REQUIREMENTS FOR UTILITY BORE AND CROSSING

BORE / TUNNEL ALIGNMENT AND LOCATION:

1. Utility bores or tunnels shall, where practicable, be located at approximately right angles to right-of-way, streets and alleys.
2. All bores or tunnels shall have a vertical profile on the plans.
3. Plan and profile view of the bore or tunnel shall include all existing utility lines, trees, signs, guide lines/wires, light poles and other obstacles.

LENGTH OF CASING:

4. Casing pipe length shall be determined by the respective governing authority.

BORE OR JACKING PITS:

5. The location of the bore/jacking pit and receiving pit shall be shown and dimensioned on the plan and profile views of the utility plans. Size of the bore pit and receiving pit shall be adequate to accommodate the boring/jacking equipment and the pipe joint lengths being used.

ISOLATION VALVES:

6. Water valves shall be located at each side of a cased bore or tunnel within effective distances at each side of the crossing to allow isolation of the water main within the bore.

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REQUIREMENTS FOR UTILITY BORE AND CROSSING (cont.)

CASING PIPE:

7. Casing pipe shall be used at all crossings of TXDOT or railroad right-of-way and shall meet the permitting and insurance requirements of the respective governing authority.
8. Casing pipe shall be used at all creek crossings (TCEQ Requirement).
9. Casing pipe shall be used as required by the City Engineer based upon specific project locations, maintenance concerns or risks to other facilities.
10. Wall thickness of the casing pipe must be no less than that specified in the below steel casing pipe wall thickness chart. If casing pipe is required a note specifying material and thickness of the casing pipe shall be included on the bore profile.
11. Casing pipe shall be welded smooth steel meeting ASTM A36 specifications with minimum yield strength of 36,000 psi. Sectional tunnel lining plate is an approved alternate casing material for casing sizes greater than 48-inch nominal diameter. If sectional tunnel lining plate is used the bottom of the tunnel shall be paved with 3,000 psi concrete to facilitate jacking of carrier pipe through the casing pipe.
12. Casing pipe and casing joints shall be capable of withstanding AASHTO H-20 traffic loading plus appropriate dead load for soil and hydrostatic pressure.
13. Casing pipe shall be designed and constructed to prevent leakage of ground water and surrounding soil into the casing throughout its length.
14. Casing pipe shall be designed and constructed to prevent the casing from becoming a pathway for ground water or surface water.
15. Casing pipe shall be installed with even bearing throughout its length and shall slope to one end. The inside diameter of the casing pipe shall be no less than 2 inches greater than largest outside diameter of carrier pipe, joints or couplings. Casing pipes larger than 48" diameter or with any portion deeper than 20' shall be submitted with design calculations to the City Engineer for approval.

Smooth Steel Casing (ASTM A36) (minimum yield strength of 36,000 psi)		
Diameter of Casing Pipe (nominal O.D.)	**Minimum Casing Thickness (Decimal Inches)**	**Minimum Casing Thickness (Fraction Inches)**
12" or less	0.2500	1/4"
Over 12" - 18"	0.3125	5/16"
Over 18" - 22"	0.3750	3/8"
Over 22" - 28"	0.4375	7/16"
Over 28" - 34"	0.5000	1/2"
Over 34" - 42"	0.5625	9/16"
Over 42" - 48"	0.6250	5/8"
Over 48-inches or Deeper than 15-feet	Individually Designed by Design Engineer. Calculations and Plans Shall be Submitted to City Engineer for Review and Approval.	

MESQUITE TEXAS Real. Texas. Service.	Public Works	UTILITY BORE & CROSSING GENERAL NOTES	GENERAL DESIGN STANDARDS UTILITY CROSSINGS	
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REQUIREMENTS FOR UTILITY BORE AND CROSSING (cont.)

MISCELLANEOUS REQUIREMENTS FOR BORES AND TUNNELS:

16. A "missile" type pneumatic/hydraulic bore may be used for copper water services, cables and conduits 2-inches in size or smaller.
17. For bores **requiring casing pipe**, the void space between casing and the earthen bore shall be completely filled with cement grout pumped under pressure into the void space. Cement grout shall conform to ASTM C476 and have a minimum compressive strength of 200-psi. Pressure grouting shall start from the lower end of the bore. Pressure grouting shall take place within 24-hours of final placement of the casing pipe. The casing pipe shall be provided with grout ports at 20-foot intervals along the casing pipe for casing pipes larger than 24-inches in nominal diameter.
18. For bores **without casing pipe**, the void space between carrier pipe and the earthen bore shall be completely filled with cement grout (200-psi mix) pumped under pressure into the void space. Pressure grouting shall start from the lower end of the bore. Pressure grouting shall take place within 24-hours of final placement of the carrier pipe.
19. Carrier pipe shall be supported within the casing pipe with City approved spacers installed according to manufactures recommendations. Spacers shall be made of High Density Polyethylene (HDPE) or Stainless Steel. Approved carrier pipe spacers are; "Raci" type protection spacers, Power Seal Model 4810, Pipeline Seal and Insulator, Inc. Ranger II, or approved equal. Spacers shall be of appropriate length to secure the pipe within the casing to prevent floating of the carrier pipe should the casing pipe become filled with water. Casing spacers shall fasten tightly onto the carrier pipe to prevent spacer movement during installation. The span between spacers should result in conservative long-term load safety factors with the carrier pipe full of fluid. The Manufacturer shall provide the load carrying capacity of the spacer assembly and maximum spacing shall conform to the manufacturer's recommendation.
20. Casing pipe shall be sealed at each end with City approved end seals. Approved casing end seals are: Advanced Products & System, Inc. Model AW (wrap around) end seal, CCI Pipeline Systems Model ESW wrap around neoprene rubber end seal, or approved equal.
21. Backfill of bore/jacking pit and receiving pits shall be with Crushed Concrete Flexible Base (TXDOT, Item 247, Grade 1, Type D) compacted to 95% standard proctor density.
22. Lateral or vertical variation in the final position of the pipe from the line and grade established on the plans shall be permitted only to the extent of 1-inch per 100-feet, provided that such variation shall be regular and only in one direction and that the final grade of the flow line shall be in the direction indicated on the plans.
23. The contractor shall comply with all applicable federal, state and local safety laws and regulations including but not limited to OSHA requirements for trench safety, confined space, personal protective equipment, tunneling operations and electrical safety.

MESQUITE TEXAS Real. Texas. Service.	Public Works	UTILITY BORE & CROSSING GENERAL NOTES	GENERAL DESIGN STANDARDS UTILITY CROSSINGS	
			SCALE - N.T.S.	
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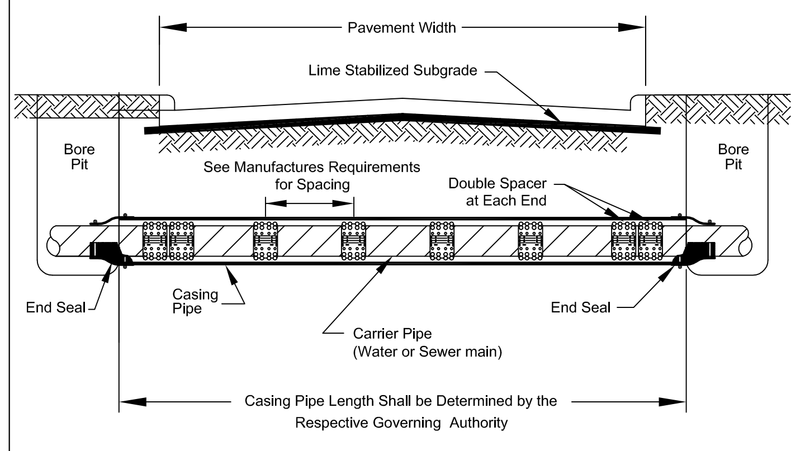
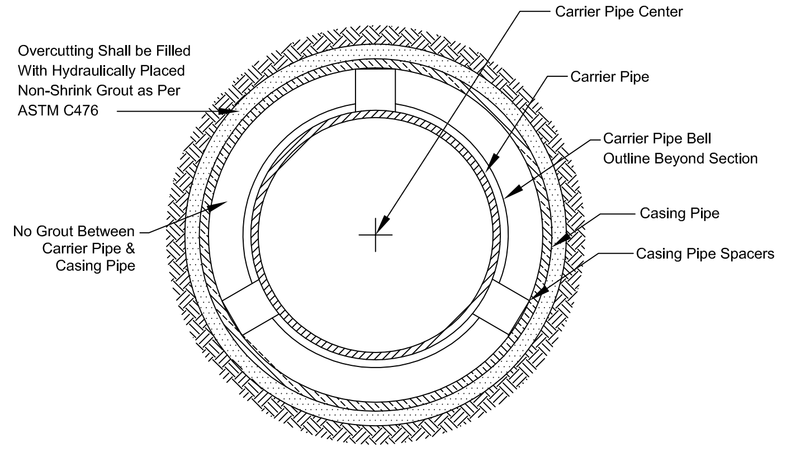


MESQUITE TEXAS Real. Texas. Service.	Public Works	UTILITY BORE & CROSSING PROFILE DETAIL	GENERAL DESIGN STANDARDS UTILITY CROSSINGS	
			SCALE - N.T.S.	
			APPROVAL DATE: 10/14/08-L	SHEET: B-4



MESQUITE TEXAS Real. Texas. Service.	Public Works	UTILITY BORE & CROSSING SECTION DETAIL	GENERAL DESIGN STANDARDS UTILITY CROSSINGS	
			SCALE - N.T.S.	
			APPROVAL DATE: 10/14/08-L	SHEET: B-5

REVISION TABLE		
NO.	REVISION	DATE

UTILITY BORE & CROSSING - 1		
ENGINEERING DIVISION		
GENERAL DESIGN STANDARDS		
City of Mesquite, Texas		
APPROVAL DATE	SCALE	DRAWN BY
4/09/09-L	N.T.S.	NCJ