

ORDINANCE NO. _____

AN ORDINANCE OF THE CITY OF MESQUITE, TEXAS, ADOPTING REVISIONS TO THE CITY OF MESQUITE ENGINEERING DESIGN MANUAL; PROVIDING A REPEALER CLAUSE; PROVIDING A SEVERABILITY CLAUSE; PROVIDING A PENALTY CLAUSE NOT TO EXCEED \$2,000.00 FOR A PERSON VIOLATING A PROVISION OF THIS ORDINANCE GOVERNING FIRE SAFETY, ZONING, OR PUBLIC HEALTH AND SANITATION AND A PENALTY NOT TO EXCEED \$500.00 FOR ALL OTHER PROVISIONS; AND DECLARING AN EFFECTIVE DATE.

WHEREAS, pursuant to Ordinance No. 4673, the Mesquite City Council adopted the City of Mesquite Engineering Design Manual (the “**Manual**”) to serve as a comprehensive manual for infrastructure design and construction; and

WHEREAS, pursuant to Ordinance No. 4728, the Mesquite City Council adopted revisions to the Manual on October 7, 2019; and

WHEREAS, Staff is proposing additional revisions to the Manual that will include the following items: (1) revise requirements for sight visibility; (2) revise requirements for minimum slopes in drainage pipes; (3) revise requirements for water service replacements; (4) revise requirements for elevation on proposed manholes in floodplain; (5) revise requirements for mow strip adjacent to screening wall; (6) revise definition of the term “Owner”; (7) add drainage maintenance agreement language; (8) revise standard details for water service, fire hydrants and curb ramps; (9) revise wastewater and water approved materials lists; and (10) add standard specification for lime treated subgrade; and

WHEREAS, the City Council has reviewed the proposed revisions to the Manual and finds it is in the best interest of the City to adopt the same.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF MESQUITE, TEXAS:

SECTION 1. That the Manual is hereby amended as follows, and in all other respects said Manual shall remain in full force and effect:

- a) *Record of Revisions.* Add a new Page ii as shown in attached Exhibit A.
- b) *Table 2-4.* Delete existing Table 2-4 and replace with a new Table 2-4 as shown on attached Exhibit B.
- c) *Table 3-9.* Delete existing Table 3-9 and replace with a new Table 3-9 as shown on attached Exhibit C.
- d) *Sections 5.12.6.A and 5.12.6.B.* Delete the text of existing Sections 5.12.6.A and 5.12.6.B and replace with new text to now read as shown on attached Exhibit D.

- e) *Section 6.5.5.* Delete the text of existing Section 6.5.5 and replace with new text to now read as shown on attached Exhibit E.
- f) *Section 7.8.5.A.* Delete the text of existing Section 7.8.5.A and replace with new text to now read as shown on attached Exhibit F.
- g) *Section 9.* Delete the definition of OWNER and replace with a new definition for OWNER to now read as shown on attached Exhibit G.
- h) *Appendix B, Item 21.* Add Item 21 to Appendix B to read as shown on attached Exhibit H.
- i) *Maintenance Agreement for Drainage Facilities.* Add the Maintenance Agreement for Drainage Facilities to read as shown on attached Exhibit I.
- j) *Standard Details.* Delete existing Standard Details G-1, W-1, W-7, W-9, P-16, P-17, P-18 and P-19 and replace Standard Details G-1, W-1, W-7, W-9, P-16, P-17, P-18 and P-19 as shown on attached Exhibit J.
- k) *Appendix E. Approved Materials List for Wastewater.* Delete existing Appendix E. Approved Materials List for Wastewater and replace with a new Appendix E. Approved Materials List for Wastewater as shown on attached Exhibit K.
- l) *Appendix E. Approved Materials List for Water.* Delete existing Appendix E. Approved Material List for Water and replace with a new Appendix E. Approved Materials List for Water as shown on attached Exhibit L.
- m) *Appendix F. Section 20020.* Delete existing Appendix F. Section 20020 and replace with a new Appendix F. Section 20020 as shown on attached Exhibit M.

All exhibits are attached to this ordinance and incorporated herein by reference and made a part thereof.

SECTION 2. That all ordinances or portions thereof in conflict with the provisions of this ordinance, to the extent of such conflict, are hereby repealed. To the extent that such ordinances or portions thereof are not in conflict herewith, the same shall remain in full force and effect.

SECTION 3. That should any word, sentence, clause, paragraph or provision of this ordinance be held to be invalid or unconstitutional, the validity of the remaining provisions of this ordinance shall not be affected and shall remain in full force and effect.

SECTION 4. That, unless specifically provided otherwise by this ordinance or by state law, any person (as defined in Chapter 1, Section 1-2 of the Mesquite City Code, as amended) violating any of the provisions or terms of this ordinance governing fire safety, zoning, or public health and sanitation, shall be deemed to be guilty of a Class C Misdemeanor and, upon conviction, shall be subject to a fine not to exceed \$2,000.00, and that any person (as defined in Chapter 1, Section 1-2 of the Mesquite City Code, as amended) violating any other provision of

this ordinance shall be deemed to be guilty of a Class C Misdemeanor, and, upon conviction, shall be subject to a fine not to exceed \$500.00. If the maximum penalty provided for by this ordinance for an offense is greater than the maximum penalty provided for the same offense under the laws of the State of Texas, the maximum penalty for violation of this ordinance for such offense shall be the maximum penalty provided by the laws of the State of Texas.

SECTION 5. That this ordinance shall take effect and be in force from and after five days after publication.

DULY PASSED AND APPROVED by the City Council of the City of Mesquite, Texas, on the 21st day of September 2020.

Bruce Archer
Mayor

ATTEST:

APPROVED AS TO LEGAL FORM:

Sonja Land
City Secretary



David L. Paschall
City Attorney

RECORD OF REVISIONS

The following list includes the effective date(s) of the City of Mesquite's *Engineering Design Manual* and a summary of significant changes.

Effective Date	Description										
05/20/2019	Adoption of the <i>Engineering Design Manual</i> by City Council.										
07/24/2019	Following Revisions were made:										
	<table border="1"> <tr> <td>Appendix B</td> <td> <ul style="list-style-type: none"> Impervious Area Summary Updated </td> </tr> <tr> <td>Appendix C</td> <td> <ul style="list-style-type: none"> Revised General Notes Sheet to require arrow boards at night on arterials, steel placement in pavement </td> </tr> <tr> <td>Appendix D</td> <td> <ul style="list-style-type: none"> Revised General-2, W-GN, P-7 P-26 </td> </tr> <tr> <td>Appendix E</td> <td> <ul style="list-style-type: none"> Revised Water Approved List to allow Fusible PVC and Certa-Lok as pipe materials. Modify Water Approved List to allow for Certa-Lok as restrained joint option Modify Sewer Approved List to allow for Fusible PVC and Certa-Lok as pipe materials. </td> </tr> <tr> <td>Appendix F</td> <td> <ul style="list-style-type: none"> Added Technical Specification 'Pipe Bursting' </td> </tr> </table>	Appendix B	<ul style="list-style-type: none"> Impervious Area Summary Updated 	Appendix C	<ul style="list-style-type: none"> Revised General Notes Sheet to require arrow boards at night on arterials, steel placement in pavement 	Appendix D	<ul style="list-style-type: none"> Revised General-2, W-GN, P-7 P-26 	Appendix E	<ul style="list-style-type: none"> Revised Water Approved List to allow Fusible PVC and Certa-Lok as pipe materials. Modify Water Approved List to allow for Certa-Lok as restrained joint option Modify Sewer Approved List to allow for Fusible PVC and Certa-Lok as pipe materials. 	Appendix F	<ul style="list-style-type: none"> Added Technical Specification 'Pipe Bursting'
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09/08/2020

Table 2-4	<ul style="list-style-type: none"> Added design speed of 35mph to table
Table 3-9	<ul style="list-style-type: none"> Corrected minimum slopes to be in ft/ft
5.12.6	<ul style="list-style-type: none"> Added further direction on when water service must be replaced
6.5.5.	<ul style="list-style-type: none"> Revised to restrict elevation of manhole relative to adjacent grade
7.8.5.4	<ul style="list-style-type: none"> Revised requirement on mow strip width
Section 0	<ul style="list-style-type: none"> Owner definition revised
Appendix B	<ul style="list-style-type: none"> Added Drainage Maintenance Agreement Language Item
Appendix D	<ul style="list-style-type: none"> Updated G-1, W-1, W-7, W-8, W-9, P-16, P-17, P-18, P-19
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Appendix F	<ul style="list-style-type: none"> Updated Specification 20020

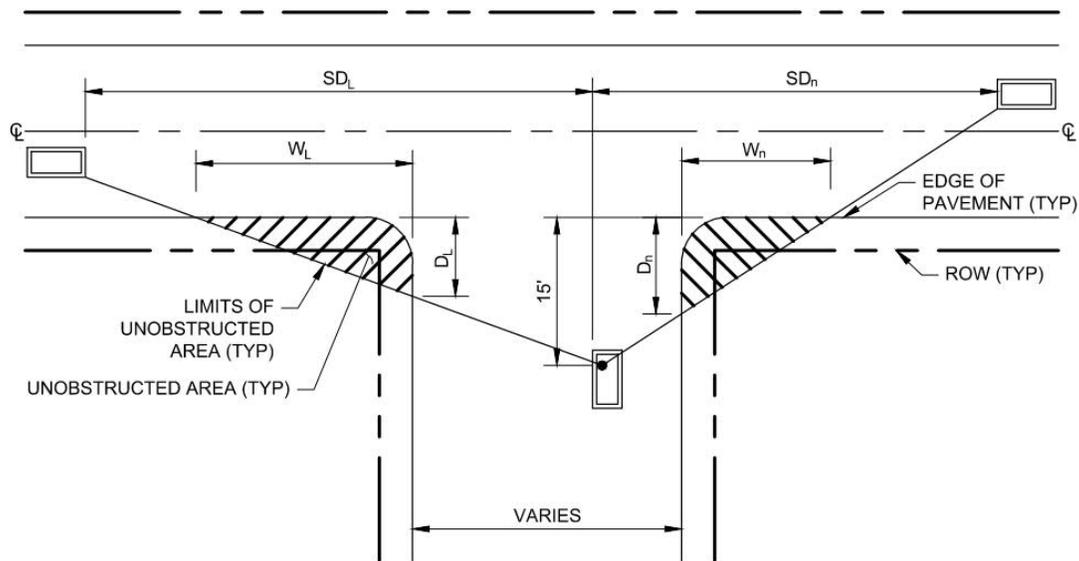


Figure 2-3. Sight Visibility Triangle Measurement

Table 2-4. Sight Visibility Triangle Dimensions

Classification	Design Speed (mph)	Minimum Sight Distance (feet)	
		SD_L^1	SD_n^1
L1, L2	25	245	255
C2, C3	30	315	325
C2, C3, S4, S5	35	390	400
S4, S5	40	480	545
S4-D, A4-D, A6-D	45	580	650

- SD_L and SD_n are the required sight distances to the left and to the right as measured from the driver's eye on the uncontrolled intersection approach looking toward oncoming cross-traffic.
- W_L and W_n are the distances along the curb line of the side of the visibility triangle parallel to the path of traffic on the uncontrolled intersection approach.
- D_L and D_n are the distances along the curb line of the side of the visibility triangle parallel to the path of the driver on the uncontrolled intersection approach.
- The dimensions for W_L , W_n , D_L , and D_n must be calculated for each intersection.

Table 3-9. Minimum Slopes for Concrete Pipes^{1,2}

Pipe Diameter (inches)	Slope (feet/feet)
18	0.00180
24	0.00120
30	0.00090
36	0.00070
42	0.00056
48	0.00048
54	0.00041
60	0.00036
66	0.00032
72	0.00028

1. Minimum slopes given to produce a velocity of 2.5 feet per second or greater.
2. Assumes a Manning's roughness coefficient of 0.013.

3.5.6. *Manning's Roughness Coefficients for Conduits* – **Table 3-10** includes the Manning's roughness coefficients that shall be used for various types of conduits.

Table 3-10. Roughness Coefficients for Closed Conduits

Materials	Manning's Roughness Coefficient (n value)
Polyvinyl Chloride (PVC) ¹	0.009
High-Density Polyethylene (HDPE) ¹	0.012
Reinforced Concrete Pipe (RCP)	0.013
Corrugated Metal Pipe (CMP) ¹	0.024

1. Provided for reference for existing closed conduits only.

3.5.7. *Design Parameters* – The following are guidelines that shall be considered and met in storm drainage design:

- 3.5.7.A. Standard pipe sizes and fittings shall be used. The minimum allowable lateral storm drain pipe diameter shall be 18 inches.
- 3.5.7.B. Pipe sizes shall not be decreased in the downstream direction, unless otherwise approved by the City Engineer.
- 3.5.7.C. At points of change in storm drain size, pipe soffits shall be set at the same elevation.
- 3.5.7.D. Laterals shall be connected to trunk lines using manholes or manufactured wye connections. Special situations may require laterals to be connected to trunk lines by a cut-in. However, such cut-ins must be approved by the City Engineer and shown as a detail in the Engineering Plans.

service saddles, corporation and angle stops have varied over the years. In addition, Type K copper is susceptible to corrosion and leaks under certain conditions.

5.12.6.A. Any existing water services over 50-years old **or not in use for the past 6 months must be replaced.**

5.12.6.B. For existing services less than 50-years old **and in continuous use** the Utility Division should verify:

- Condition of Existing Meter Box;
- Condition of Existing Meter Set including Angle Stop;
- Condition of Service, if there are any leaks apparent or suspected;
- Verify service is connected and active by opening the angle stop for a short time to verify flow;
- Verify if a meter is present, if so size and condition;
- Verify if the address has a current utility account; and,
- Any defects identified shall be noted and replacement of any defective or deteriorated water service parts noted on the Engineering Plans as a condition of development.

6.5.3. *Manhole Size and Type* – The minimum manhole diameter and wall thickness shall follow the requirements in **Table 6-3**.

Table 6-3. Manhole Size and Wall Thickness

Condition	Minimum Manhole Diameter	Minimum Wall Thickness
Depth of Manhole less than 15 feet (top of ring to flowline of lowest main) with the largest main entering the manhole less than 15 inches diameter	4 feet	5 inches Pre-Cast
		6 inches Cast-in-Place
Depth of Manhole greater than 15 feet (top of ring to flowline of lowest main) with the largest main entering the manhole less than 15 inches diameter	5 feet	6 inches Pre-Cast
		8 inches Cast-in-Place
All drop manholes (internal drop required) or any manhole with largest main entering 15 inches to 21 inches in diameter	5 feet	6 inches Pre-Cast
		8 inches Cast-in-Place
Manholes with largest main entering 24 inches to 30 inches in diameter	6 feet	8 inches
Larger or deeper mains and other special conditions and situations not covered by above requirements	As required by the City Engineer	As required by the City Engineer

6.5.4. *Drop Manholes* – Drop Manholes shall be installed if there is an incoming main with a vertical drop of more than 2 feet measured from flowline to flowline. All drop manholes shall be internal and conform to the Standard Details. Drop manholes shall have a minimum diameter of 5 feet. Existing manholes that have drops installed may terminate at the drop pipe at the invert ledge.

6.5.5. *Manhole Elevation* – The top of a manhole located within the 100-year floodplain shall be the lesser of a minimum elevation of 1 foot above the ultimate 100-year water surface elevation or 3 feet above adjacent grade. The tops of all other manholes shall be set to the grade of adjacent land or paving. Manholes shall have a concrete apron constructed at grade around all manholes in floodplain.

6.5.6. *Manhole at End of a Main* – In accordance with 30 TAC Chapter 217, all wastewater mains that may be extended at a future date, and laterals, shall end (highest point) with a manhole. The manhole should be placed after the last service.

7.8.5. Screening Wall Concrete Mow Strip

- 7.8.5.A. The concrete mow strip between piers shall be at least as wide as the maximum outside dimension of the pier/pier cap and no less than 24 inches wide. If mow strip will be 3 feet or less from pavement (including sidewalk) then mow strip shall extend to the pavement.
- 7.8.5.B. The concrete mow strip shall include a minimum of three longitudinal #4 steel reinforcing bars with 12-inch maximum spacing and #3 steel reinforcing bars at 24-inch maximum spacing transversely.
- 7.8.5.C. The concrete mow strip shall be a minimum thickness of 6-inches and be variable height to limit the gap between the wall panels and the mow strip finished grade to a maximum of 1.5-inches. The mow strip must be formed above ground and a minimum of 6-inches below the finished grade at all locations.
- 7.8.5.D. Approved expansion material 3/4-inch in thickness shall be placed on each side of the fence column pier caps where the concrete mow strip meets the pier caps.
- 7.8.5.E. The concrete mow strip shall include a City-approved method to accommodate through drainage. Screening walls and mow strips shall be designed to accommodate through drainage if dictated by the drainage plans approved by the City Engineer.

7.8.6. Wall Panels

- 7.8.6.A. Reinforcing steel shall be determined by a registered Engineer and shall meet the requirements of *ACI-318: Building Code Requirements for Reinforced Concrete* or minimums specified herein, whichever is greater.
- 7.8.6.B. Wall panels shall be, at a minimum, continually reinforced along the top and bottom portions of the panels with deformed steel reinforcing bars conforming to ASTM A615 grade 60 with reinforcement provided being #4 bars or larger as required.
- 7.8.6.C. Wall panels shall be continually reinforced with a minimum of one mat of grade 60 welded wire conforming to ASTM A185 or A497 and attached to the top rebar with a minimum vertical and horizontal area of 0.08 inch-squared/foot or larger as required.
- 7.8.6.D. The construction plans showing the reinforcing placement shall be signed and sealed by a Professional Engineer licensed in the State of Texas.
- 7.8.6.E. Minimum panel thickness shall be 5 inches for rebar reinforced portions of the wall and 3 inches for wire mesh reinforced portions of the wall.
- 7.8.6.F. Panels shall be uniform in finish, color, and appearance and shall be readily interchangeable.

system by pumps. The distribution system, including storage and pumping capacity, shall be able to satisfy this demand. Also known as peak flow.

Median – The portion of a divided roadway separating the opposing traffic flows. A median may be traversable or non-traversable.

Median Opening – An opening in a non-traversable median that allows accessing or crossing the opposing traffic lanes.

Minimum Hourly Demand – The rate at which water is drawn from the distribution system during the hour of minimum demand on the day of maximum demand. This rate is used in the water distribution analysis to determine the adequacies of the system to replenish elevated storage.

Natural Channel – An unlined and unimproved existing drainage channel that has not been graded, modified, cleared, or created by equipment. Also known as natural creek and natural stream.

Non-traversable Median – A physical barrier in a roadway or driveway that separates vehicular traffic traveling in opposite directions, and prohibits movement of traffic across the median. Non-traversable medians include, but are not limited to, concrete barriers, raised concrete curbs and/or islands, and grass or swale medians.

Normal Water Surface Elevation – The typical observed water surface elevation in the absence of a flood event. Also referred to as ordinary high water mark or normal pool level.

Open Channel – A channel in which water flows with a free surface. Includes creeks, lakes, flood control sags, or natural water ways.

Owner – Except for in Appendix A, the term Owner means the person or entity financially responsible for developing a particular site or project. Also referred to as Developer. When used in Appendix F the term Owner is the City of Mesquite.

Parkway – An area within the right-of-way but outside the edge of pavement which is typically reserved for public use other than vehicular traffic.

Post-development – The condition of the given site and drainage area after the anticipated development has taken place. Also known as proposed condition or post-project.

Pre-development – The existing condition of the given site and drainage area prior to development. Also known as existing condition or pre-project.

Right-of-Way (ROW) – A strip of land dedicated by plat for use of public roadways and/or related facilities. Other facilities include, but are not limited to, utilities, drainage systems, and other transportation uses. Unless otherwise specified, the term right-of-way shall refer to a public right-of-way.

ROW Width – The shortest horizontal distance between the lines which delineate the limits of right-of-way.

Schools – A public, private, or parochial institution for the education of students in any grade between pre-kindergarten through twelfth grade or any combination thereof. A public school includes an open enrollment charter school as defined under the Texas Education Code. Includes elementary and secondary schools. Does not include trade, vocational, or commercial schools.

Sidewalk – A paved area behind the curb intended for the use of pedestrians and/or bicyclists.

CITY CHECKLISTS

1. Engineering Plan Submittal Requirements
2. Engineering Plan Submittal Checklist
3. Traffic Impact Analysis Checklist
4. Geotechnical Report for Roadways Checklist
5. Operations and Maintenance Form
6. Grading and Floodplain Development Permit Form
7. Underground Fire Sprinkler Mains – Engineering Plans Checklist
8. Water and/or Sewer Service Only Project Checklist
9. Culvert and Drive Approach Only Project Checklist
10. Individual Single Family Lot Residential Development – Engineering Plans Checklist
11. Parking Lot Improvement Checklist
12. Impervious Area Summary Form
13. ROW and Easement Abandonment Procedure
14. Temporary Concrete Batch Plant Permit Procedure
15. Record Drawings Procedures for Private Projects
16. Acceptance Letter Request Form
17. Project Closeout and Acceptance Checklist
18. Mass Grading Coordination with Building Inspection Procedure
19. Engineering Plan Changes After Release Procedure
20. Variance Request to Engineering Design Manual
21. Drainage Maintenance Agreement Language

The Engineer shall verify the current edition of the checklists with the Engineering Division.

CITY OF MESQUITE
MAINTENANCE AGREEMENT FOR DRAINAGE FACILITIES

The Owner of the platted property agrees to perpetually maintain the drainage facilities within the drainage, floodplain and maintenance easements shown on this plat as follows:

The Owner agrees to maintain in good structural condition and repair all drainage pipes, including reinforced concrete pipe (RCP) and other drainage piping material. The Owner agrees to repair any defects in the storm drainage piping system, including leaking pipe joints, deflection of flexible pipe diameter in excess of 5%, pipe structural failure, or other defects that might impair the hydraulic capacity or structural soundness of the drainage system. The Owner agrees to repair any drainage pipe defects within 30 calendar days after having notice or knowledge of the problem via inspection by the Owner, and/or the City of Mesquite.

The Owner agrees to maintain, repair and remove obstructions in the storm drainage inlet and outlet structures, including but not limited to grate inlets, curb inlets, catch basins, Y-inlets, and headwalls. The Owner agrees to repair any defects in the storm drainage inlet or outlet structures and remove obstructions that might impair the hydraulic capacity or structural soundness of the drainage system. The Owner agrees to repair any drainage inlet or outlet structural defects and remove obstructions within 30 calendar days after having notice or knowledge of the problem via inspection by the Owner, and/or the City of Mesquite.

The Owner agrees to maintain and repair concrete channel lining, pilot channels, rock rip-rap, gabions or any other channel lining material and to repair any defects in the channel lining material including undermining, excessive cracking and settlement, structural failure, or other defects that might impair the hydraulic capacity or structural soundness of the drainage system. Rock rip-rap washed downstream will be replaced as needed to maintain the rock layer thickness as designed. The Owner agrees to repair any defects in the channel lining within 30 calendar days after having notice or knowledge of the problem via inspection by the Owner, and/or the City of Mesquite.

The Owner agrees to maintain and repair channels, ditches and detention or retention ponds and to repair erosion in same by backfilling the eroded area and re-establishing protective vegetation or by armoring the eroded area with gabions, rock rip-rap, concrete or other material approved by the City Engineer. The Owner agrees to repair any eroded areas in the channels, ditches and detention or retention ponds within 30 calendar days after having notice or knowledge of the problem via inspection by the Owner, and/or the City of Mesquite.

Channels, ditches and detention or retention ponds will be inspected monthly by the Owner to determine vegetation removal maintenance. Removal of willows, cottonwoods or other "woody" vegetation from channels, ditches, detention ponds and retention ponds shall be done at least once a year. Ditches, earthen channels and detention or retention ponds shall be mowed as frequently as required to prevent grassy vegetation from exceeding a height of more than one foot.

Channels, ditches, detention or retention ponds, inlet and outlet structures and drainage piping will be inspected for debris, trash and sediment accumulation at least once a year. The

accumulated debris, trash or sediment will be removed as needed to insure the designed hydraulic capacity of the drainage system, with sediment accumulations in detention ponds not to exceed 18-inches in depth before removal is required. Trash or debris shall not be allowed to accumulate and shall be removed within 30 calendar days after having notice or knowledge of the problem via inspection by the Owner, and/or the City of Mesquite.

The Owner or a representative agent agrees to inspect all drainage facilities every 365 calendar days to identify any obstructions or structural problems, complete a written inspection report, and take the actions necessary to remove obstructions and repair structural problems within 30 calendar days. The Owner shall ensure a copy of the inspection report is forwarded to the Engineering Division within 10 calendar days of the inspection.

Owner agrees to maintain access to the drainage system within the drainage, floodway and maintenance easements for maintenance and inspection by the Owner, and/or the City of Mesquite.

All references in this maintenance agreement to repairs to be made "within 30 calendar days" shall mean that the Owner shall commence repairs within 30 calendar days after having notice or knowledge of the problem via inspection by the Owner, and/or the City of Mesquite. The Owner shall diligently work to complete such repairs.

DETAIL NO.	DETAIL NAME	EFFECTIVE DATE
GENERAL		
G-GN	GENERAL NOTES	11/11/2019
G-1	TABLE OF CONTENTS	05/20/2019
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
PAVING		
P-1	EXPANSION JOINTS	11/11/2019
P-2	CONSTRUCTION JOINTS	11/11/2019
P-3	SAWED CONTRACTION & ISOLATION JOINTS	05/20/2019
P-4	STREET JOINTING	05/20/2019
P-5	TYPICAL HEADERS	05/20/2019
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
P-14	CONCRETE PAVING DETAIL - TYPICAL SECTION	05/20/2019
P-15	CONCRETE SIDEWALK WITH RETAINING WALL	05/20/2019
P-16	CURB RAMP - TYPE A	09/08/2020
P-17	CURB RAMP - TYPE B	09/08/2020
P-18	CURB RAMP - TYPE C	09/08/2020
P-19	CURB RAMP - TYPE D	09/08/2020
P-20	FIRE LANE PAVING	05/20/2019
P-21	FIRE LANE STRIPING	05/20/2019
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
P-25	ALLEY UTILITY LOCATION	05/20/2019
P-26	DRIVEWAY - GENERAL	07/24/2019
P-27	DRIVEWAY - FLARED	05/20/2019
P-28	DRIVEWAY - RADIAL	05/20/2019
P-29	DRIVEWAY - RESIDENTIAL ALLEY	05/20/2019
WATER		
W-GN	GENERAL NOTES - WATER	07/24/2019
W-1	TYPICAL WATER MAIN PIPE EMBEDMENT (NOT UNDER PAVEMENT)	09/08/2020
W-2	TYPICAL WATER MAIN PIPE EMBEDMENT (UNDER PAVING)	11/11/2019
W-3	WATER FLANGED FITTINGS	05/20/2019
W-4	WATER VALVE	05/20/2019
W-5	ABANDONMENT OF VALVE STACK	05/20/2019
W-6	AIR RELEASE VALVE	05/20/2019

	Public Works	TABLE OF CONTENTS	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: G-1A
			REVISION DATE: 09/08/2020	

W-7	WATER SERVICE	09/08/2020
W-8	TYPICAL UTILITY LOCATIONS	09/08/2020
W-9	FIRE HYDRANT	09/08/2020
W-10	FIRE HYDRANT (STRAIGHT)	05/20/2019
W-11	FIRE HYDRANT (90 BEND)	05/20/2019
W-12	WATER FLANGED FITTINGS	05/20/2019
W-13	FIRE SPRINKLER YARD PIPING	05/20/2019
W-14	REMOTE FDC AND FIRE LINE	05/20/2019
W-15	3" THRU 10" DOMESTIC TURBINE WATER METER ASSEMBLY	05/20/2019
W-16	FIRE HYDRANT BOLLARD	05/20/2019
WASTEWATER		
WW-GN	GENERAL NOTES - WASTEWATER	11/11/2019
WW-1	WASTEWATER EMBEDMENT (NOT UNDER PAVING)	04/13/2020
WW-2	WASTEWATER EMBEDMENT (UNDER PAVING)	04/13/2020
WW-3	WASTEWATER LATERAL	05/20/2019
WW-4	WASTEWATER MAINLINE CLEANOUT	05/20/2019
WW-5	WASTEWATER MANHOLE RING AND COVER	05/20/2019
WW-6	WASTEWATER MANHOLE RING AND COVER (RETROFIT ONLY)	05/20/2019
WW-7	DOUBLE CLEANOUT	05/20/2019
WW-8	SINGLE CLEANOUT	05/20/2019
WW-9	PRECAST MANHOLE	05/20/2019
WW-10	CAST-IN-PLACE MANHOLE	05/20/2019
WW-11	PRECAST DROP MANHOLE	05/20/2019
WW-12	CAST-IN-PLACE DROP MANHOLE	05/20/2019
WW-13	ABANDONED MANHOLE	05/20/2019
WW-14	MANHOLE INVERT AND CONNECTION	05/20/2019
WW-15	MANHOLE BLOCKOUT	05/20/2019
WW-16	MANHOLE VENT	05/20/2019
WW-17	PRECAST FLAT MANHOLE LID	05/20/2019
WW-18	CAST-IN-PLACE FLUSH MANHOLE LID	05/20/2019
WW-19	CAST-IN-PLACE MANHOLE LID	05/20/2019
TRAFFIC		
T-1A:1D	PAVEMENT MARKING	05/20/2019
T-5	JIGGLE BARS & TRAFFIC ARROWS	05/20/2019
T-6	STREET LIGHTING CONDUIT	05/20/2019
T-7	CROSSWALK PAVEMENT MARKING	05/20/2019
T-8	STREET NAME SIGN LAYOUT	05/20/2019
SOLID WASTE		
SW-1A:1B	DUMPSTER ENCLOSURE	05/20/2019
DRAINAGE		
D-1A:1B	5' AND 10' SINGLE RECESSED CURB INLET	05/20/2019
D-2A:2B	15' AND 20' DOUBLE STANDARD CURB INLET	05/20/2019
D-3A:3B	5' AND 10' SINGLE STANDARD CURB INLET	05/20/2019
D-4	CURB INLET DETAILS AND NOTES	05/20/2019
D-5	CURB INLET REINFORCING	05/20/2019
D-6A:6B	STORM DRAIN MANHOLE 4', 5', OR 6' SQUARE	05/20/2019

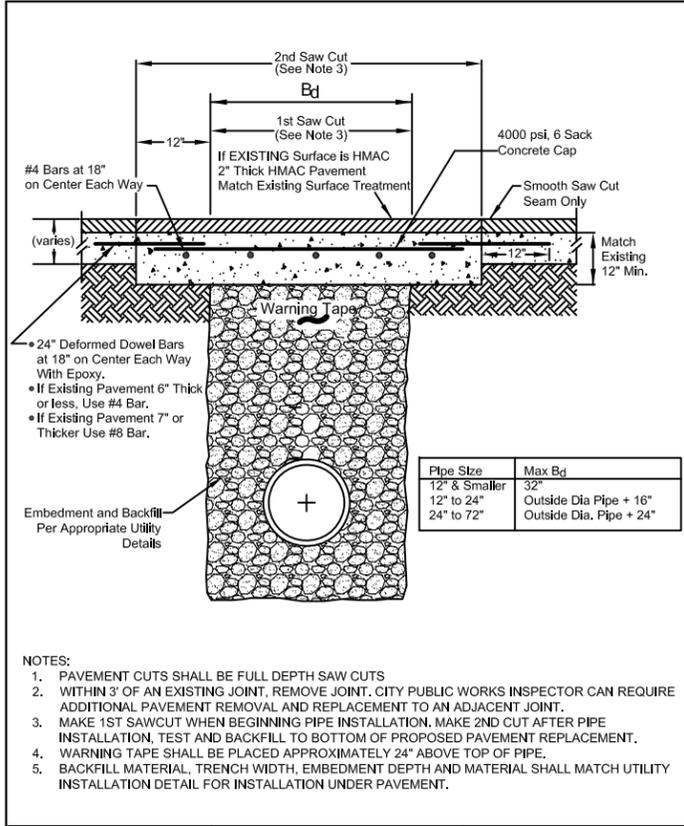
	Public Works	TABLE OF CONTENTS	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: G-1B
			REVISION DATE: 09/08/2020	

D-7A:7B	CONCRETE CHANNEL DETAILS	05/20/2019
D8	CONCRETE COLLAR	11/11/2019
D9	STORM DRAIN EMBEDMENT	11/11/2019
FRANCHISE UTILITY		
F-1	FRANCHISE UTILITY PAVEMENT CUT REPLACEMENT	05/20/2019
F-2	TYPICAL FRANCHISE UTILITY LOCATION IN STREET ROW	05/20/2019
F-3	TYPICAL FRANCHISE UTILITY LOCATION IN ALLEY ROW	05/20/2019
F-4	RESERVED FOR FUTURE USE	
F-5A	FRANCHISE UTILITY GENERAL NOTES	04/13/2020
F-5B	FRANCHISE UTILITY GENERAL NOTES	05/20/2019

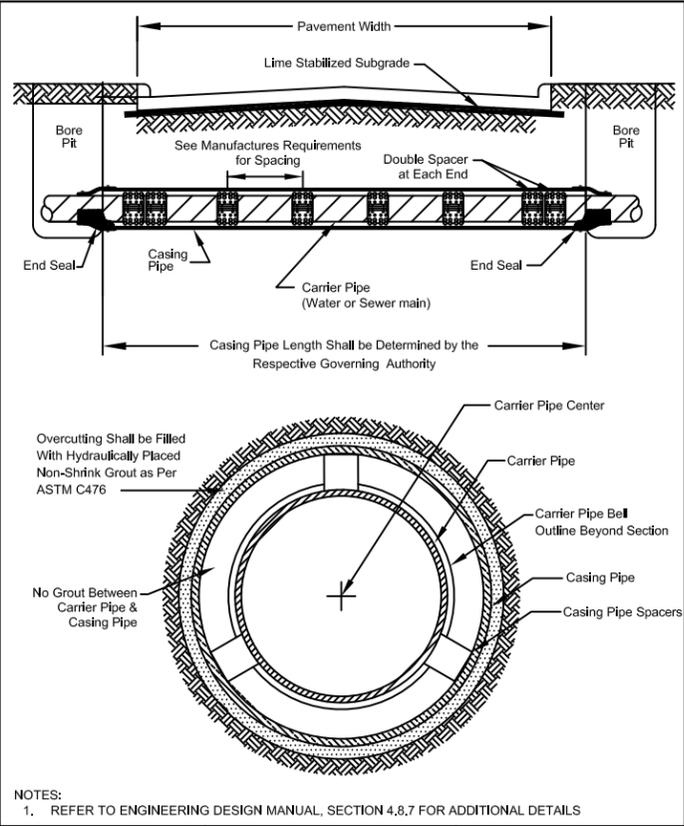
	Public Works	TABLE OF CONTENTS	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: G-1C
			REVISION DATE: 04/13/2020	

GENERAL		
G-GN	GENERAL NOTES	11/11/2019
G-1	TABLE OF CONTENTS	05/20/2019
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
PAVING		
P-1	EXPANSION JOINTS	11/11/2019
P-2	CONSTRUCTION JOINTS	11/11/2019
P-3	SAWED CONTRACTION & ISOLATION JOINTS	05/20/2019
P-4	STREET JOINTING	05/20/2019
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P-9	MONOLITHIC NOSE	05/20/2019
P-10	MEDIAN	05/20/2019
P-11	STAMPED CONCRETE MEDIAN PAVEMENT	05/20/2019
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P-17	CURB RAMP - TYPE B	09/08/2020
P-18	CURB RAMP - TYPE C	09/08/2020
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P-21	FIRE LANE STRIPING	05/20/2019
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
P-25	ALLEY UTILITY LOCATION	05/20/2019
P-26	DRIVEWAY - GENERAL	07/24/2019
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P-28	DRIVEWAY - RADIAL	05/20/2019
P-29	DRIVEWAY - RESIDENTIAL ALLEY	05/20/2019
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W-GN	GENERAL NOTES - WATER	07/24/2019
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W-2	TYPICAL WATER MAIN PIPE EMBEDMENT (UNDER PAVING)	11/11/2019
W-3	WATER FLANGED FITTINGS	05/20/2019
W-4	WATER VALVE	05/20/2019
W-5	ABANDONMENT OF VALVE STACK	05/20/2019
W-6	AIR RELEASE VALVE	05/20/2019

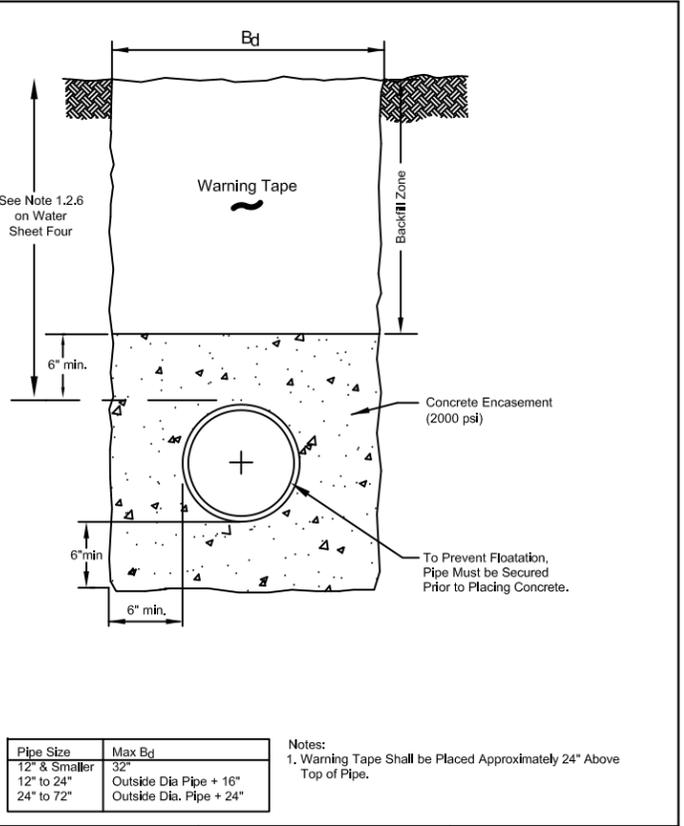
	Public Works	TABLE OF CONTENTS	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: G-1D
			REVISION DATE: 05/20/2019	



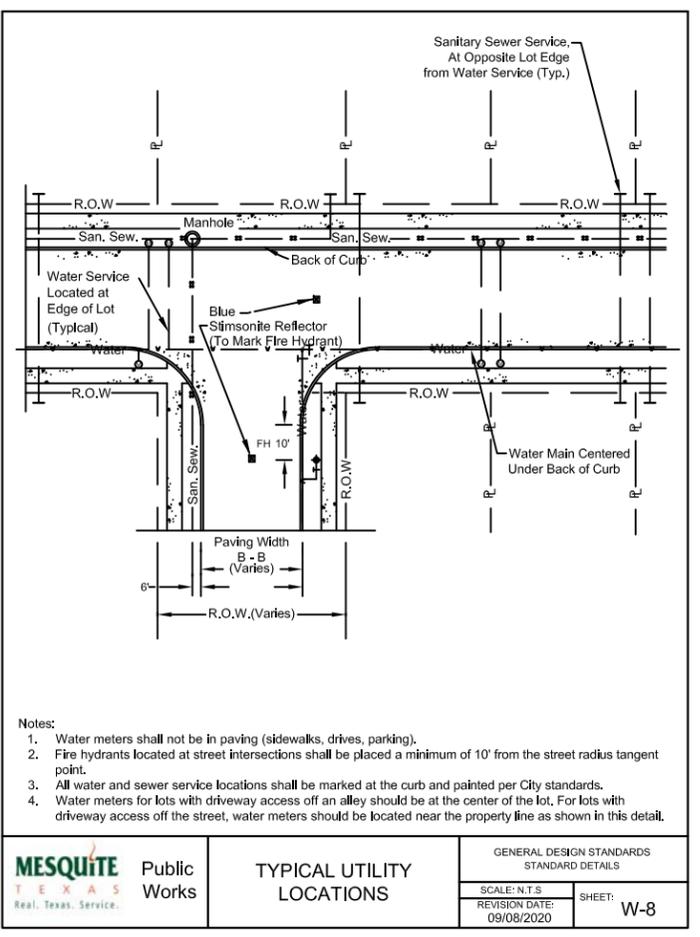
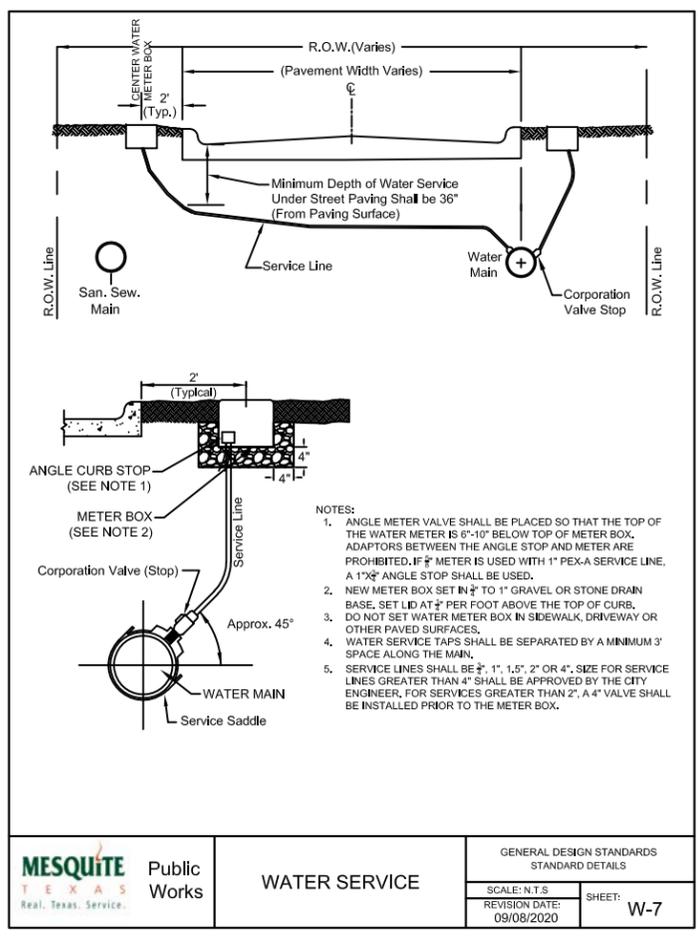
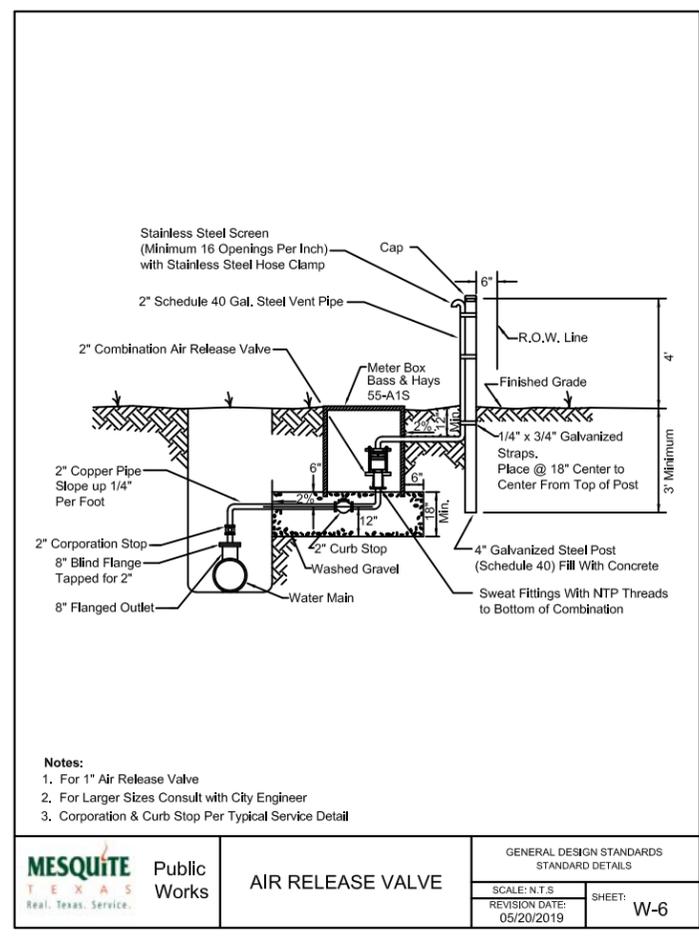
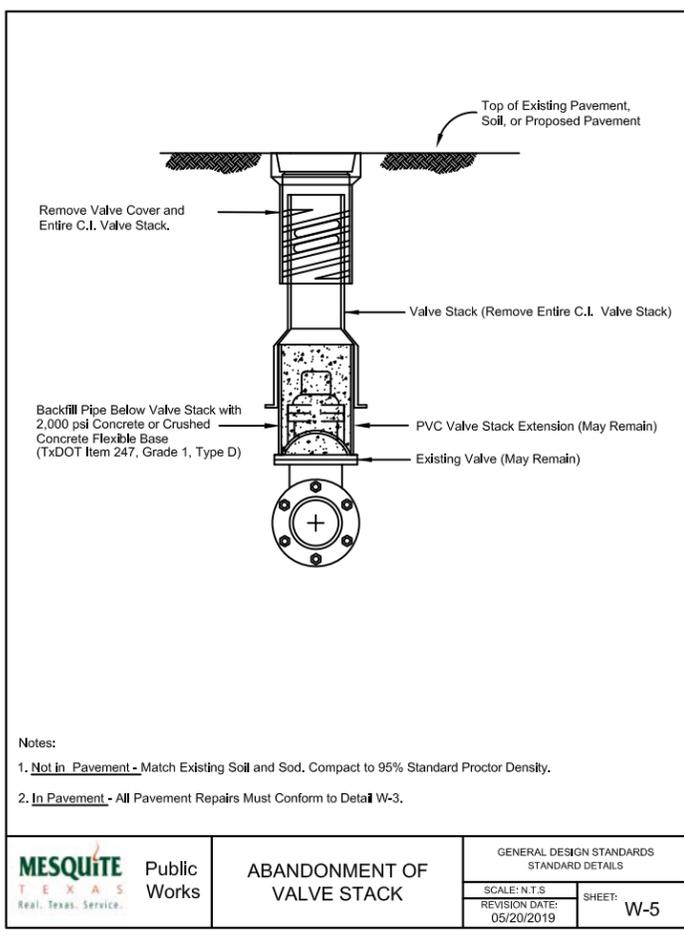
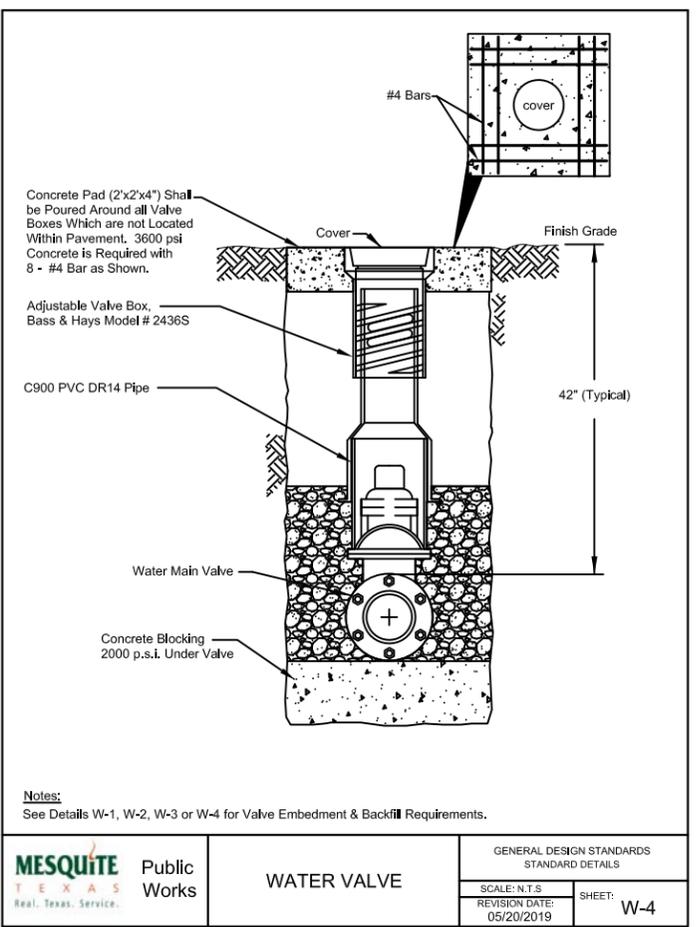
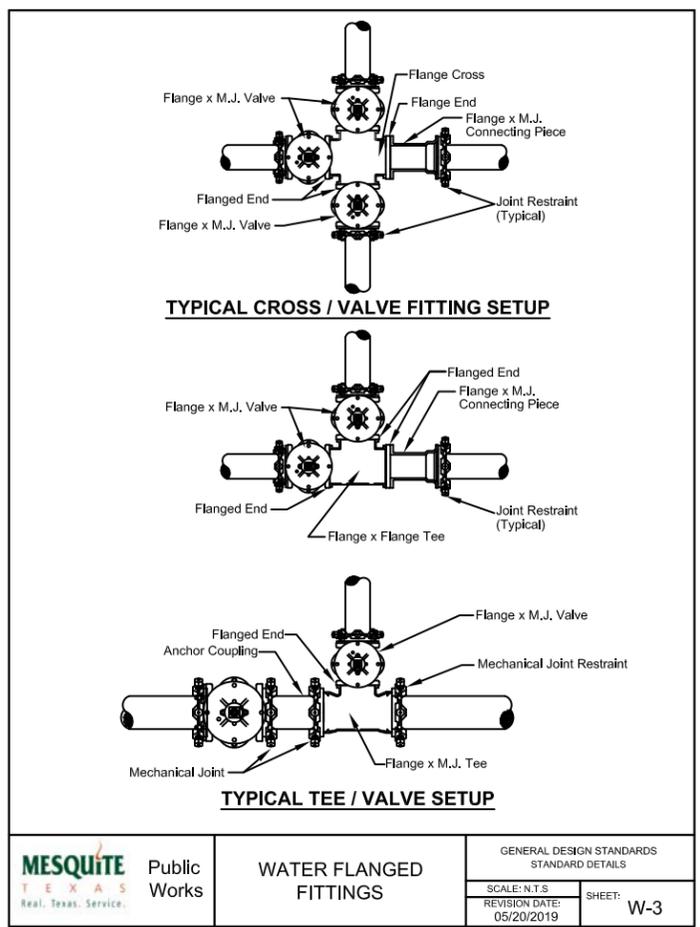
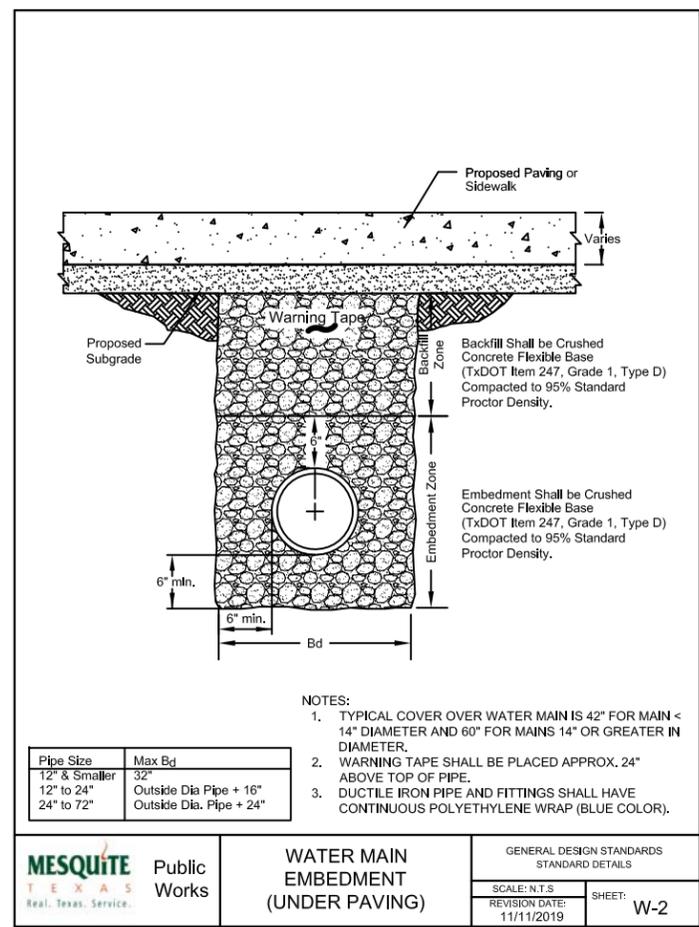
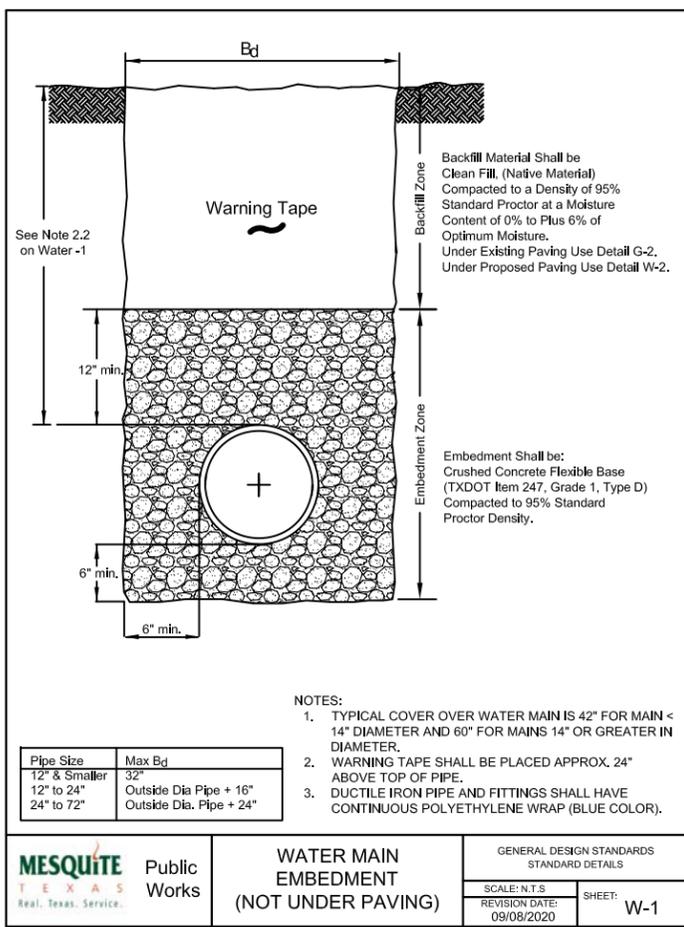
	Public Works	TYPICAL PAVEMENT REPAIR OVER TRENCH	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: G-2
			REVISION DATE: 11/11/2019	

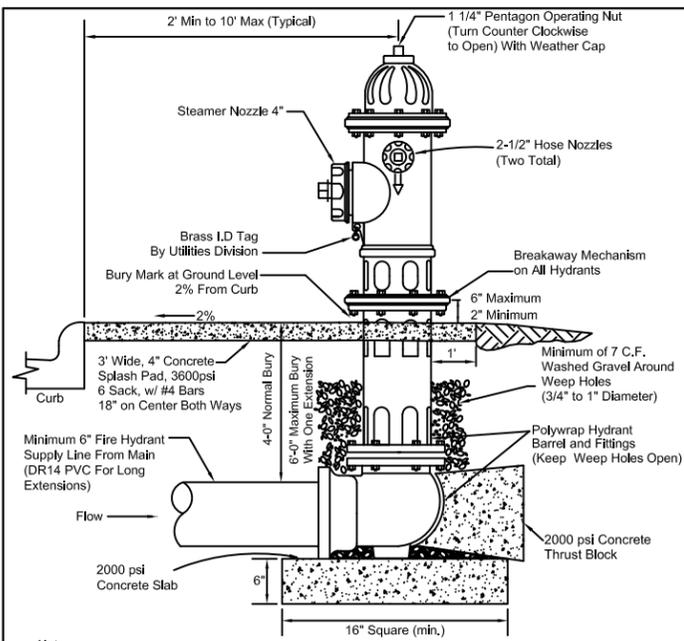


	Public Works	UTILITY BORE	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: G-3
			REVISION DATE: 05/20/2019	



	Public Works	CONCRETE ENCASEMENT	GENERAL DESIGN STANDARDS STANDARD DETAILS	
			SCALE: N.T.S.	SHEET: G-4
			REVISION DATE: 05/20/2019	





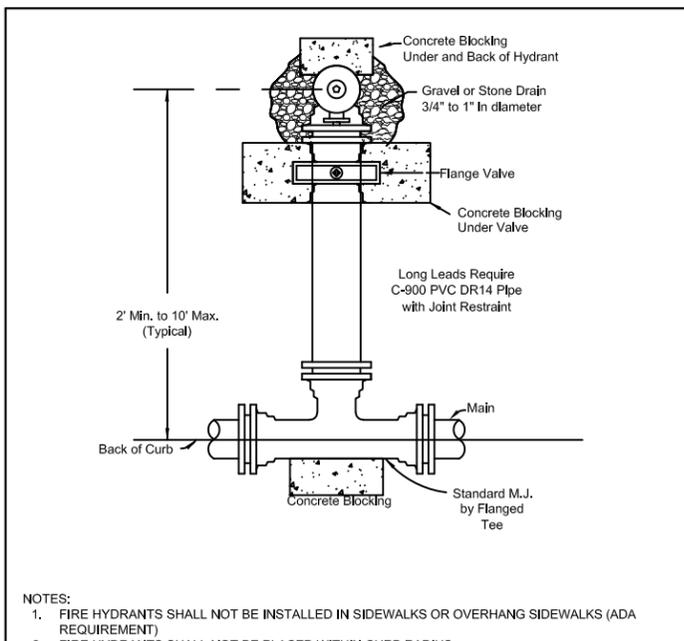
- Notes:**
1. Fire Hydrants shall not be Installed in Sidewalks or Overhang Sidewalks (ADA Requirement).
 2. Fire Hydrants shall not be Placed Within Curb Radius.
 3. Fire Hydrants Located Between Street Intersections Shall be Placed at a Property Line (Extended).
 4. Fire Hydrant Leads shall have Embedment & 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: 09/08/2020



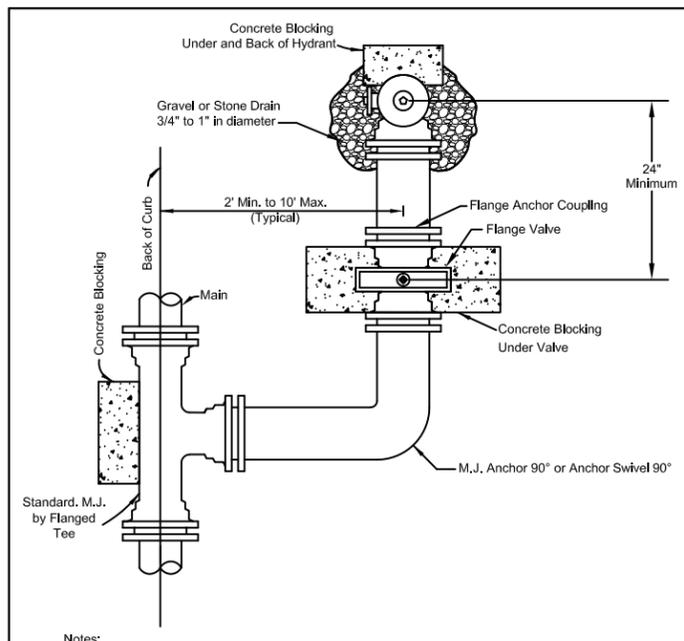
- NOTES:**
1. FIRE HYDRANTS SHALL NOT BE INSTALLED IN SIDEWALKS OR OVERHANG SIDEWALKS (ADA REQUIREMENT)
 2. FIRE HYDRANTS SHALL NOT BE PLACED WITHIN CURB RADIUS
 3. FIRE HYDRANTS LOCATED BETWEEN STREET INTERSECTIONS SHALL BE PLACED AT A PROPERTY LINE (EXTENDED)
 4. FIRE HYDRANT LEADS SHALL HAVE EMBEDMENT 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



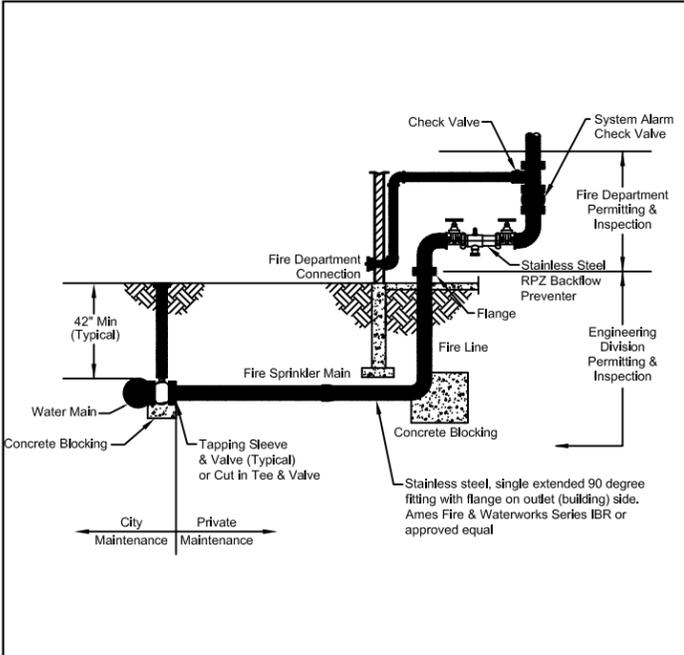
- Notes:**
1. Fire Hydrants shall not be Installed in Sidewalks or Overhang Sidewalks (ADA Requirement).
 2. Fire Hydrants shall not be Placed Within Curb Radius.
 3. Fire Hydrant Located Between Street Intersections Shall be Placed at a Property Line (Extended).
 4. Fire Hydrant Leads shall have Embedment & 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



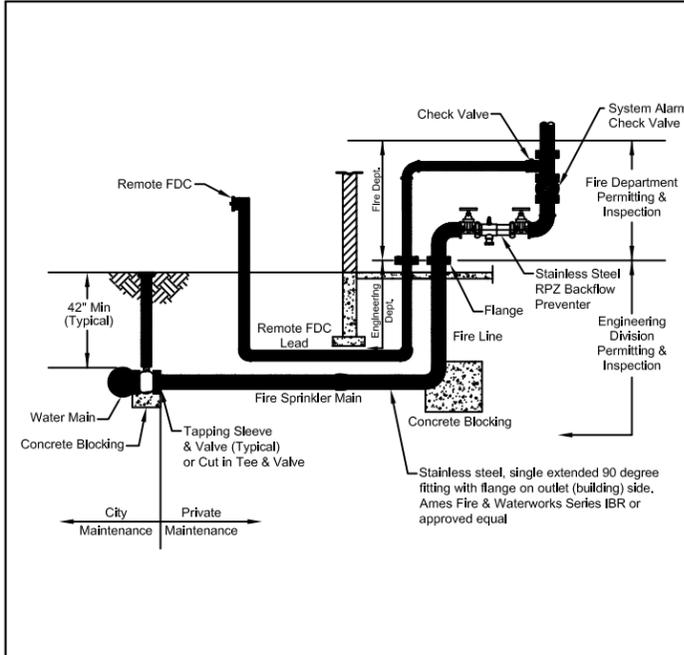
- Notes:**
1. All Fittings Must be Mechanically Anchored & Blocked.
 2. All Below Grade / Ground construction is Permitted & Inspected by the Engineering Division (Including Remote FDC).
 3. All Above Grade / Ground Construction is Permitted & Inspected by Fire Department.
 4. All Concrete Blocking shall 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



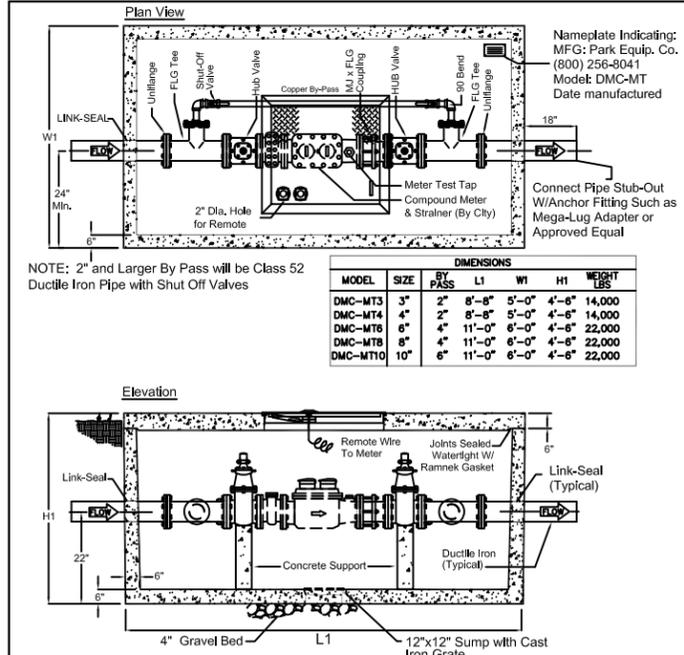
- Notes:**
1. All Fittings Must be Mechanically Anchored & Blocked.
 2. All Below Grade / Ground construction is Permitted & Inspected by the Engineering Division (Including Remote FDC).
 3. All Above Grade / Ground Construction is Permitted & Inspected by Fire Department.
 4. All Concrete Blocking shall 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



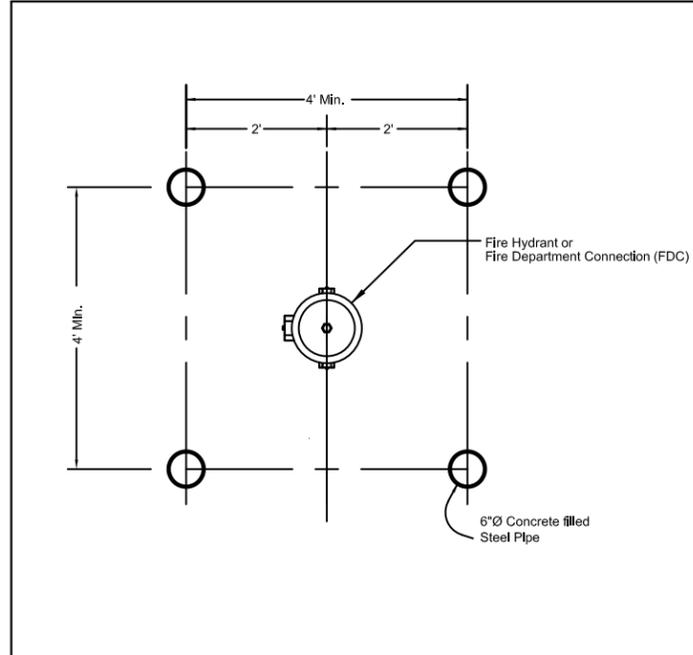
- Notes:**
1. Vault Concrete: Class 1 Concrete with Design Strength of 4500 PSI at 28 Days. Unit is of Monolithic Construction at Floor and First Stage of Wall with Sectional Riser Depth.
 2. Vault Reinforcement: Grade 60 Reinforced. Steel Rebar Conforming to ASTM A615 on Required Centers or Equal.
 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

EXHIBIT K

**City of Mesquite
Approved Materials List for Wastewater
Last Revised - September 8, 2020**

BASIC PRODUCT CATEGORY	SUB-CATEGORY	MANUFACTURER	MODEL, TYPE, OR STYLE APPROVED	GOVERNING SPECIFICATION	GENERAL REQUIREMENTS	NOTES
Sewer Pipes						
Sewer Main	4" to 15" Dia		PVC, SDR-26	ASTM D3034	Green color	Fusible PVC and Certa-Lok are acceptable PVC pipe materials
			HDPE, DR 13.5	ASTM F714, PE 4710		
	18" to 30" Dia		PVC, PS115	ASTM F679		Fusible PVC and Certa-Lok are acceptable PVC pipe materials
	18" to 54" Dia	Hobas Pipe, US Composite Pipe South and Ameron International	Fiberglass	ASTM D3262 / ASTM 4161		Must submit thickness design for wall thickness calculations
Aerial Crossing			Ductile iron pipe (CL 54) with Protecto 401 internal coating		Green color	
Service Laterals			PVC		Green color	Green color
Manhole and Appurtenances						
Manhole Pipe connectors		A-Loc National Pollution Control Systems Inc. Press-Seal	KOR-N-SEAL 306 Series PSX: Direct Drive			
Manhole Lids and Rings	Connectings Lines < 15" Dia	EJ USA, Inc.	30-in ERGO XL SS (Product No. 00148026L01)		30" Clear Opening; AASHTO HS-20 Load Rated; Words and Logo per Standard Detail	Equipped with MPIC Pick Slot, elastomer T-Gasket in lid, infiltration plugs at hinge
	Connecting Lines ≥ 15" Dia	Manhole Rehab, Inc. Composite Access Products	Sewper Cover 3200 Product Series Composite Manhole Frame and Cover (Model CAP ONE - 30, bolt down)			
	Retrofit Work Only	EJ USA, Inc.	24-in ERGO SS (Product No. NPR10-1213A)			Equipped with MPIC Pick Slot, elastomer T-Gasket in lid, infiltration plugs at hinge
Manhole Coating		Armorock	Armorock liner inserts for existing manholes or Armorock manholes for new manholes may be used in lieu of concrete manholes with coating where coating is required			Armorock manholes shall not be allowed where manhole is required to be above adjacent grade (i.e. floodplains). Inserts are still allowed in floodplain.
		Raven Lining Systems	Raven 405			125 mils thick
Manhole Grade Rings		Cretex Seals EJ USA, Inc.	ARPRO Expanded Polypropylene Infra-Riser	ASTM D3575		
Pre-Cast Manhole Ring Gasket		Hydroconduit Hanson	Profile CR 097			
Geotextile Material Under Manhole		Tencate Propex Geosolutions	Mirafi 140N Geotex 401			
Manhole Chimney Seals, Ring & Cover sealing systems		Pipeline Seal & Insulator Inc.	Riser-Wrap			
	Retrofit Work Only	Cretex	Interior Chimney Seal with stainless steel self locking bands			for use with EJ USA, Inc. 24-in manhole lid only
Threaded Lid Anchor						All manhole ring anchors must be embedded a minimum of 4.5-inches into concrete cone. All Stainless Steel Bolts Threads and Nuts must be coated with approved anti-seize compound: Permatex Nickel Anti-Seize or approved equal.
		Hilti USA Simpson Strong-Tie	KWIK BOLT 3 SS 304 5/8" or equal Strong Bolt 5/8"			
Miscellaneous						
Double Cleanout Meter Box		Bass & Hays	3-LID2 (Sewer)			

EXHIBIT L

**City of Mesquite
Approved Materials List for Water
Last Revised - September 8, 2020**

BASIC PRODUCT CATEGORY	SUB-CATEGORY	MANUFACTURER	MODEL, TYPE, OR STYLE APPROVED	GOVERNING SPECIFICATION	GENERAL REQUIREMENTS	NOTES
Water Pipe						
Water Main	4" to 18" Dia		PVC, Class 305, DR 14	AWWA C900	Designed for minimum working pressure of 200psi and minimum field test pressure of 200 psi; HS-20 Live Load; HDPE and PVC shall be blue in color	Push on joints: ASTM D-3139; Gaskets: ASTM F477; Fusible PVC and Certa-Lok are acceptable PVC pipe materials
			HDPE, Class 333, DR7	ASTM F714, PE 4710		
	> 12" Dia		Ductile Iron, Class 52	AWWA C151		Interior cement mortar lining and exterior asphaltic coating in accordance with AWWA C104; Wrapped with polyethylene wrap
		>16" Dia		Reinforced Concrete Cylindrical Pipe (RCCP)		
Water Services	<1" Dia		Type K Copper			
			Type K Copper			
	>=1" Dia	Rehau Municipex	PEX-A	AWWA C904, ASTM F876	Blue Color	Cross-linked polyethylene; Stainless steel stiffeners shall be used; Install with 12 gauge detectable tracing wire with HDPE coating
Fire Hydrants						
Fire Hydrants		Mueller	Super Centurion 250-A423		Manufactured within 2 years of install date; 1~ 4" Steamer Nozzle; 2 ~ 2.5" Hose Nozzles; 1 1/4" Pentagon Operating Nut turns Counter - Clockwise to Open; Install without chains	
		American Darling	B-84B-5			
		Waterous	Pacer WB67			
		Kennedy	K81A Guardian			
		Clow	Medallion			
Fire Hdyrant Paint	Aluminum	Flynt				
	Blue	Groco	GRO-LAC, QDM, Part No. 766-1010-01			
	Yellow	Groco	GRO-LAC, QDM, Part No. 766-2115-01			
Valves						
Valves	>= 6"	Mueller	Resilient Seat		Valves >24" shall be horizontal installation valves	
		Mueller	Resilient Wedge			
		American Darling	Resilient Wedge			
		US Pipe & Foundry	Metro-Seal Resilient Wedge			
		American Flow Control	Series 2500 Resilient Wedge			
		Kennedy	Resilient Wedge			
		Clow	Resilient Wedge			
		MH	Resilient Wedge Gate Valve			
	American	AVK Resilient Seated Gate Valve Series 25, 4"-12"				
	> 36"	Mueller	Butterfly		Butterfly only allowed with approval of City of Engineer	
American Darling		Butterfly				
Pratt		Butterfly				
Air Release Valves		Vent-O-Mat	025 RBX 2521 (1") / 050 RBX 2521 (2")			
Valve Stacks and Boxes		Bass & Hays	Model 2436S			

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Fittings, Misc							
Tapping Sleeves		Mueller	H304		Require 3/4" NPT Brass Test Plug; Stainless Steel Tapping Sleeve with Stainless Steel Flange		
		Ford	FTSS, FTSS-MJ				
		Smith-Blair	665, 665MJ				
		Dresser	630				
		PowerSeal	Model 3490				
Restraint (Retainer) Glands	Ductile Iron	Romac Industries	SST III		Require 3/4" NPT Brass Test Plug; Stainless Steel Tapping Sleeve with Stainless Steel Flange		
		Uni-Flange	Series 1400				
		EBAA	Iron 1100 Series Megalug				
		Stargrip	Series 3000				
		Tyler Union	Field Lock, Tufgrip 1000				
	PVC	SIP Industries	EZ Grip				
		Uni-Flange	Series 1500				
		EBAA	Iron 2000PV Series Megalug				
		Stargrip	Series 4000				
		Tyler Union	Tufgrip 2000				
		SIP Industries	EZ Grip				
		Napco	Certa-Lok AWWA C900 Restrained Joint Integral Bell				
	Sigma	One Lok					
Ductile Iron Fittings		American Pipe			Require 3/4" NPT Brass Test Plug; Stainless Steel Tapping Sleeve with Stainless Steel Flange		
		Tyler Pipe Products					
		Clow Products					
		Star Pipe Products	Tees, bends, anchor nipples				
		Sigma/Nappco	Tees, bends, anchor nipples				
		Griffin Pipe Products					
Restraint (Internal Joint Restraint)	C900 PVC Pipe	SIP Industries					
		Eagle	LOC 900				
		Diamond	Lok-21				
Couplings		Romac Industries, Inc.	Macro HP				
Flushing Systems		Mueller Co.	Hydro-Guard HG-1 Automatic Flushing System				
Polyethylene Wrap				AWWA C105, Method A	All ductile iron pipe and fittings shall be wrapped	For wrapping pipe - blue color	
Bores							
Casing Spacers		Pipeline Seal and Insulator, Inc.	Model Ranger II				
		Power Seal	Model 4810				
Casing End Seals		Advanced Product & Systems, Inc.	Model AW (wrap around) End Seal				
		CCI Pipeline Systems	Model ESW Wrap Around Neoprene Rubber End Seal				

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BASIC PRODUCT CATEGORY	SUB-CATEGORY	MANUFACTURER	MODEL, TYPE, OR STYLE APPROVED	GOVERNING SPECIFICATION	GENERAL REQUIREMENTS	NOTES
Service Connections						
Corporation Valve (Stops)	3/4", 1", 1.5", 2"	Mueller	B-25008		AWWA C800 equipped with ball valve; For Ductile Iron pipe - use threaded corp stop with Teflon tape wrap;	
		Jones	J-1937-SG			
		Ford	FB-1000-3-Q, FB-1000-4-Q, FB-1000-6-Q, FB-1000-7-Q			
		A.Y. McDonald	4701BQ			
Angle Valve (Stops)	3/4", 1", 1.5", 2"	Mueller	B-24258 (3/4", 1"); B-24276 (1.5", 2")		AWWA C800 equipped with ball valve and lock wing	
		Jones	J-1963W-SG (3/4", 1"); J-1975W-SG (1.5", 2")			
		Ford	BA43-332-WQ (3/4"), BA43-444-WQ (1"), BFA43-666-WQ (1.5"), BFA43-777-WQ (2")			
		A.Y. McDonald	4602BQ			
Service Saddles	For PVC, DI, CI Pipe: 3/4", 1", 1.5", 2"	Mueller	BR-2B, BR-2S		AWWA C800 with AWWA taper threads outlet; CC Thread; Stainless Steel Bolt/Nut/Washer, with the exception of double strap	
		Jones	J-979, J-969			
		Ford	202B, 202BS			
	A.Y. McDonald	3825, 3845				
	For AC Pipe	Ford	FS2			Tapped, Minimum 12.5" Length
Access Hatch	For meter vaults	Forterra	Aluminum Hatch Pedestrian 36x36, Single Leaf, Trough Frame (Drawing No. SPT3636AL)		Hinged 1/4" aluminum diamond plate cover with 1/4" extruded aluminum frame. Hatch to be furnished with 316 Stainless Steel Snap Lock & Brass Hinges	
		Bilco	PCM-4			
Meter Boxes	3/4" Service	DFW Plastics	DFW1814F1PS-1KA%F with DFW18AMR-1KA%F-LID		HDPE Base Enclosure - With Slot; Not Traffic Rated; Cast Iron Ring with HDPE Locking Lid that will accept AMR/AMI antenna through lid	Nominal 18-inch diameter
	1", 1.5", 2" Service	DFW Plastics	DFW2818F-1BA MCK with DFW20AMRI-1BA MCK-LID			Nominal 30" diameter

SECTION 20020**LIME TREATED SUBGRADE****PART 1 – GENERAL****1.1 DESCRIPTION**

- A. The work as specified in this section includes all labor, materials and equipment necessary for the placement and compaction of Lime Treated Base to the lines and grades indicated on the plans.

1.2 SUBMITTAL**1.3 QUALITY CONTROL**

- A. General
 - 1. Locations for testing will be determined by the City Public Works Construction Inspector. Most current ASTM specifications shall govern testing methods.
- B. Testing Requirements, reference Section 10020 Testing Laboratory Services
 - 1. Lime Treated Subgrade
 - a. Proctor analysis
 - b. Moisture content and compaction shall be tested every 300 linear feet per lane
 - c. Check for depth of lime treatment every 300 linear feet per lane using phenolphthalein
 - d. Provide sieve analysis for material at 500-foot intervals per lane

PART 2 – MATERIALS AND EQUIPMENT**2.1 LIME**

- A. Lime for lime treated subgrade application shall be provided in accordance with NCTSSPWC Item 301.2, Lime Treatment.
- B. Lime shall be Type A, Hydrated Lime, as specified by NCTSSPWC Item 301.2.1.1.

PART 3 – EXECUTION**3.1 PREPARATION**

- A. Prepare roadbed in accordance with NCTSSPWC Item 301.2.3.
- B. Depth of preparation per plans.

3.2 INSTALLATION

- A. Installation of Lime Products in accordance with NCTSSPWC Item 301.2.3.
- B. Depth of installation per plans.
- C. Compaction shall be 95% to 100% per ASTM D698 or ASTM D 2922.

PART 4 – MEASUREMENT AND PAYMENT

- A. This section shall be measured by the square yard of lime treated subgrade installed at the depth and concentration specified and shall be full compensation for lime, hauling, mixing, scarifying, testing, compaction, grading; and for all manipulation, labor, tools, equipment and incidentals necessary to complete the work, all in accordance with the plans and these specifications.

END OF SECTION