# THE BASTROP WATER DISTRICT

**P.O. BOX 708**

**106 CONFERENCE DRIVE**

**BASTROP, TX 78602**

**May 2017**

# SPECIFICATIONS FOR THE INSTALLATION

# OF WATER MAINS AND APPURTENANCES

**BASTROP WATER DISTRICT**
**PLANS AND SPECIFICATIONS**
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**BASTROP WATER DISTRICT**
Abbreviations and Terms

Whenever in these Standard Specifications the following abbreviations and terms are used, the intent and meaning shall be interpreted as follows:

**Abbrevations:**

| | |
|---|---|
| AWWA | American Water Works Association |
| THE DISTRICT | Bastrop County Water Control and Improvement District # 2 |

**Terms:**

Backflow: The flow of water or other liquids, mixtures, gasses, or substances into the distribution pipes of a potable water supply, from any source other than intended source.

Consumer/ Customer: Any person, firm, or corporation using or receiving water from the public water system.

Contractor: The person, firm, or corporation entering into contract with the owner, developer, or Bastrop Water District for the performance of work required under said contract and the Town of Northbridge's ordinances, rules and regulations and specifications.

Tap: Physical connection to a Distribution Main which, together with appropriate license, effects water service to individual consumers.

Water Main or Distribution Main: A 16-inch or smaller diameter pipe along public streets or appropriate rights-of-way used for distribution water to individual services.

# SECTION 1

# GENERAL

Bastrop Count Water Control and Improvement District # 2 (The District) is a public water supply and wastewater supplier regulated by the Texas Commission on Environmental Quality. The Specifications set forth herein are intended to ensure that the expansion and/or improvements to any portion of The District systems will be completed in such a fashion that the workmanship and materials will last for an optimum period of time. Installation of any water infrastructure shall be inspected by The District or its designee to ensure that these standards and any additional pre-approved standards are adhered to.

## PART 1

### 1.01 SCOPE

A. The work covered under these specifications includes furnishing all labor, tools, equipment and materials to perform all operations with respect to the installation of water mains, valves and fittings must be approved by Bastrop Water District and installed according to the specifications herein.

## PART 2 INSTALLATION

### 2.01 HANDLING AND STORAGE

A. The loading, trucking, unloading and handling of pipe and appurtenant materials shall be bone by the contractor with extreme care so as not to damage the pipe, appurtenant materials or the street surface. Dropping the pipe, valves or appurtenances from the truck onto the ground surface will not be permitted. The contractor will be responsible for any damage done to the pipe or appurtenant materials once they have arrived at the job site and until they are accepted in the completed work.

### 2.02 INSTALLING WATER MAIN AND APPURTENANCES

A. The pipes are to be thoroughly cleaned before being laid. Particular attention is to be paid to the proper positioning of the rubber gaskets. Under no conditions will the contractor be allowed to “pop” the pipe home, only approved methods such as driving the pipe home with a bar and block, by using the bucket of the backhoe to push the pipe home (utilizing a block in front of the bell to push against) or other methods as may be approved by the Engineer will be allowed.

Temporary plugs must be used at the end of each day to prevent the intrusion of debris or water from entering the main.

In areas with high water or the potential of flooding from storm drains or sanitary sewers, a water tight plug must be installed prior to leaving the job site.

In the event of flooding of the main, all pipe laying shall cease until the mains have been thoroughly cleaned and approved by the engineer.

B. When joined together, the pipes are to form a smooth continuous line and grade on a straight section of the road and on curved (both horizontal and vertical) are to have uniform deflections within the required limits conforming in general to the line and profile of the adjacent roads. The location of the rubber rings to be determined with a checking gauge before back filling the trench.

C. Pipe shall be laid and joined in accordance with the manufacturers latest published instructions AWWA regulations C600 for ductile iron water mains and appurtenances.

D. Backfill shall be placed on both sides of the pipe and compacted simultaneously with approved tamping bars for the full length of the pipe. Bell holes shall be excavated as necessary to ensure that the pipes and not the pipe bells are bearing the weight of backfill and traffic load.

E. Pipe shall not be laid in areas where excavation has been carried below trench grade, or where water conditions create unstable bottoms, until such time as the trench is excavated, refilled and compacted to the satisfaction of the Engineer.

F. Bells or other joints shall not be installed directly under existing utilities or structures. Use short or random lengths to avoid such conditions.

G. Where water lines and sanitary sewers are to be located on the same street, a 10 foot horizontal separating distance shall be maintained at all times. In areas where it is not practical to maintain a 10 foot horizontal separating distance, the sewer or water main must be encased in concrete and extra heavy materials (mechanical joints) must be used.

H. Where water lines and sanitary sewers must cross, a minimum of 18 vertical inches must be maintained with the water main being laid over the sanitary sewer. In those cases where the water line will be installed below the sanitary sewer, the sewer must be reinforced with an approved sleeve or by encasement in concrete. In all cases, the water main must be installed so that one full length of pipe will be located with both ends as far from the crossing as possible.

## 2.03 MECHANICAL JOINTS

A. Mechanical joints shall be of an approved type with the required joint accessories, cast iron follower glands with drilled holes, cast iron teehead bolts, hexagonal nuts, etc. Torque wrenches shall be used to take up such joints. Wrenches shall be equipped with adjusting breakable tension gauge, set to break the tension at the tension loading recommended by the manufacturer.

## 2.04 CUTTING OF PIPE

A. All cuts of ductile iron shall be made with either an electric or gasoline powered saw. Blades shall be carbide tipped for cutting cement lined ductile iron pipe.

B. When lengths of pipe are field cut to provide for short lengths, the outside of the cut ends shall be tapered back about 1/8 inch at an angle of 30 degrees with the centerline of the pipe, before field cuts pieces are used in the Push-on type joints.

## 2.05 HYDRANT INSTALLATION

A. The hydrant installation shall consist of a valve anchoring tee, a six inch gate valve (mechanical joint) and a six inch ductile, mechanical joint type pipe of necessary length. Fire Hydrants shall conform to the requirements of AWWA C502 Dry Barrel Fire Hydrants. The base of the hydrant shall be set on a concrete pad. The hydrant shall be restrained with thrust rods or equivalent retaining devices. A hydrant riser shall be installed as needed to provide a hydrant elevation acceptable to The District. A hydrant drain well must be installed around the drain consisting of 2-inch stone with the capacity of ½ cubic yard. The hydrant shall be given two coats of a quality paint, the color approved by The District.

## 2.06 CONNECTION TO EXISTING WATER MAINS

A. The work shall be coordinated with The District so a minimal amount of interference will be experienced by the existing customers. The District will instruct the contractor as to when the water may be shut off for mechanical work.

## 2.07 CEMENT THRUST BLOCKS

A. Furnish and place thrust blocks in such locations and quantities as may be required by The District.

B. Care shall be taken to ensure that all concrete thrust blocks bear against undisturbed trench walls, and not to encase flanges and bolts on mechanical joint fittings.

C. Galvanized thrust rods or approved equivalent retaining devices can be used if prior approval is given by The District.

## 2.08 VALVE BOXES

A. Valve boxes shall be placed directly over the operating nut of valves in a vertical position. They shall be adjusted to correspond with surrounding ground or street elevations.

## 2.09 TAPPING MAINS

A. Dry taps will not be allowed unless permission is granted by The District. Wet taps will include corporation cocks, PE tubing approve, CTS, a minimum pressure rating of 200 psi, curb stops, fittings and meter box approved by the district. Service lines shall be installed to the location which appears on the drawings or to the satisfaction of The District and shall be equipped with tracer wire tied back to the main from the meter box.

B. Water mains shall be tapped in accordance with the latest manufacturers recommendations such as the depth of tap, number of threads exposed, allowable sizes etc., and the contractor shall strictly adhere to these recommendations. Tapping machines and drill bits shall be inspected regularity for signs of wear and shall be changed as needed.

## 2.10 INSTALLING TAPPING SLEEVES AND VALVES

Tapping sleeves are not allowed.

## 2.11 BACKFLOW PREVENTION

A. Backflow prevention is the undesirable reversal of flow in a potable water distribution system. The District will decide the necessary backflow devices required pursuant to an application.

## 2.12 TESTING BACKFLOWS

A. All backflow prevention assemblies and approved testers shall be registered with The District. All backflow prevention assemblies shall be nationally recognized and certified as an approved testable device.

B. All backflow prevention assemblies shall be tested according to AWWA Manual M14 regulations prior to the permanent activation of the plumbing system and thereafter annually or otherwise specified.

C. All backflow prevention assemblies shall have plastic or brass caps placed upon all test cocks (NO GALVANIZED PLUGS).

D. All back flow prevention assembly devices that do not have manufactures identification plate attached to the device and that do not have a legible serial number must be replaced with a new device.

E. All backflow prevention assemblies shall be installed by licensed individuals who meet the requirements. All backflow prevention assemblies must be tested after installation by an approved The District registered tester. Test reports must be submitted to the Bastrop Water District, 106 Conference Drive, Bastrop, TX 78602 within 15 days of the test.

# PRESSURE TESTING AND DISINFECTING MAINS

## PART 3.0 GENERAL

All work in this section shall be performed in accordance with AWWA standards section C651. The work includes the furnishing o all labor, tools, equipment and materials and performing all operations necessary for the flushing, pressure testing, leakage testing and chlorinating of water mains as specified herein.

Prior to the commencement of any pressure tests and /or leakage test the new mains shall be purged of all air by filling the pipes slowly and allowing the air to escape by means of hydrants, blow-offs or air release valves.

Each section of pipe to be tested must be isolated by valves, approved plugs or dead-ends. The contractor must supply all equipment necessary to perform the test. The exact location and acceptable format for the test will be determined by The District personnel.

If visible signs of leakage or the allowable amount of leakage is exceeded it will be the contractors sole responsibility to locate and repair any and all leaks until the main can satisfactorily pass the leakage and pressure tests.

## 3.01 PRESSURE TESTING

A. All newly laid main shall be subjected to hydrostatic pressure testing. The pressure in the main shall be raised by means of a booster pump to 180 psi. In no case shall the pressure be raised to less than 1.50 the average working pressure at the highest point in the distribution system. The test pressure shall not exceed the pipe manufacturer's specifications or the thrust restrainers design limits. The test shall be maintained for a minimum of 2 hours, with a maximum drop in pressure of 5 psi for the duration of the test.

## 3.02 LEAKAGE TEST

A. The leakage test and the pressure test can be performed simultaneously. The amount of leakage will be determined by the volume of water required to maintain the pressure within 5 psi of the test pressure stated in section 3.01 above. The volume of leakage can not exceed the allowable levels as stated in the AWWA standards for leakage tests.

## 3.03 DISINFECTION

No main under any circumstances shall be placed into service prior to being disinfected and tested, with satisfactory results, for coliform bacteria.

Chlorine tablets shall be placed on the top of each length of pipe as it is being installed. The tablets will be 5 grams each and adhered to the pipe with Permatex No. 1 adhesive. The tablets will be calcium hypochlorite and installed according to the following table:

CHLORINE TABLETS PER LENGTH OF PIPE

| Pipe Diameter | No. of Tablets |
|---|---|
| 4” | 2 |
| 6” | 3 |
| 8” | 4 |
| 12” | 6 |

The mains shall be filled slowly and allowed to stand for 24 hours with the chlorine solution in place prior to flushing the main and taking the appropriate water quality tests. Should the water fail the coliform bacteria tests, the contractor will be responsible for disinfecting the main again in accordance with AWWA standards C651 until an acceptable bacteria sample is obtained.

## EARTHWORK AND TRENCHING

### PART 4.0 GENERAL

The contractor will be responsible for: furnishing all materials, labor, tools and equipment necessary for receiving, inspecting, distributing and installing the materials and appurtances provided by The District; grubbing and stripping, removing pavement, excavation and backfilling, dewatering, siltation and erosion control, traffic control, installing water pipe, valves and fittings as specified herein, shown on the drawings or required by The District.

### 4.01 HANDLING AND DISTRIBUTING PIPE MATERIALS

The contractor shall receive and inspect all materials and equipment as they arrive at the job site. The materials and equipment shall be inventoried and the contractor will be responsible to replace at his cost any lost or damaged materials and equipment.

The contractor will be responsible to transport the materials and equipment in a safe and responsible fashion to the necessary location once they have arrived at the job site and store the equipment and materials in a manner acceptable to The District.

### 4.02 PUBLIC SAFETY AND TRAFFIC CONTROL

The contractor shall supply, place and maintain all traffic signs, marking cones, and personnel requires to provide a safe working environment which is also acceptable to the local and state authorities.

All excavations shall be properly marked and protected by barricades and flasher where required. Roads, driveways, public access locations and sidewalks shall be kept open to the extent possible at all times. It is the responsibility of the contractor to notify and coordinate all work activities on roadways which may effect traffic in any way.

## 4.03 PAVEMENT REMOVAL

Wherever the removal of bituminous and / or concrete pavement is required in order to install water mains and equipment, the road must be saw cut. Ripping of pavement in any form will not be tolerated. Excavating pavement must not be placed back in the trench under any circumstances.

## 4.04 PLACEMENT OF SPOILS AND CONSTRUCTION EQUIPMENT

Equipment, materials and spoils must not be placed in areas where they will obstruct streets, roads or right of ways. Excavated materials shall be placed in as neat and orderly fashion as possible so as to minimize the effects to the pass ability of the road. The excavated materials must not be placed in any area which will adversely effect the natural or manmade flow of surface/storm water.

Under no circumstances shall any section of a City or County road be closed to traffic without receiving permission from City or County officials.

## 4.05 DUST CONTROL

The contractor shall keep an adequate supply of Calcium Chloride on hand at all times and use as so directed to control the production of excess dust.

## 4.06 TRENCH SPECIFICATIONS

The trench shall be excavated to a depth which will provide a minimum cover of 3 feet measured from the top of the pipe unless prior approval is granted by The District. The trench shall be wide enough to provide a (6) inch separation from the sides of the trench to the sides of the water pipe.

A minimum (6) inch layer of ¾ inch processed gravel or sand shall be provided under the entire length of pipe regardless of the texture of the existing soils. The ¾ inch gravel or sand shall be tamped and leveled to ensure the pipe will be evenly supported and will not experience any points of stress. Special care shall be taken to ensure the area directly under the bell is slightly lower than the main body of the pipe so as not to create excessive force on the bell itself.

Once the pipe has been satisfactorily laid on the bed of sand or gravel, additional ¾” processed gravel or sand shall be slowly backfilled over the pipe to a depth of (1) foot measured from the top of the pipe. The gravel

shall be then tamped with approved tamping equipment which ensures that the entire length of pipe is supported evenly throughout its circumference.

Backfill from one foot above the pipe to the surface shall be of the best available material and under no circumstances shall any rock with a diameter greater than (10) inches be allowed in the trench. When the installation of the water main is under Town or County roads, the backfill material must be compacted with approved equipment in maximum (1) foot lifts. Any settlement which occurs in the trench area for a period of 3 years will be the responsibility of the contractor and they will incur all expenses necessary to return the trench to the satisfaction of The District and /or the City or County officials.

Under extreme circumstances where the placement of ¾" processed gravel the pipe is unreasonable (i.e. river crossings, high ground water) alternate materials approved by The District will be used (3/4" inch stone, etc.)

## 4.07 TRENCH SAFETY

It is the sole responsibility of the contractor to ensure that all safety regulations pertaining to earth work are strictly adhered to. The District will not provide instruction or equipment that is required by federal or state regulations. The District will not be responsible for any fines or injuries which occur to the contractor's equipment or personnel as a result of failing to comply with regulations.

## 4.08 CLEANUP AND APPEARANCE

The work area shall be maintained in a reasonably neat fashion at all times during the construction process. Unless specifically approved by The District, all excavations shall be backfilled each day and the roadways kept in a clean and orderly fashion. Work shall be completed in daylight hours and if necessary, work shall be scheduled to avoid heavy traffic periods.

Materials and equipment shall be stored each night in a location which is off the road in a safe manner and does not crate a nuisance to any homeowners.

The contractor shall clean, restore and/or replace any property that is affected or damaged by the construction operations to a condition which is equivalent to the condition of the property immediately prior to the commencement of construction.

All materials used in the construction operation shall be removed from the site upon completion and material shall not be disposed of on adjacent properties. The contractor shall not leave any personal belongings on the job site once the job is completed.

# 5.0 APPROVED MATERIALS

**Water Mains:** Shall be ductile iron centrifugally cast with push-on joints conforming to AWWA/ANSI C151. Pipe shall be Pressure class 300, cement lined and bituminous coated conforming to AWWA/ANSI C104.

**Gate Valve:** : Shall be 200 psi working pressure, non-rising stem, "O" ring, **open left**, mechanical joint, two-inch ductile iron operating nut with stainless steel bolts, resilient seated (resilient wedge) gate valve conforming to ANSI/AWWA C509 – No Manufacturer Specified. Valves shall be epoxy coated and supplied with restrained mechanical joint accessories, high strength alloy steel bolts and heavy hexagon nuts conforming to ANSI/AWWA C111.

**Gate Valve Boxes:** Shall be cast iron, two piece, sliding type with a non-flange top section, no inside stops, and an outside shaft diameter of six inches. Bottom section shall be belled base. Length of top section shall be minimum of 24 inches. Middle and bottom section length as needed. Boxes shall have the word "WATER" cast into cover. No Manufacturer Specified.

**Ductile Iron Fittings (Including bends, reducers, off-sets, tees and sleeves):** Pipe fittings shall have mechanical joint ends conforming to ANSI/AWWA C1/A21.11, epoxy coated lining or bituminous coating conforming to ANSI/AWWA C104.A21.4. Fittings shall be supplied with mechanical restrained joint accessories unless specified others, with high strength low alloy steel bolts and heavy hexagon nuts conforming to ANSI/AWWA C111.A21.11. Long body fittings shall be Class 350 ductile iron conforming to ANSI/AWWA C110/A21.10. Compact body fittings shall be Class 350 ductile iron conforming to ANSI/AWWA C153/A21.53.

**Hydrants**: All Hydrants must be Meuller Centurian open left, dry barrel, with break flange. Hydrants are to be painted red with oil based paint. Hydrants must conform to ANSI/AWWA C502.

**Service Line from Main to Curb:** Type K Copper (ASTM B88), minimum size 1" or PE pipe, CTS, pressure rating of 200 psi and minimum size of 1 inch.

**Corporation:** Ball valve type construction with inlet CC thread and compression pack joint on the outlet, heavy patterns, and conforming to AWWA/ANSI C800 – No Manufacturer Specified. Inlet iron pipe threads are required for 1-1/2" and larger corporations. All brass must be "Lead Free" in compliance with the Federal Reduction of Lead in Drinking Water Act.