

# APPENDIX D

## STANDARD DETAILS

Engineer shall select applicable details and include in plan set.

DETAIL NO.	DETAIL NAME	EFFECTIVE DATE
GENERAL		
G-GN	GENERAL NOTES	11/11/2019
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G-2	TYPICAL PAVEMENT CUT OVER TRENCH	11/11/2019
G-3	UTILITY BORE	05/20/2019
G-4	CONCRETE ENCASEMENT	05/20/2019
G-5A/C	AERIAL CROSSING	05/20/2019
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P-6	THICKENED CONCRETE EDGE	05/20/2019
P-7	TYPICAL CURB & GUTTER	07/24/2019
P-8	PEDESTRIAN FACILITIES	11/11/2019
P-9	MONOLITHIC NOSE	05/20/2019
P-10	MEDIAN	05/20/2019
P-11	STAMPED CONCRETE MEDIAN PAVEMENT	05/20/2019
P-12A:12B	PERMANENT BARRICADE	05/20/2019
P-13A:13B	LEFT TURN LANE	05/20/2019
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P-15	CONCRETE SIDEWALK WITH RETAINING WALL	05/20/2019
P-16	CURB RAMP - TYPE A	05/20/2019
P-17	CURB RAMP - TYPE B	05/20/2019
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P-19	CURB RAMP - TYPE D	05/20/2019
P-20	FIRE LANE PAVING	05/20/2019
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P-22	ALLEY PAVING	05/20/2019
P-23	ALLEY/STREET INTERSECTION - OFFSET SIDEWALK	05/20/2019
P-24	ALLEY/STREET INTERSECTION - ADJACENT SIDEWALK	05/20/2019
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P-29	DRIVEWAY - RESIDENTIAL ALLEY	05/20/2019
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W-2	TYPICAL WATER MAIN PIPE EMBEDMENT (UNDER PAVING)	11/11/2019
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W-6	AIR RELEASE VALVE	05/20/2019

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W-13	FIRE SPRINKLER YARD PIPING	05/20/2019
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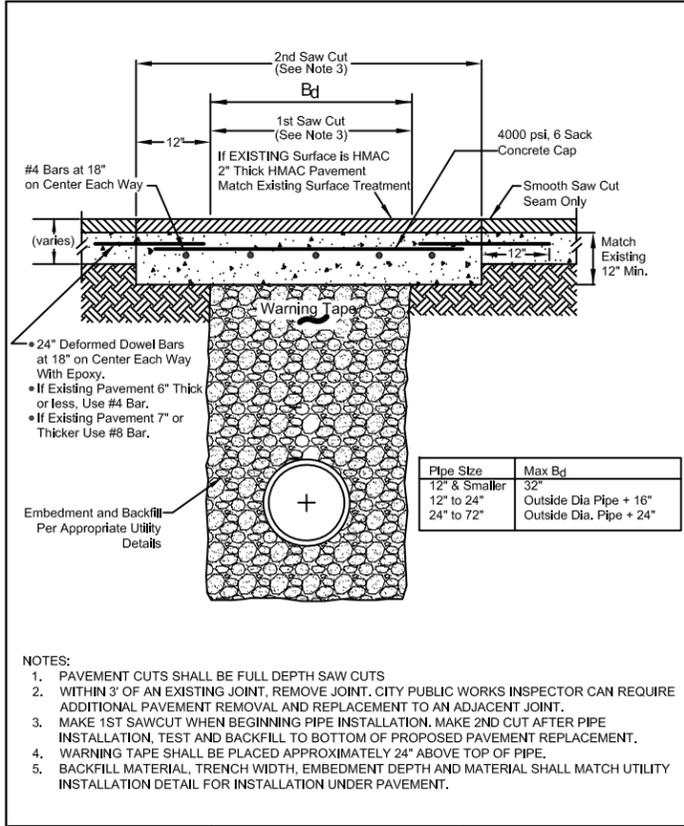
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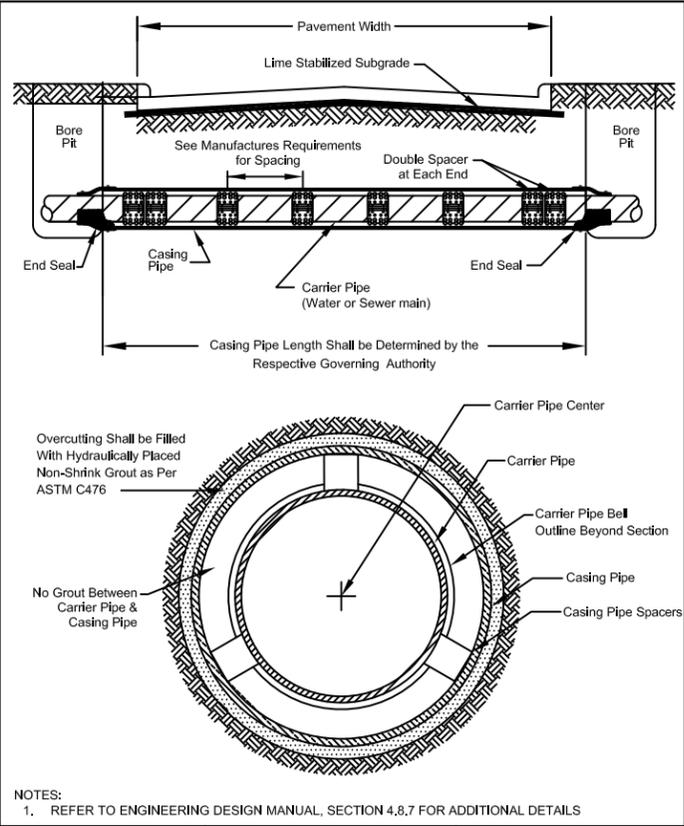
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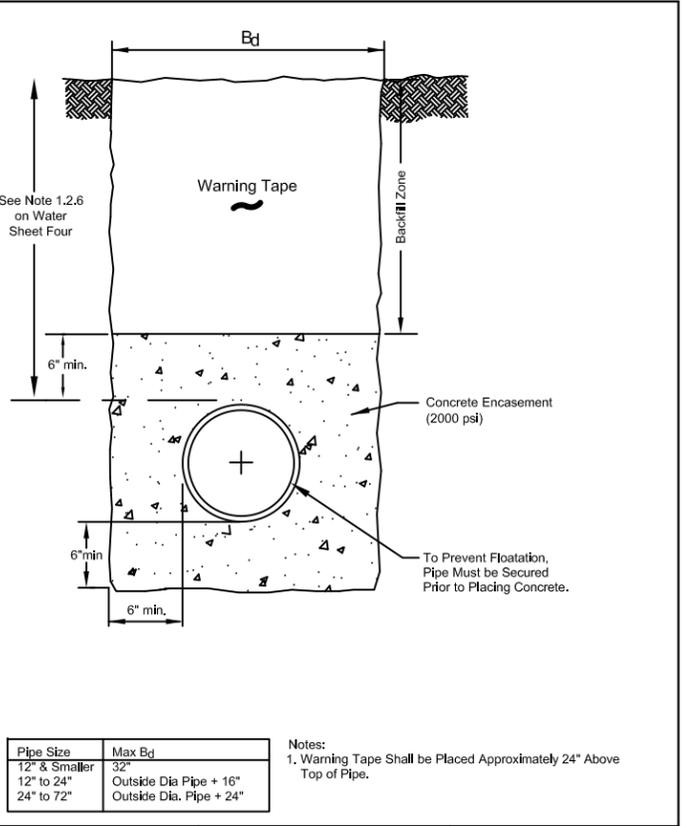
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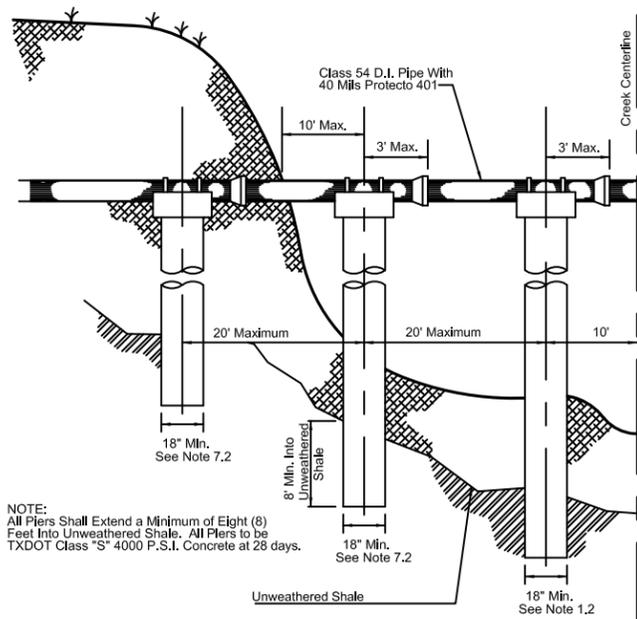
	Public Works	TYPICAL PAVEMENT REPAIR OVER TRENCH	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: G-2
			REVISION DATE: 11/11/2019	



	Public Works	UTILITY BORE	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: G-3
			REVISION DATE: 05/20/2019	



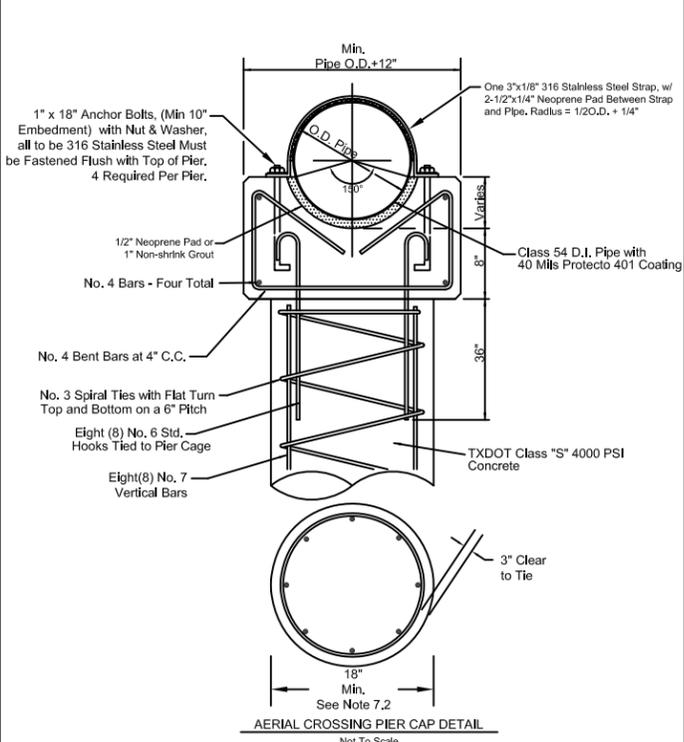
	Public Works	CONCRETE ENCASEMENT	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: G-4
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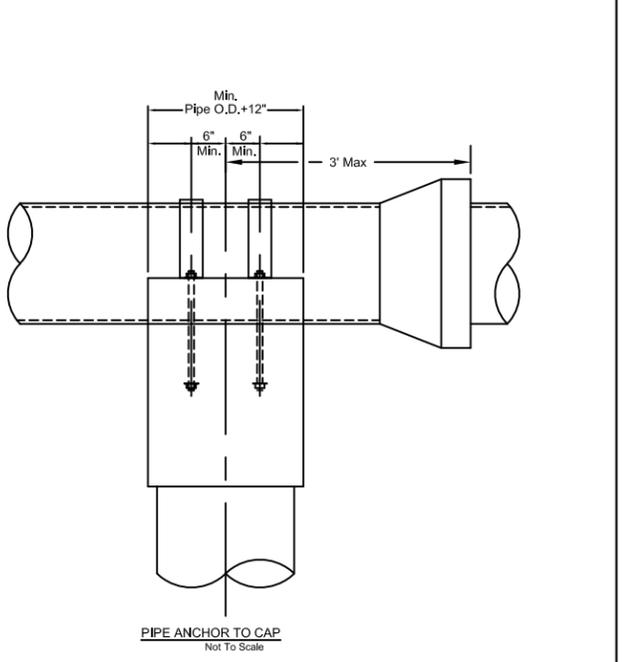
NOTE:  
All Piers Shall Extend a Minimum of Eight (8) Feet Into Unweathered Shale. All Piers to be TXDOT Class "S" 4000 P.S.I. Concrete at 28 days.

- NOTES:
1. Reinforcing Steel Shall Conform to ASTM A-615, Grade 60.
  2. Concrete for Drilled Shafts Shall be Poured Within 8 Hours of Drilling the Hole.
  3. Casing May be Required During Installation of the Piers to Keep the Walls of the Shafts from Caving In and to Limit Groundwater Seepage into Pier Shafts.
  4. Ductile Iron Pipe to be Class 54 with Protecto 401 Interior Coating. Polywrap all D.I. Pipe Below Grade.
  5. TXDOT Specifications Shall Govern Construction of Drill Shafts, Columns and Pier Caps.
  6. 2" Cover for all Steel Reinforcing Above Grade.
  7. 3" Cover for all Steel Reinforcing Below Grade.
  8. 3/4" Chamfer on all Exposed Corners.
  9. THIS DETAIL GIVES MINIMUM ACCEPTABLE CRITERIA. ALL AERIAL CROSSINGS SHALL BE DESIGNED IN ACCORDANCE WITH ENGINEERING DESIGN MANUAL, SECTION 4.8.6

	Public Works	AERIAL CROSSING	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: G-5A
			REVISION DATE: 05/20/2019	



	Public Works	AERIAL CROSSING	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: G-5B
			REVISION DATE: 05/20/2019	



	Public Works	AERIAL CROSSING	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: G-5C
			REVISION DATE: 05/20/2019	

GENERAL NOTES FOR WATER MAINS AND RELATED APPURTENANCES:

1. GENERAL:
  - 1.1. All water system improvements in the City of Mesquite, both privately and publicly maintained shall be designed and constructed in accordance with the City of Mesquite Engineering Design Standards.
  - 1.2. All water system design and construction shall conform to the current Texas Commission on Environmental Quality (TCEQ) regulations. These regulations can be found in the Texas Administrative Code (TAC), Title 30, Chapter 290, Subchapter D - (Rules and Regulations for Public Water Systems).
  - 1.3. All water system design, construction and materials shall conform to current American Water Works Association (AWWA) standards.
  - 1.4. All materials that will come into contact with potable water must be approved for use under National Sanitation Foundation (NSF) Standard 61 (Drinking Water System Components - Health Effects)
  - 1.5. Water systems shall be designed to comply with the latest City adopted version of the International Fire Code with adopted City amendments.
  - 1.6. Water systems shall be designed to comply with the current Insurance Services Office (ISO) Fire Suppression Rating Schedule (edition 02-03) - Section 600 - Water Supply.
2. GENERAL INSTALLATION
  - 2.1. All components of the water system (pipe, valves, fittings, restraints, blocking, services, and appurtenances) shall be designed for 200 psi working pressure and an AASHTO HS-20 live load except where loading conditions could exceed HS-20 live load limits in which case the City Engineer shall specify the appropriate design load.
  - 2.2. Minimum Cover: Water mains with a nominal diameter less than 14-inches shall have a minimum cover of 42" and water mains with a nominal diameter 14" or greater shall have a minimum cover of 60-inches, unless otherwise approved by the City Engineer.
  - 2.3. Utility Clearance: Water mains and sanitary sewer mains shall have a minimum clearance of nine (9) feet. If this clearance cannot be maintained, TCEQ alternate requirements shall be met.
  - 2.4. Water mains are generally placed to be centered under the back of curb, unless otherwise approved by the City Engineer.
  - 2.5. Storm Sewer Inlets shall be staked prior to water main placement so that the water main can be gradually deflected around and below the proposed inlets or other obstructions or conflicts in alignment. The Contractor shall stake the location of the back of curbs to ensure no valves fall within a curb.
  - 2.6. Warning Tape: Warning tape shall be installed 24 inches above the top of pipe or as otherwise directed by the City Engineer. The tape shall be a plastic, high stretch, 4-inch width tape approved by the City Engineer. The tape shall be blue in color and have the words "Caution - Water Main Buried Below" imprinted on the tape.
  - 2.7. Grading Operations: The Contractor shall complete all fill and cut operations in accordance with released engineering plans prior to installing any utilities (i.e. water, sanitary sewer, drainage).
  - 2.8. The Contractor shall not operate any valves in the existing water system nor operate any new valves that would allow connection to the City water system. The Contractor shall coordinate and notify the City Public Works Construction Inspector 48-hours in advance to schedule a shut-down of the existing water system by City personnel. The City may require a night or weekend shut-down in order to maintain customer service.
  - 2.9. Temporary Fire Hydrant Meters: The City of Mesquite requires portable fire hydrant meters for temporary and/or construction water use at construction sites. They are routinely used to account for water usage prior to installation of a permanent water meter. These meters have a backflow prevention device attached. The City requires support for this device to prevent excessive torque when attached to a fire hydrant. The City requires payment for each meter. An invoice for water use is rendered each month. Arrangements for portable fire hydrant meters are administered by the City of Mesquite Water & Sewer Accounting Division at 757 N. Galloway Avenue. Please coordinate meter usage through the Utilities Division - Meter Services Section.
3. MATERIALS
  - 3.1. Bolts and nuts for all fittings shall be stainless steel Grade 304 or 316 or ASTM A325 Type 3 Enhanced Corrosion Resistant steel. Stainless steel all-thread may be used in some applications with the approval of the City Engineer.
  - 3.2. All fittings shall be mechanically restrained using restrained fittings as shown on the City of Mesquite Approved Water Materials List and meeting requirements of ASTM F1674 (PVC) or U.L. Standard 194 (Ductile Iron). Restraint gland and body and wedge components shall be ductile iron material. For pipe diameters 12" or greater, waterline plan shall show length of joints to be restrained on each side of fittings. For pipe diameters less than 12", all joints within 15-feet of fitting shall be restrained.
  - 3.3. Concrete Blocking: All fittings, valves, hydrants, etc. shall be blocked with 2,000 p.s.i. concrete, 4-sack minimum cement content. All blocking shall be poured to avoid nuts and bolts to allow easy access for maintenance. Excessive blocking shall not be allowed and shall be removed at the contractor's expense. Sizing and construction of blocking shall be as shown in standard drawings 4010A to 4040 of the North Central Texas Council of Governments Public Works Construction Standards, Fourth Edition (October 2004).
  - 3.4. Polyethylene Tube Wrap: All cast and ductile iron pipe, fittings and valves shall be wrapped with polyethylene tube wrap in accordance with AWWA C105. The polyethylene wrap must be blue in color. The wrap shall be installed in accordance with AWWA C105, Method A.
4. VALVES
  - 4.1. Location: Valves shall be anchored to adjacent fittings at Tee and Cross fittings and on fire hydrant leads. Valves shall not be used at the dead end of mains as a plug. Contractors generally do not wish to pressure test against an old valve that may leak, therefore new mains shall start with a valve and end with a plug.
  - 4.2. Location Marking: Valves located within a right-of-way shall be indicated on the face of the curb, or where curbs do not exist, on a conspicuous location adjacent to the valve location. Markings are to be the cutting of a four (4) inch high and 1/8" deep letter "V" with the point of the "V" pointing towards the valve location. The "V" shall be cut into the curb or paving using an approved motor driven concrete saw. The completed cut and valve riser lids shall receive a coating of blue paint if a main line valve or red if a fire hydrant valve. Contractor shall coat the interior, and exterior of the cut to a width of one (1) inch.
  - 4.3. Joint Restraint: All valves shall be mechanically restrained per Section 3.2. Bolts and Nuts for all fittings shall be ASTM A325 Type 3 Enhanced Corrosion Resistant steel, or stainless steel A151 304 or 316.
  - 4.4. Three-piece adjustable valve boxes: Adjustable valve boxes shall be furnished and set on each valve in accordance with the appropriate General Design Standards and the City of Mesquite Approved Water Materials List. After the final clean up and alignment has been completed, the Contractor shall cast in place a concrete block, 2-foot x 2-foot x 4-inch around all valve box tops at the finish grade.
5. TAPPING SLEEVES AND VALVES
  - 5.1. Wet connections to existing water mains (6-inch through 12-inch in size), shall be made with a tapping sleeve and valve. EXCEPTION: In some cases where the size of the tap approaches the size of the main, as judged by the City Engineer, the use of a cut-in sleeve and tee will be required. Both the tapping sleeve and valve shall be rated for a minimum 200 psi service pressure.
  - 5.2. Prior to tapping, all tapping sleeves and valves shall be air tested at 120 psi for three (3) minutes, with no pressure loss.
  - 5.3. Tapping is to be accomplished with no interruption of service. Facilities shall be provided for proper dewatering and for disposal of water removed from the water mains and excavations without damage to adjacent property. Special care shall be taken to prevent contamination of the existing potable water line when dewatering, cutting, and making connections with existing pipe. No trench water, mud, or other contaminating substances shall be permitted to enter the existing lines. The interior of all tapping sleeves, tapping machine cut assemblies, and tapping gate valves installed in such connections, and the surface of the existing pipe at these connections, shall be thoroughly cleaned and then swabbed with a solution having a chlorine content of 200 milligrams per liter.
6. FIRE HYDRANTS
  - 6.1. Fire hydrants shall be located to minimize interference with driveways and shall be located with sufficient clearance from drive and street radii to prevent the fire hydrant from being struck if a vehicle jumps the curb and/or takes a wide turn. Hydrants shall not be placed in intersection radii or other locations with a high probability of being damaged by traffic. A 3-foot clear space shall be maintained around the circumference of fire hydrants except as otherwise required or approved.
  - 6.2. Mid-block fire hydrants shall be located on property lines (extended) to minimize interference with drives and on-street parking.
  - 6.3. Hydrants shall be placed 2-feet to 10-feet from the back of curb and shall not interfere with sidewalks, driveways, etc. Hydrants shall be placed so the bury mark is at ground or paving level. Mounding of the ground or paving shall not be allowed to achieve this requirement. No more than one extension of 18 inches maximum will be allowed for grade adjustment. Hydrants shall have a barrel length of 4-feet to 6-feet unless approved by the City Engineer. All hydrants shall be surrounded by a 2 to 9 feet long x 3-feet wide x 4-inch thick concrete pad with 3,600 psi, 6 sack concrete and #4 reinforcing bars on 18" centers both ways placed to anchor the hydrant and to provide a splash pad between the hydrant and the curb for flushing operations.
  - 6.4. Installation: Installation shall be of a type as detailed in these standards. All fire hydrant leads shall be from an MJ to Flanged tee and all valves and fittings from the tee to hydrant shall be flanged.
  - 6.5. Out of Service: If a fire hydrant is out of service, for any reason, the contractor shall bag the fire hydrant with a black trash bag secured with duct tape and report hydrant to the Utility Dispatch office with the reason why it is out of service. This includes, but is not limited to, hydrants that are out of service for the following reasons:
    - 6.5.1. Water main valved-off and being abandoned but connected hydrant is not yet removed.
    - 6.5.2. New hydrant recently installed but not yet ready for service
    - 6.5.3. Hydrant temporarily out of service due to main shut down
  - 6.6. Fire Hydrant Markers: The contractor shall place a Stemsnite Model 88-SSA blue fire hydrant marker in the street adjacent to the hydrant. The marker shall be located perpendicular to the curb, at the center of the driving lane closest to the fire hydrant. The marker shall be installed with a two part epoxy adhesive per manufacturer's instructions.
  - 6.7. Fire Hydrant Painting (color coding): All fire hydrants are to be painted with a base coat consisting of two (2) coats of aluminum paint as specified below. Refer to City of Mesquite Approved Water Materials List for approved paint. When a color code other than aluminum is required, the top bonnet (from operating nut to underneath the uppermost flange) shall be painted two coats of the appropriate color in accordance with the following color code. Nozzle caps are not to be color-coded.
    - 6.7.1. Base undercoat: Two (2) coats of aluminum paint are required as a base coat on all hydrants.

6.7.2. Overcoats: Two (2) additional coats of paint are required over the base coat. The colors shall conform as follows:

MAIN SIZE	COLOR
6 INCHES	ALUMINUM - TOP & BOTTOM
8 INCHES	BLUE TOP - ALUMINUM BOTTOM
10 INCHES OR LARGER	YELLOW TOP - ALUMINUM BOTTOM

7. SERVICES AND METERS

- 7.1. Meter and Service Location: Meters and services must be located within R.O.W. or easements in accordance with City approved plans and details. In residential developments, residential water meters and services are generally placed at the center of the lot in the grassed parkway. Water meters shall not be located in proposed driveways, sidewalks, parking lots or other paved areas. For narrow lots or front entry lots, the designer must design the location of the meters to make sure they are placed in an unpaved area. Meters in conflict with this requirement will be relocated by the developer/builder at their expense. In non-residential developments, water meters shall be located in unpaved islands. Meters should be set so that the meter face is 6-inches to 10-inches below finished grade.
- 7.2. All PEX-A water service lines shall be in accordance with ASTM F876 and AWWA C904 and the following procedures:
  - 7.2.1. For installation under a non-residential street, service line shall be installed with detectable tracing wire. Detectable tracing wire shall be a minimum 12 gauge with HDPE coating.
  - 7.2.2. A Plastic insert stiffener shall be used at all fittings.
- 7.3. All water services shall be continuous from the corporation valve at the water main to the angle meter valve in the meter box (No Couplings). Service line shall be "goose necked". Crimping or excessive bending of the service line shall not be allowed. Service lines shall be continuous and shall have no fittings under any paving, unless approved by the City Engineer. Long copper service lines that exceed the length of standard rolls of copper may be spliced in unpaved areas with a silver solder coupling. When installing a water main the Contractor shall furnish and install new meter boxes. Service lines shall be poly-wrapped for the first 5-feet of copper service from the main. Water services shall have a minimum depth under paving of 36-inches (measured from surface of paving).
- 7.4. All service connections to the main for services 2" or smaller shall be made with service saddles.
- 7.5. A water meter box with locking lid shall be furnished and installed by the Contractor after paving and line grading is complete. When installing a water main, new meter boxes shall be furnished, installed and connected to the main. Meters larger than 2-inches in size shall be furnished and installed by the Contractor in concrete vaults in accordance with City details.
- 7.6. Each individual service location shall be marked on the face of the curb with a 4-inch high and 1/8-inch deep scribe mark "I" cut in the curb using an approved motor driven concrete saw. The scribe mark "I" shall receive a coating of blue paint, which shall coat the interior and exterior of the cut to a width of 1-inch.

8. WATER SYSTEM INSTALLATION

- 8.1. Excavation: Excavation in general, shall be made in open cut from the surface of the ground and shall be no greater in width and depth than is necessary to permit the proper construction of the work. When the trench depth exceeds five (5) feet, see Standard Procedures Section 12.2 regarding "Trench Safety" requirements. The amount of trench excavation to grade shall not exceed 100 (one hundred) feet from the end of the pipe laying operations and no excavation shall be 300 (three hundred) feet in advance of the completed pipe operations (includes backfilling). At the end of the workday, all trench excavation shall be backfilled. Any landscaping and irrigation system within the City medians and right-of-ways that are disturbed, removed, or damaged during construction shall be replaced to original condition or better by a licensed irrigator.
- 8.2. Minimum bury depth: Minimum bury depth shall be forty-two (42) inches from finished grade to the top of the pipe, unless otherwise directed by the City Engineer.
- 8.3. Sanitation: The inside of all pipe and fittings shall be kept clean during installation. The City Engineer may require swabbing or pigging of all new pipe if the pipe is installed in an unsanitary manner. See Section 11 TESTING PROCEDURES for more information.
- 8.4. Lifting Straps: All water pipe, valves, fire hydrants, and fittings shall be installed by the use of lifting straps. The use of chains is prohibited.
- 8.5. Backfill and Compaction: For trenches not under paving, final backfill material shall be from the trench excavation placed in a maximum of 12 inch loose lifts and compacted to 95% of Standard Proctor Density (ASTM D698) at a moisture range of 0% to plus 6% of optimum moisture. Under existing or proposed paving (public/private sidewalks, streets, alleys, driveways, etc.), backfill shall be crushed concrete flexible base (TxDOT, Item 247, Grade 1, Type D) compacted to 95% of Standard Proctor Density (ASTM D698) at a moisture range of 0% to plus 6% of optimum moisture unless alternate material is approved by the City Engineer. The contractor shall take new proctors at each change in soil type. Water jetting will not be allowed for any trench.

9. TESTING PROCEDURES

- 9.1. Notification of Testing: The Contractor shall hire an independent testing lab, subject to the approval of the City Engineer, for all material and acceptance testing at Contractors Expense. The Contractor shall notify the assigned City Public Works Construction Inspector of all density testing 24 hours prior to the scheduled test. Copies of all test reports shall be sent to the Public Works Inspector for review and acceptance and inclusion in the City project file. Projects will not receive City acceptance until all test results are complete and satisfactory.
- 9.2. Compaction of Trenches and Excavations: Density tests shall be performed at a frequency of one test per lift, per 300 linear feet of trench (including services) at locations specified by the City Public Works Construction Inspector. All nuclear gauge density tests shall be performed per ASTM D2922.
- 9.3. Pressure Testing and Disinfecting Water Mains: The purpose of this specification is to define the minimum requirements for the pressure testing and disinfection of water mains, including the preparation of water mains, hydrostatic tests, flushing, application of chlorine, and sampling for the presence of coliform bacteria. Water mains, services and fire sprinkler systems shall be flushed and disinfected per the following requirements and in accordance with AWWA C651 "Disinfecting Water Mains".
- 9.4. Connection to Existing Water System: Water required to fill the new main for hydrostatic pressure testing, disinfection, and flushing shall be supplied through a temporary connection between the distribution system and the new main. The temporary connection shall include an appropriate cross-connection control device and shall be disconnected during the hydrostatic pressure test. As an alternate, a connection to the existing distribution system is permitted provided a new valve is placed at the connection point. Do not test against an existing valve in the existing system.
- 9.5. General Procedures and Precautions Taken During Construction:
  - 9.5.1. Inspect materials prior to installation to ensure their cleanliness and integrity.
  - 9.5.2. Keep interior of pipe dry and clean during storage and installation. Prevent contaminants from entering the water main during storage and construction.
  - 9.5.3. If dirt enters the pipe during storage or installation, it shall be removed and the interior surface swabbed with a 1 to 5 percent hypochlorite disinfecting solution.
  - 9.5.4. During construction openings in the pipe shall be closed with a watertight plug when pipe laying is stopped at the close of each day's work or for other reasons such as rest breaks and meals to prevent contaminants and animals from entering pipe
  - 9.5.5. Remove, by flushing or other means, those materials that may have entered the water main.
  - 9.5.6. Chlorinating any residual contamination that may remain, and flushing the chlorinated water from the main.
  - 9.5.7. Protecting the existing distribution system from backflow caused by hydrostatic test and disinfection procedure.
  - 9.5.8. Documenting that an adequate level of chlorine contacted each pipe to provide disinfection.
  - 9.5.9. Once the contractor has been notified by the City Public Works Construction Inspector of a successfully (negative result) laboratory bacteriological testing result, the contractor can make connection of the approved new water main to the active distribution system.
- 9.6. Hydrostatic (Pressure) Test: All water mains, fittings and services shall be tested with a hydraulic test pressure of not less than 200 psi over a period of not less than 2 hours. The allowable leakage, in gallons, of all pipe tested shall be calculated per the following equation:

$$\text{ALLOWABLE LEAKAGE} = \frac{28,28L^2D}{148,000}$$

WHERE L = LENGTH OF PIPE (FT)  
D = DIAMETER OF PIPE (IN)

- 9.6.1. For a two hour pressure test at a pressure of 200 psi, if the tests indicate a leakage in excess of the acceptable rate, the Contractor shall be required to find and repair the leak. Even if the test requirements are met, all apparent leaks shall be repaired and stopped.
- 9.6.2. The hydrostatic pump shall be connected to a system where the amount of leakage can be determined by measurement or gauge. The 200-psi pressure shall be maintained at the highest point of the main being tested over the entire 2-hour test period. The leakage shall be determined by comparing the quantity of water in the measuring system at the beginning of the test and quantity of water at the end of the test. The difference in these quantities shall be the leakage. An alternate method is to add water to the measuring system during the test. At the end of the 2-hour test, the quantity of water added shall be the leakage.
- 9.7. Flushing and Pigging the Main Prior to Disinfection / Chlorination
  - 9.7.1. Flushing Method: Before the main is chlorinated, it shall be filled to eliminate air pockets and flushed to remove particulates. The flushing velocity in the main shall not be less than 3.0 ft/sec. Below is the required flow and openings needed to flush pipelines with a pressure of 40 psi

M	FLOW (GPM)	1' TAP	1.5' TAP	2' TAP	2.5" HYDRANT OUTLET
4"	120	1			1
6"	260		1		1
8"	470		2		1
10"	730		3	2	1
12"	1060			3	2
16"	1880			5	2

9.7.2. Pigging Method:

- 9.7.2.1. Pigging is accomplished by passing an appropriate sized pig through the pipe. A pig is a bullet-shaped, flexible sponge available in different sizes, densities, and degrees of roughness. All mains 12-inch and larger must be pigged prior to flushing and disinfection with chlorine.
- 9.7.2.2. The pig shall be inserted in the new conduit at the location where the new conduit is connected to the active distribution system.
- 9.7.2.3. Where expulsion of the pig is required through a dead-ended conduit, the Contractor shall make every effort to prevent back flow of the purged water into the conduit after passage of the pig. Backwater re-entry into the pipe can be prevented by the temporary installation of mechanical joint bends and pipe joints to provide a riser out of the trench.
- 9.7.2.4. After passage of the pig, flushing of all backwater from the pipe, and satisfactory test results, the Contractor shall secure the test location openings and then proceed with disinfection.

9.8. Disinfection (Chlorination):

- 9.8.1. The Continuous-feed method must be used unless it is stated otherwise in the Contract Specifications.
- 9.8.2. The Contractor shall install and remove all pump-in, blow-off and sampling points.
- 9.8.3. Water from the existing system or other approved source shall be made to flow at a constant rate in the new main.
- 9.8.4. At a point no more than 10-ft downstream of the beginning of the new conduit, water entering the new conduit shall receive a dose of chlorine such that the water shall have not less than 100-mg/L (ppm) free chlorine. Chlorine application shall not cease until the entire conduit is filled with heavily chlorinated water. 125 lbs of Calcium Hypochlorite (65% available chlorine) is required in 100,000 gal of water to produce 100 mg/L (ppm) Chlorine concentration.
- 9.8.5. The chlorinated water shall be retained in the conduit for at least 24 hours, during which time all valves and hydrants in the section treated shall be operated in order to disinfect the appurtenances. Every effort shall be made to prevent the flow of chlorinated water into conduits in active service. At the end of the 24-hour period, the treated water in all portions of the conduit shall have a residual of at least 10-mg/L (ppm) free chlorine.
- 9.8.6. Chlorine for Disinfection:
  - 9.8.6.1. Calcium Hypochlorite in granular form conforming to ANSI/AWWA B300 must be used and must contain approximately 65 percent available chlorine by weight. The material should be stored in a cool, dry, and dark environment to minimize deterioration.
  - 9.8.6.2. The heavily chlorinated water shall then be flushed from the conduit and disposed in a manner meeting the requirements set out below.
  - 9.8.6.3. The chlorine residual shall be tested prior to flushing operations.
- 9.9. Disposal of Hyper-Chlorinated Water: If the chlorine residual exceeds 4-mg/L (ppm) the water shall remain in the new water conduit until the chlorine residual is less than 4-mg/L (ppm). As an alternate, the Contractor may choose to evacuate the water into water trucks, or an approved storage facility (such as a detention pond until the chlorine residual is 4-mg/L (ppm) or less), or treat the water with Sodium Bisulfite or another dechlorination chemical (Sulfur Dioxide, Sodium Sulfite, Sodium Thiosulfate, or Ascorbic Acid) or method appropriate for potable water and approved by the Owner until the chlorine residual is reduced to 4-mg/L (ppm) or less. The heavily chlorinated water shall not be disposed of into the storm sewer system. After the specified chlorine residual is obtained, less than 4-mg/L (ppm), the water may then be discharged into the storm sewer or utilized by the Contractor.

9.9.1. The requirement for discharge of heavily chlorinated water is found in the TPDES General Permit to Authorize the Discharge of Storm Water and Certain Non-Storm Water Discharges from Regulated Construction Activities Within the State of Texas.

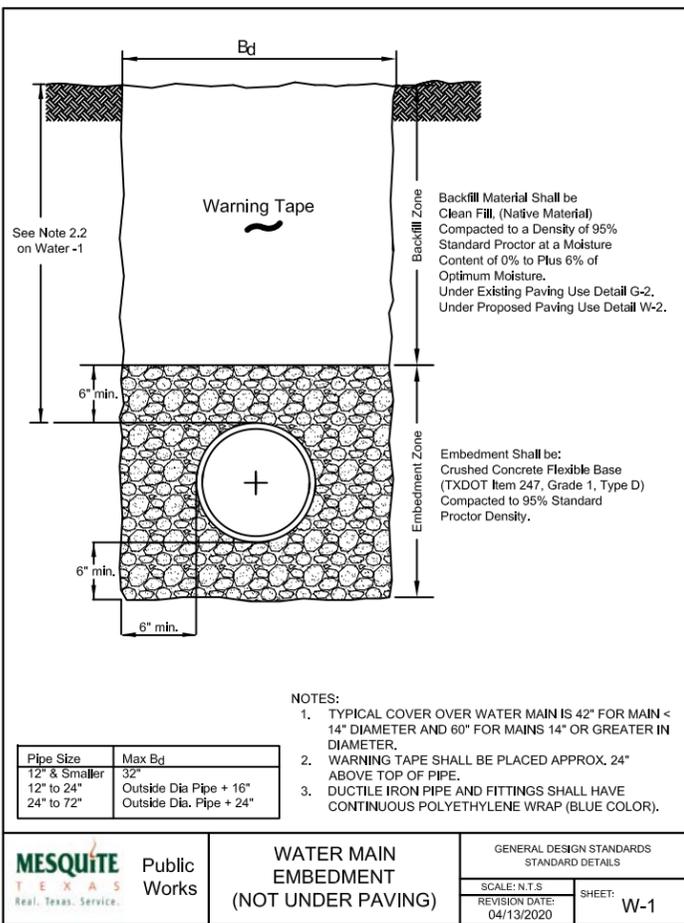
- 9.9.2. The Contractor shall prepare the conduit for disinfection activities and secure same after chlorination is complete.
- 9.9.3. This shall consist of furnishing all equipment, material and labor to satisfactorily prepare the conduit for disinfection. The Contractor shall also be required to provide adequate provisions for sampling.
- 9.9.4. The Contractor shall make all necessary taps into the pipe to accomplish chlorination of a new line.
- 9.9.5. After satisfactory completion of the disinfection operation, the Contractor shall remove surplus pipe at the chlorination and sampling points, plug the remaining pipe, backfill, and complete all appurtenant work necessary to secure the conduit.

9.10. Bacterial Sampling:

- 9.10.1. Unless otherwise specified, the Contractor shall inject chlorine disinfectant into the conduit and monitor the solution.
- 9.10.2. The City Public Works Construction Inspector shall supervise the taking of water samples from a suitable tap (not through a fire hydrant) for analysis by the North Texas Municipal Water District laboratory. The sample(s) shall be transported by City staff to the laboratory at 9:00 AM on Tuesdays and Thursdays. Samples may not be taken earlier than 3:00 PM on the day prior to delivery. The City Public Works Construction Inspector shall notify the Contractor of the results.
- 9.10.3. Microbiological sampling shall be done prior to connecting the new conduit into the existing distribution system in accordance with AWWA C651 Disinfecting Water Mains. Samples shall be tested in accordance with Standard Methods for the Examination of Water and Wastewater. Samples for bacteriological analysis shall be collected in sterile bottles treated with sodium thiosulfate. At least one sample shall be collected from every 1,000-linear-feet of new water conduit, plus one set from the end of the line and at least one set from each branch. If trench water has entered the new conduit during construction or, if in the opinion of the City inspector, excessive quantities of dirt or debris have entered the new conduit, samples shall be taken at intervals of approximately 200-linear-feet. Samples shall be taken of water that has been in the new conduit for at least 16-hours.
- 9.10.4. Unsatisfactory test results shall require a repeat of the disinfection process and resampling as required above until a satisfactory sample is obtained.
- 9.10.5. In the event there are two unsatisfactory test results from the same sampling point, the Contractor must "poly-plg" the new water main and samples taken again until a satisfactory sample is obtained.
- 9.11. Tapping Sleeve and Valve Air Test: Prior to tapping, all tapping sleeves and valves shall be air tested at 120 psi for three (3) minutes, with no pressure loss.

GENERAL DESIGN STANDARDS STANDARD DETAILS	
SCALE: N.T.S.	SHEET:
REVISION DATE: 07/24/2019	W-GN

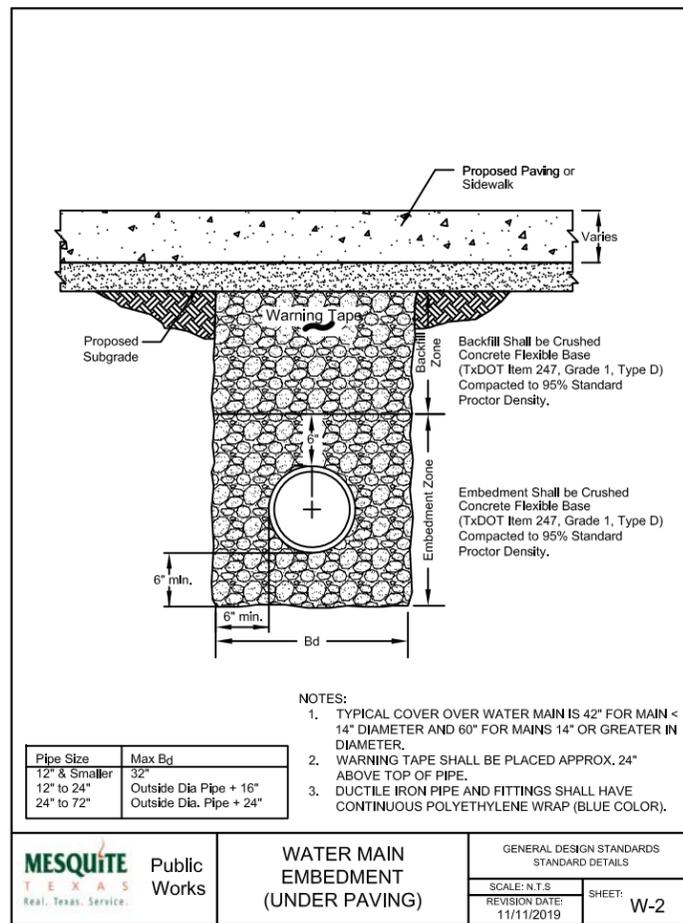




- NOTES:
1. TYPICAL COVER OVER WATER MAIN IS 42" FOR MAIN < 14" DIAMETER AND 60" FOR MAINS 14" OR GREATER IN DIAMETER.
  2. WARNING TAPE SHALL BE PLACED APPROX. 24" ABOVE TOP OF PIPE.
  3. DUCTILE IRON PIPE AND FITTINGS SHALL HAVE CONTINUOUS POLYETHYLENE WRAP (BLUE COLOR).

Pipe Size	Max Bd
12" & Smaller	32"
12" to 24"	Outside Dia Pipe + 16"
24" to 72"	Outside Dia. Pipe + 24"

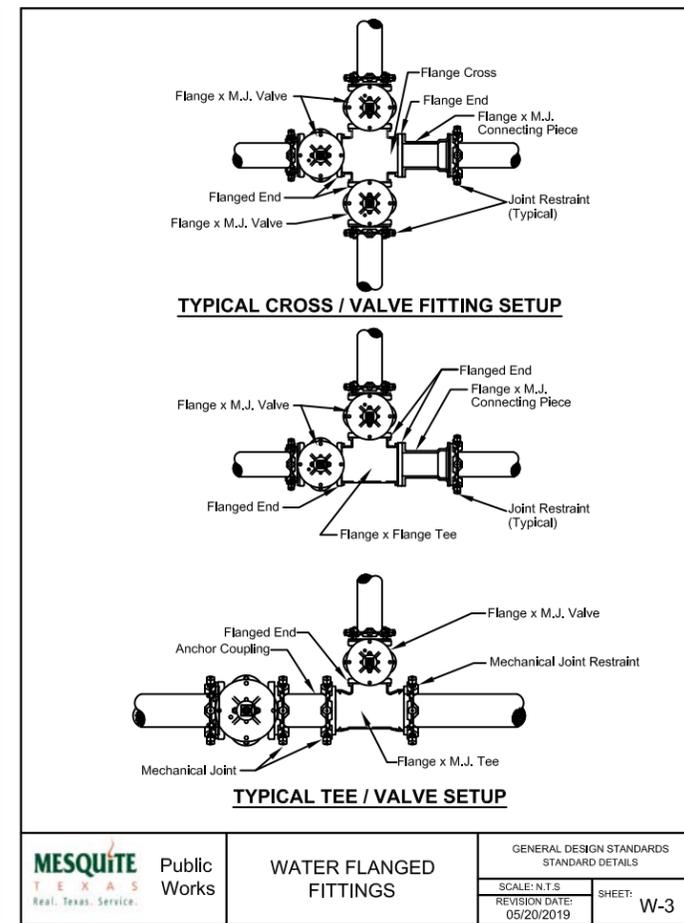
MESQUITE TEXAS Public Works WATER MAIN EMBEDMENT (NOT UNDER PAVING) GENERAL DESIGN STANDARDS STANDARD DETAILS SCALE: N.T.S. REVISION DATE: 04/13/2020 SHEET: W-1



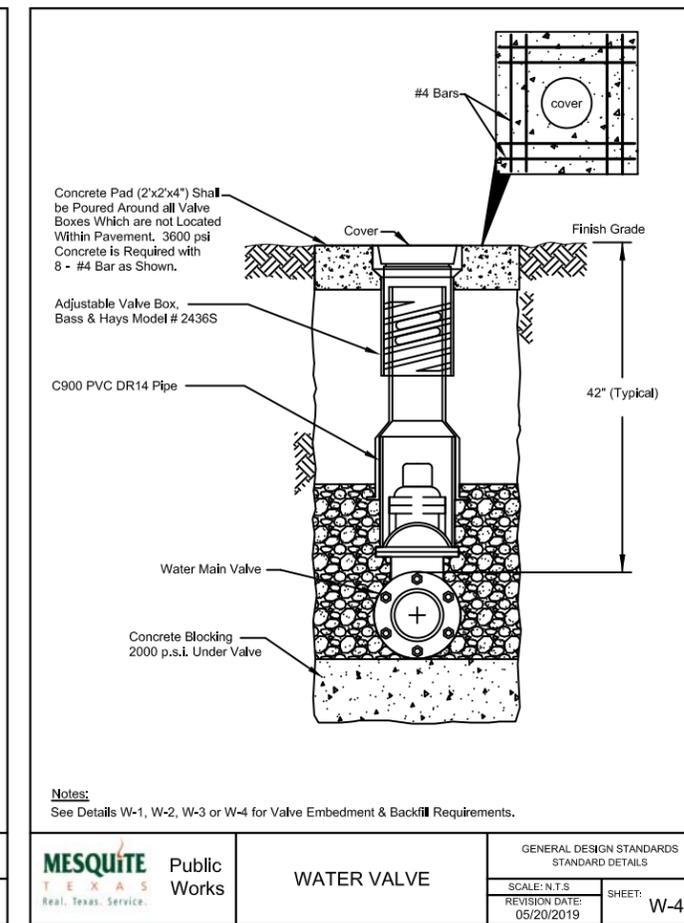
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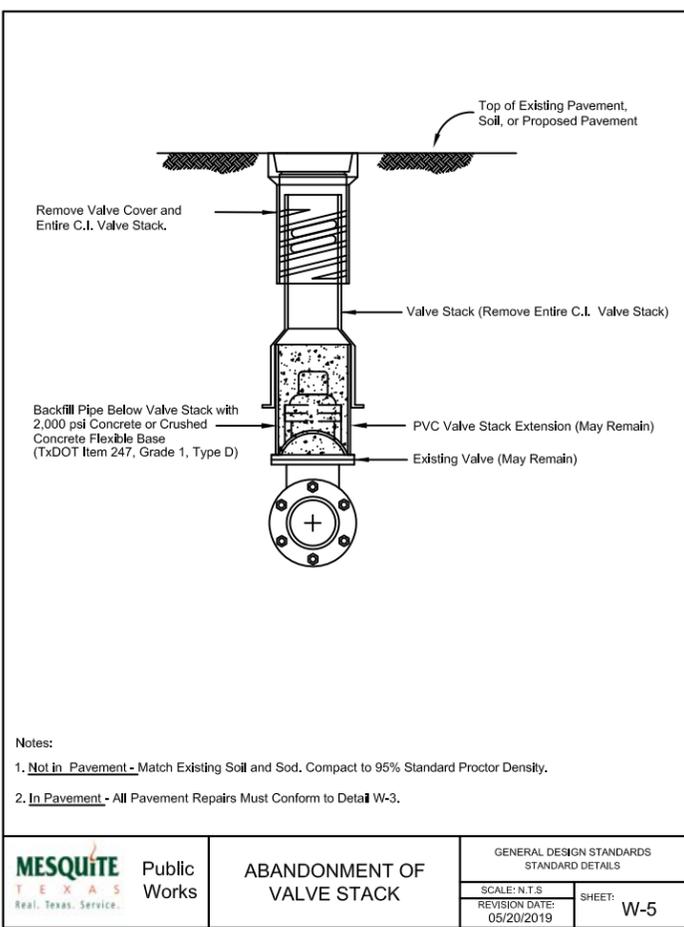
MESQUITE TEXAS Public Works WATER MAIN EMBEDMENT (UNDER PAVING) GENERAL DESIGN STANDARDS STANDARD DETAILS SCALE: N.T.S. REVISION DATE: 11/11/2019 SHEET: W-2



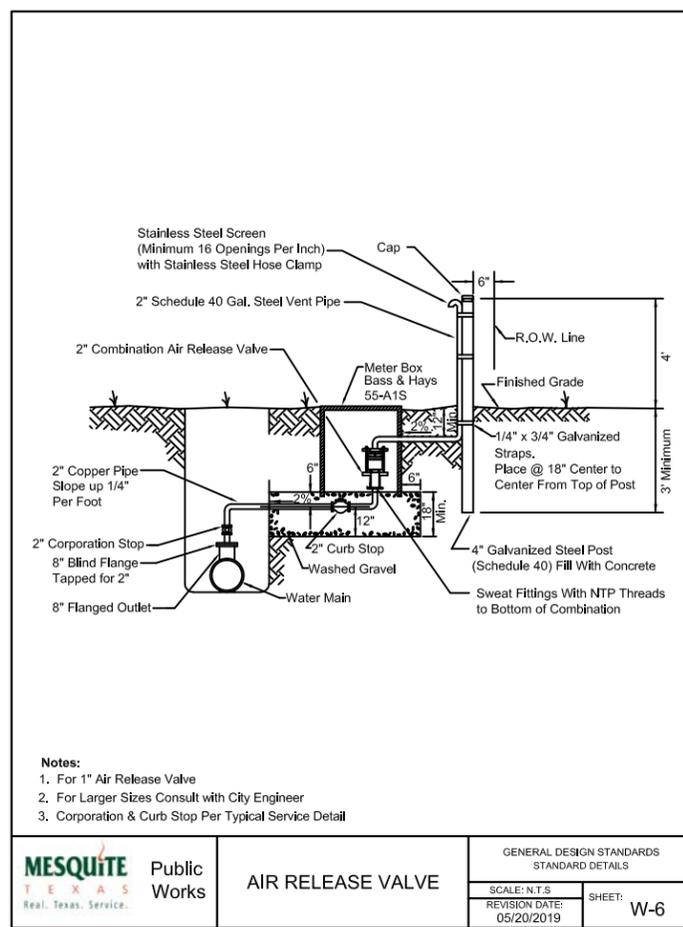
MESQUITE TEXAS Public Works WATER FLANGED FITTINGS GENERAL DESIGN STANDARDS STANDARD DETAILS SCALE: N.T.S. REVISION DATE: 05/20/2019 SHEET: W-3



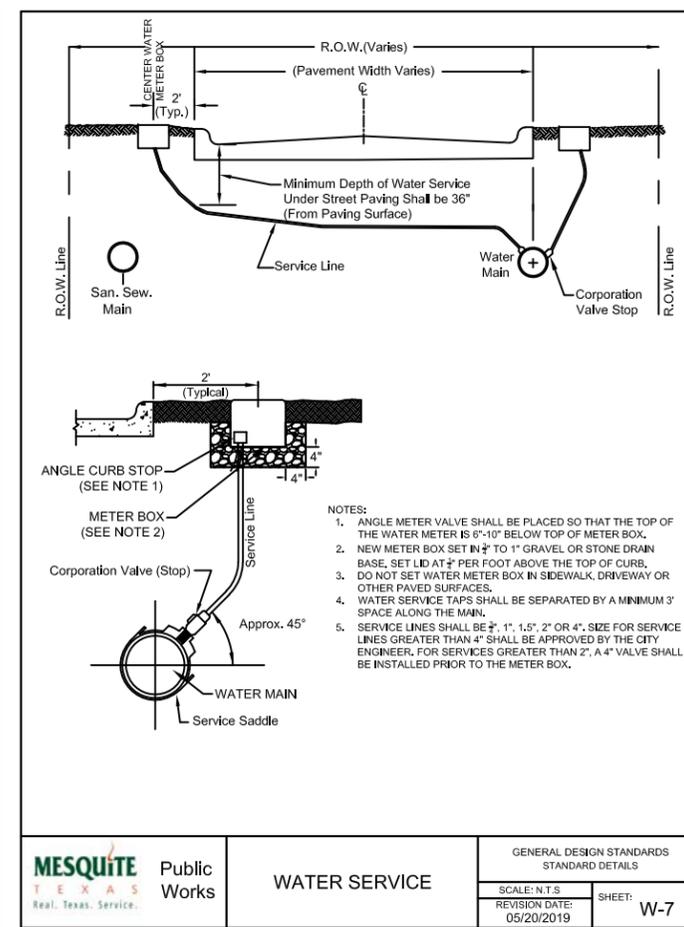
MESQUITE TEXAS Public Works WATER VALVE GENERAL DESIGN STANDARDS STANDARD DETAILS SCALE: N.T.S. REVISION DATE: 05/20/2019 SHEET: W-4



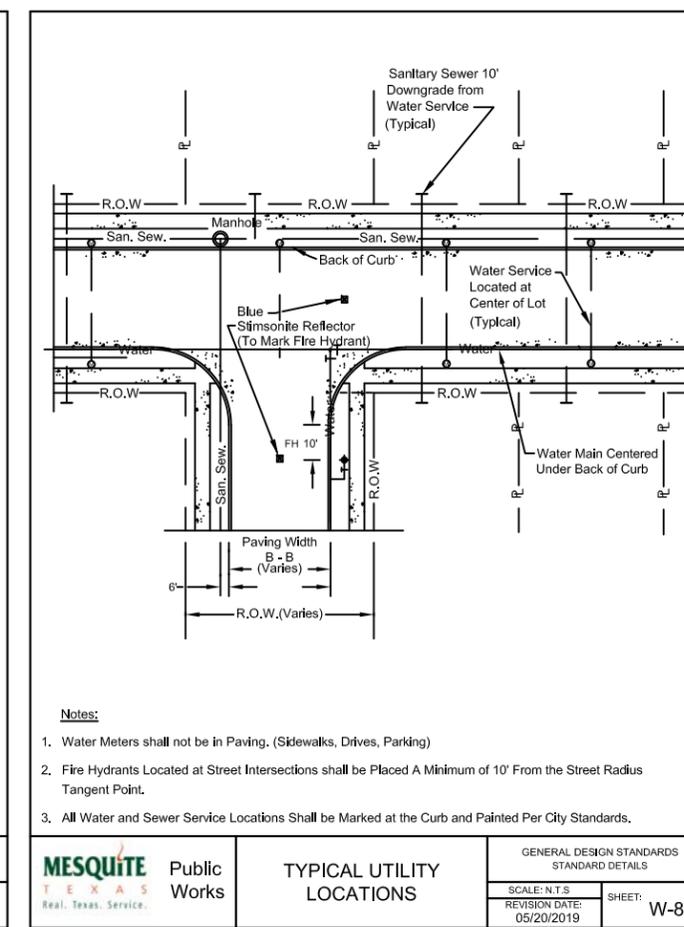
MESQUITE TEXAS Public Works ABANDONMENT OF VALVE STACK GENERAL DESIGN STANDARDS STANDARD DETAILS SCALE: N.T.S. REVISION DATE: 05/20/2019 SHEET: W-5



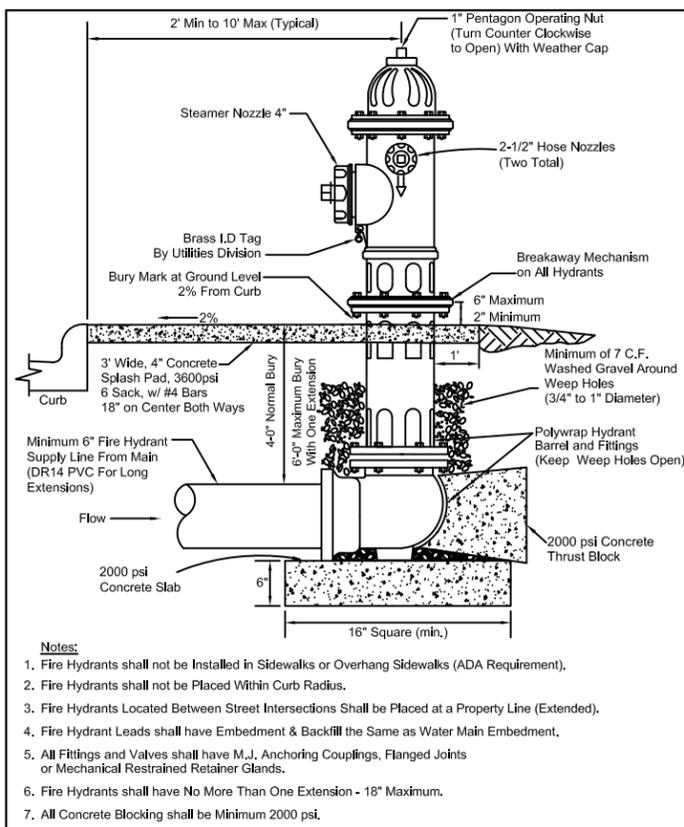
MESQUITE TEXAS Public Works AIR RELEASE VALVE GENERAL DESIGN STANDARDS STANDARD DETAILS SCALE: N.T.S. REVISION DATE: 05/20/2019 SHEET: W-6



MESQUITE TEXAS Public Works WATER SERVICE GENERAL DESIGN STANDARDS STANDARD DETAILS SCALE: N.T.S. REVISION DATE: 05/20/2019 SHEET: W-7



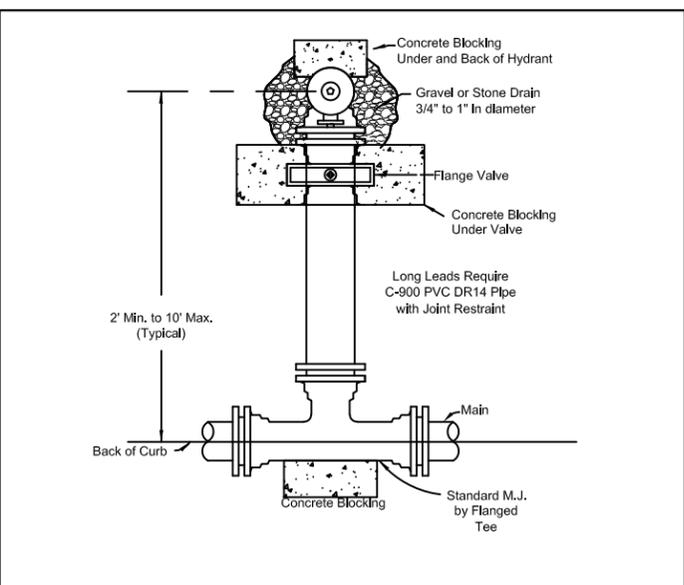
MESQUITE TEXAS Public Works TYPICAL UTILITY LOCATIONS GENERAL DESIGN STANDARDS STANDARD DETAILS SCALE: N.T.S. REVISION DATE: 05/20/2019 SHEET: W-8



**Notes:**

1. Fire Hydrants shall not be Installed in Sidewalks or Overhang Sidewalks (ADA Requirement).
2. Fire Hydrants shall not be Placed Within Curb Radius.
3. Fire Hydrants Located Between Street Intersections Shall be Placed at a Property Line (Extended).
4. Fire Hydrant Leads shall have Embedment & Backfill the Same as Water Main Embedment.
5. All Fittings and Valves shall have M.J. Anchoring Couplings, Flanged Joints or Mechanical Restrained Retainer Glands.
6. Fire Hydrants shall have No More Than One Extension - 18" Maximum.
7. All Concrete Blocking shall be Minimum 2000 psi.

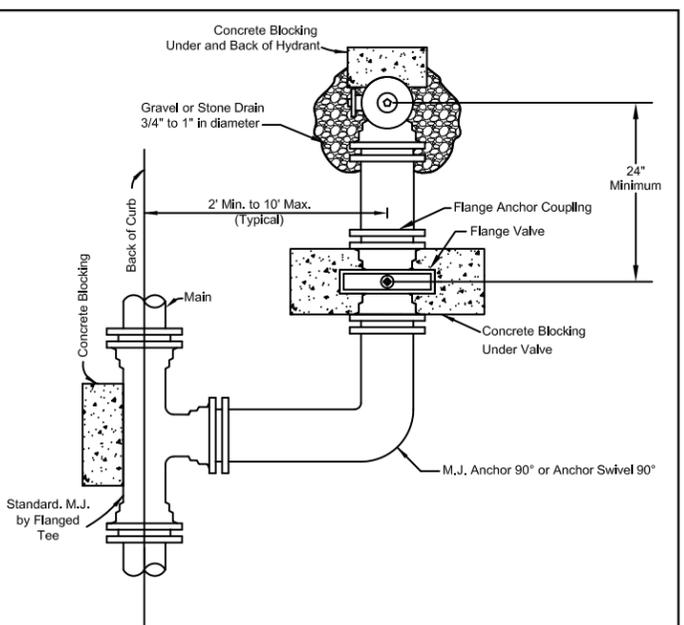
MESQUITE TEXAS Public Works FIRE HYDRANT GENERAL DESIGN STANDARDS STANDARD DETAILS SCALE: N.T.S. SHEET: W-9 REVISION DATE: 11/11/2019



**Notes:**

1. FIRE HYDRANTS SHALL NOT BE INSTALLED IN SIDEWALKS OR OVERHANG SIDEWALKS (ADA REQUIREMENT)
2. FIRE HYDRANTS SHALL NOT BE PLACED WITHIN CURB RADIUS
3. FIRE HYDRANTS LOCATED BETWEEN STREET INTERSECTIONS SHALL BE PLACED AT A PROPERTY LINE (EXTENDED)
4. FIRE HYDRANT LEADS SHALL HAVE EMBEDMENT AND BACKFILL THE SAME AS WATER MAIN EMBEDMENT
5. ALL FITTINGS AND VALVES SHALL HAVE M.J. ANCHORING COUPLINGS, FLANGED JOINTS OR MECHANICAL RESTRAINED RETAINER GLANDS
6. FIRE HYDRANTS SHALL HAVE NO MORE THAN ONE EXTENSION - 18" MAXIMUM
7. ALL CONCRETE BLOCKING SHALL BE MINIMUM 2000 PSI
8. IF HYDRANT LEAD EXTENDS UNDER ARTERIAL ROADWAY, AN ADDITIONAL VALVE SHALL BE INSTALLED AT THE TEE.

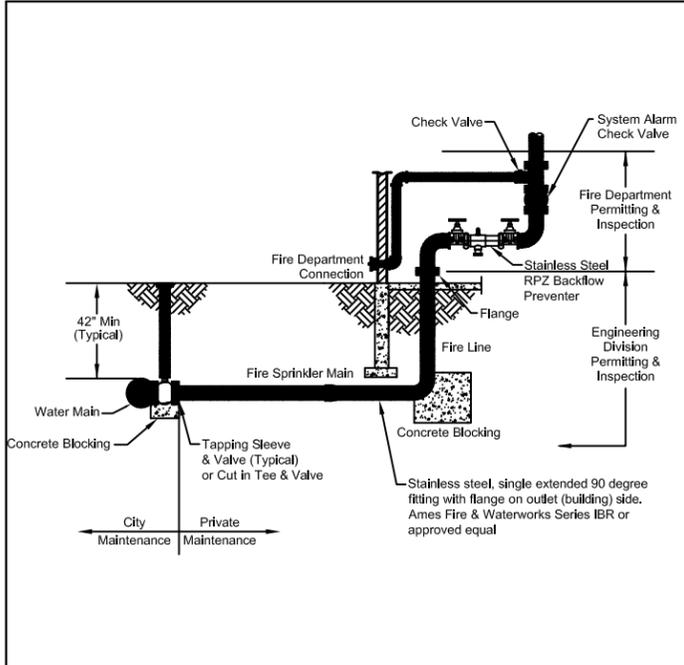
MESQUITE TEXAS Public Works FIRE HYDRANT (STRAIGHT) GENERAL DESIGN STANDARDS STANDARD DETAILS SCALE: N.T.S. SHEET: W-10 REVISION DATE: 05/20/2019



**Notes:**

1. Fire Hydrants shall not be Installed in Sidewalks or Overhang Sidewalks (ADA Requirement).
2. Fire Hydrants shall not be Placed Within Curb Radius.
3. Fire Hydrant Located Between Street Intersections Shall be Placed at a Property Line (Extended).
4. Fire Hydrant Leads shall have Embedment & Backfill the Same as Water Main Embedment.
5. All Fittings and Valves shall have M.J. Anchoring Couplings, Flanged Joints or Mechanical Restrained Retainer Glands
6. Fire Hydrants shall have No More Than One Extension - 18" Maximum.
7. All Concrete Blocking shall be Minimum 2000 psi.

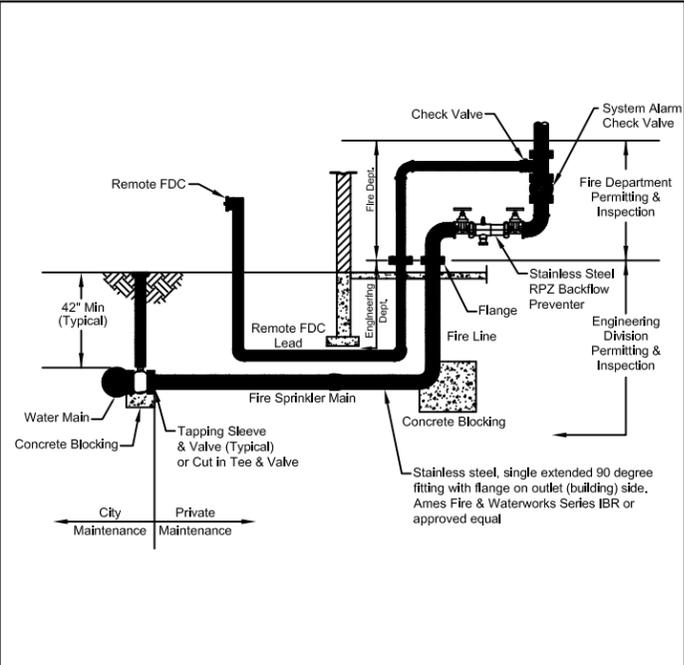
MESQUITE TEXAS Public Works FIRE HYDRANT (90 BEND) GENERAL DESIGN STANDARDS STANDARD DETAILS SCALE: N.T.S. SHEET: W-11 REVISION DATE: 05/20/2019



**Notes:**

1. All Fittings Must be Mechanically Anchored & Blocked.
2. All Below Grade / Ground construction is Permitted & Inspected by the Engineering Division (Including Remote FDC).
3. All Above Grade / Ground Construction is Permitted & Inspected by Fire Department.
4. All Concrete Blocking shall be Minimum 2000 psi.
5. Underground Test Reports are Required for Fire Sprinkler Lead and FDC by a Licensed Installer.

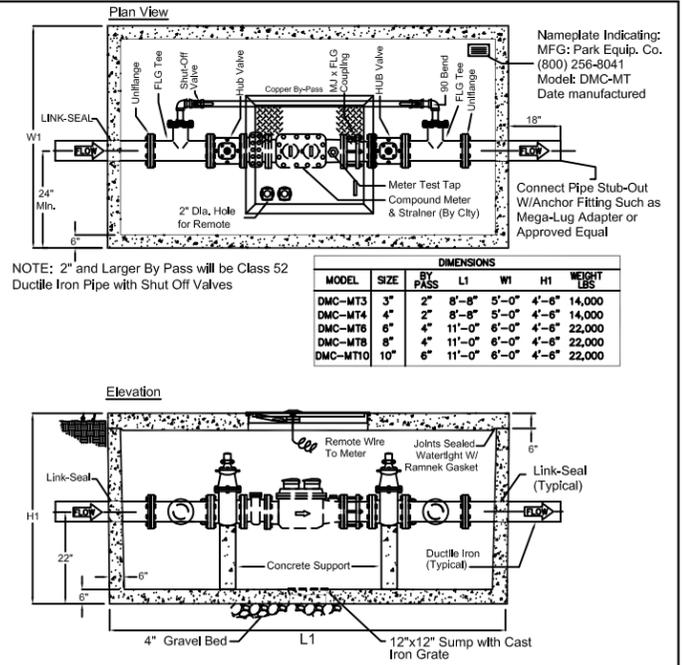
MESQUITE TEXAS Public Works FIRE SPRINKLER YARD PIPING GENERAL DESIGN STANDARDS STANDARD DETAILS SCALE: N.T.S. SHEET: W-13 REVISION DATE: 05/20/2019



**Notes:**

1. All Fittings Must be Mechanically Anchored & Blocked.
2. All Below Grade / Ground construction is Permitted & Inspected by the Engineering Division (Including Remote FDC).
3. All Above Grade / Ground Construction is Permitted & Inspected by Fire Department. (Including Remote FDC that Remains in the Building and Above Ground)
4. All Concrete Blocking shall be Minimum 2000 psi.
5. Underground Test Reports are Required for Fire Sprinkler Lead and FDC by a Licensed Installer.

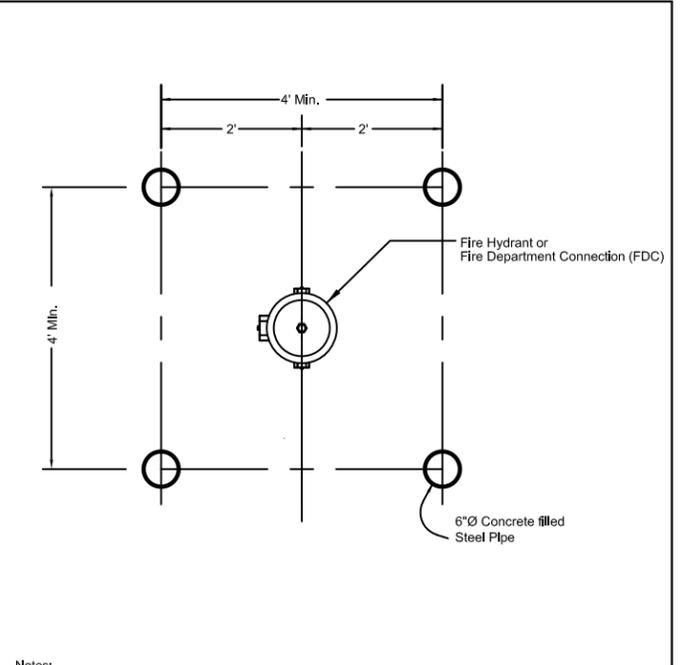
MESQUITE TEXAS Public Works REMOTE FDC AND FIRE LINE GENERAL DESIGN STANDARDS STANDARD DETAILS SCALE: N.T.S. SHEET: W-14 REVISION DATE: 05/20/2019



**Notes:**

1. Vault Concrete: Class 1 Concrete with Design Strength of 4500 PSI at 28 Days. Unit is of Monolithic Construction at Floor and First Stage of Wall with Sectional Riser Depth.
2. Vault Reinforcement: Grade 60 Reinforced. Steel Rebar Conforming to ASTM A615 on Required Centers or Equal.
3. Vault Hatchway: 36" x 36" Aluminum hatchway (BILCO PCM-4). Hinged 1/2" Aluminum Diamond Plate Cover, with 1/2" Extruded Aluminum Frame. Hatch to be Furnished with 316 Stainless Steel Snap Lock & Brass Hinges.

MESQUITE TEXAS Public Works 3" THRU 10" DOMESTIC TURBINE WATER METER ASSEMBLY GENERAL DESIGN STANDARDS STANDARD DETAILS SCALE: N.T.S. SHEET: W-15 REVISION DATE: 05/20/2019



**Notes:**

1. Bollards are not a Substitute for Proper Traffic Flow Layout and should be used Only After Options for Relocation of Hydrant Have Proved Infeasible.
2. Bollards shall only be Used in Low Speed Areas Where Speed Limit is 10 MPH or Lower (Such as Around Loading Docks and in Parking Lots).
3. Bollards shall not be Used in City Street Right-of-Way or Alley Right-of-Way.
4. 5' of Bollard shall Extend Above Paving to Allow Viewing of Bollard in Rear View Mirrors.
5. 6" Diameter Steel Pipe, Schedule 40, 0.28" Wall Thickness, Filled with Concrete.
6. 8' Length (5' Above Paving, 3' Below Paving), Set 18" Diameter Pier.
7. Bollard shall be Painted Yellow.

MESQUITE TEXAS Public Works FIRE HYDRANT BOLLARD GENERAL DESIGN STANDARDS STANDARD DETAILS SCALE: N.T.S. SHEET: W-16 REVISION DATE: 05/20/2019

GENERAL NOTES FOR WASTEWATER MAINS AND RELATED APPURTENANCES:

1. GENERAL:
  - 1.1. All sanitary sewer system improvements in the City of Mesquite, both privately and publicly maintained shall be designed and constructed in accordance with the City of Mesquite Engineering Design Standards.
  - 1.2. All sanitary sewer system design and construction shall conform to the most current Texas Commission on Environmental Quality (TCEQ) regulations. These regulations can be found in the Texas Administrative Code (TAC), Title 30, Chapter 217, Subchapter C (Design Criteria for Domestic Wastewater Systems).
2. SANITARY SEWER MAINS:
  - 2.1. Sanitary sewer mains are generally placed in the parkway, 6 feet back of curb, unless otherwise approved by the City Engineer.
  - 2.2. Trench boxes shall be required for construction of mains where adequate clearance from streets or primary structures cannot be achieved. Adequate clearance is defined as a distance from the pavement / structure equal to the depth of the trench.
  - 2.3. The spacing and separation of water mains from sanitary sewer mains shall follow the nine (9) foot rule as set forth in the TCEQ regulation (30 TAC 217.53). Water and sanitary sewer mains (including manholes) shall be separated by nine feet in all directions and installed in separate trenches.
  - 2.4. Warning tape shall be installed 18 inches above the top of the embedment or as otherwise directed by the Public Works Construction Inspector. The tape shall be a plastic, high stretch, 4 inch width tape approved by the City Engineer. The tape shall be green in color and have the words "Caution Sanitary Sewer Main Buried Below" imprinted on the tape.
  - 2.5. Private sanitary sewer mains and laterals shall be designed, permitted and inspected per the International Plumbing Code; generally private systems are permitted and inspected by the City Building Inspection Division.
3. SERVICE LATERALS
  - 3.1. Service laterals shall be located ten (10) feet downstream of the water service for the lot (water service generally to be located at the centerline of the lot), and plugged suitable for testing.
  - 3.2. All sanitary sewer services are to have a minimum cover of three (3) feet and a maximum cover of five (5) feet as measured at the property line or easement line from the proposed grade to top of pipe. In general, the minimum depth for sewer to serve given property with a 4-inch lateral shall be 3-feet plus 2% times the length of the lateral to the middle of the structure. Services that are longer than 100 feet from the main and larger buildings may require a deeper service line and may request an exemption by the City Engineer from the maximum cover requirements. **No services shall be connected to mains over 15 feet deep as measured from the proposed ground elevation to the main flowline.**
  - 3.3. Contractor shall install a property line cleanout per the City of Mesquite General Design Details if required by the City Engineer. Contractor shall not install double service cleanouts in concrete paving.
  - 3.4. Service fittings shall be a tee or wye fitting to be installed on the main. Saddle services are not allowed for new construction.
  - 3.5. Each individual service location shall be marked on the face of the curb with a four (4) inch high and 1/8" deep double scribe mark "II" cut in the curb using an approved motor driven concrete saw. The double scribe mark "II" shall receive a coating of green paint, which shall coat the interior and exterior of the cut to a width of one (1) inch.

4. MANHOLES

4.1. Manhole wall thickness shall conform to the following table:

MANHOLE DIAMETER	MINIMUM WALL THICKNESS (PRE-CAST)	MINIMUM WALL THICKNESS (CAST-IN PLACE)
4 FEET	5"	6"
5 FEET	6"	8"
6 FEET	8"	8"
> 6 FEET AND/OR SPECIAL CONDITIONS AND SITUATIONS	AS REQUIRED BY CITY ENGINEER	

- 4.2. Drop Manholes shall be installed if there is an incoming line with a vertical drop of more than two (2) feet measured from flowline to flowline. All drops manholes shall be internal and conform to City of Mesquite standard details. Drop manholes shall have a minimum diameter of five (5) feet. Existing manholes that have drops installed may terminate the drop pipe at the invert ledge.
- 4.3. The top of a manhole located in a floodplain area shall have a minimum elevation of the ultimate 100 year water surface elevation and shall be a minimum of 2-feet and a maximum of 3-feet above the adjacent grade. The tops of all other manholes shall be set to the grade of adjacent land or paving.
- 4.4. The excavation within 6-feet of a manhole shall be backfilled with crushed concrete flexible base (TxDOT, Item 247, Grade 1, Type D) compacted to 95% of Standard Proctor Density (ASTM D698) at a moisture range of 0% to plus 6% of optimum moisture. Pre-cast manholes shall be used on all new construction unless an alternate is approved by the City Engineer.
- 4.5. MANHOLE MATERIALS
  - 4.5.1. Pre-cast concrete shall conform to current ASTM designation C 478 (C 478M). Lifting eyes are not allowed in pre-cast manholes. "T" base manholes may be substituted with the City Engineer's approval for pre-cast manholes for RCP mains larger than 36 inches in diameter. Shop drawing shall be submitted to the City Engineer for all pre-cast manholes.
  - 4.5.2. Cast-in-place concrete manholes shall only be allowed with special permission of the City Engineer. Generally the City Engineer will only grant permission for cast-in-place manholes for connections to existing mains carrying live sewer. When cast-in-place manholes are approved by the City Engineer, construction must conform to City of Mesquite Engineering Design Standards. Manholes must have a concentric top cone section. Eccentric cone manholes may be used in situations where conflicts with other facilities warrant it.
  - 4.5.3. Brick or fiberglass manholes or any other type of manhole material other than concrete will not be allowed.
- 4.6. All rings shall be bolted to the manhole cone section with a layer of mastic applied between the ring and cone section.
- 4.7. All manhole ring and covers on manholes with a connecting sanitary sewer main size of 15-inches or larger shall be coated with a City approved structural / high sulfide resistant coating (see City of Mesquite Approved Sewer Materials List).
- 4.8. Manhole rings and covers shall be adjusted by the use of approved grade rings with butyl sealant between grade rings, cover ring and manhole. Maximum adjustment is eight (8) inches. Grade rings may be HDPE or Rubber as shown on the City of Mesquite Approved Sewer Materials List and in accordance with NCTCOG Public Works Construction Standard 502.1.2. Precast concrete grade rings, bricks, steel, iron or and broken concrete are not acceptable for adjustment.
- 4.9. All manholes shall have full depth inverts to the depth of the largest entering main.
- 4.10. Manhole Ring Sealing to Manhole Cone/Flat Top: All manholes rings shall be sealed and contain an internal manhole chimney seal or approved external seal or wrap as shown on the City of Mesquite Approved Sewer Materials List.
- 4.11. False Bottoms: All manholes shall have a ¾ inch thick plywood false bottom installed prior to initiation of grading and/or liming operations.
- 4.12. Manhole Coatings: All manholes with a connecting pipe of fifteen (15) inches in diameter or larger shall be coated. Manholes shall be coated with a City approved structural/high sulfide resistant coating (see City of Mesquite Approved Sewer Materials List). Coating application procedures shall conform to the recommendations of the coating manufacturer, including material handling, mixing, and environmental controls during application, safety, and equipment.
- 4.13. Manhole Testing: Manhole testing shall be in accordance with section 5.3.
- 4.14. Location Marking: Each manhole shall be marked on the face of the curb with a four (4) inch high and 1/8" deep mark "MH" cut in the curb using an approved motor driven concrete saw. The double mark "MH" shall receive a coating of green paint, which shall coat the interior and exterior of the cut to a width of one (1) inch.
- 4.15. Main Line Cleanouts: Main line cleanouts are to be located and installed as per approved drawings and City of Mesquite Engineering Design Standards. Each cleanout shall be marked on the face of the curb with a four (4) inch high and 1/8" deep mark "CO" cut in the curb using an approved motor driven concrete saw. The double mark "CO" shall receive a coating of green paint, which shall coat the interior and exterior of the cut to a width of one (1) inch.
- 4.16. Manhole Stub Outs: Stub outs from manholes shall be a minimum five (5) foot long and capped.
- 4.17. Manholes located in floodplain or in middle of field shall have a minimum 5' tall marker attached to manhole lid.

5. INSTALLATION AND CONSTRUCTION

- 5.1. Installation of all sanitary sewer shall conform to North Central Texas Council of Governments (NCTCOG) Standard Specifications for Public Works Construction Items 505.1 and 507 except as amended in these standards.
- 5.2. Excavation in general, shall be made in open cut from the surface of the ground and shall be no greater in width and depth than is necessary to permit the proper construction of the work. When the trench depth exceeds five (5) feet, see Section 6.2 regarding "trench safety" requirements. The amount of trench excavation to grade shall not exceed one hundred (100) feet from the end of the pipe laying operations and no excavation shall be three hundred (300) feet in advance of the completed pipe operations (includes backfilling). At the end of the workday, all trench excavation shall be backfilled. Any landscaping and irrigation system within the City medians and right-of-ways that is disturbed, removed, or damaged during construction shall be replaced to original condition or better by a licensed irrigator.
- 5.3. Backfill and Compaction: For trenches not under paving, final backfill material shall be from the trench excavation placed in a maximum of 12 inch loose lifts and compacted to 95% of Standard Proctor Density (ASTM D698) at a moisture range of 0% to plus 6% of optimum moisture. Under existing or proposed paving (public/private sidewalks, streets, alleys, driveways, etc.), backfill shall be crushed concrete flexible base (TxDOT, Item 247, Grade 1, Type D) compacted to 95% of Standard Proctor Density (ASTM D698) at a moisture range of 0% to plus 6% of optimum moisture unless alternate material is approved by the City Engineer. The contractor shall take new proctors at each change in soil type. Water jetting will not be allowed for any trench.

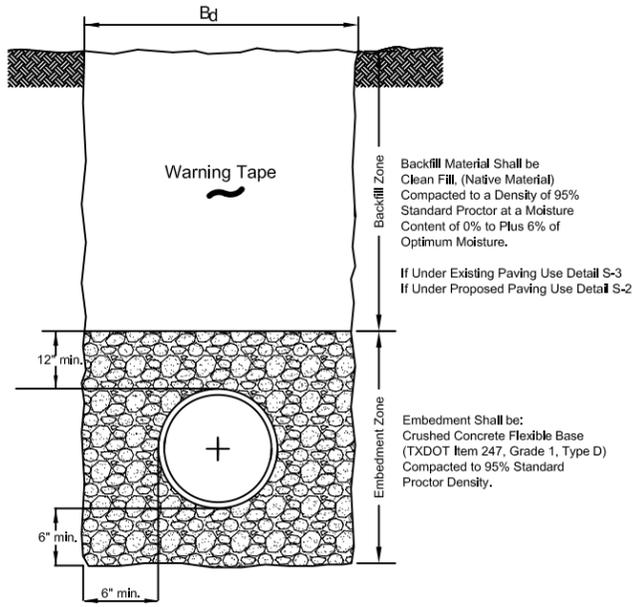
6. TESTING

- 6.1. Notification of Testing: The Contractor shall notify the assigned City Public Works Construction Inspector of all testing 24 hours prior to the scheduled test. Copies of all test reports shall be sent to the City Public Works Construction Inspector for review and acceptance and inclusion in the City project file. Projects will not receive City acceptance until all test results are complete and satisfactory.
- 6.2. Compaction of Trenches and Excavations: The Contractor shall take nuclear gauge density tests per ASTM D2922 at a frequency of one test per lift, per 300 linear feet of trench (including services) at locations specified by the City Public Works Inspector. In addition to the above trench density tests, two nuclear gauge density tests per ASTM D2922 shall be taken of the manhole backfill within 4 foot of the manhole. Density tests must meet a

minimum compaction of 95% of Standard Proctor Density (ASTM D698) at a moisture range of 0% to plus 6% of optimum moisture.

- 6.3. Manhole Testing: All manholes shall be vacuum tested including grade rings and casing per NCTCOG Public Works Construction Standard 502.1.5.2 and meet TCEQ regulations 30 TAC 217 and ASTM C1244, "Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill". The time for the vacuum to drop from 10 inches of mercury to 9 inches shall not be less than two (2) minutes.
- 6.4. Deflection Testing: Mains less than thirty six (36) inches in diameter shall pass deflection mandrel test per NCTCOG Standard Specifications for Public Works Construction, Item 507.5.1.4 Flexible Pipe (Deflection) Testing and TCEQ regulations Chapter 217.57(b) Deflection Testing. Alternate methods for measuring deflection for pipes larger than thirty six (36) inches in diameter subject to City approval. Testing of mains thirty six (36) inches and larger shall occur at least 30 days after installation and backfill. Pipe with deflection exceeding the percentage allowed deflection per NCTCOG table 507.5.1.4.2(a) at the time of testing shall be uncovered and reinstalled. If deflection exceeds 7% at the time of testing, pipe shall be removed and replaced with new materials. All failed joints, pipes, sections or structures shall be retested upon completion of remedial actions. Failed sections shall be retested after the remedial construction has been in place for 30 days.
- 6.5. Air Testing: Mains less than thirty six (36) inches in diameter and laterals shall pass a Low Pressure Air Test per NCTCOG Standard Specifications for Public Works Construction, Item 507.5.1.3 Low Pressure Air Testing and TCEQ regulations 30 TAC Chapter 217.57(a)(1) Low Pressure Air Test. Pipes 36-inches and larger may be tested per NCTCOG item 507.5.1.3.3 (individual joint air test method). Testing of mains thirty six (36) inches and larger shall occur at least 30 days after installation and backfill. All failed joints, pipes, sections or structures shall be retested upon completion of remedial actions. Failed sections shall be retested after the remedial construction has been in place for 30 days.
- 6.6. TV Camera Inspection: After the deflection mandrel and air pressure test, the contractor shall conduct a color television camera inspection of the interior of the installed sanitary sewer system. The main must be laced with enough water to fill any low points. A copy of the recording in digital format and storage device (DVD disk, flash drive, etc.) as specified by the City, with written log of the inspection, shall be provided to the Public Works Construction Inspector prior to final acceptance of the project.

GENERAL DESIGN STANDARDS STANDARD DETAILS	
SCALE: N.T.S.	SHEET:
REVISION DATE: 11/11/2019	WW-GN



Backfill Material Shall be Clean Fill. (Native Material) Compacted to a Density of 95% Standard Proctor at a Moisture Content of 0% to Plus 6% of Optimum Moisture.

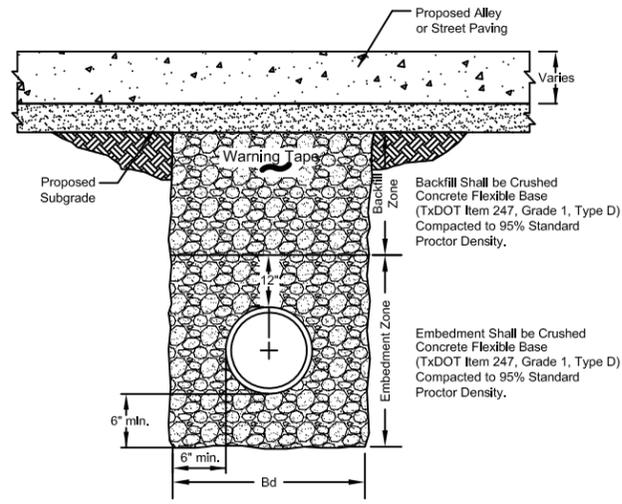
If Under Existing Paving Use Detail S-3  
If Under Proposed Paving Use Detail S-2

Embedment Shall be: Crushed Concrete Flexible Base (TXDOT Item 247, Grade 1, Type D) Compacted to 95% Standard Proctor Density.

Pipe Size	Max Bd
12" & Smaller	32"
12" to 24"	Outside Dia. Pipe + 16"
24" to 72"	Outside Dia. Pipe + 24"

- Notes:
- See Sewer System Improvements Notes for Design & Construction Requirements.
  - Warning Tape Shall be Placed Approximately 24" Above Top of Pipe.

**MESQUITE TEXAS** Public Works  
**WASTEWATER EMBEDMENT (NOT UNDER PAVING)**  
 GENERAL DESIGN STANDARDS STANDARD DETAILS  
 SCALE: N.T.S. SHEET: WW-1  
 REVISION DATE: 04/13/2020



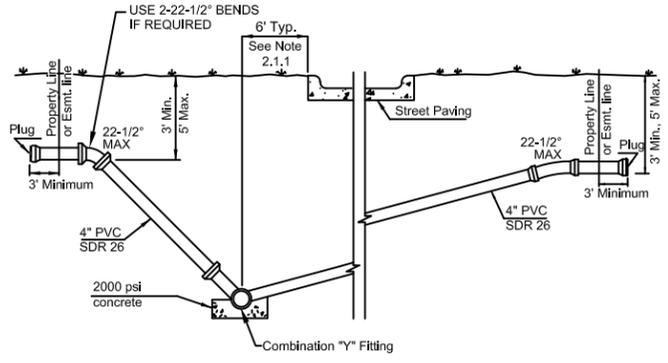
Backfill Shall be Crushed Concrete Flexible Base (TXDOT Item 247, Grade 1, Type D) Compacted to 95% Standard Proctor Density.

Embedment Shall be Crushed Concrete Flexible Base (TXDOT Item 247, Grade 1, Type D) Compacted to 95% Standard Proctor Density.

Pipe Size	Max Bd
12" & Smaller	32"
12" to 24"	Outside Dia. Pipe + 16"
24" to 72"	Outside Dia. Pipe + 24"

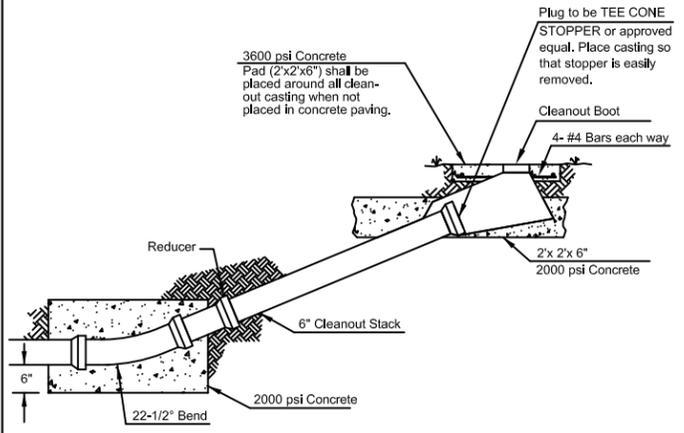
- Notes:
- See Sewer System Improvements Notes for Design & Construction Requirements.
  - Warning Tape Shall be Placed Approximately 24" Above Top of Pipe.

**MESQUITE TEXAS** Public Works  
**WASTEWATER EMBEDMENT (UNDER PAVING)**  
 GENERAL DESIGN STANDARDS STANDARD DETAILS  
 SCALE: N.T.S. SHEET: WW-2  
 REVISION DATE: 04/13/2020



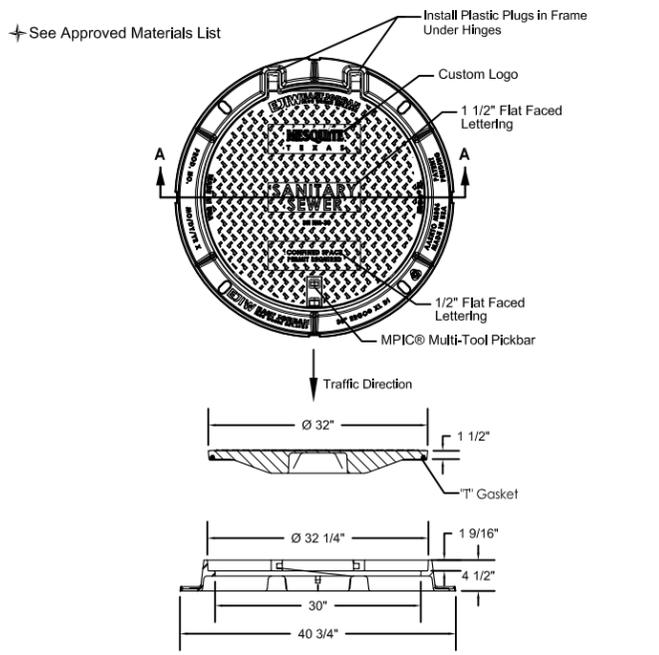
USE 2-22-1/2" BENDS IF REQUIRED  
 6" Typ. See Note 2.1.1  
 3' Minimum  
 5' Max.  
 22-1/2" MAX  
 3' Minimum  
 5' Max.

**MESQUITE TEXAS** Public Works  
**WASTEWATER LATERAL**  
 GENERAL DESIGN STANDARDS STANDARD DETAILS  
 SCALE: N.T.S. SHEET: WW-3  
 REVISION DATE: 05/20/2019



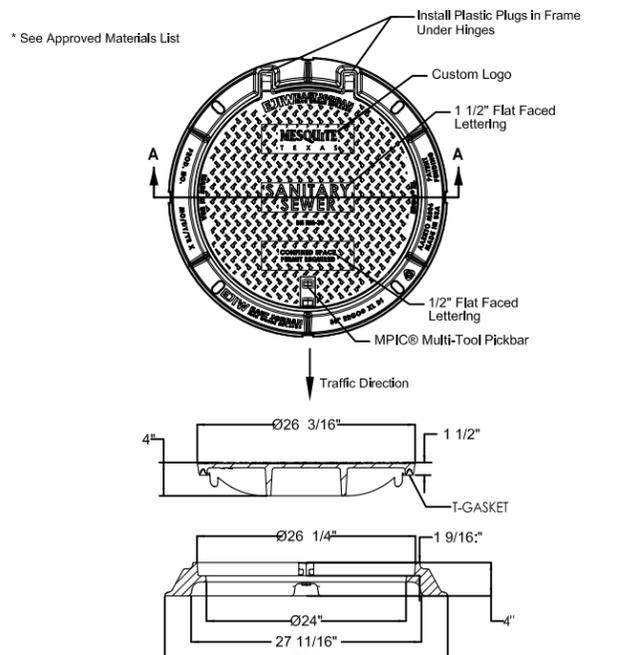
- NOTES:
- EMBEDMENT FOR LATERAL AND MAINLINE CLEANOUTS TO BE THE SAME AS THE MAINLINE.
  - MAINLINE CLEANOUTS SHALL ONLY BE USED AT THE DIRECTION OF THE CITY ENGINEER.

**MESQUITE TEXAS** Public Works  
**WASTEWATER MAINLINE CLEANOUT**  
 GENERAL DESIGN STANDARDS STANDARD DETAILS  
 SCALE: N.T.S. SHEET: WW-4  
 REVISION DATE: 05/20/2019



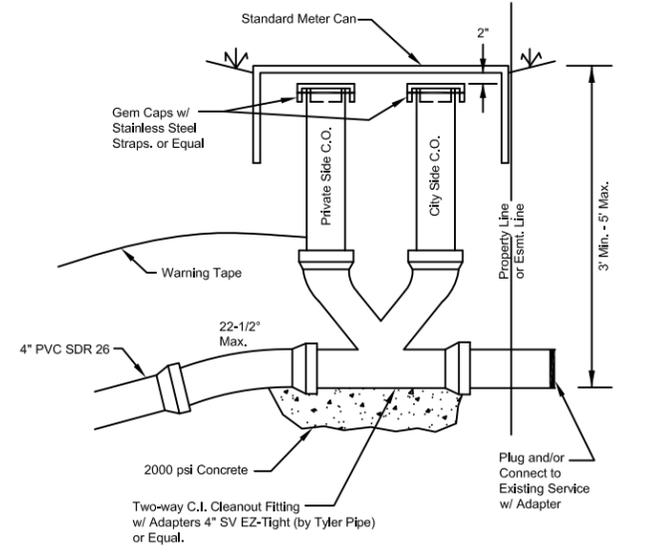
- Notes:
- Materials Shall be Ductile Iron ASTM A536 for Frame and Cover
  - Design Load Shall be Heavy Duty (HS-20)
  - Lid Shall be Oriented such that Pickbar is Oriented with Traffic Flow
  - Lid shall be bolted when in floodplain

**MESQUITE TEXAS** Public Works  
**WASTEWATER MANHOLE RING AND COVER (RETROFIT ONLY)**  
 GENERAL DESIGN STANDARDS STANDARD DETAILS  
 SCALE: N.T.S. SHEET: WW-5  
 REVISION DATE: 05/20/2019



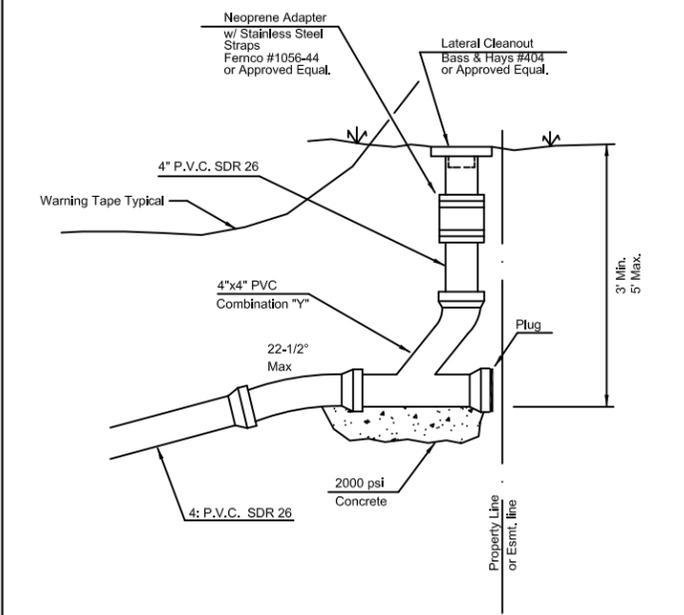
- Notes:
- Materials Shall be Ductile Iron ASTM A536 for Frame and Cover
  - Design Load Shall be Heavy Duty (HS-20)
  - Lid Shall be Oriented such that Pickbar is Oriented with Traffic Flow
  - Lid shall be bolted when in floodplain

**MESQUITE TEXAS** Public Works  
**WASTEWATER MANHOLE RING AND COVER (RETROFIT ONLY)**  
 GENERAL DESIGN STANDARDS STANDARD DETAILS  
 SCALE: N.T.S. SHEET: WW-6  
 REVISION DATE: 05/20/2019



Install only at the direction of the City Engineer.

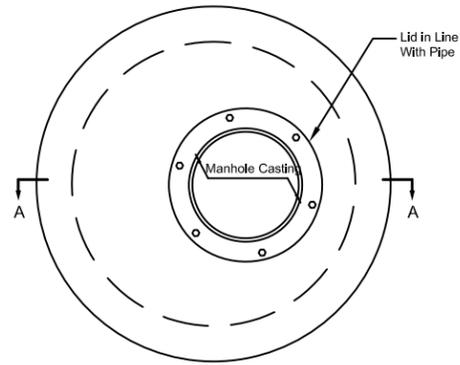
**MESQUITE TEXAS** Public Works  
**DOUBLE CLEANOUT**  
 GENERAL DESIGN STANDARDS STANDARD DETAILS  
 SCALE: N.T.S. SHEET: WW-7  
 REVISION DATE: 05/20/2019



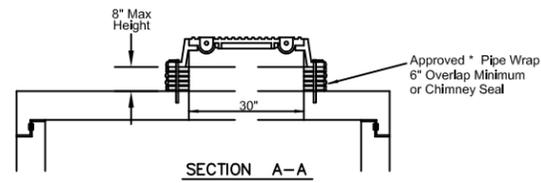
Install only at the direction of the City Engineer.

**MESQUITE TEXAS** Public Works  
**SINGLE CLEANOUT**  
 GENERAL DESIGN STANDARDS STANDARD DETAILS  
 SCALE: N.T.S. SHEET: WW-8  
 REVISION DATE: 05/20/2019





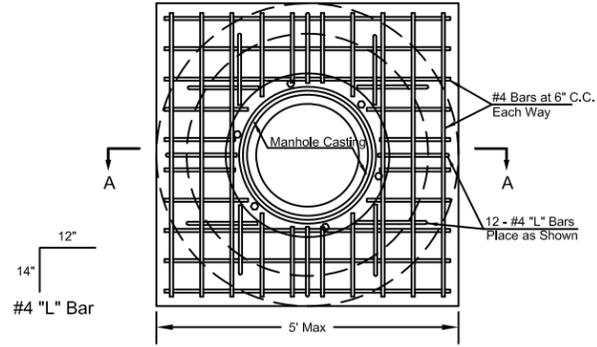
\* See Approved Materials List



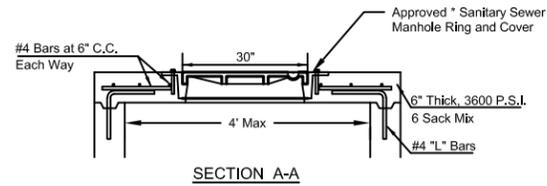
Notes:

1. Manhole Flat Lids Must be Load Rated for HS-20 Loadings.
2. See Cast-in-Place Manhole Detail for Additional Requirements.
3. Alternate: Ring and Cover May be Cast in to the Lid Per Detail S-16.

	Public Works	PRECAST FLAT MANHOLE LID	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S. REVISION DATE: 05/20/2019	SHEET: WW-17



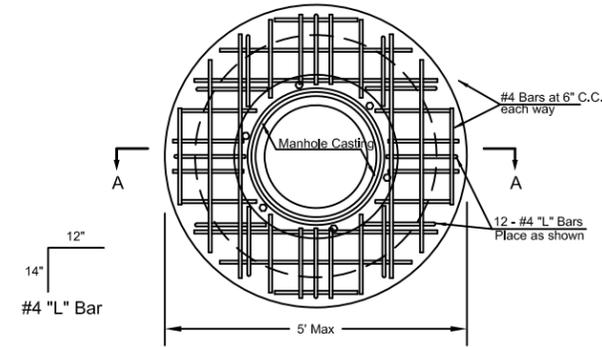
\* See Approved Materials List



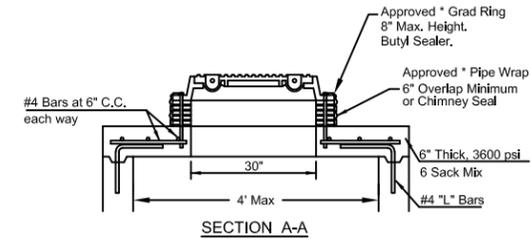
Notes:

1. Use Must be Approved by the City Engineer. For In Street Application Only.
2. Manhole Flat Lids Must be Load Rated for HS-20 Loadings.
3. See Cast-in-Place Manhole Detail for Additional Requirements.

	Public Works	CAST-IN-PLACE FLUSH MANHOLE LID	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S. REVISION DATE: 05/20/2019	SHEET: WW-18



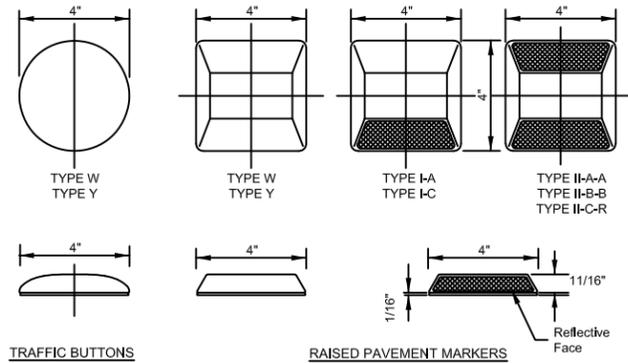
\* See Approved Materials List



Notes:

1. Use Must be Approved by the City Engineer.
2. For In Street Application Only
3. Manhole Flat Lids Must be Load Rated for HS-20 Loadings.
4. See Cast-in-Place Manhole Detail for Additional Requirements.

	Public Works	CAST-IN-PLACE MANHOLE LID	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S. REVISION DATE: 05/20/2019	SHEET: WW-19

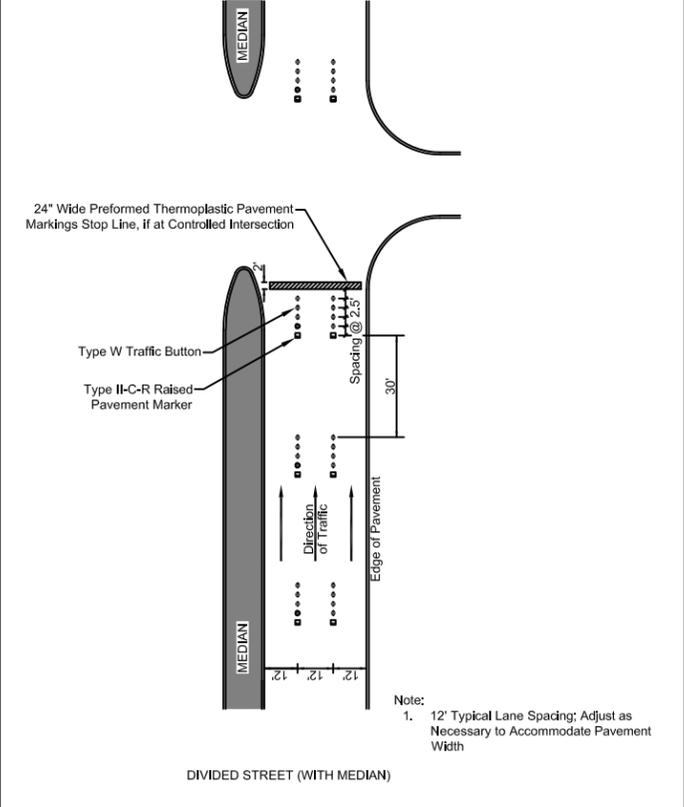


**REQUIREMENTS FOR INSTALLATION OF PAVEMENT MARKERS AND MARKINGS ON ALL PUBLIC ROW:**  
 UPDATED: 5-4-2012

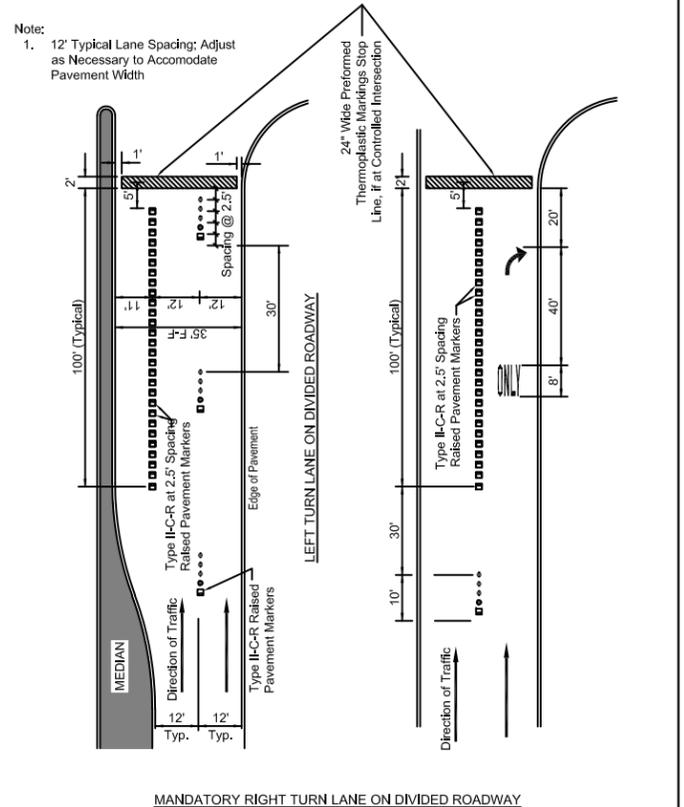
- REFLECTOR CODE: A - AMBER REFLECTOR, C - WHITE REFLECTOR, R - RED REFLECTOR, B - BLUE REFLECTOR
- PAVEMENT UPON WHICH TRAFFIC BUTTONS, PAVEMENT MARKERS, JIGGLE BAR TILES, THERMOPLASTIC AND PAINT ARE TO BE APPLIED SHALL HAVE ITS SURFACE PREPARED IN ACCORDANCE WITH TxDOT SPECIFICATIONS ITEM 677.1 TO 677.4 INCLUSIVE AND ITEM 678.1 TO 678.4 INCLUSIVE. MEASUREMENT AND PAYMENT FOR REMOVAL OF EXISTING PAVEMENT MARKINGS AND MARKERS AND SURFACE PREPARATION SHALL BE SUBSIDIARY TO THE PAVEMENT MARKINGS OR MARKER INSTALLATION PAY ITEMS.
- TRAFFIC BUTTONS, PAVEMENT MARKERS AND JIGGLE BAR TILES SHALL BE INSTALLED IN ACCORDANCE WITH TxDOT SPECIFICATION 672; HOWEVER ALL TRAFFIC BUTTONS, PAVEMENT MARKERS AND JIGGLE BAR TILES SHALL BE INSTALLED USING EPOXY ADHESIVE. USE OF BITUMINOUS ADHESIVE IS PROHIBITED. TYPE IC AND TYPE II-C RAISED PAVEMENT MARKERS MUST HAVE A WHITE COLORED BODY; A SILVER-WHITE BODY COLOR IS PROHIBITED.
- TYPE II-B (BLUE REFLECTORS) PAVEMENT MARKERS SHALL ONLY BE USED TO IDENTIFY FIRE HYDRANT LOCATIONS.
- RAISED PAVEMENT MARKERS AND TRAFFIC BUTTONS SHALL NOT BE INSTALLED OVER PAVEMENT JOINTS OF ANY KIND.
- THERMOPLASTIC SHALL BE INSTALLED PER TxDOT SPECIFICATIONS ITEM 666 AND / OR ITEM 668, AND CITY SPECIFICATIONS, WHICHEVER IS MORE RESTRICTIVE.
- DIMENSIONAL LAYOUT, SIZING AND SPACING FOR ALL TRAFFIC ARROWS, "ONLY" DESIGNATIONS, AND OTHER PAVEMENT MARKINGS SHALL CONFORM TO THE MOST RECENT FEDERAL HIGHWAY ADMINISTRATION (FHWA) STANDARD HIGHWAY SIGNS MANUAL AND THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD), PART 3.
- THERMOPLASTIC STOP BARS SHALL STOP 12-INCHES FROM FACE OF CURB.
- ALL PREFORMED THERMOPLASTIC PAVEMENT MARKING MATERIAL SHALL BE PER THE TRAFFIC APPROVED MATERIALS LIST OR AS APPROVED BY MANAGER OF TRAFFIC ENGINEERING.

**GUARDRAIL DELINEATORS:**  
 ALL CORRUGATED W-BEAM METAL GUARDRAIL INSTALLED IN THE CITY SHALL BE INSTALLED WITH TRIANGULAR GUARDRAIL REFLECTORS TABS (BOLT ON TYPE) OF THE APPROPRIATE COLOR INSTALLED IN THE CENTER OF THE CORRUGATED RAIL AT EACH POST BOLT, BUT NO LESS THAN EVERY 6-FEET.

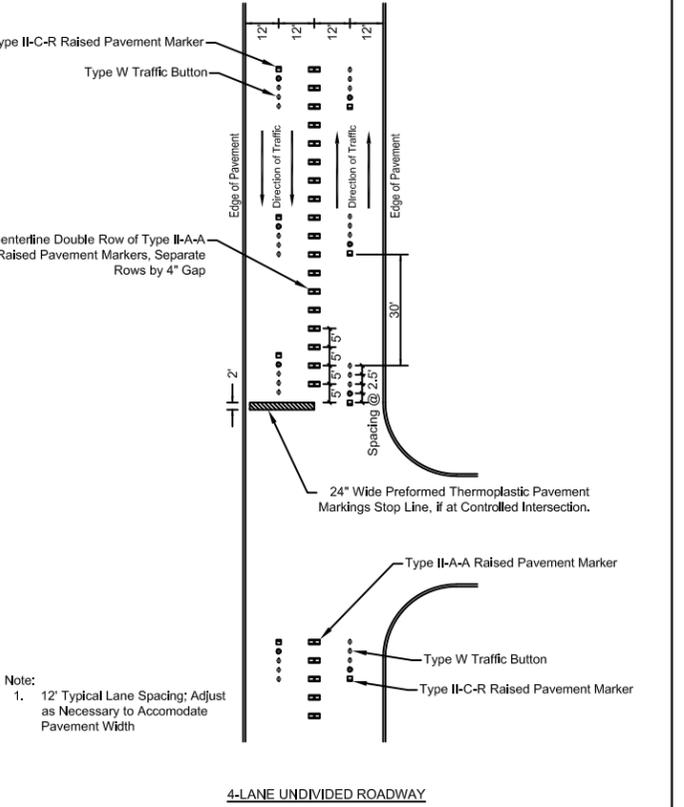
	Public Works	PAVEMENT MARKING	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: T-1A
			REVISION DATE: 05/20/2019	



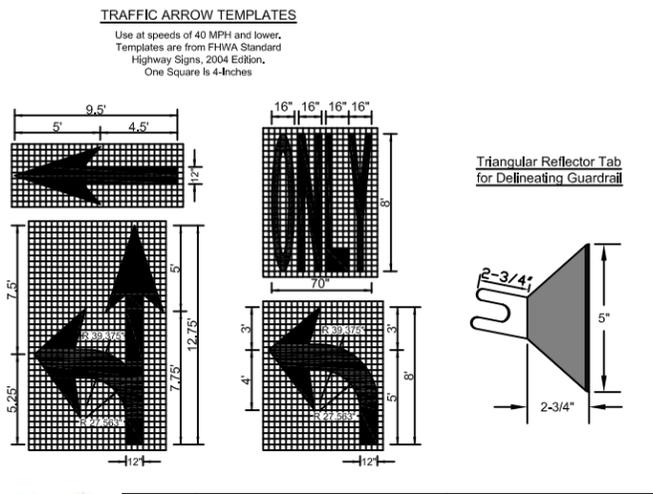
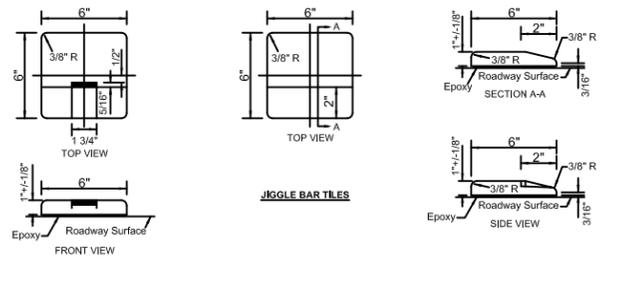
	Public Works	PAVEMENT MARKING	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: T-1B
			REVISION DATE: 05/20/2019	



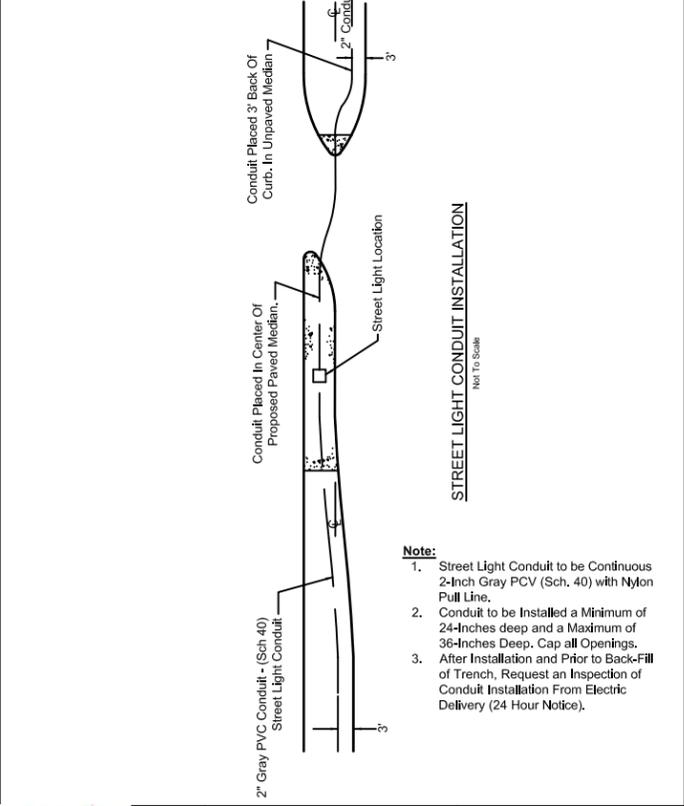
	Public Works	PAVEMENT MARKING	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: T-1C
			REVISION DATE: 05/20/2019	



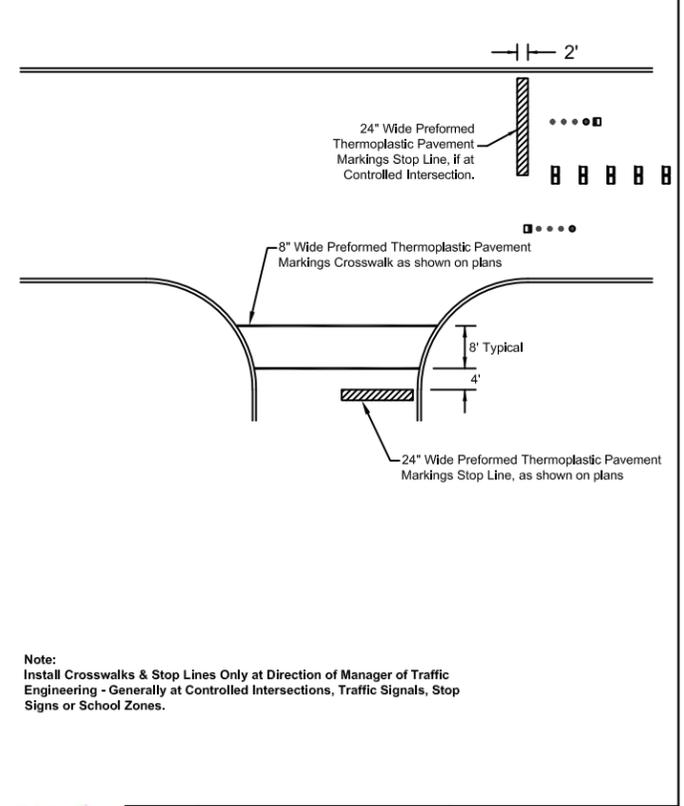
	Public Works	PAVEMENT MARKING	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: T-1D
			REVISION DATE: 05/20/2019	



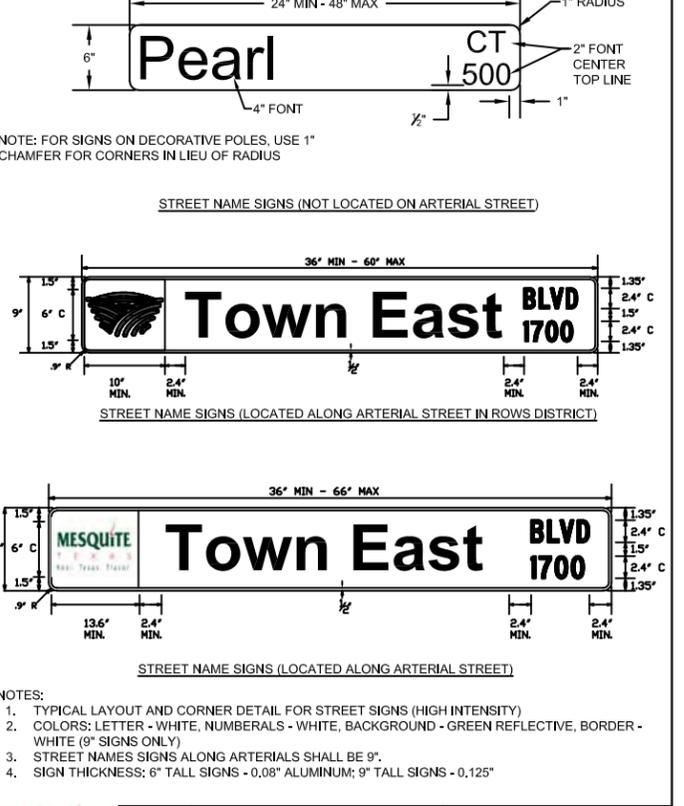
	Public Works	JIGGLE BARS & TRAFFIC ARROWS	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: T-5
			REVISION DATE: 05/20/2019	



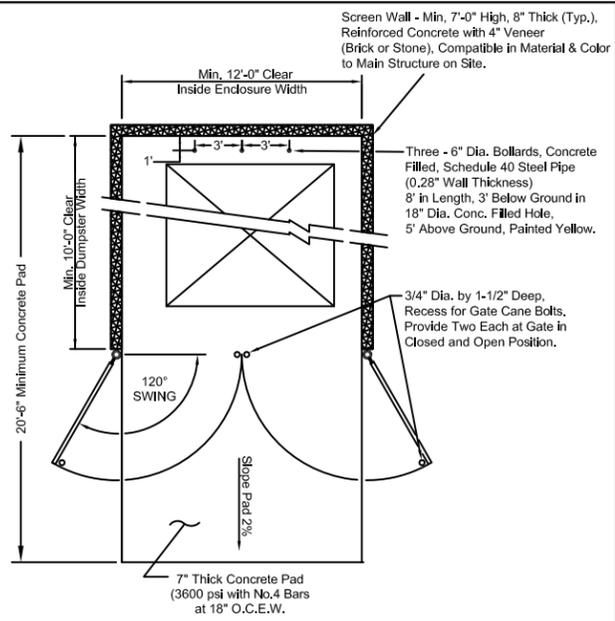
	Public Works	STREET LIGHTING CONDUIT	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: T-6
			REVISION DATE: 05/20/2019	



	Public Works	CROSSWALK PAVEMENT MARKING	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: T-7
			REVISION DATE: 05/20/2019	



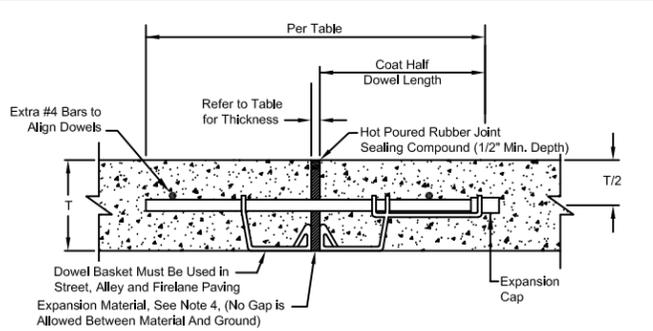
	Public Works	STREET NAME SIGN LAYOUT	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: T-8
			REVISION DATE: 05/20/2019	



**DUMPSTER ENCLOSURE NOTES:**

1. The solid waste container pad shall be a minimum of 20'-6" long by 14' wide (12-foot wide minimum internal dimension for the screening enclosure).
2. The solid waste container pad shall be constructed of 7" thick concrete (3,600 psi) reinforced with No. 4 steel reinforcing bars on 18" centers (both ways).
3. The solid waste container pad shall be poured with a 2% slope to prevent water from ponding within solid waste container enclosure.
4. The interior of the solid waste container enclosure shall have three bollards installed with one-foot clearance from the inside rear of the enclosure. The bollards shall be 6-inch diameter schedule 40 steel pipe (0.28" wall thickness), filled with concrete. The bollards shall be 8-feet in length with 3-feet buried below ground in an 18-inch diameter concrete filled hole and 5-feet above ground. The bollard shall be painted yellow.
5. The minimum inner dimension of the solid waste container enclosure opening must be 12-feet wide by 10-feet deep.

 <b>MESQUITE</b> TEXAS Real. Texas. Service.	<b>Public Works</b>	<b>DUMPSTER ENCLOSURE</b>	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S. REVISION DATE: 05/20/2019	SHEET: SW-1A

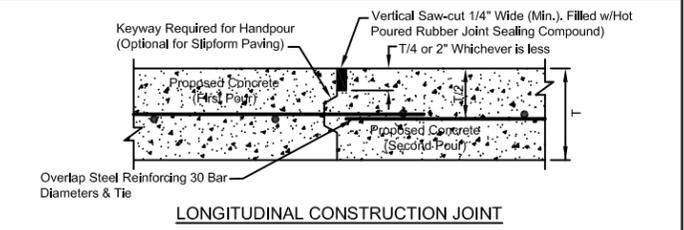


**EXPANSION JOINT**

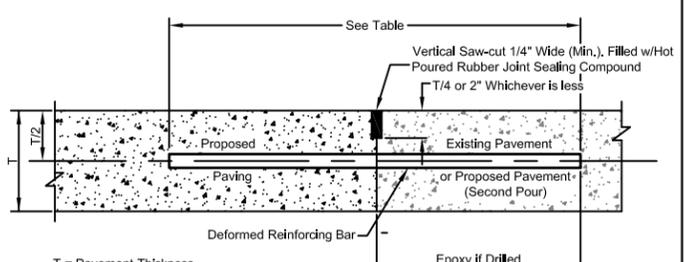
Smooth Dowel Bars				
Commercial Driveway, Street, Alley & Firelane Paving Thickness (In.)	Diameter (In.)	Length (In.)	Spacing (In.)	Expansion Joint Thickness
6	#8 (1 In.)	30	18	3/4"
> 6 and ≤ 12	#11 (1.4 In.)	30	12	3/4"
> 12	Determined by City Engineer			
Skewwalk, Residential Driveway and Trail Thickness (In.)				
4-6	#4 (1/2 In.)	24	12	1/2"

- NOTES:
- Expansion Cap for Dowels Shall have an Inside Diameter of 1/16" Greater than that of Dowel and be Designed to Provide Free Movement of the Dowel Bar.
  - Expansion Cap to Fit Dowel Min. 2" Embedment and Min. 1-1/4" Clearance from the Closed End of the Sleeve to the Dowel.
  - Expansion Joints Shall be Installed at a Maximum Distance of Six Hundred (600) Feet, and at Street Intersections Radii, PC's and PT's or as Otherwise Directed. No Expansion Joint Shall fall in a Driveway Approach or Inlet.
  - Expansion Material Per Approved Material List.
  - Dowel Bars to be Placed Parallel to Pavement at Spacing and Lengths per Table, Centered on Expansion Material. One Side of Dowel Bar Shall be Coated in Thin Film of Grease or Other Approved De-Bonding Material. Where Drilling of Dowel Bars is Required, it Shall be Done by an Approved Mechanical Rig.
  - Expansion Joints Shall Not be Placed At Pavement Grade Breaks.

MESQUITE TEXAS Public Works EXPANSION JOINTS GENERAL DESIGN STANDARDS STANDARD DETAILS SCALE: N.T.S. REVISION DATE: 11/11/2019 SHEET: P-1



**LONGITUDINAL CONSTRUCTION JOINT**

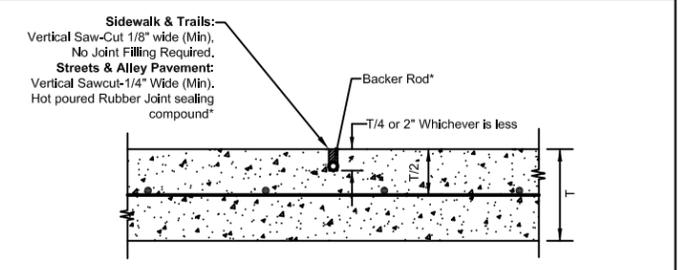


**TRANSVERSE CONSTRUCTION JOINT**

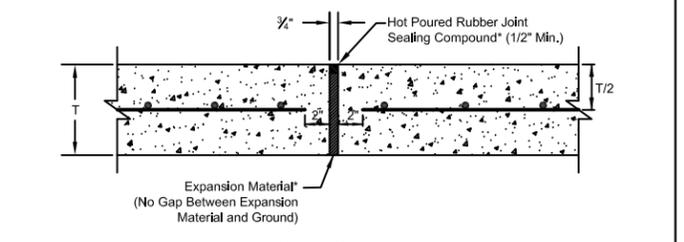
Deformed Reinforcing Bars			
Commercial Driveway, Street, Alley & Firelane Paving Thickness (In.)	Diameter (In.)	Length (In.) (L)	Spacing (In.)
< 8	#8 (1 In.)	30	18
≥ 8	#11 (1.4 In.)	30	12
Sidewalk, Residential Driveway and Trail Thickness (In.)			
4-6	#4 (.5 In.)	24	12

- NOTES:
- Dowel Bars to be Placed Parallel to Pavement at Spacing and Lengths per Table. Where Drilling of Dowel Bars is Required, it Shall be Done by an Approved Mechanical Rig.
  - Transverse Construction Joint can be used as Longitudinal Construction Joint in applications where new pavement is to be constructed or reconstructed next to old pavement.

MESQUITE TEXAS Public Works CONSTRUCTION JOINTS GENERAL DESIGN STANDARDS STANDARD DETAILS SCALE: N.T.S. REVISION DATE: 11/11/2019 SHEET: P-2



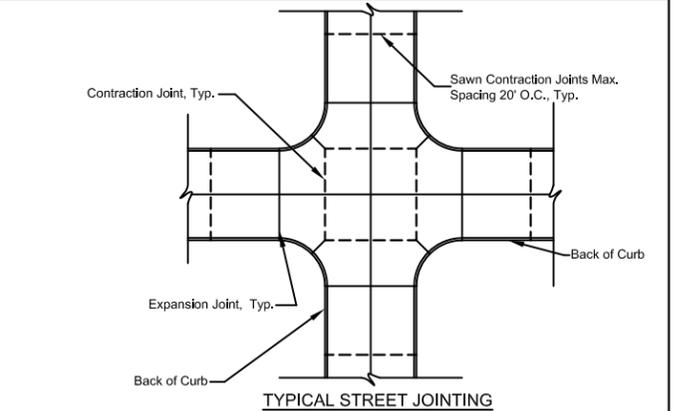
**SAWED CONTRACTION JOINT**



**ISOLATION JOINT**

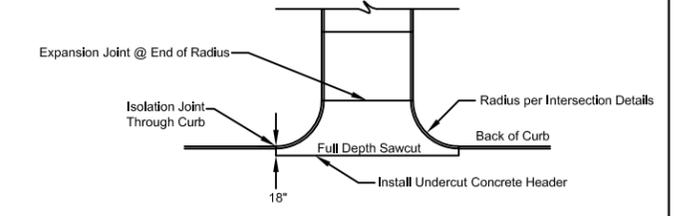
\* Refer Approved Materials List for recommended material.

MESQUITE TEXAS Public Works SAWED CONTRACTION & ISOLATION JOINT GENERAL DESIGN STANDARDS STANDARD DETAILS SCALE: N.T.S. REVISION DATE: 05/20/2019 SHEET: P-3



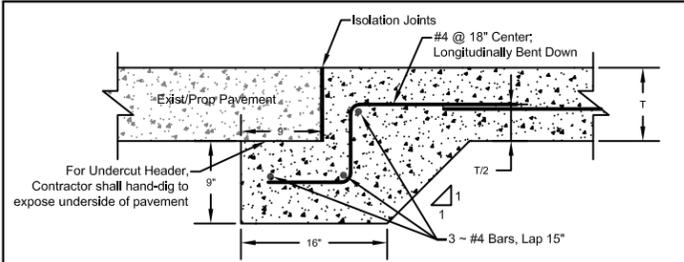
**TYPICAL STREET JOINTING**

- NOTE:
- All Concrete Placement Shall End in a Construction Joint, an Expansion Joint or a Concrete Header.
  - Sawed Contraction Joints are Required at Center Line and Lane Line on any Street Pavement Width Greater than 22.5 Feet (Back to Back of Curb).
  - Expansion Joints Shall be Installed at a Maximum Distance of Six Hundred (600) Feet and Street Intersections, PC's and PT's or as Otherwise Directed. No Expansion Joint Shall Fall in a Driveway Approach or Inlet.



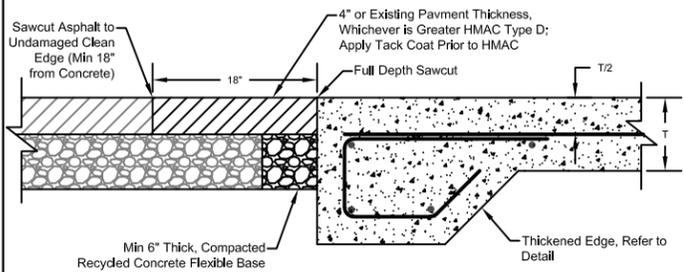
**EXISTING CONCRETE STREET TO NEW CONCRETE STREET TEE INTERSECTION**

MESQUITE TEXAS Public Works STREET JOINTING GENERAL DESIGN STANDARDS STANDARD DETAILS SCALE: N.T.S. REVISION DATE: 05/20/2019 SHEET: P-4



**CONCRETE HEADER**

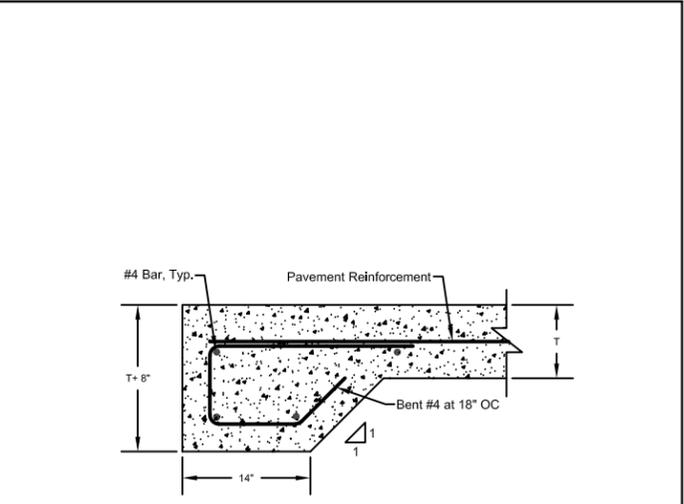
T = Pavement Thickness, Not Less than Street Pavement Depth or 8", whichever is greater



**CONCRETE TO ASPHALT HEADER**

- NOTES:
- Concrete Headers Shall be Continuous Along Existing or Phased Pavement when Adjacent to the New Pavement. Additional Locations can be Shown on the Plans or at the Discretion of the City Engineer.

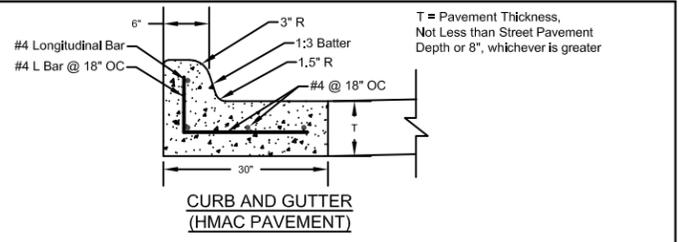
MESQUITE TEXAS Public Works TYPICAL HEADERS GENERAL DESIGN STANDARDS STANDARD DETAILS SCALE: N.T.S. REVISION DATE: 05/20/2019 SHEET: P-5



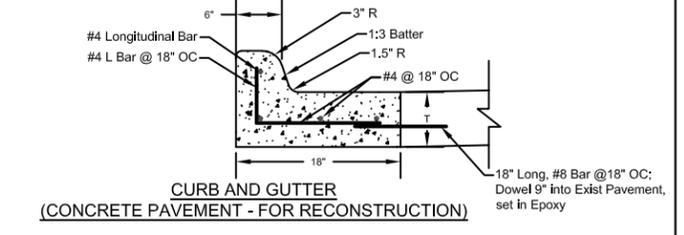
**THICKENED CONCRETE EDGE**

T = Pavement Thickness, Not Less than Street Pavement Depth or 8", whichever is greater

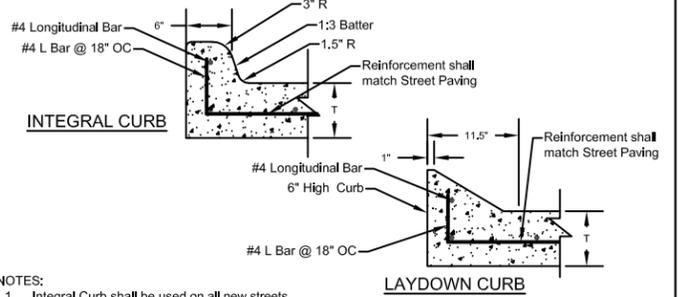
MESQUITE TEXAS Public Works THICKENED CONCRETE EDGE GENERAL DESIGN STANDARDS STANDARD DETAILS SCALE: N.T.S. REVISION DATE: 05/20/2019 SHEET: P-6



**CURB AND GUTTER (HMAC PAVEMENT)**



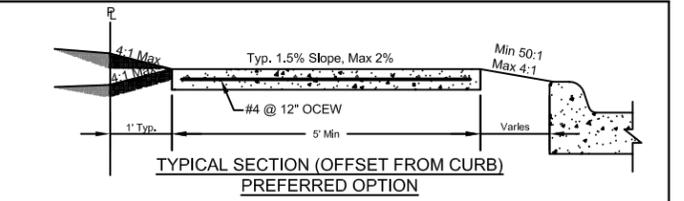
**CURB AND GUTTER (CONCRETE PAVEMENT - FOR RECONSTRUCTION)**



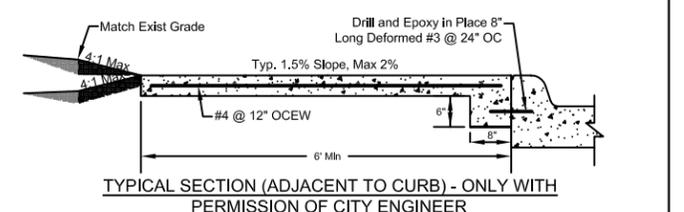
**INTEGRAL CURB**

- NOTES:
- Integral Curb shall be used on all new streets.
  - Any honeycomb present on backside of curb shall be filled in.

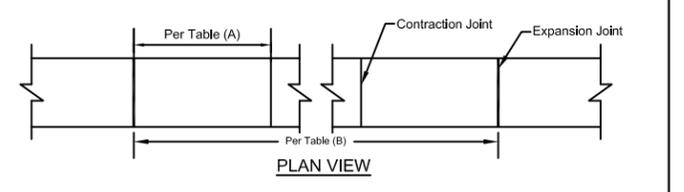
MESQUITE TEXAS Public Works TYPICAL CURB & GUTTER GENERAL DESIGN STANDARDS STANDARD DETAILS SCALE: N.T.S. REVISION DATE: 07/22/2019 SHEET: P-7



**TYPICAL SECTION (OFFSET FROM CURB) PREFERRED OPTION**



**TYPICAL SECTION (ADJACENT TO CURB) - ONLY WITH PERMISSION OF CITY ENGINEER**

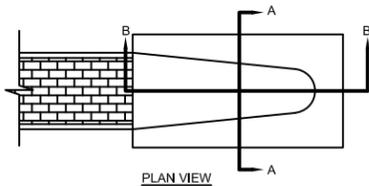


**PLAN VIEW**

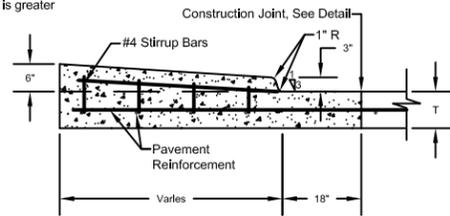
Type	Width	Thickness	Contraction Joint (A)	Expansion Joint (B)
Sidewalk	Min. 5' < 8'	4"	10' Spacing Tooled Joint	120' Max.
Trail - Hike & Bike	≥ 8'	6"	15' Spacing Sawcut	600' Max

- NOTES:
- Expansion Joints Shall be Placed at Maximum Intervals per Table and Shall also be Placed at each Lot Line
  - Expansion Joint is required between sidewalk and abutting concrete pavement. No expansion joint is required between sidewalk and adjacent street curb, For expansion joints on driveways, refer to P- 26 through P-29.
  - All Sidewalks shall drain positive.

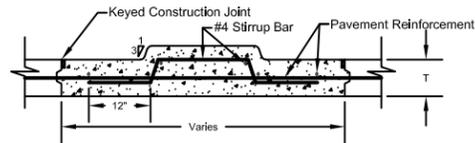
MESQUITE TEXAS Public Works PEDESTRIAN FACILITIES GENERAL DESIGN STANDARDS STANDARD DETAILS SCALE: N.T.S. REVISION DATE: 11/11/2019 SHEET: P-8



T = Pavement Thickness, Not Less than Street Pavement Depth or 8", whichever is greater



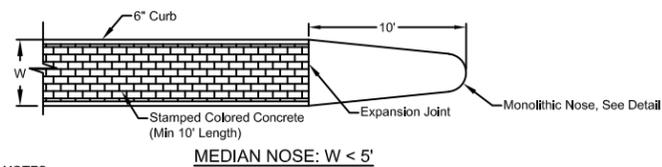
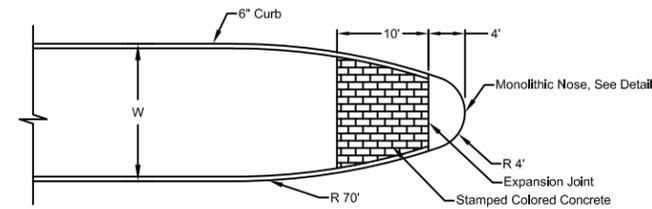
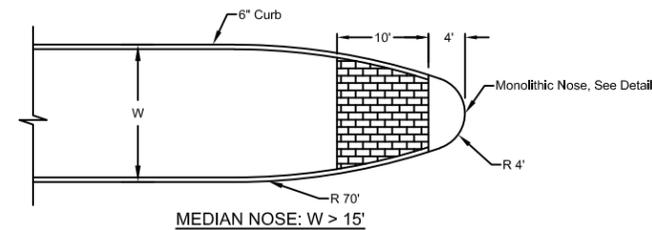
SECTION B-B



SECTION A-A

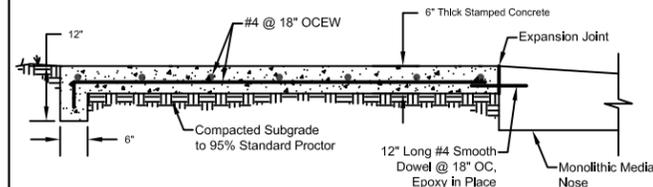
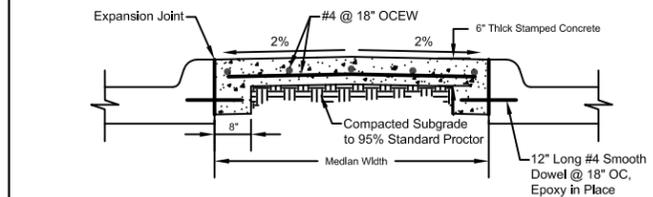
- NOTES:
1. If constructing median nose on existing pavement, contractor shall full depth sawcut existing pavement and shall dowel into existing pavement per Transverse Construction Joint detail

	Public Works	MONOLITHIC NOSE	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: P-9
			REVISION DATE: 05/20/2019	



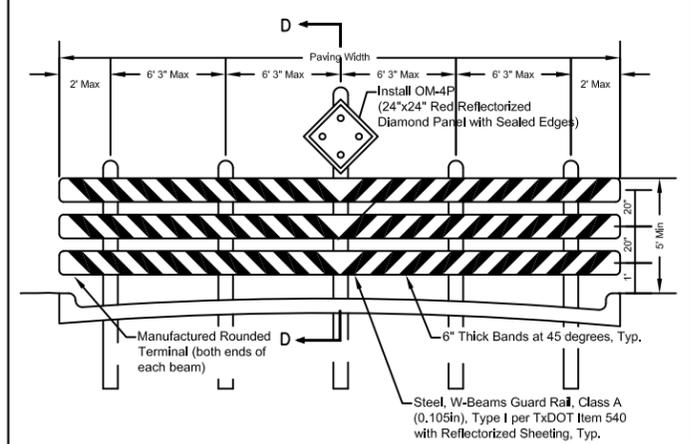
- NOTES:
1. Medians less than 5' in width, back-of-curb to back-of-curb, shall be stamped colored concrete
  2. Median areas that are not stamped concrete or part of the monolithic nose shall be filled with six inches of top soil or sandy loam. All rocks, large roots and other debris shall be removed and the area graded smooth.

	Public Works	MEDIAN	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: P-10
			REVISION DATE: 05/20/2019	



- NOTES:
1. Contractor to Provide Concrete Stamping Mats used for Construction, to City upon Completion of Construction.
  2. Color shall be full depth and integral with concrete and shall comply with the Approved Materials List.
  3. Pattern shall be a running bond, and as per Approved Materials List.
  4. Stamped Concrete Shall be Antique Red in Color.

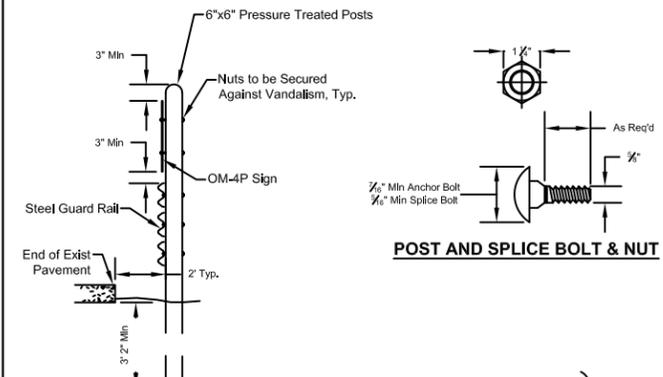
	Public Works	STAMPED CONCRETE MEDIAN PAVEMENT	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: P-11
			REVISION DATE: 05/20/2019	



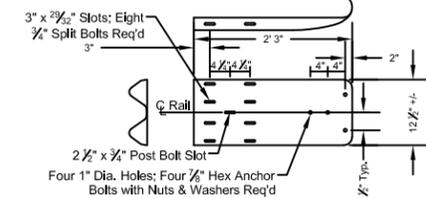
TYPICAL PERMANENT BARRICADE (MUTCD 3F-1)

- NOTES:
1. This permanent barricade is intended for dead-end streets when a hazardous condition exists past the extents of the pavement, such as a natural stream or deep excavation. At other dead ends, only place the sign OM-4P(24"x24") MUTCD 3C-4, with sealed edges.
  2. Typical mounting height shall be as shown and the offset from the point of road closure shall be 10'. The exact location and height of Metal Beam Guard Fence shall be as directed by City Engineer.
  3. Bolts shall be 3/8" diameter, galvanized and of sufficient length to extend through the full thickness of the nut and no more than 3/8" beyond it.
  4. Posts to be backfilled with a cohesionless material. Do not backfill timber posts with concrete. Posts shall be 7" diameter creosote treated wood.
  5. Metal beams, bolts, splices and all fittings to be galvanized.
  6. Red reflectorized stripes shall be high intensity sheeting.
  7. Directional signs may be required on barricades at discretion of the City Engineer (S.D.H.P.T. CWI-6 or CWI-7)
  8. Consult the Texas Manual of Uniform Traffic Control Devices for direction of striping

	Public Works	PERMANENT BARRICADE	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: P-12A
			REVISION DATE: 05/20/2019	

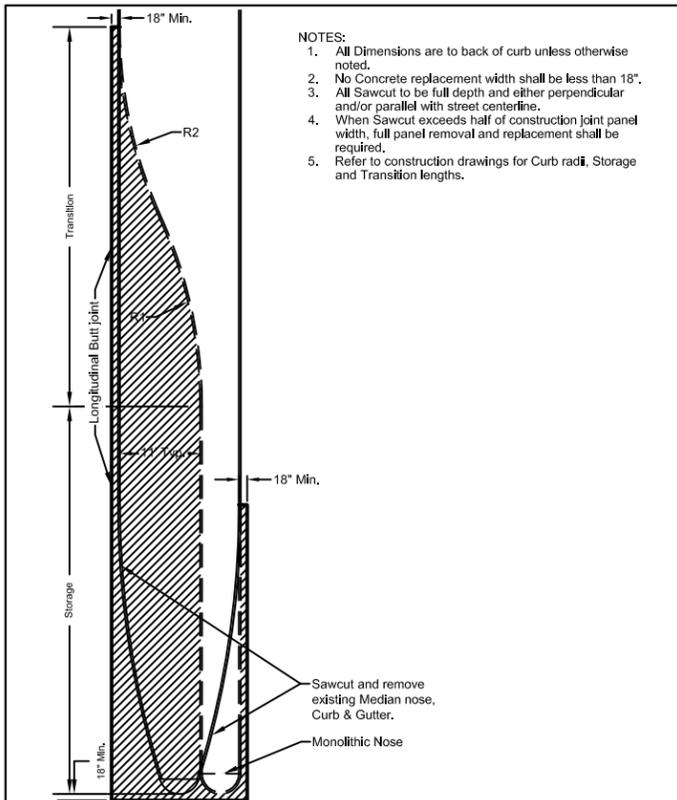


POST AND SPLICE BOLT & NUT



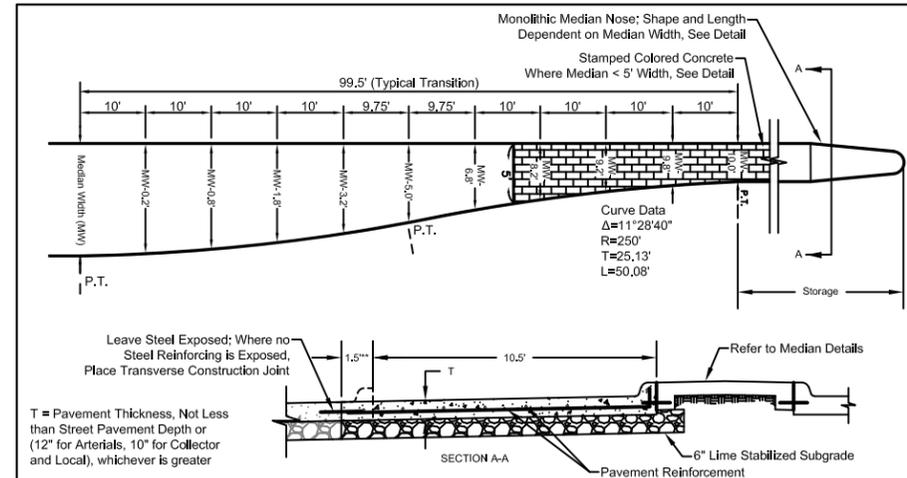
ROUNDED TERMINAL DETAIL

	Public Works	PERMANENT BARRICADE	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: P-12B
			REVISION DATE: 05/20/2019	



- NOTES:
1. All Dimensions are to back of curb unless otherwise noted.
  2. No Concrete replacement width shall be less than 18".
  3. All Sawcut to be full depth and either perpendicular and/or parallel with street centerline.
  4. When Sawcut exceeds half of construction joint panel width, full panel removal and replacement shall be required.
  5. Refer to construction drawings for Curb radii, Storage and Transition lengths.

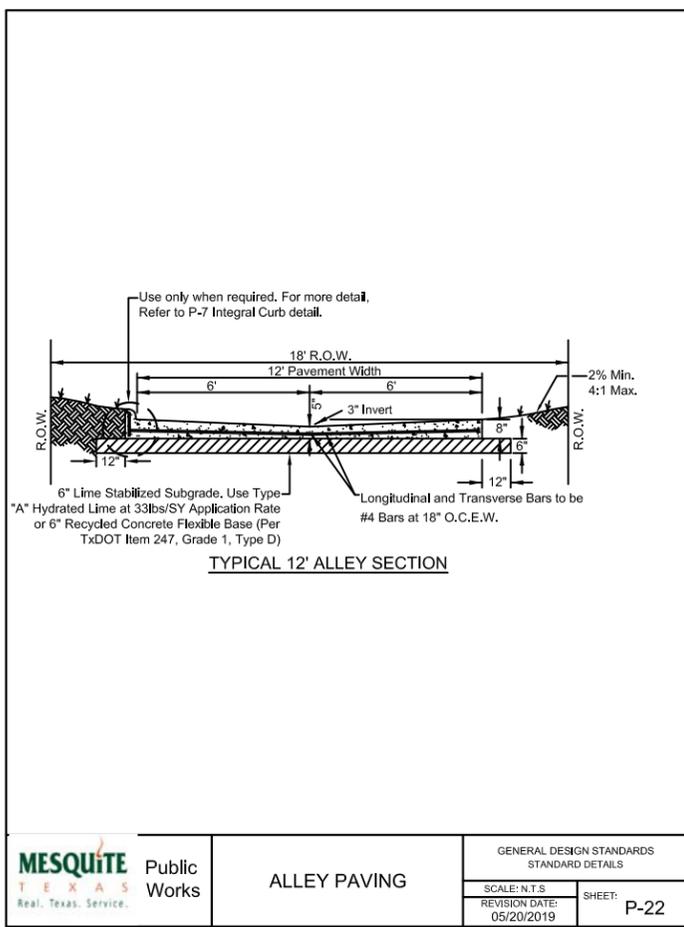
	Public Works	LEFT TURN LANE CONCRETE REMOVAL AND REPLACEMENT	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: P-13A
			REVISION DATE: 05/20/2019	



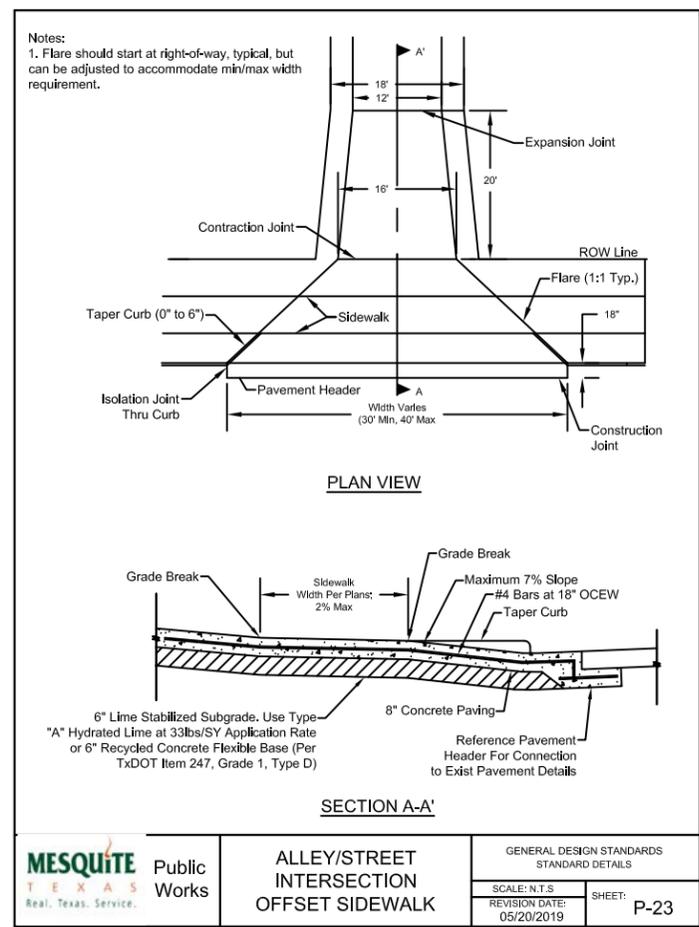
- NOTES:
1. In lieu of 6" Lime stabilized subgrade, contractor may install 6" Recycled Crushed concrete, TxDOT item No. 247, Grade 1, Type D or increase paving depth by 2".
  2. See City Pavement Marking Standards for marking left turn lane.
  3. For project specific Transition and Storage lengths, refer to Construction Drawings.
- \*\* This configuration applies only where a new Left Turn Lane is introduced on a median.

	Public Works	LEFT TURN LANE DETAIL	GENERAL DESIGN STANDARDS PAVING DETAILS	
			SCALE: N.T.S.	SHEET: P-13B
			REVISION DATE: 05/20/2019	

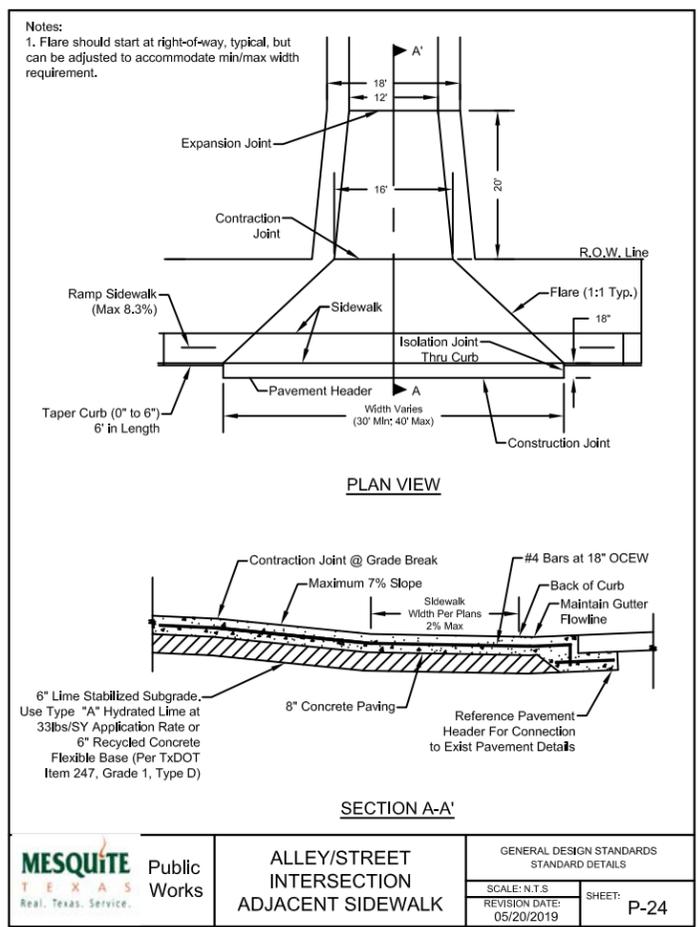




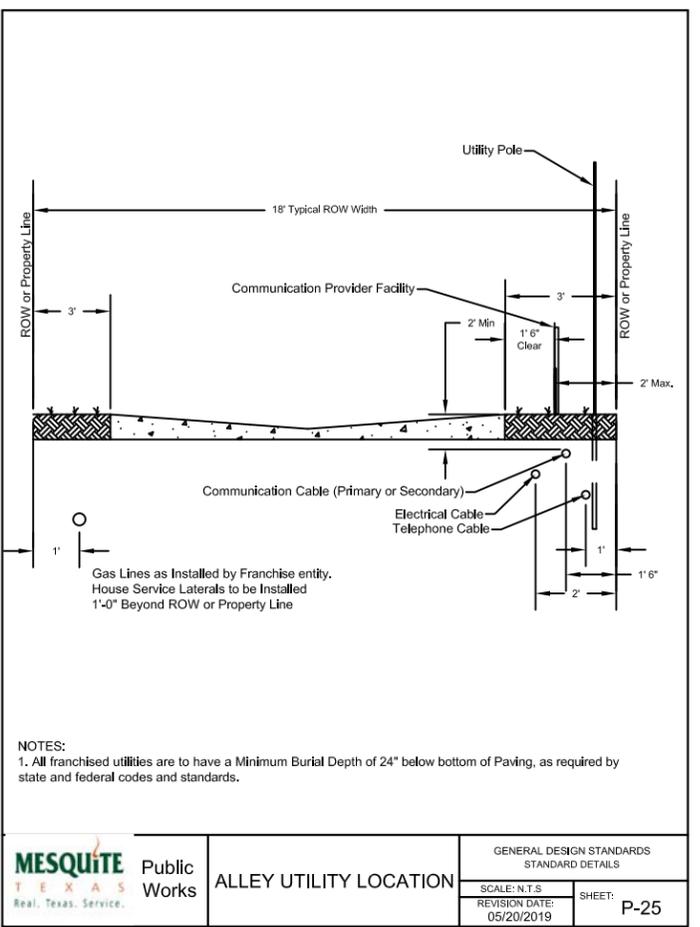
	Public Works	ALLEY PAVING	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: P-22
			REVISION DATE: 05/20/2019	



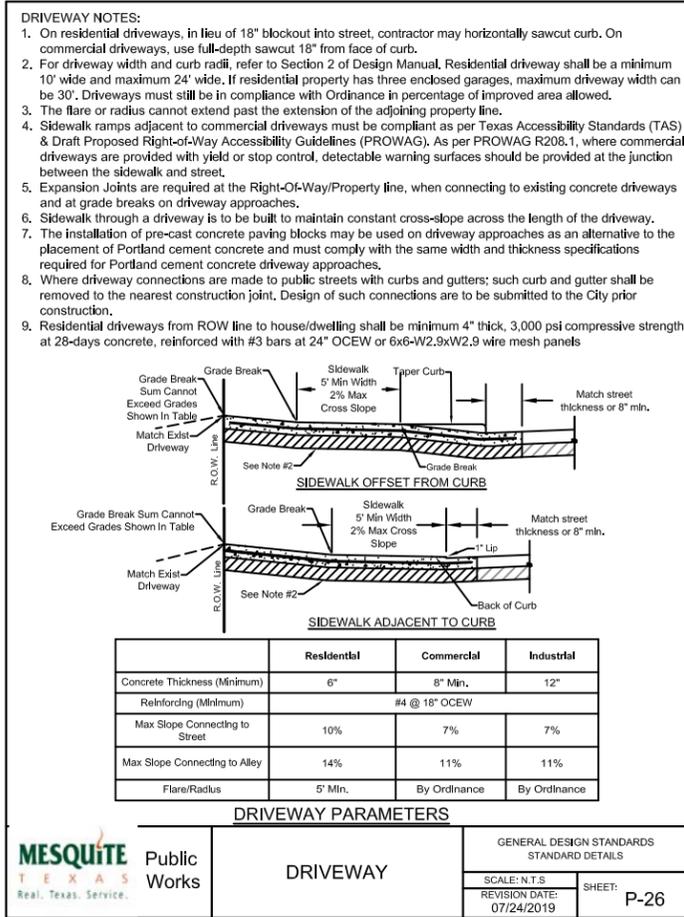
	Public Works	ALLEY/STREET INTERSECTION OFFSET SIDEWALK	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: P-23
			REVISION DATE: 05/20/2019	



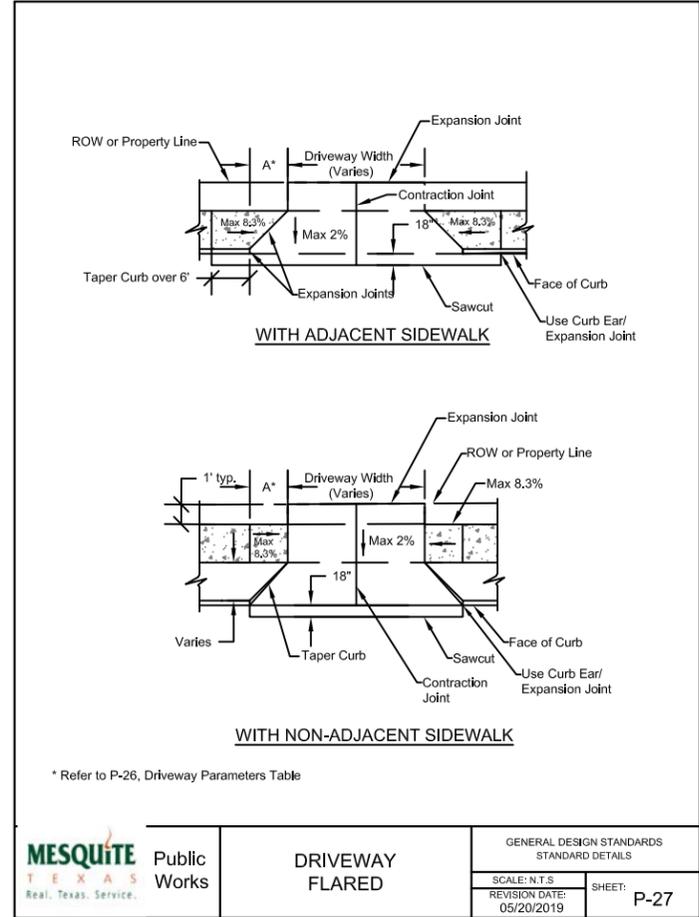
	Public Works	ALLEY/STREET INTERSECTION ADJACENT SIDEWALK	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: P-24
			REVISION DATE: 05/20/2019	



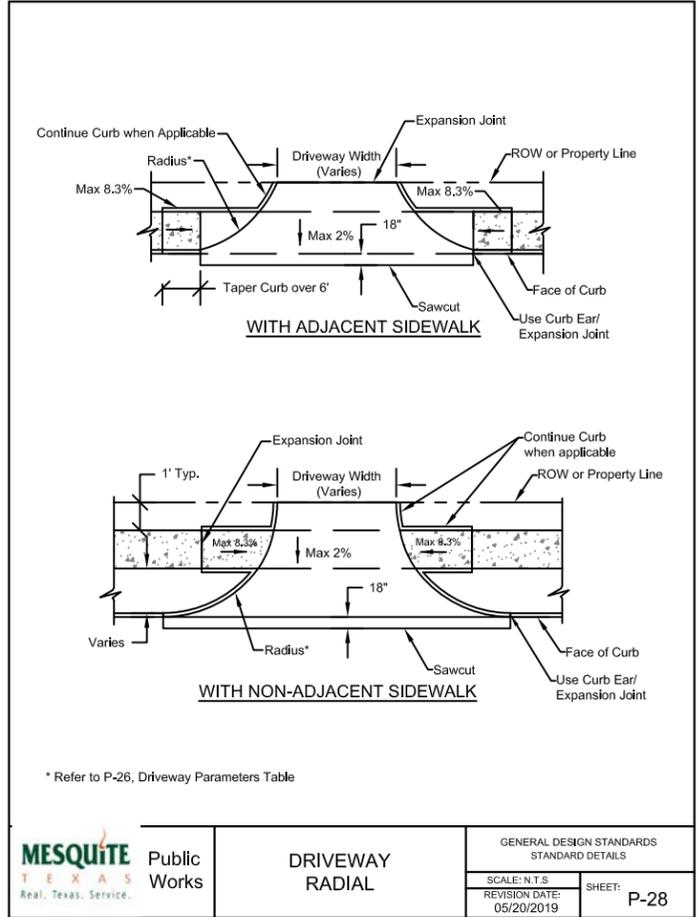
	Public Works	ALLEY UTILITY LOCATION	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: P-25
			REVISION DATE: 05/20/2019	



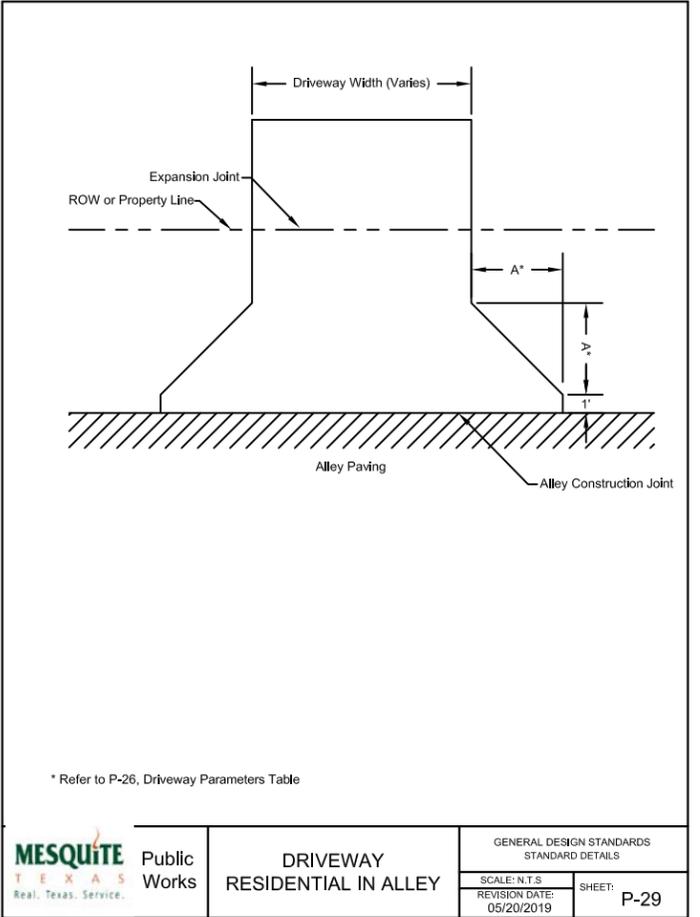
	Public Works	DRIVEWAY	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: P-26
			REVISION DATE: 07/24/2019	



	Public Works	DRIVEWAY FLARED	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: P-27
			REVISION DATE: 05/20/2019	



	Public Works	DRIVEWAY RADIAL	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: P-28
			REVISION DATE: 05/20/2019	



	Public Works	DRIVEWAY RESIDENTIAL IN ALLEY	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: P-29
			REVISION DATE: 05/20/2019	

**5 AND 10 FOOT RECESSED INLETS - PLAN VIEW**

**SECTION C-C - 5 AND 10 FOOT RECESSED INLETS**

GENERAL DESIGN STANDARDS STANDARD DETAILS  
SCALE: N.T.S. SHEET: D-1A  
REVISION DATE: 05/20/2019

**SECTION A-A - 5 AND 10 FOOT RECESSED INLETS**

**SECTION B-B - 5 AND 10 FOOT RECESSED INLETS**

GENERAL DESIGN STANDARDS STANDARD DETAILS  
SCALE: N.T.S. SHEET: D-1B  
REVISION DATE: 05/20/2019

**15 AND 20 FOOT STANDARD INLETS - PLAN VIEW**

**SECTION A-A - 15 AND 20 FOOT STANDARD INLETS**

GENERAL DESIGN STANDARDS STANDARD DETAILS  
SCALE: N.T.S. SHEET: D-2A  
REVISION DATE: 05/20/2019

**SECTION B-B - 15 AND 20 FOOT STANDARD INLETS**

**SECTION C-C - 15 AND 20 FOOT STANDARD INLETS**

GENERAL DESIGN STANDARDS STANDARD DETAILS  
SCALE: N.T.S. SHEET: D-2B  
REVISION DATE: 05/20/2019

**5 AND 10' STANDARD CURB INLET - PLAN VIEW**

**SECTION C-C - 5 AND 10 FOOT STANDARD INLETS**

GENERAL DESIGN STANDARDS STANDARD DETAILS  
SCALE: N.T.S. SHEET: D-3A  
REVISION DATE: 05/20/2019

**SECTION A-A - 5 AND 10 FOOT STANDARD INLETS**

**SECTION B-B - 5 AND 10 FOOT STANDARD INLETS**

GENERAL DESIGN STANDARDS STANDARD DETAILS  
SCALE: N.T.S. SHEET: D-3B  
REVISION DATE: 05/20/2019

**INSTALLATION DRAWING FOR PRECAST CURB INLETS**

GENERAL DESIGN STANDARDS STANDARD DETAILS  
SCALE: N.T.S. SHEET: D-4  
REVISION DATE: 05/20/2019

Inlet Opening "L"	Bar	Bar Size	Bar Length	Bar Spacing	Inlet Opening "L"	Bar	Bar Size	Bar Length	Bar Spacing	
										Double Inlets
7'-6"	A	#4	16'-4"	8" O.C. MAX.	10'-0"	A	#4	21'-4"	8" O.C. MAX.	
	B	#4	16'-4"	8" O.C. MAX.		B	#4	21'-4"	8" O.C. MAX.	
	C	#4	16'-4"	8" O.C. MAX.		C	#4	21'-4"	8" O.C. MAX.	
	C2	#4	3'-2"	8" O.C. MAX.		C2	#4	3'-2"	8" O.C. MAX.	
	D	#5	4'-6"	12" O.C. MAX.		D	#5	4'-6"	12" O.C. MAX.	
	F	#5	3'-3"	12" O.C. MAX.		F	#5	3'-3"	12" O.C. MAX.	
	G	#4	3'-6"	12" O.C. MAX.		G	#4	3'-6"	12" O.C. MAX.	
	H	#4	2'-6"	12" O.C. MAX.		H	#4	2'-6"	12" O.C. MAX.	
	I	#4	2'-0"	8" O.C. MAX.		I	#4	2'-0"	8" O.C. MAX.	
	J	#5	4'-8"	12" O.C. MAX.		J	#5	4'-8"	12" O.C. MAX.	
5'-0"	K**	#4	3'-0"	8" O.C. MAX.	K**	#4	3'-0"	8" O.C. MAX.		
	L	#4	3'-0"	8" O.C. MAX.	L	#4	3'-0"	8" O.C. MAX.		
	M**	#4	4'-0"	8" O.C. MAX.	M**	#4	4'-0"	8" O.C. MAX.		
	N	#5	6'-2"	8" O.C. MAX.	N	#5	6'-2"	8" O.C. MAX.		
	U	#4	3'-4"	8" O.C. MAX.	U	#4	3'-4"	8" O.C. MAX.		
	5'-0"	A	#4	5'-0"	8" O.C. MAX.	10'-0"	A	#4	9'-0"	8" O.C. MAX.
		B	#4	5'-0"	8" O.C. MAX.		B	#4	9'-0"	8" O.C. MAX.
		C	#4	5'-0"	8" O.C. MAX.		C	#4	9'-0"	8" O.C. MAX.
		C2	#4	3'-2"	8" O.C. MAX.		C2	#4	3'-2"	8" O.C. MAX.
		D	#5	4'-6"	12" O.C. MAX.		D	#5	4'-6"	12" O.C. MAX.
F		#5	3'-3"	12" O.C. MAX.	F		#5	3'-3"	12" O.C. MAX.	
G		#4	3'-6"	12" O.C. MAX.	G		#4	3'-6"	12" O.C. MAX.	
H		#4	2'-6"	12" O.C. MAX.	H		#4	2'-6"	12" O.C. MAX.	
J		#5	4'-8"	12" O.C. MAX.	J		#5	4'-8"	12" O.C. MAX.	
K**		#4	3'-0"	8" O.C. MAX.	K**		#4	3'-0"	8" O.C. MAX.	
2'-0"	L	#4	3'-0"	8" O.C. MAX.	1'-0"	L	#4	3'-0"	8" O.C. MAX.	
	M**	#4	4'-0"	8" O.C. MAX.		M**	#4	4'-0"	8" O.C. MAX.	
	N	#5	6'-2"	8" O.C. MAX.		N	#5	6'-2"	8" O.C. MAX.	

Bar Lengths Shown are for MAX. Height Inlets. Values Shall be Adjusted for Usual Height Inlets. Dimensions Shown for Top Slab Openings as Shown in the Details. Additional Bars Shall be Provided at All Pipe Openings as Shown in the Details. Number and Dimensions to be Modified as Needed.

GENERAL DESIGN STANDARDS STANDARD DETAILS  
SCALE: N.T.S. SHEET: D-5  
REVISION DATE: 05/20/2019

2 Layers of 4 #5 Bars (4'-0" Long) at Opening (Bend As Necessary)

#4 Bars @ 6" C-C (4' M.H.) or #5 Bars @ 8" C-C (5' & 6' M.H.) Each Way.

M.H. SIZE (W)	V	T	E	F	G	H
4'	5'-4"	8"	8"	9"	6"	1'-3"
5'	6'-4"	8"	8"	12"	8"	1'-8"
6'	7'-6"	9"	9"	16"	10"	2'-2"

PLAN N.T.S.

Standard 30" Manhole Ring and Cover  
24" Max. Soil Cover  
Proposed Grade

Non-Shrink Grout  
Use Precast Concrete Grade Rings as Required to Raise to Grade.

#5 Bars @ 12" E.W. E.F. (Typ.)

#4 Bars @ 6" C-C (4' M.H.) or #5 Bars @ 8" C-C (5' & 6' M.H.) T.&B. E.W.

Additional Reinforcing Around Opening (Match Manhole Reinforcing Shown in Plan Above)

Slope 3/8" to Drain  
6" Base Slab Extension (Typ.)

Steel Trowel Finish

2" X 4" Keyway (Typ.)

SECTION B-B N.T.S.

#4 Bars @ 6" C-C (4' M.H.) or #5 Bars @ 8" C-C (5' & 6' M.H.) Top and Bottom, Each Way.

Soil Cover + "E" + 6 inches

Varies

BAR A DETAIL N.T.S.

MESQUITE TEXAS Real. Texas. Service. Public Works

STORM DRAIN MANHOLE 4', 5' OR 6' SQUARE (1 OF 2)

GENERAL DESIGN STANDARDS STANDARD DETAILS

SCALE: N.T.S. SHEET: D-6

REVISION DATE: 05/20/2019

Reinforcing Not Shown for Clarity. See Plan and Section B-B for Reinforcing. Reinforcing Shall be the Same for All Four Sides

12' Max.

5' Min.

SECTION A-A N.T.S.

#5 Bars @ 12"

1'-0"

1'-0"

#5 Bars @ 12"

#5 Bars @ 12"

CORNER DETAIL (Plan or Elevation) N.T.S.

NOTES:

1. Chamfer all exposed edges 3/4".
2. All reinforcing steel shall be ASTM 615 Grade 60 steel.
3. Concrete shall be 3,600 psi minimum. Mix designs for concrete shall be submitted to owner for approval prior to construction.
4. Reinforcing bar dimensions are to outside of bar unless otherwise noted.
5. Contractor to verify all elevations and dimensions.
6. Clear cover for reinforcing shall be 2" for formed surfaces and 3" where concrete is placed against earth.
7. Grout shall conform to TxDOT DMS-4675 Cementitious Grouts and Mortars for Miscellaneous Applications.
8. Storm drain manholes greater than 6' shall be designed by a registered professional engineer. Design shall be submitted for review.
9. Design is based on the following geotechnical values:  
- Bearing Pressure  $\geq 2,000$  psf  
- Equivalent Fluid Pressure  $\leq 100$  pcf  
- Unit Weight of Soil  $\leq 130$  pcf

If any of these conditions are not present at the installation site, a separate engineering evaluation shall be performed.

MESQUITE TEXAS Real. Texas. Service. Public Works

STORM DRAIN MANHOLE 4', 5' OR 6' SQUARE (2 OF 2)

GENERAL DESIGN STANDARDS STANDARD DETAILS

SCALE: N.T.S. SHEET: D-6B

REVISION DATE: 05/20/2019

12" Min.

3" Min. 3" Min. (Typ.)

3'-0" Min.

NOTE: For concrete channel lengths over 150', provide intermediate toe walls at 100' maximum spacing

TYPICAL INTERMEDIATE TOE WALL DETAIL

12" Min.

24" Min.

12" Min.

3" Min. 3" Min. (Typ.)

3'-0" Min.

3'-0" Min.

3" Min. 3" Min. (Typ.)

Permissible Construction Joint

TYPICAL TRANSVERSE TOE WALL DETAIL

TYPICAL TOE WALL DETAIL AT TOE OF SLOPE

12" Min.

12" Min.

3" Min. All Sides

2"

3" Min. (Typ.) 3" Min.

3'-0" Min.

TYPICAL TOE WALL CORNER DETAIL

TYPICAL LONGITUDINAL TOE WALL DETAIL AT TOP OF SLOPE

NOTE: Minimum requirements only. Design shall be submitted.

MESQUITE TEXAS Real. Texas. Service. Public Works

CONCRETE CHANNEL DETAILS (1 OF 2)

GENERAL DESIGN STANDARDS STANDARD DETAILS

SCALE: N.T.S. SHEET: D-7A

REVISION DATE: 05/20/2019

10'-0" Min.

Existing Ground (Typ.)

Invert 1/2" / LF Min. Slope

3" Min. 3" Min. (Typ.)

3'-0" Min. Toewall

Alternative Drainage Media Toewall

3'-0" Min.

Intermediate Toe Walls for Channels Longer than 150' (100' Max. Spacing)

Provide 2" Diameter Weep Holes 3" Above Channel Bottom at 8' C-C with a 12"x12" Continuous Free Draining Granular Pocket Wrapped in Mirafi 140N or Approved Equal

Refer to Toewall Details (Typ.)

CONCRETE CHANNEL LINING TYPICAL SECTION

NOTES:

1. Chamfer all exposed edges of concrete 3/4".
2. All concrete shall have a 28-day compressive strength of 3,000 psi.
3. All clear cover for concrete shall be 3" against earth and 2" elsewhere unless otherwise shown.
4. All reinforcing steel shall be ASTM 615 GR 60 steel.
5. All material shall be submitted to owner for approval prior to construction.
6. Mix designs for concrete shall be submitted to owner for approval prior to construction.
7. Reinforcing bar dimensions are to outside of bar unless otherwise noted.
8. Contractor to verify all elevations and dimensions.
9. For slopes steeper than 3H:1V, slope stability analysis shall be performed by a licensed geotechnical engineer in the state of Texas.
10. Concrete channels shall have a minimum thickness of 6" but shall be designed for site specific conditions. Design shall be performed by a licensed engineer in the state of Texas.
11. Alternative drainage Media may be submitted for review. Alternative shall be designed by a licensed engineer in the state of Texas.

100 Year Velocity (fps)	Armoring Material	Requirements
$\leq 6$	Turf Mat	Per Manufacturer
$\leq 12$	Gabion	Per Standard Detail
Per Manufacturer	Articulated Concrete Block (ACB)	Per Manufacturer

8"

4" Min. Armoring Per Table

Varies (8" Min.)

4" Min. Armoring Per Table

2% Min.

2% Min.

6" Crushed Stone Bedding Wrapped in Mirafi 140 N Filter Fabric Or Equal

#4 Bars @ 12" Spacing

#4 Bars @ 12" Spacing

Existing Ground. If Disturbed, Turf Mat Shall Be Provided. (Typ.)

CONCRETE PILOT CHANNEL TYPICAL SECTION

MESQUITE TEXAS Real. Texas. Service. Public Works

CONCRETE CHANNEL DETAILS (2 OF 2)

GENERAL DESIGN STANDARDS STANDARD DETAILS

SCALE: N.T.S. SHEET: D-7B

REVISION DATE: 05/20/2019

DIAMETER VARIES

DIAMETER VARIES

DIAMETER VARIES

DIAMETER VARIES

LARGER PIPE DIAMETER	D
$\geq 36"$	6" MIN
$> 36"$	12" MIN

MESQUITE TEXAS Real. Texas. Service. Public Works

CONCRETE COLLAR

GENERAL DESIGN STANDARDS STANDARD DETAILS

SCALE: N.T.S. SHEET: D-8

REVISION DATE: 11/11/2019

WHEN UNDER PAVEMENT BACKFILL SHALL BE CRUSHED CONCRETE FLEXIBLE BASE (TXDOT ITEM 247, GRADE 1, TYPE D) COMPACTED TO 95% STANDARD PROCTOR DENSITY. IF STORM SEWER IS NOT UNDER PAVEMENT, BACKFILL CAN BE CLEAN FILL (NATIVE MATERIAL) COMPACTED TO DENSITY OF 95% STANDARD PROCTOR AT A MOISTURE CONTENT OF 0% TO PLUS 6% OF OPTIMUM MOISTURE.

EMBEDMENT SHALL BE CRUSHED CONCRETE FLEXIBLE BASE (TXDOT ITEM 247, GRADE 1, TYPE D) COMPACTED TO 95% STANDARD PROCTOR DENSITY

Bd  
MAX TRENCH WIDTH

Pipe Dia (in)	Bd (In.)	A (In.)	B (In.)
15	35	4	5
18	39	4	6
21	42	4	7
24	46	4	7
27	49	5	8
30	53	5	9
33	57	5	10
36	60	5	11
39	72	6	12
42	75	6	13
45	78	6	14
48	82	7	15
51	85	7	15
54	89	8	16
60	96	8	18
66	102	8	20
72	108	9	22
78	114	8	23
84	120	8	25
90	126	8	27
96	132	8	29

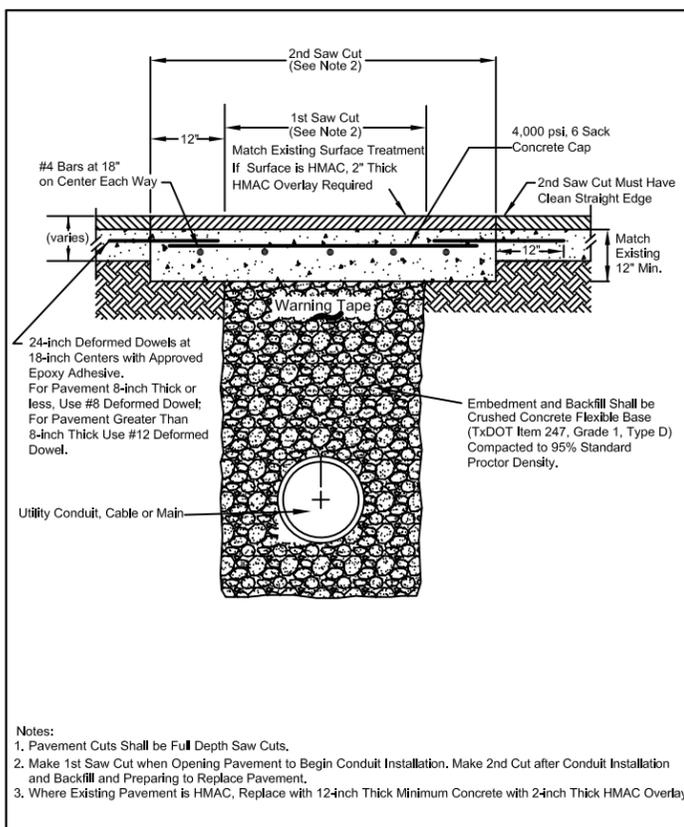
MESQUITE TEXAS Real. Texas. Service. Public Works

STORM DRAIN EMBEDMENT

GENERAL DESIGN STANDARDS STANDARD DETAILS

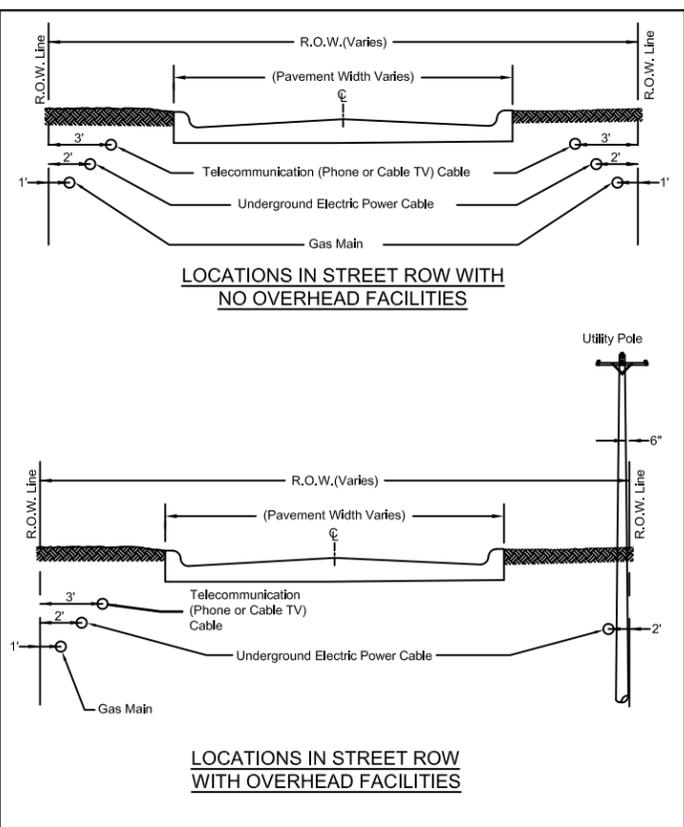
SCALE: N.T.S. SHEET: D-9

REVISION DATE: 11/11/2019

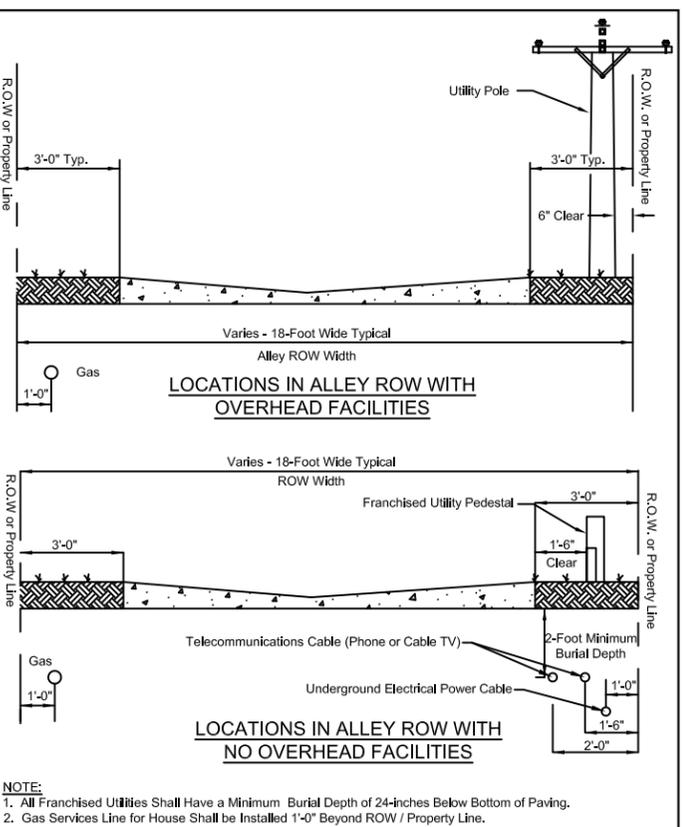


Notes:  
 1. Pavement Cuts Shall be Full Depth Saw Cuts.  
 2. Make 1st Saw Cut when Opening Pavement to Begin Conduit Installation. Make 2nd Cut after Conduit Installation and Backfill and Preparing to Replace Pavement.  
 3. Where Existing Pavement is HMAC, Replace with 12-inch Thick Minimum Concrete with 2-inch Thick HMAC Overlay

MESQUITE TEXAS Real. Texas. Service. Public Works	FRANCHISE UTILITY PAVEMENT CUT REPLACEMENT	GENERAL DESIGN STANDARDS STANDARD DETAILS	SCALE: N.T.S.	SHEET: F-1
			REVISION DATE: 05/20/2019	

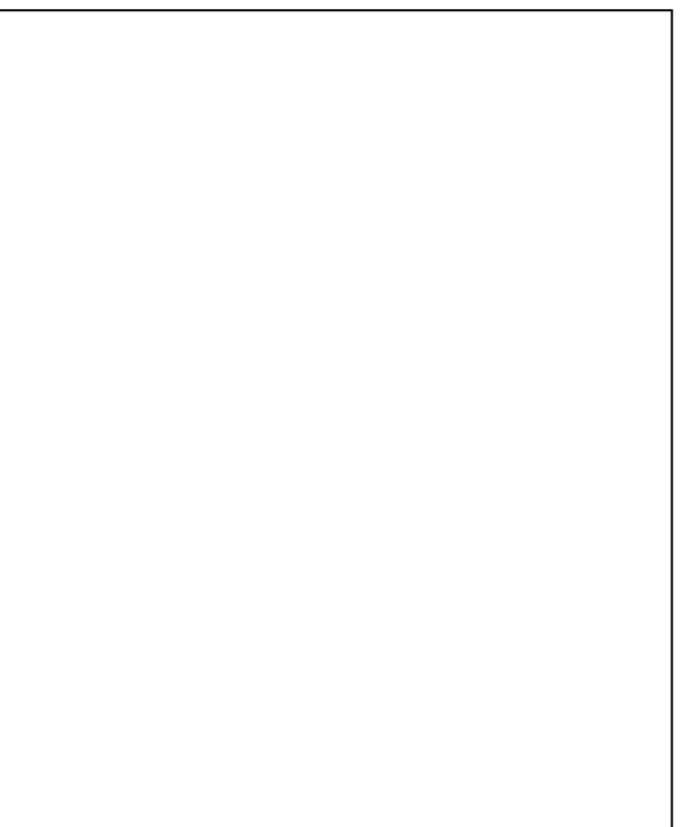


MESQUITE TEXAS Real. Texas. Service. Public Works	TYPICAL UTILITY LOCATIONS IN STREET ROW	GENERAL DESIGN STANDARDS STANDARD DETAILS	SCALE: N.T.S.	SHEET: F-2
			REVISION DATE: 05/20/2019	



NOTE:  
 1. All Franchised Utilities Shall Have a Minimum Burial Depth of 24-inches Below Bottom of Paving.  
 2. Gas Services Line for House Shall be Installed 1'-0" Beyond ROW / Property Line.

MESQUITE TEXAS Real. Texas. Service. Public Works	TYPICAL UTILITY LOCATIONS IN ALLEY ROW	GENERAL DESIGN STANDARDS STANDARD DETAILS	SCALE: N.T.S.	SHEET: F-3
			REVISION DATE: 05/20/2019	



MESQUITE TEXAS Real. Texas. Service. Public Works	RESERVED FOR FUTURE USE	GENERAL DESIGN STANDARDS STANDARD DETAILS	SCALE: N.T.S.	SHEET: F-4
			REVISION DATE: 05/20/2019	

**CITY OF MESQUITE - ENGINEERING DIVISION**  
**UTILITY RIGHT-OF-WAY/EASEMENT USE & CONSTRUCTION PERMIT**  
**CONDITIONS AND RESTRICTIONS**

THIS PERMIT IS ISSUED IN ACCORDANCE WITH THE MESQUITE CITY CODE, CHAPTER 15, ARTICLE III AND THE APPLICABLE FRANCHISE AGREEMENT BETWEEN THE UTILITY FRANCHISE REQUESTING THE PERMIT AND THE CITY OF MESQUITE AND OTHER APPLICABLE FEDERAL, STATE AND CITY LAWS, REGULATIONS AND ORDINANCES.

**DESIGN AND LOCATION OF FACILITIES:**  
 GENERALLY, FRANCHISED UTILITY CABLES, GUYS, POLES, CONDUIT, ETC SHALL BE PLACED AS CLOSE TO THE R.O.W. LINE AS PRACTICABLE. SEE ATTACHED DETAIL SHEETS TITLED "TYPICAL UTILITY LOCATION PLAN" FOR STANDARD UTILITY LOCATIONS. PLEASE CONSULT THE CITY PUBLIC WORKS CONSTRUCTION INSPECTOR FOR THE LOCATION WHERE ABOVE GROUND GUYS, POLES, ETC. SHALL BE PLACED.

**CABLE OR FACILITY BURIAL DEPTH:** ALL CONDUCTOR BURIAL DEPTHS SHALL BE IN COMPLIANCE WITH THE NATIONAL ELECTRICAL SAFETY CODE, SECTION 353.D (PUBLISHED BY THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., (IEEE) AND APPROVED BY THE AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)). MINIMUM DEPTH FOR VOLTAGES 0 TO 600 VOLTS IS 24-INCHES BELOW BOTTOM OF EDGE OF PAVEMENT FOR STREETS WITH CURB AND GUTTER OR BELOW ROADWAY DITCH FLOWLINE GRADE FOR STREETS WITHOUT CURB AND GUTTER.

**VISIBILITY OBSTRUCTIONS:** NO FACILITY SHALL BE DESIGNED OR INSTALLED WHERE IT CAUSES A SIGHT VISIBILITY OBSTRUCTION OR VIEW OBSTRUCTION. PLEASE CONSULT MESQUITE CITY CODE, CHAPTER 9, ARTICLE X (SECTIONS 9-305 TO 9-308) FOR REQUIREMENTS AND DETAILS.

**ACCESSIBLE ROUTES:** OBSTRUCTIONS OR PROTRUSIONS OF UTILITY POLES, GUY LINES, PEDESTALS, CABINETS OR OTHER UTILITY FACILITIES OVER A SIDEWALK, RAMP, TRAIL OR OTHER TRANSPORTATION FACILITY SO AS TO HINDER OR PREVENT FULL USE OF THE FACILITY OR IMPEDE FULL ACCESS ARE PROHIBITED.

**FRANCHISED UTILITY SIGNAGE AND MARKERS:** ALL FRANCHISED UTILITY SIGNAGE AND MARKERS SHALL BE OF THE FLEXIBLE VERTICAL FIBERGLASS CARBONITE® TYPE AND NO TALLER THAN 48-INCHES ABOVE GRADE (SEE [HTTP://WWW.CARBONITE.COM/UTL-MARKERS.ASP](http://www.carbonite.com/utl-markers.asp)) OR STICKERS & PLAQUES PLACED ON EXISTING FACILITIES SUCH AS POLES, PEDESTALS AND CABINETS OR PLACEMENT MARKER BUTTONS ON CURBS, SIDEWALKS OR PAVEMENT. GENERALLY, SEPARATE SIGNAGE IS DISCOURAGED. SIGNAGE SHALL BE FLEXIBLE SO THAT IT DOES NOT PRESENT A DANGER TO PEDESTRIANS, BICYCLISTS AND MOTORISTS IF THE SIGNAGE IS IMPACTED AT SPEED. METAL POLES AND SIGNS ARE PROHIBITED. THE CITY WILL REQUIRE REMOVAL OF PROHIBITED, DAMAGED OR DILAPIDATED EXISTING SIGNAGE WITHIN 300-FEET OF PROPOSED CONSTRUCTION.

**BOLLARDS:** USE OF BOLLARDS IN CITY RIGHT-OF-WAY IS PROHIBITED. BOLLARDS PRESENT A DANGER TO MOTORISTS, BICYCLISTS AND OTHER USERS OF THE ROW AND EASEMENTS. IF A FACILITY IS IN DANGER OF BEING HIT BY A MOTORIST IT SHOULD BE RELOCATED TO A SAFER LOCATION RATHER THAN BE PROTECTED BY BOLLARDS. IN ADDITION, THE CITY WILL REQUIRE REMOVAL OF EXISTING BOLLARDS WITHIN 300-FEET OF PROPOSED CONSTRUCTION.

**CONSTRUCTION TRAFFIC CONTROL, BARRICADING AND SIGNING:** THE UTILITY COMPANY AND THEIR CONTRACTORS AND SUBCONTRACTORS ARE RESPONSIBLE FOR DESIGN AND IMPLEMENTATION OF A PLAN DURING CONSTRUCTION AND MAINTENANCE OPERATIONS FOR TRAFFIC CONTROL, BARRICADING AND SIGNAGE THAT SHALL AS A MINIMUM MEET THE REQUIREMENTS OF THE MOST CURRENT "TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES" (MESQUITE CITY CODE SECTIONS 11-104 AND 11-105). NO ALLEY OR STREET SHALL BE CLOSED WITHOUT 48 HOURS NOTICE TO THE ASSIGNED PUBLIC WORKS CONSTRUCTION INSPECTOR.

THE CITY PUBLIC WORKS CONSTRUCTION INSPECTOR WILL PERIODICALLY REVIEW THE PROJECT BARRICADING AND NOTIFY THE UTILITY SUPERVISOR/FOREMAN OF ANY DEFICIENCY OBSERVED.

**ABANDONMENT OF FACILITIES:** ANY CONDUIT/PIPE THAT IS ABANDONED IN PLACE AND IS 6" OR GREATER IN DIAMETER SHALL BE GROUT FILLED.

MESQUITE TEXAS Real. Texas. Service. Public Works	FRANCHISE UTILITY GENERAL NOTES	GENERAL DESIGN STANDARDS STANDARD DETAILS	SCALE: N.T.S.	SHEET: F-5A
			REVISION DATE: 04/13/2020	

**TRENCH SAFETY, CONFINED SPACE AND OTHER SAFETY ISSUES:**  
 ALL OSHA GUIDELINES MUST BE FOLLOWED INCLUDING BUT NOT LIMITED TO TRENCH SAFETY, CONFINED SPACE ENTRY, PERSONAL PROTECTIVE EQUIPMENT AND TRAFFIC CONTROL.

THE FRANCHISED UTILITY COMPANY AND SUBCONTRACTOR (IF ANY) ARE RESPONSIBLE FOR DESIGN AND IMPLEMENTATION OF A PLAN TO ENSURE TRENCH SAFETY THAT, AS A MINIMUM SHALL MEET THE REQUIREMENTS OF OSHA STANDARDS AND INTERPRETATIONS, PART 1926, SUBPART P - EXCAVATIONS, TRENCHING, SHORING AND ANY OTHER APPLICABLE FEDERAL, STATE AND CITY LAWS, REGULATIONS AND ORDINANCES. TRENCH SAFETY PLANS SHALL BE SEALED BY A PROFESSIONAL ENGINEER. THE FRANCHISED UTILITY COMPANY AND HIS SUBCONTRACTOR (IF ANY) ARE RESPONSIBLE FOR MAKING A SOIL CLASSIFICATION FOR TRENCH SAFETY DESIGN PURPOSES. IF THE FRANCHISED UTILITY DOES NOT MAKE A DETERMINATION OF SOIL TYPE, ALL INSPECTION SHALL BE BASED ON THE WORST CASE SOIL TYPE (TYPE C). THE FRANCHISED UTILITY COMPANY AND HIS SUBCONTRACTOR (IF ANY) SHALL ALSO DESIGNATE A "COMPETENT PERSON", AS DEFINED BY OSHA TRENCH SAFETY REGULATIONS, TO MAKE AT LEAST A DAILY TRENCH SAFETY INSPECTION.

**FACILITY LOCATES NOTIFICATION PRIOR TO DIGGING:**  
 THE UTILITY COMPANY AND THEIR CONTRACTORS AND SUBCONTRACTORS ARE RESPONSIBLE FOR NOTIFYING DIG TESS FOR UTILITY LOCATES 48-HOURS BEFORE COMMENCING DIGGING. IN ADDITION, THE UTILITY COMPANY AND THEIR CONTRACTORS AND SUBCONTRACTORS ARE RESPONSIBLE FOR NOTIFYING THE CITY OF MESQUITE WATER UTILITIES DISPATCH OFFICE FOR LOCATIONS OF WATER AND SANITARY SEWER MAINS AND NOTIFICATION OF THE TRAFFIC SUPERINTENDENT FOR LOCATION OF TRAFFIC SIGNAL CONDUITS AND CONDUCTORS A MINIMUM OF 48-HOURS BEFORE COMMENCING DIGGING.  
 SEE CITY OF MESQUITE CONTACT LIST FOR PHONE NUMBERS AND OTHER CONTACT INFORMATION.

**PAVEMENT CUTS:**  
 NO PAVEMENT SHALL BE CUT OR REPAIRED WITHOUT PRIOR NOTIFICATION AND INSPECTION BY THE ASSIGNED PUBLIC WORKS CONSTRUCTION INSPECTOR.

ALL PAVEMENT CUTS SHALL BE BACKFILLED TO BOTTOM OF REPLACEMENT PAVEMENT WITH RECYCLED CRUSHED CONCRETE FLEXIBLE BASE (PER TXDOT ITEM 247, GRADE 1, TYPE D) TO PREVENT FUTURE SETTLEMENT. ALL BACKFILL SHALL BE COMPACTED TO 95% STANDARD PROCTOR. PAVEMENT CUTS ON PAVEMENT LESS THAN 5-YEARS OLD SHALL REPLACE THE ENTIRE PANEL OR AS REQUIRED BY THE CITY PUBLIC WORKS CONSTRUCTION INSPECTOR. DETAILS FOR REPAIR OF PAVEMENT CUTS ARE AVAILABLE FROM THE CITY ENGINEERING DIVISION WEBSITE AT: [HTTP://WWW.CITYOFMESQUITE.COM/ENGINEERING/FRANCHISEUTILITY.PHP](http://www.cityofmesquite.com/engineering/franchiseutility.php)

**NOISE AND ALLOWABLE WORKING HOURS:**  
 NOISE FROM CONSTRUCTION AND ALLOWABLE WORKING HOURS ARE REGULATED BY SECTIONS 10-66 TO 10-77 OF THE MESQUITE CITY CODE. ALLOWABLE WORKING HOURS ARE BETWEEN 7:00 AM AND 10:00 P.M., MONDAY THROUGH SATURDAY. NO WORK IS ALLOWED ON SUNDAY WITHOUT SPECIFIC WRITTEN PERMISSION OF THE CITY ENGINEER. PLEASE CONSULT THE CITY PUBLIC WORKS CONSTRUCTION INSPECTOR WITH ANY QUESTIONS ON THESE ISSUES.

**CONSTRUCTION INSPECTION:**  
 THE CITY PUBLIC WORKS CONSTRUCTION INSPECTOR SHOULD BE NOTIFIED PRIOR TO ANY TRENCH BACKFILLING OR PAVEMENT REPAIR WITHIN A CITY R.O.W. OR EASEMENT SO THAT A PROPER INSPECTION CAN BE MADE. IF CITY INSPECTION IS REQUIRED OUTSIDE NORMAL WORKING HOURS THE FRANCHISED UTILITY AND HIS SUBCONTRACTOR WILL BE RESPONSIBLE FOR PAYING THE CITY CONSTRUCTION INSPECTOR'S OVERTIME WAGE PLUS BENEFITS. THE CITY CONSTRUCTION PUBLIC WORKS INSPECTOR WILL BE HAPPY TO ANSWER ANY QUESTIONS CONCERNING CURRENT CITY STANDARDS AND REQUIREMENTS. SEE PERMIT OR ATTACHED AREA MAP TO DETERMINE RESPONSIBLE INSPECTOR.

**RESTORATION OF PROPERTY:**  
 PER THE MESQUITE CITY CODE, EMERGENCY WORK CAN PROCEED AS NEEDED TO MAINTAIN & RESTORE EXISTING SERVICE TO CUSTOMERS ON THE CONDITION THAT A PERMIT SHALL BE OBTAINED FROM THE CITY WITHIN TWO (2) WORKING DAYS AFTER THE START OF THE EMERGENCY WORK.

MESQUITE TEXAS Real. Texas. Service. Public Works	FRANCHISE UTILITY GENERAL NOTES	GENERAL DESIGN STANDARDS STANDARD DETAILS	SCALE: N.T.S.	SHEET: F-5B
			REVISION DATE: 05/20/2019	