



STANDARD CONSTRUCTION SPECIFICATIONS FOR PUBLIC WORKS PROJECTS

WATER DISTRIBUTION

Gate Valves

1. All gate valves shall be “wedge type” with AWWA approved cast iron fittings secured with star grips or mega lugs on fittings.
2. Use square head valves. Use curb and angle stops for the 2” and smaller pipe. All fittings to be brass.
3. Valve boxes shall be fitted with lid liners to prevent dirt and infiltration. Operating nut will be centered and accessible by valve wrench.
4. All valves more than 4’ deep to operating nut shall be furnished with an extension.
5. All valves shall have a “V” stamped on the adjacent curb with the point of the “V” pointed in the direction of the valve.
6. All valves shall have an 18” x 18” x 6” concrete pad, reinforced with #3 rebar, surrounding the top of the valve box.
7. All valve lids shall be painted with the following color for identification

| | |
|------------------|--------|
| In-Line | Blue |
| Fire Hydrants | Silver |
| Fire Suppression | Red |
| End of Line | White |
8. All valves shall be off of “T’s” where applicable.

Water Mains

1. Water mains shall be DR-18 (C-900), 8” minimum. Any exceptions MUST be previously authorized in writing by the Public Works Director.
2. Water main piping shall be laid with the writing on the pipe facing up.
3. Water mains shall be marked under the ground surface two feet above the pipe by placing a 2” wide metalized plastic tape with the word “WATER” printed on the tape.
4. Water mains to be installed with a (stranded #12 AWG THWN or THHN Gas and Oil Resistant) tracer wire affixed to the top of the pipe and the wire extended up and through gate valve boxes. Make sure wires are accessible at gate valve boxes.
5. All tapping sleeves will be full circle stainless steel.

Water Main Embedment

- | | | |
|-------------------|---|-------------|
| Depth below pipe | - | 6” minimum |
| Height above pipe | - | 12” minimum |

| | | |
|----------|---|--|
| Width | - | O.D. + 18" |
| Material | - | Cushion sand |
| Density | - | 95% standard proctor density under pavement 90% standard proctor density outside pavement |

6. Excavated ditches shall remain open for inspection. Piping and tracer wire shall be inspected and approved prior to being covered. Tracer tape shall be placed and visible for inspection prior to placement of final cover.
7. All ditches shall be compacted in a maximum of 12" inch lifts to proper density. (See **Water Main Embedment** criteria above).
8. All installations of water mains will require 150-psi hydrostatic test of a 4-hour duration and water quality testing by an approved lab.
9. Every 1,000' feet or portion thereof of all water mains shall have a separate hydrostatic and water quality test performed.
10. All water mains running under the roadway shall be installed with an appropriate casing size.

Fire Hydrants

1. Fire hydrants will be painted silver (Devoe, Devguard #4308) after pressure testing by the contractor. In addition, the contractor will provide color-coded (pressure rated) 5 ¼" quick disconnect Storz caps for each hydrant.
2. Fire hydrants will be positioned in the "Parkway" approximately 24" inches from backside of curb. Minimum and maximum distances shall in all instances be no less than 18" inches or greater than 30" inches from back side of curb. Contractors are encouraged to utilize "parallel hydrant tees" to achieve the above dimensions from the curb.
3. All fire hydrant assemblies shall have a valve and anchor coupling attachment.
4. The top of the fire hydrant gate valve cap shall be painted silver like the fire hydrants.
5. Fire hydrants shall have a 36" x 36" x 6" concrete pad installed 6" to 12" below finished grade. Reinforce with #3 bars on 6" centers.
6. Fire hydrants shall be manufactured by M&H, AVK, Waterous or acceptable equivalent.
7. Fire hydrants shall be located away from all drive approaches and street radius as practical.
8. Fire hydrants shall have a minimum of 18" clearance from the bottom of the cap nut to the flange of the fire hydrant.
9. The color of the Storz cap shall be determined by the pitot test results conducted by the fire department.

Service Lines

1. The location of water services shall be stamped on the adjacent curb with a "W" and painted blue in color.

2. Meter boxes shall be circular plastic, black on the outside, with an inside diameter based on the size of the meter. $\frac{3}{4}$ " & 1" meters, use DFW-1818F-1BA; 2" meter, use DFW-2418-1BA, and 3" inches of pea gravel to be included inside of the meter box.
3. Residential meter boxes shall be located in the parkway approximately 3' feet from back of curb and clear of sidewalk and driveway approach.
4. Commercial meter boxes shall be located in the parkway approximately 3' feet behind the sidewalk.
5. All fittings shall be compression type No flared fittings shall be used.
6. All U branches / Bull Heads will have a 1" ball valve in front of the connection.
7. All water service lines running under the street will be encased in PVC pipe, 4" and above requires spacers.
8. Each lot shall have a minimum 1" soft copper service line.
9. All single services shall be reduced down to $\frac{3}{4}$ " meter unless directed otherwise by the Director of Public Works.
10. All single services shall have brass or bronze compression type curb stops / angle stops with locks. (Ford #KV43-332W-G or #KV43-342W-G or equivalent)
11. All service lines shall be installed using a double strap bronze tapping saddle. No epoxy allowed.
12. All 2" inch and larger service lines shall have square head gate valves installed as close to the main as is practical. Brass nipples and fittings shall be used.

Vaults

1. Place a minimum of 8" inches of washed rock under all concrete vaults. Install 1" inch diameter weep holes in concrete base to drain seepage.
2. All vault lids in unpaved areas shall be outfitted with welded hasps for locking.
3. All fire protection service lines require double check valves contained in a vault **unless there is an outside door to the riser room**. Resilient wedge valves shall be placed on the main side of the vault, outside the vault.

WASTEWATER COLLECTION

Man Holes

1. All manholes shall have a 60" x 60" x 6" concrete pad constructed around it. Pads shall be reinforced with #3 bars on 6" centers.
2. All manholes shall be outfitted with an inflow protection lid liner.
3. All manholes shall have a minimum 32" man way opening.
4. All manhole rings and lids will be manufactured by Bass and Hayes or approved equal. No imports allowed.

Lift Stations

1. All lift stations having a wet well depth greater than (6) six feet shall have a strong, rigid aluminum safety grate installed under the access cover.

Sewer Mains

1. Sanitary Sewer mains shall be SDR35 8" minimum.
2. Sanitary Sewer Embedment

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|-------------------|---|---|
| Depth below Pipe | - | 6" min. |
| Height above Pipe | - | 12" min. |
| Width | - | O.D. + 18" |
| Material | - | Course Crushed Rock or Natural Gravel |
| Density | - | 95% Standard Proctor Density under Pavement |
| | - | 90% Standard Proctor Density outside Pavement |

3. Sewer mains shall be marked under the ground surface two feet above pipe by placing 2" metalized tape with the word 'SEWER' printed on the tape at regular intervals.
4. Sewer mains to be installed with a (stranded #12 AWG THWN or THHN Gas and Oil Resistant) tracer wire attached to the pipe and the wire shall be extended up and thru all manholes.
5. Excavated ditches shall remain open for inspection. Piping and tracer wire shall be inspected and approved prior to being covered. Tracer tape shall be placed and visible for inspection prior to placement of final cover.
6. All ditches shall be compacted in a minimum of 12" lifts to proper density. (see sanitary sewer embedment criteria above)
7. Cleanouts installed at end of mains shall have approved cast iron box with lid and an 18" x 18" x 6" concrete pad around the lid. Pad shall be reinforced with #3 bars on 6" centers.

Sewer Services

1. All sanitary sewer services are 4" minimum SDR35 and shall have two way cleanouts installed at the property line.
2. The location of sanitary sewer services shall be stamped on the adjacent curb with an "S" and painted green in color.

Sewer Service Testing

1. Required testing to include, camera, pressure, mandrel and vacuum test of the manholes. Camera recorded footage shall be of good clarity and shall show line identification coinciding with the project plans, footage, date and time.

Concrete Paving

1. **Concrete paving operations shall be performed by a slip form machine method.** (Exceptions to this shall require special permission of the city and only for irregular paving areas not able to be poured by a slip form machine and areas deemed too small for a slip form operation).
2. Concrete paving shall adhere to the TXDOT specifications.
3. Concrete compressive strength for all city paving and infrastructure shall meet or exceed 3,600 psi.

4. All concrete pours other than slip form machine pours shall have **ONE (1) sack** of cement per cubic yard added in addition to the mix design.
5. Concrete shall not be placed when the temperature is 40° F and falling. Concrete may be placed when the temperature is 35° F and rising, and the concrete must be protected at a minimum temperature of 35° F for 72 hours. Concrete shall not be placed when the temperature of the concrete exceeds 95° F.
6. Approved mechanical vibrators will be utilized in front of all screed and/or finishing machines. Concrete paving will incorporate a “tine” grooved surface finish, with grooves perpendicular to the flow of traffic, spaced 1” apart, and penetrating to a depth of at least 1/8” into the concrete.
7. Curing compound shall be applied immediately after finishing operations

Expansion Joints

1. All expansion joints will incorporate lubricated smooth dowels with caps supported by wire “street baskets.”
2. Saw cut grooves in concrete paving will be filled with a low modulus polyurethane based elastomeric sealant such as Sika Sikaflex – 15LM or approved silicone equivalent. Asphalt sealant or hot poured rubber is not allowed.
3. Transverse contraction or dummy joints on concrete pavement shall be placed at the intervals shown below:

| <u>Pavement Thickness</u> | <u>Joint Spacing</u> |
|---------------------------|----------------------|
| 5” & 6” | 12’-0” |
| 7” & 8” | 15’-0” |

4. All sawing operations shall be conducted and completed within that period of time from 5 to 12 hours after the concrete slab has been poured, including the sealing operations.
5. Tooled or dummy joints on curb and gutter shall be spaced at 5’ - 0” intervals.

ADA Ramps / Sidewalks

ADA ramps will be constructed in accordance with the latest published addition of “Technical Requirements” of the Texas Accessibility Standards” (TAS). The following parameters affecting slope accessibility routes shall be maintained unless otherwise directed:

- a. Cross slope at walking surfaces maximum ¼” per foot.
- b. Slope of curb ramps in direction of travel maximum 1” per 12”.
- c. Slope of flared edges of curb ramps maximum 1” per 10”.
- d. Ramps shall be a minimum of 36” wide with truncated domes extending the entire width of the ramp.
2. Show the location of sidewalks and access ramps on construction plans.
3. Sidewalks shall be “flagged” at intervals equal to the width of the walk with a marking tool. When the sidewalk is against the curb, expansion joints and tooled grooves shall match those in the curb.

Storm Drains

1. The minimum size storm drain is 18” RCP.
2. All storm drain RCP will be installed a minimum of 18” below the top of curb or existing grade.

3. Embedment shall be washed gravel, washed crushed stone or washed crushed gravel.

Storm Drain Embedment

| | | |
|------------------------|---|---|
| Depth below pipe | - | 6" minimum |
| Height above flow line | - | ¾" of pipe O.D. |
| Width | - | O.D. + 18" |
| Material | - | Course Crushed Rock or Natural Gravel |
| Density | - | 95% Standard Proctor Density under Pavement |
| | - | 90% Standard Proctor Density outside Pavement |

4. All storm drain rings and lids will be manufactured by Bass and Hayes or approved equal. No imports allowed.
5. Excavated ditches shall be left open for inspection of all storm sewer piping and infrastructure prior to covering.

Storm Drain Testing

Required testing to include camera of lines **Public and Private**. Camera recorded footage shall be of good clarity and shall show line identification coinciding with the project plans, footage, date and time.

Miscellaneous Requirements

1. Rehabilitated streets milled for new flex base and HMA will require marking of all valve boxes, clean-outs, and manholes within the street. It will be the contractor's responsibility to inspect these components for damage prior to installation of concrete pads. All manholes will be properly aligned and valve boxes clean of debris with adjusting tool accessibility.
2. All cement and lime stabilization materials shall be applied as a slurry mix.
3. All sub grades shall be compacted in 6" lifts to a density of 95% +/- standard proctor, as verified by lab results.
4. Street light support structure shall be installed in the parkway approximately 1' to 3' in back of curb. Excavation for street light pole installation shall remain clear of "parkway" utilities. Damage to any underground utility will be the contractor's responsibility.