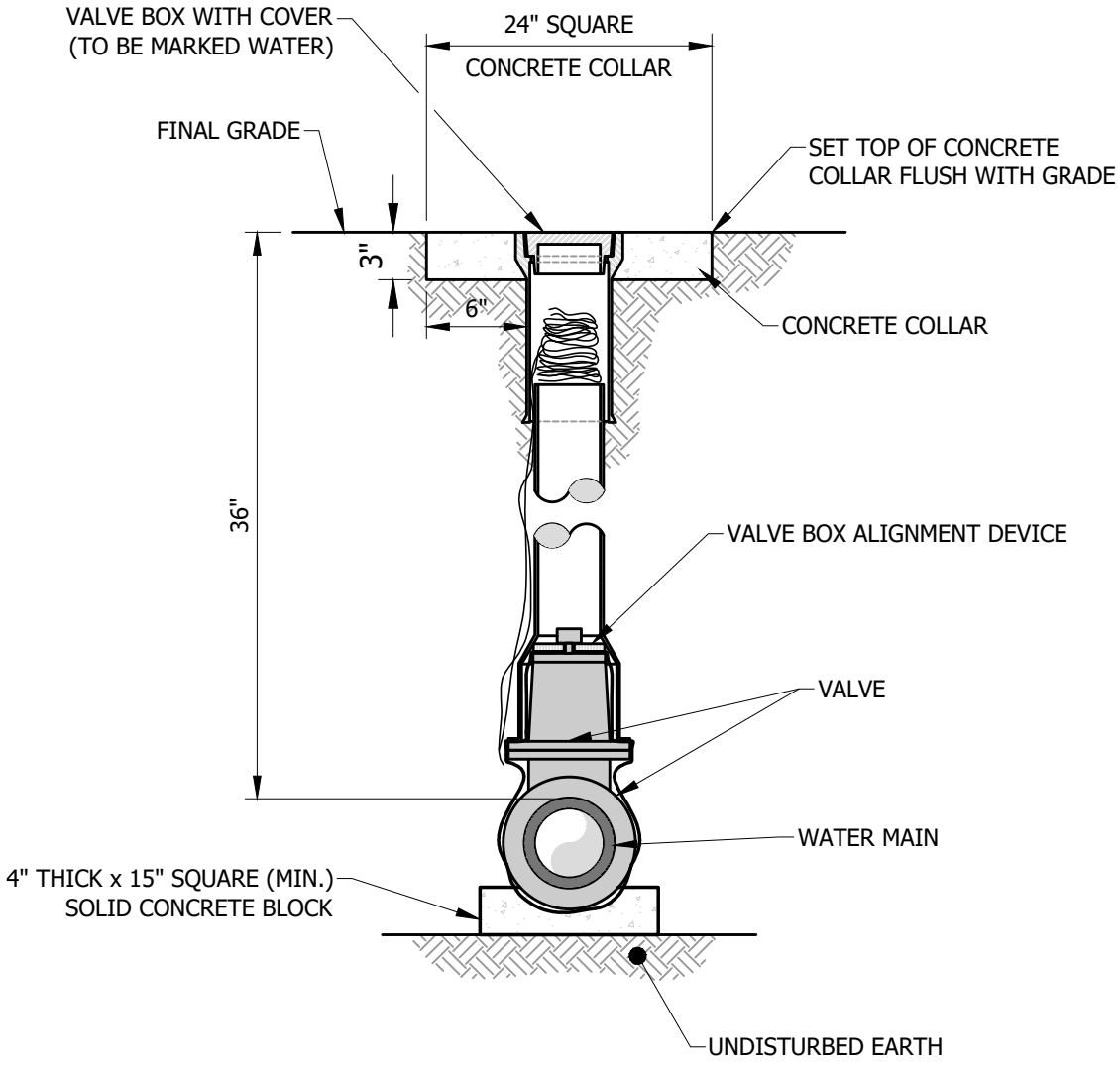


TOWN OF CHANDLER

101 CONSTITUTION COURT. CHANDLER, IN 47610

2" WATER SERVICE CONNECTION

Approved: 07/18/22	Adopted: 07/18/22	Figure 6
Approved By: RDC	Scale: N.T.S.	



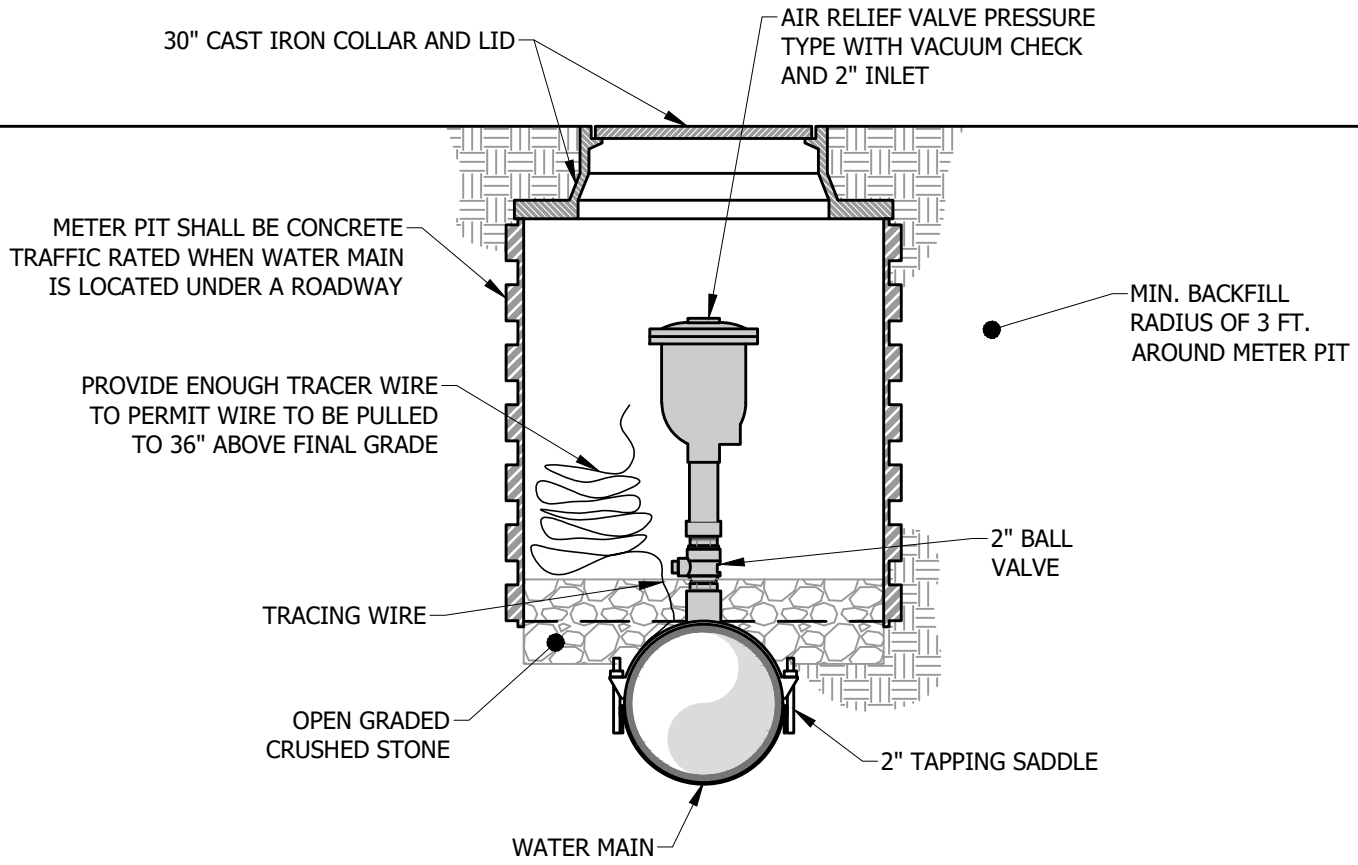
NOTE: VALVE BOX TO BE CONCRETE ENCASED IF NOT IN PAVED AREA

TOWN OF CHANDLER

101 CONSTITUTION COURT. CHANDLER, IN 47610

STANDARD VALVE BOX DETAIL

Approved: 07/18/22	Adopted: 07/18/22	Figure 7
Approved By: RDC	Scale: N.T.S.	

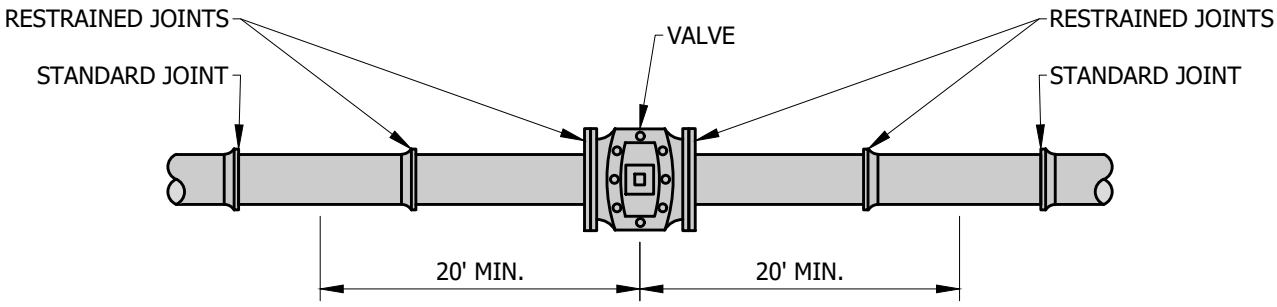


TOWN OF CHANDLER

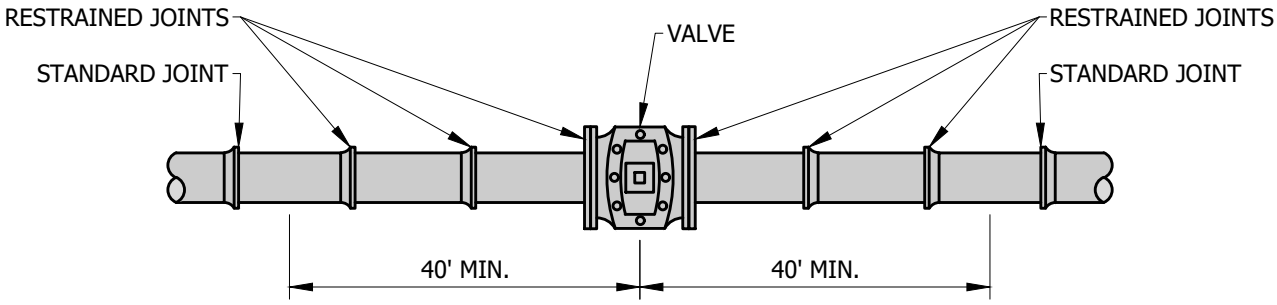
101 CONSTITUTION COURT. CHANDLER, IN 47610

AIR RELIEF ASSEMBLY

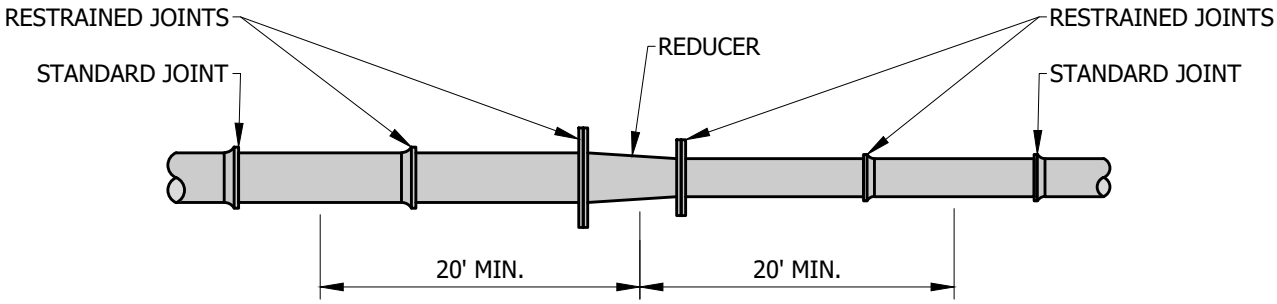
Approved: 07/18/22	Adopted: 07/18/22	Figure 8
Approved By: RDC	Scale: N.T.S.	



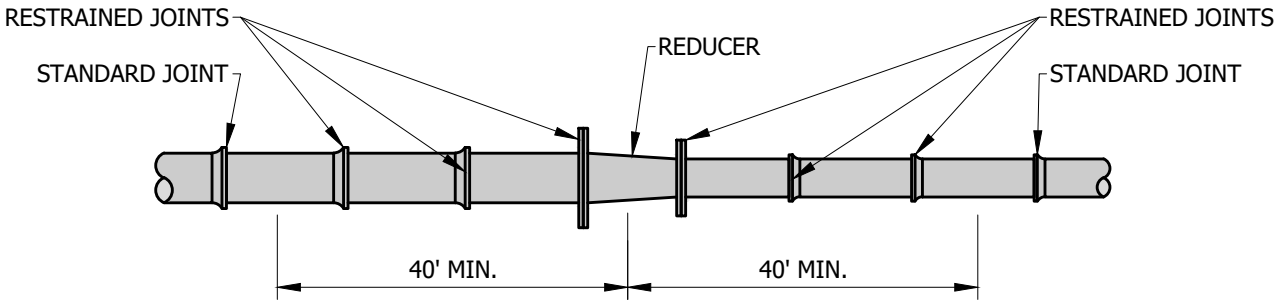
VALVES (NON-DEAD END) 8" AND SMALLER



VALVES (NON-DEAD END) 12" AND LARGER



REDUCERS - LARGER PIPE DIAMETER IS 8" OR SMALLER



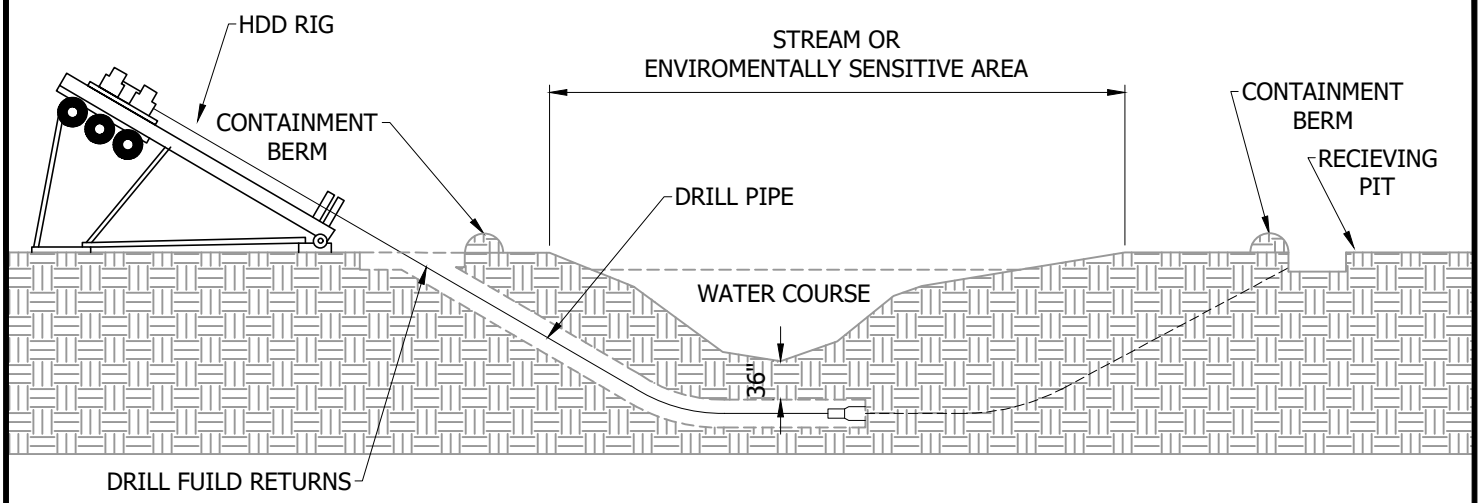
REDUCERS - LARGER PIPE DIAMETER IS 12" OR LARGER

TOWN OF CHANDLER

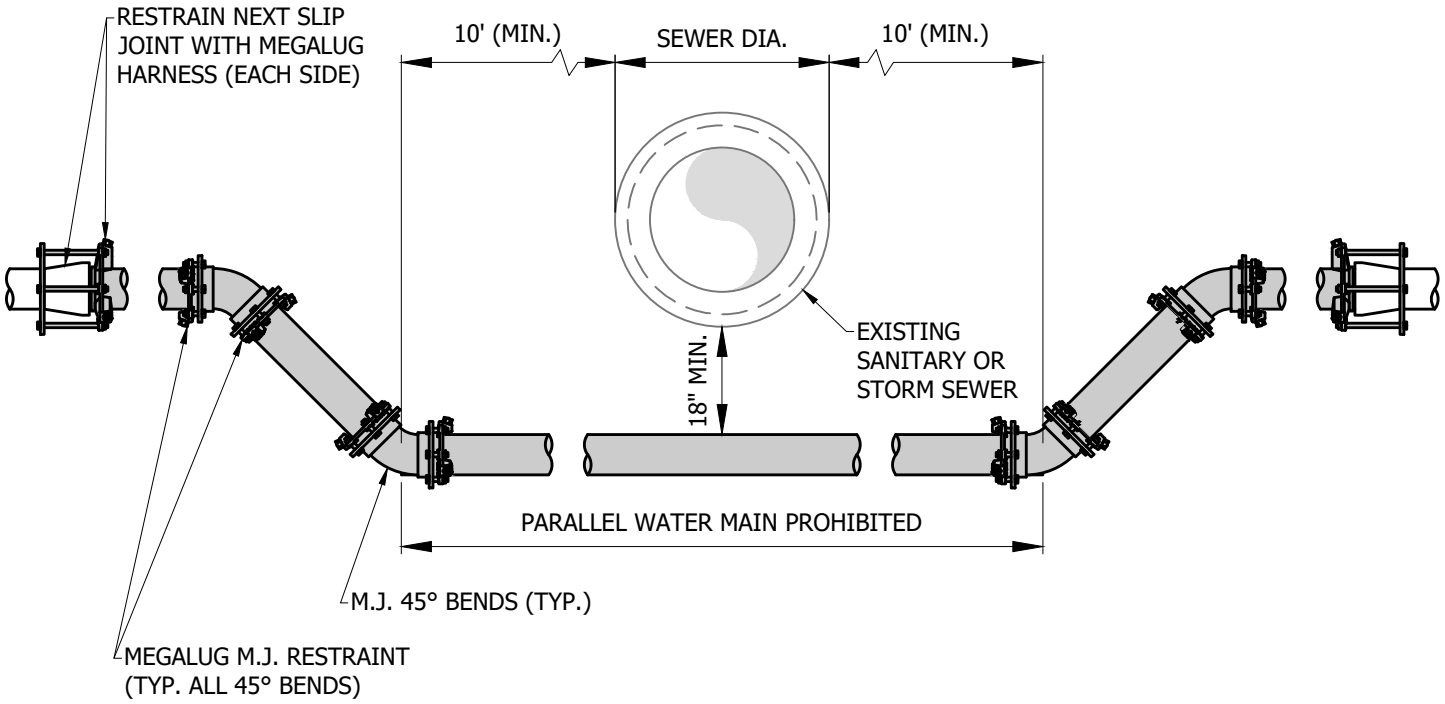
101 CONSTITUTION COURT. CHANDLER, IN 47610

TYPICAL RESTRAINING FOR VALVES & REDUCERS

Approved: 07/18/22	Adopted: 07/18/22	Figure 9
Approved By: RDC	Scale: N.T.S.	



STREAM CROSSING



UTILITY CROSSING

NOTES:

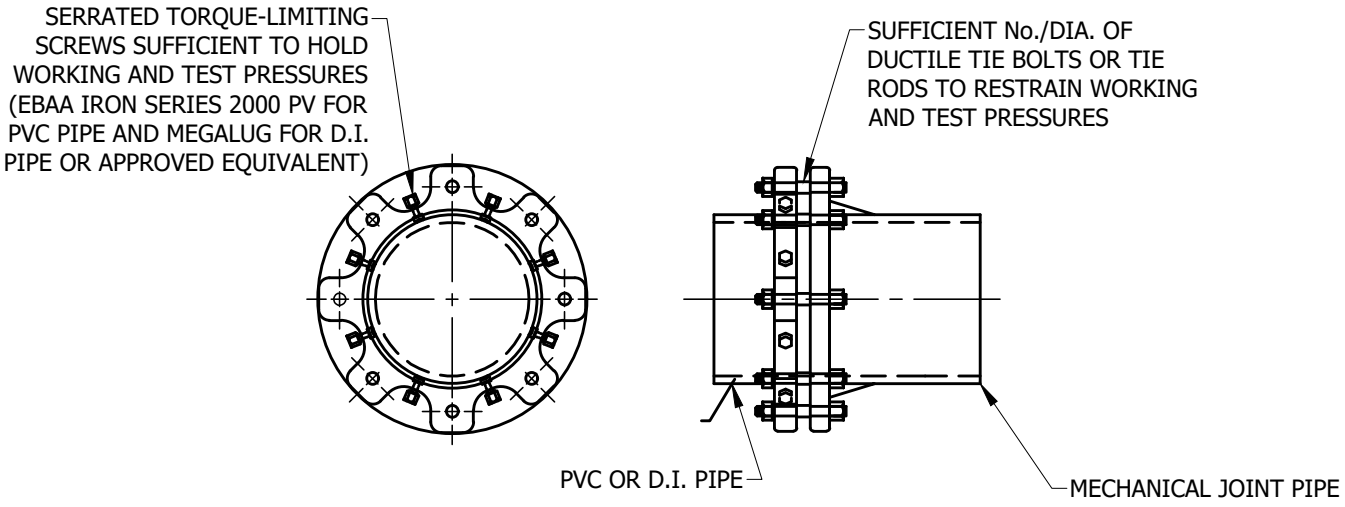
1. WHERE IT IS NOT POSSIBLE FOR THE WATER LINE TO BE 1.5 FEET ABOVE THE SEWER LINE, OR THE WATER LINE PASSES UNDER THE SEWER LINE, THE EXISTING SEWER LINE SHALL BE EXPOSED FOR A DISTANCE OF 10 FEET ON EACH SIDE OF THE CROSSING, AND SHALL BE REPLACED WITH CLASS 50 DUCTILE IRON PIPE AS APPROVED BY THE ENGINEER, AND A LENGTH OF WATER PIPE SHALL CENTERED AT THE CROSSING, OR AS APPROVED BY THE ENGINEER.
2. DUCTILE IRON CLASS 52 PIPE WITH M.J. FITTINGS, ONE FULL PIPE LENGTH CENTERED ON CROSSING

TOWN OF CHANDLER

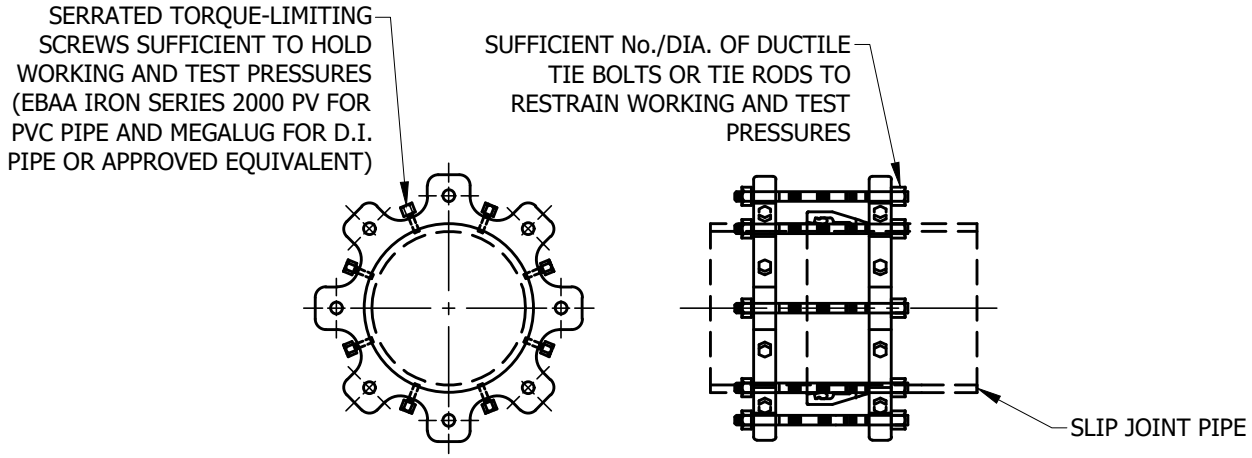
101 CONSTITUTION COURT. CHANDLER, IN 47610

TYPICAL OFFSET ASSEMBLY

Approved: 07/18/22	Adopted: 07/18/22	Figure 10
Approved By: RDC	Scale: N.T.S.	



RESTRAINED JOINTS ON MECHANICAL JOINT PIPE & FITTINGS



RESTRAINED JOINTS ON SLIP JOINT PIPE

(USING GRIPPING TYPE RETAINERS)

MINIMUM FOOTAGE OF RESTRAINED PIPE FOR VARIOUS DIAMETERS & DEGREES CAST & DUCTILE IRON ELBOWS

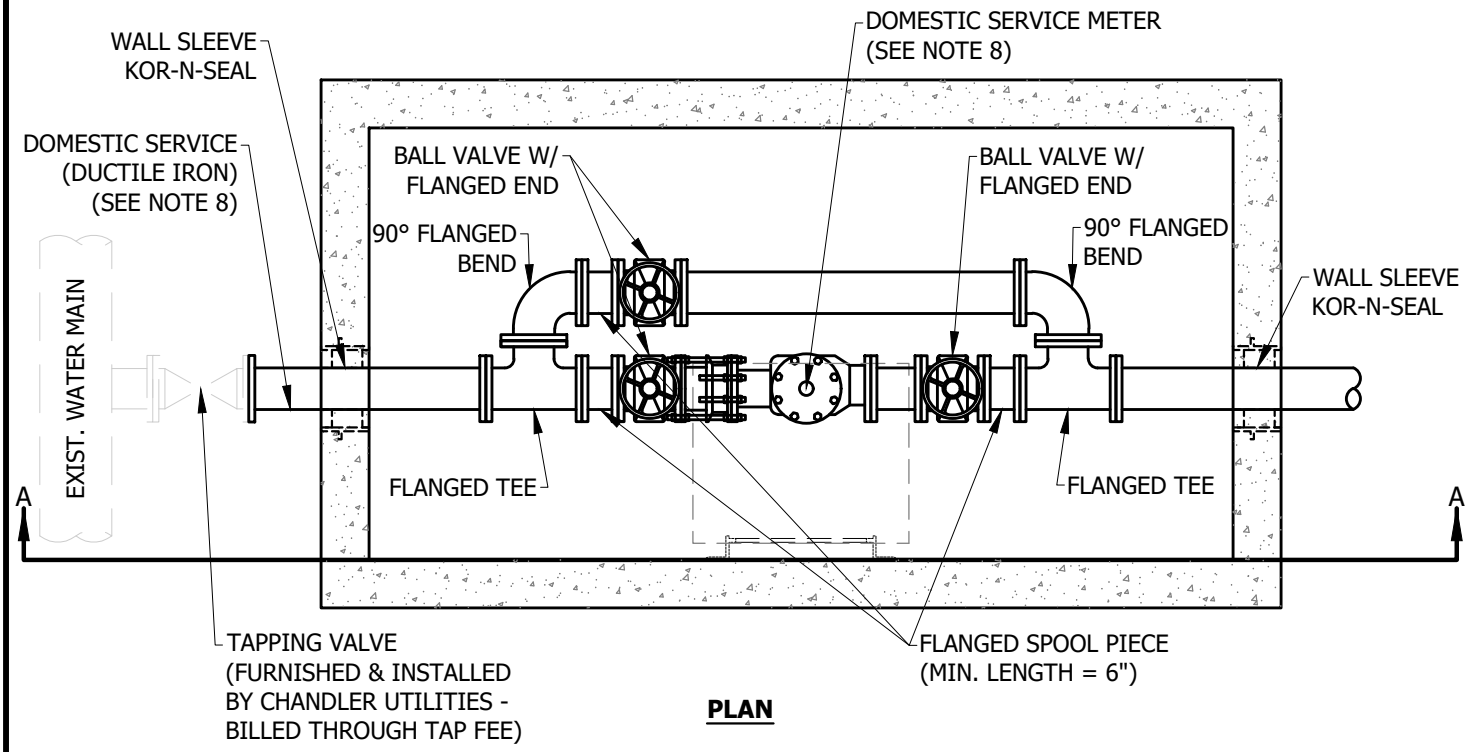
COVER / DIA. MAIN	DEGREE OF ELBOW						BRANCH OF TEE	REDUCER (LARGE SIDE ONLY)
	11 ¼°	22 ½°	45°	90°	VERTICAL OFFSET 45°			
					UPPER BEND (3')	LOWER BEND (3')		
DIA. MAIN	3'	3'	3'	3'			3'	3'
6"	2'	5'	10'	25'	49'	10'	9'	159'
8"	3'	6'	13'	32'	63'	12'	?'	?'
10"	4'	8'	16'	39'	77'	15'	119'	107'
12"	5'	9'	19'	47'	90'	36'	163'	N/A

TOWN OF CHANDLER

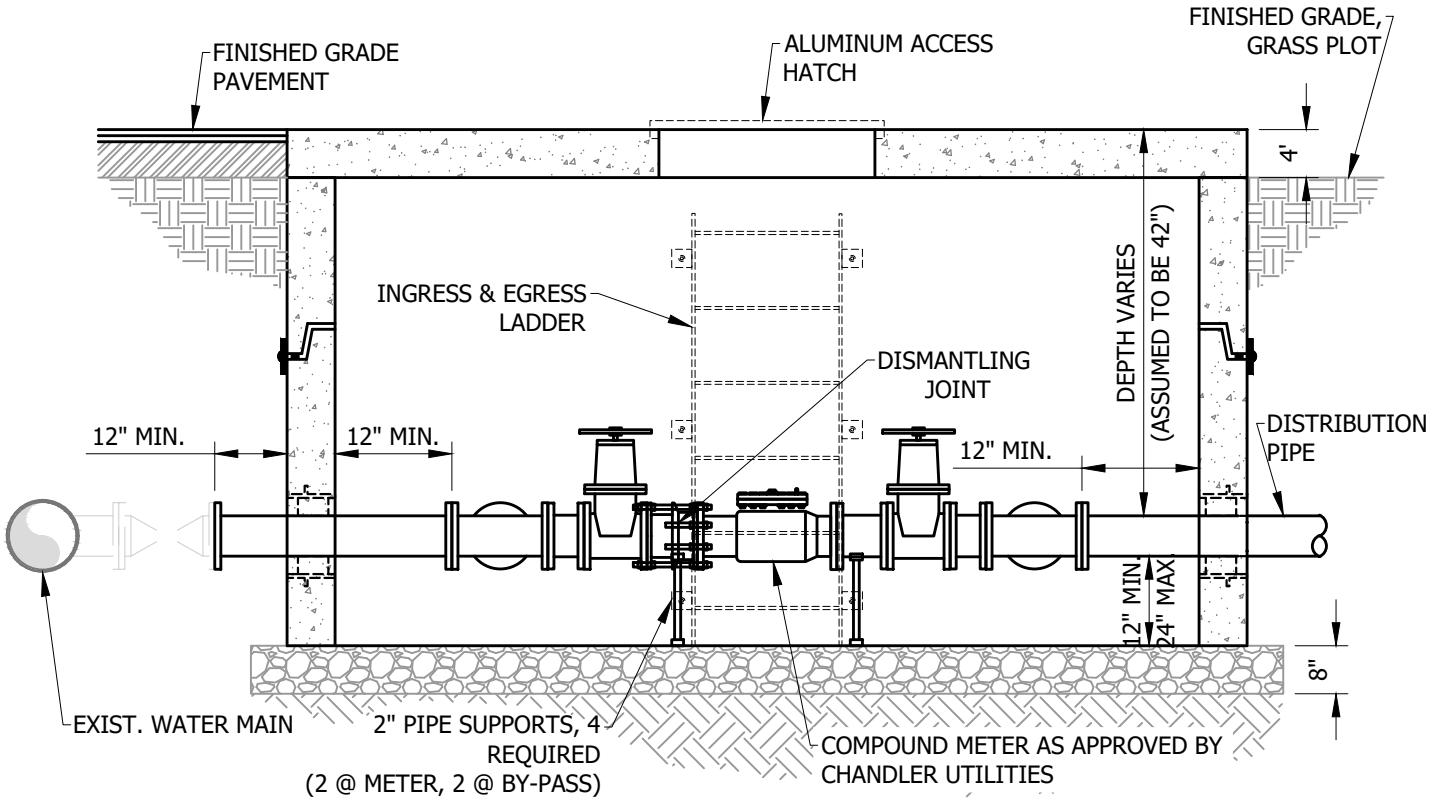
101 CONSTITUTION COURT. CHANDLER, IN 47610

RESTRAINED JOINTS DETAIL

Approved: 07/18/22	Adopted: 07/18/22	Figure 11
Approved By: RDC	Scale: N.T.S.	



PLAN



SECTION "A-A"

TOWN OF CHANDLER

101 CONSTITUTION COURT. CHANDLER, IN 47610

STANDARD 3" OR LARGER METER INSTALLATION DETAIL

Approved: 07/18/22	Adopted: 07/18/22	Figure 12A
Approved By: RDC	Scale: N.T.S.	

NOTES:

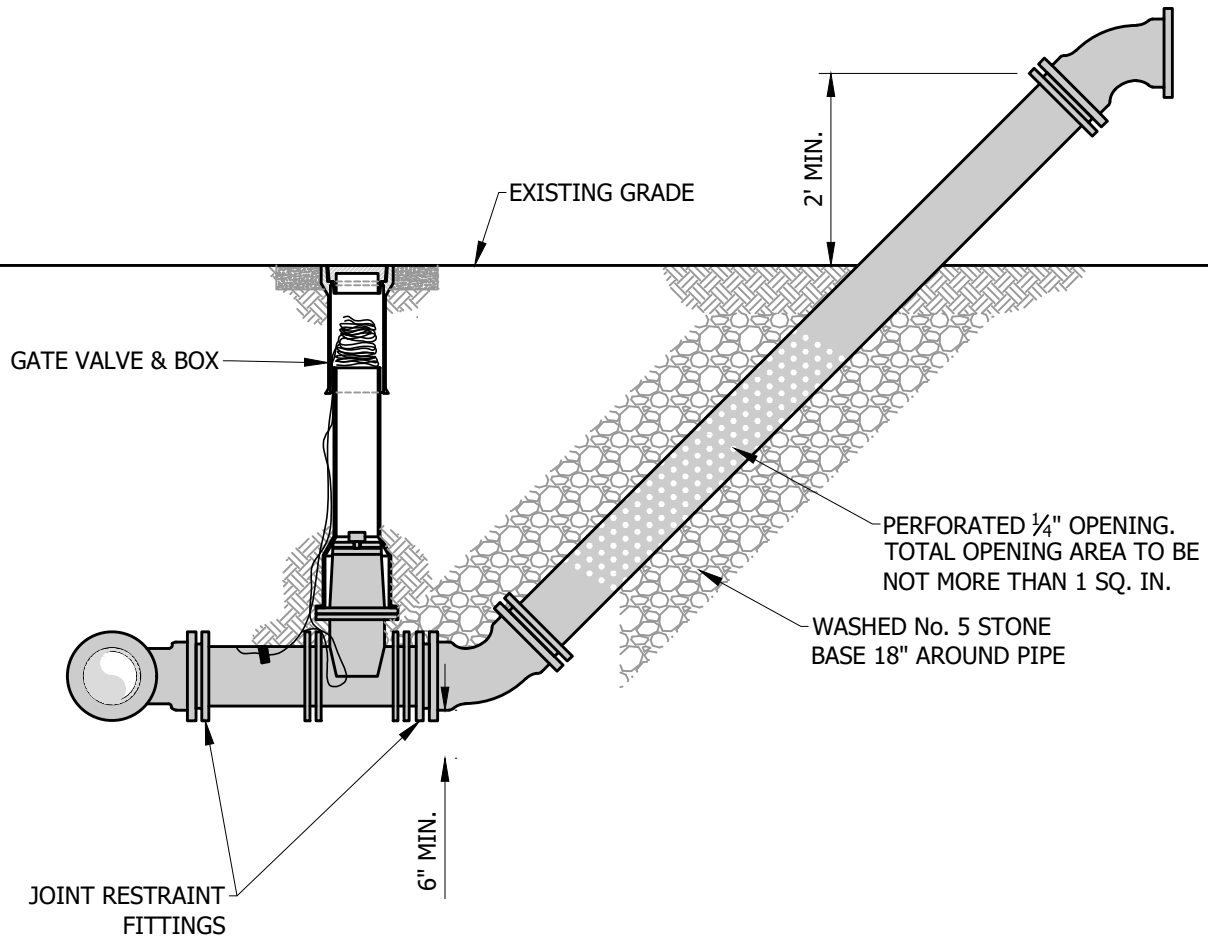
1. DEVELOPER SHALL FURNISH & INSTALL VAULT.
2. VAULT CONSTRUCTION MATERIAL SHALL BE 8" X 8" X 8", 4,500 PSI OR SIZED AS NEEDED IN ACCORDANCE WITH ASTM C-913.
3. TOP OF VAULT TO BE CONCRETE AT LEAST 4" THICK WITH REINFORCING SUITABLE FOR ANTICIPATED LOADING. WHEN VAULT IS CONSTRUCTED IN PAVED AREAS, PAVEMENT IS TO BE LEVEL WITH TOP OF VAULT, AND THE TOP REINFORCED AS REQUIRED TO SUPPORT TRAFFIC LOADS (I.E. H-20 WHEEL LOADS). WHEN VAULT IS CONSTRUCTED IN GRASS PLOT, TOP OF VAULT SHALL BE 4" ABOVE FINISHED GRADE.
4. ACCESS HATCH IN TOP OF VAULT SHALL BE 30" X 36" ALUMINUM. ACCESS HATCH SHALL HAVE SAME OR GREATER LOADING CAPACITY AS VAULT LID. PIPE HATCH FRAME DRAIN IS VAULT FLOOR OR FLOOR DRAIN IF APPLICABLE.
5. LADDER FOR VAULT INGRESS AND EGRESS SHALL BE PER OSHA REQUIREMENTS. LADDER MATERIAL SHALL BE ALUMINUM OR FIBERGLASS AND INCLUDE BILCO "LADDER-UP" SAFETY DEVICE OR EQUAL.
6. UTILITY AND DEVELOPER RESPONSIBILITIES:
   - 6.1. UTILITY WILL FURNISH AND INSTALL TAPPING SLEEVE, TAPPING VALVE, BOX VALVE, AND DOMESTIC SERVICE FROM TAP ON MAIN.
   - 6.2. DEVELOPER SHALL FURNISH AND INSTALL ALL PIPING FROM DISCHARGE SIDE OF TAPPING VALVE, METER PIT, METER, AND ALL INTERIOR PIPING.
7. CONTRACTOR SHALL VERIFY WITH METER MANUFACTURE FOR THE REQUIRED SPACING BETWEEN SPOOL PIECES FOR INSERTION OF METER.
8. VAULT SHALL BE MADE AS WATER TIGHT AS POSSIBLE.
9. VAULT SHALL HAVE A MINIMUM 3" DRAIN TO THE OUTSIDE.
10. VAULT TO BE CLEAN AND FREE OF DEBRIS PRIOR TO CHARGING OF ALL LINES.
11. ALL PIPING IN VAULT SHALL BE SUPPORTED AS NEEDED AND WITH PROPER MATERIAL.

TOWN OF CHANDLER

101 CONSTITUTION COURT. CHANDLER, IN 47610

STANDARD 3" OR LARGER METER INSTALLATION DETAIL

Approved: 07/18/22	Adopted: 07/18/22	Figure 12B
Approved By: RDC	Scale: N.T.S.	



NOTE:
BLOW OFF PIPING AND GATE VALVE SHALL BE SAME SIZE AS WATER MAIN.

TOWN OF CHANDLER

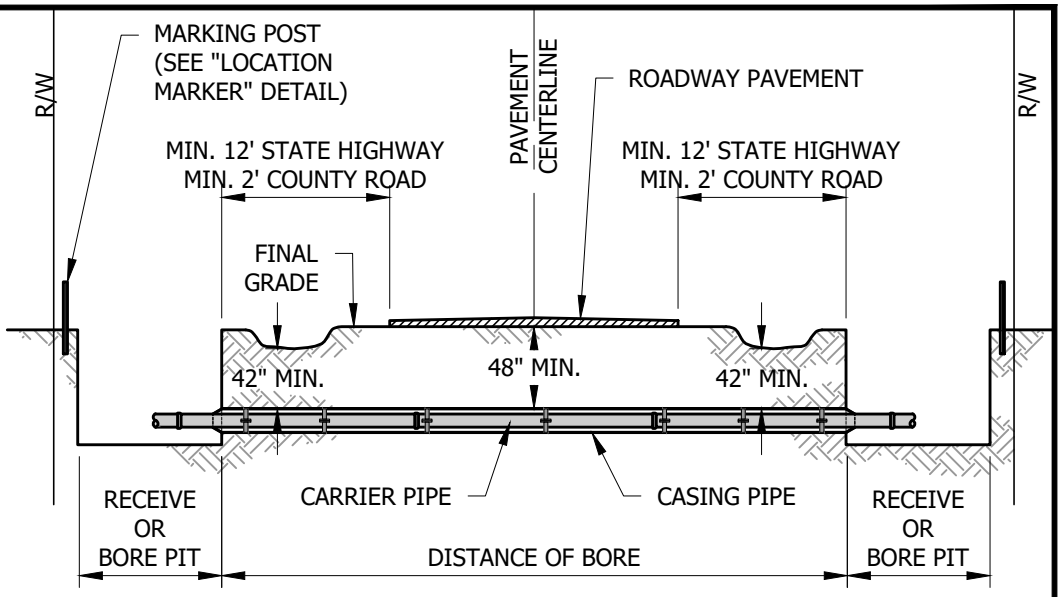
101 CONSTITUTION COURT. CHANDLER, IN 47610

BLOW-OFF VALVE DETAIL

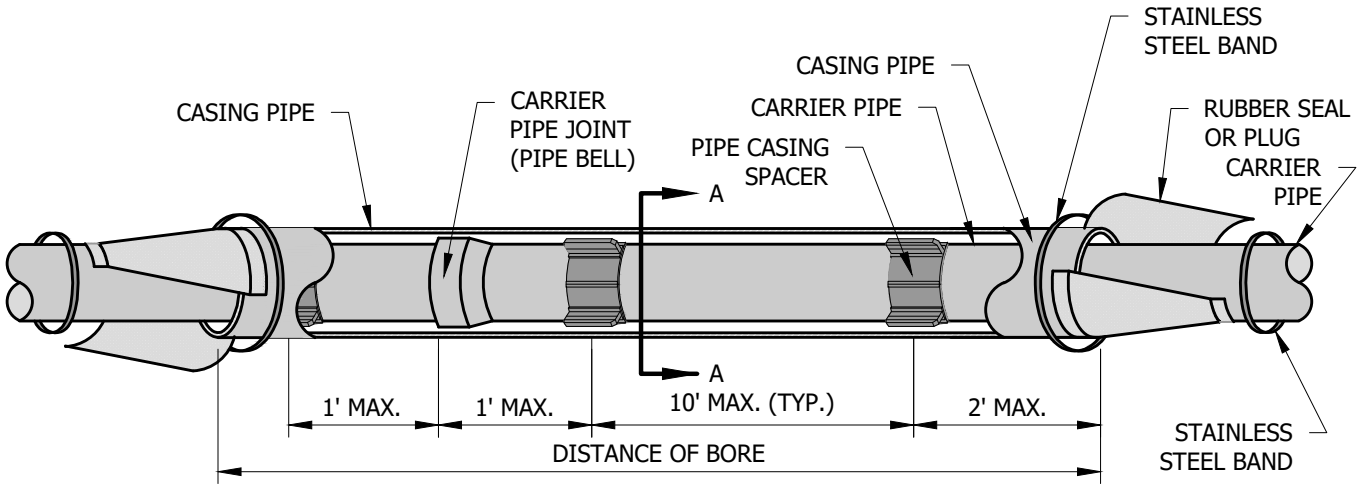
Approved: 07/18/22	Adopted: 07/18/22	Figure 13
Approved By: RDC	Scale: N.T.S.	

DI CARRIER PIPE	WELDING STEEL CASING PIPE	CASING PIPE THICKNESS
6"	16"	0.25"
8"	20"	0.25"
12"	24"	0.375"
16"	30"	0.375"
20"	30"	0.375"
24"	36"	0.375"
30"	42"	0.375"
36"	54"	0.5"

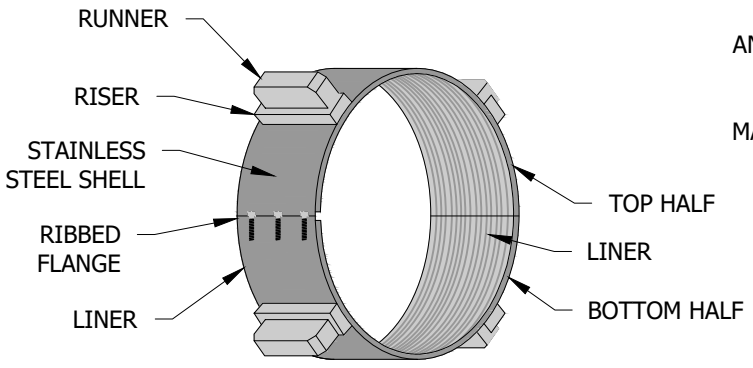
PIPING SIZES



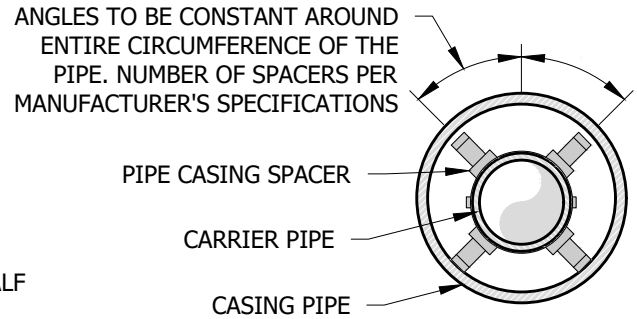
BORING SECTION



CASING DETAIL



PIPE CASING SPACER (RACI OR EQUAL)



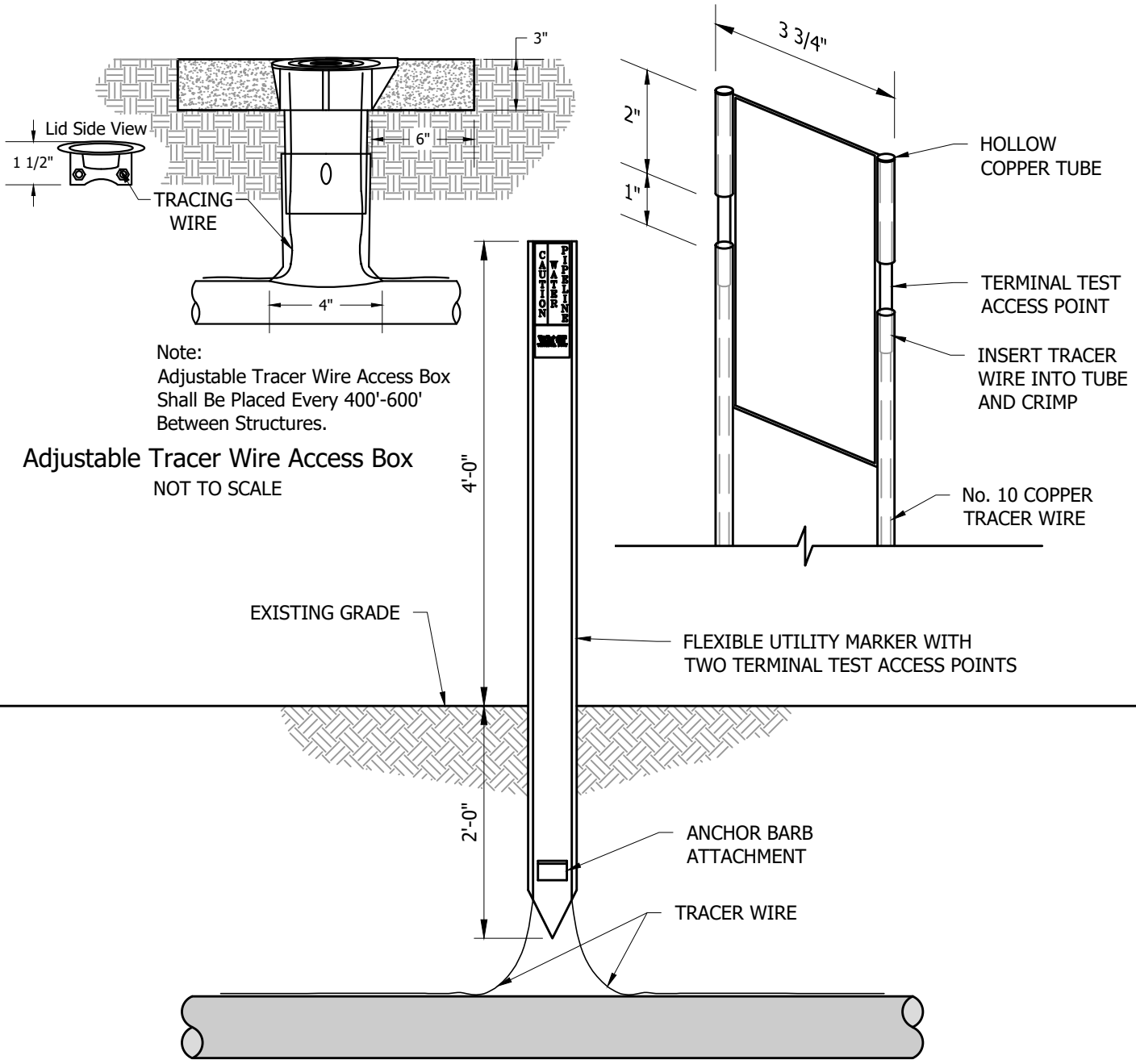
CASING DETAIL SECTION "A-A"

TOWN OF CHANDLER

101 CONSTITUTION COURT. CHANDLER, IN 47610

BORING SECTION & CASING DETAIL

Approved: 07/18/22	Adopted: 07/18/22	Figure 14
Approved By: RDC	Scale: N.T.S.	



NOTES:

1. FLEXIBLE UTILITY MARKER WITH TWO TERMINAL TEST ACCESS POINTS FOR TRACER WIRE COLOR BLUE MODEL "TUFFCAT" CTFCO7208U WITH DECALS CW-112 AND TOF-2508 AS MANUFACTURED BY CARSONITE INTERNATIONAL, PH. 1-800-648-7917 (OR EQUAL) TO BE INSTALLED AT 1000 FT. MAXIMUM SPACING, IN FENCE LINES, ADJACENT TO FIRE/FLUSH HYDRANTS, ETC.
2. TRACER WIRE SHALL BE No. 10 AWG USE-2, RHY-2, OR RHH SOLID COPPER WIRE WITH 45 MIL POLYETHYLENE INSULATION AND SUITABLE FOR DIRECT BURIAL INSTALLED LONGITUDINALLY ALONG THE PIPE TRENCH. ALL UNDER GROUND SPLICES IN TRACER WIRE SHALL BE CONNECTED WITH A 3M ELECTRICAL PRODUCT DIVISION No. 054007-09053 DIRECT BURIAL SPLICE KIT.

TOWN OF CHANDLER

101 CONSTITUTION COURT. CHANDLER, IN 47610

LOCATION MARKER W/ TRACER WIRE TERMINAL TEST POINTS

Approved: 07/18/22	Adopted: 07/18/22	Figure 15
Approved By: RDC	Scale: N.T.S.	