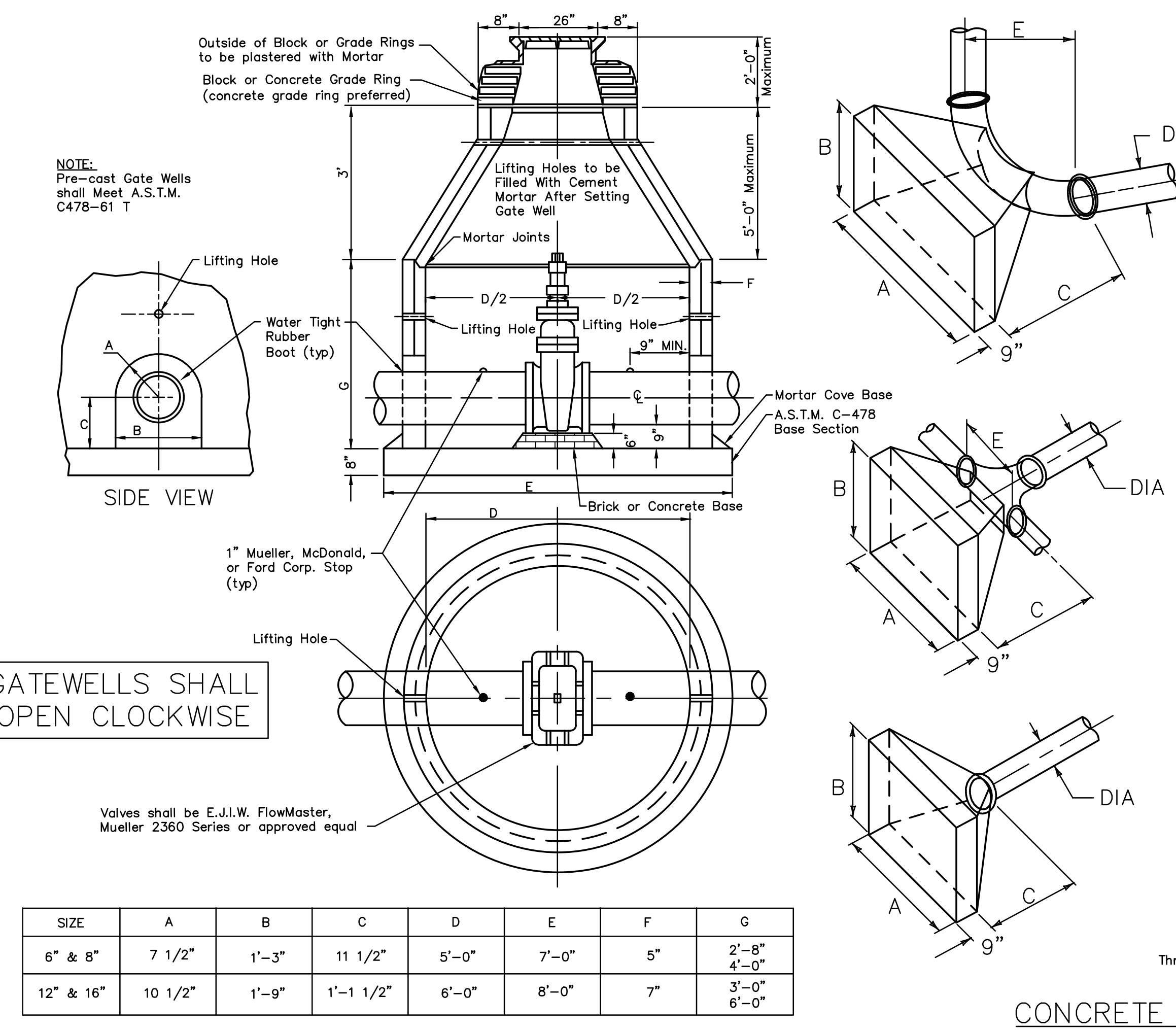
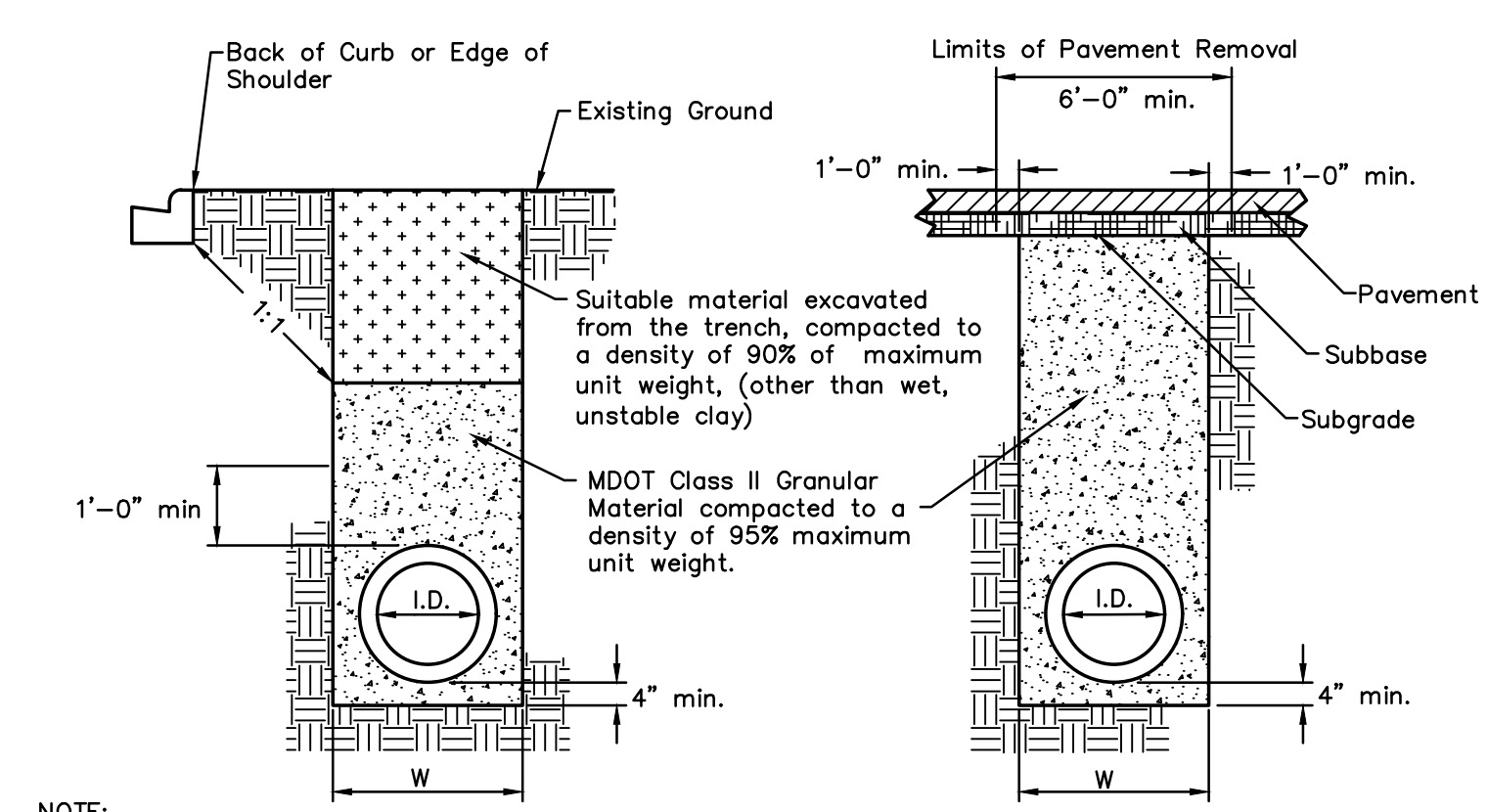
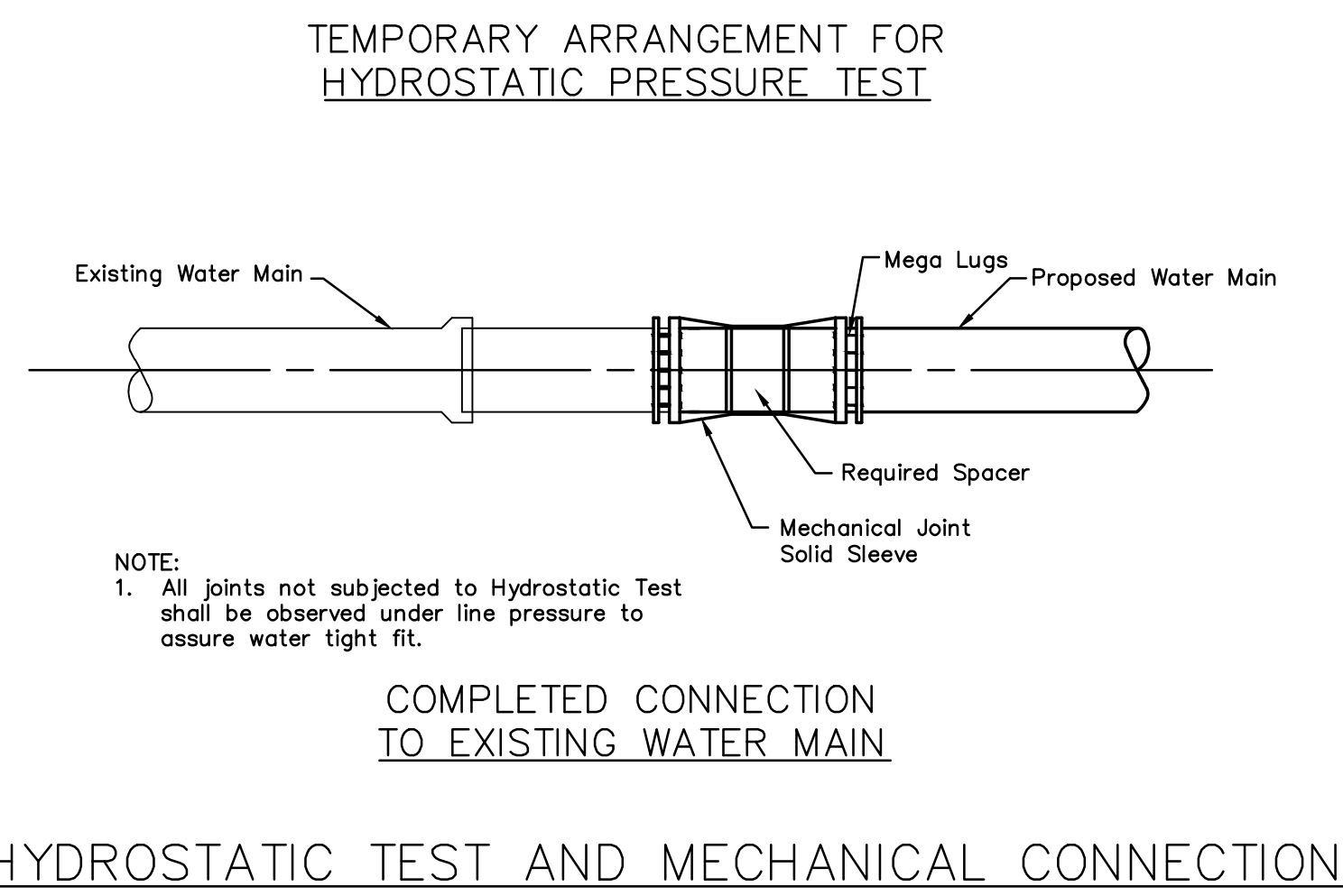
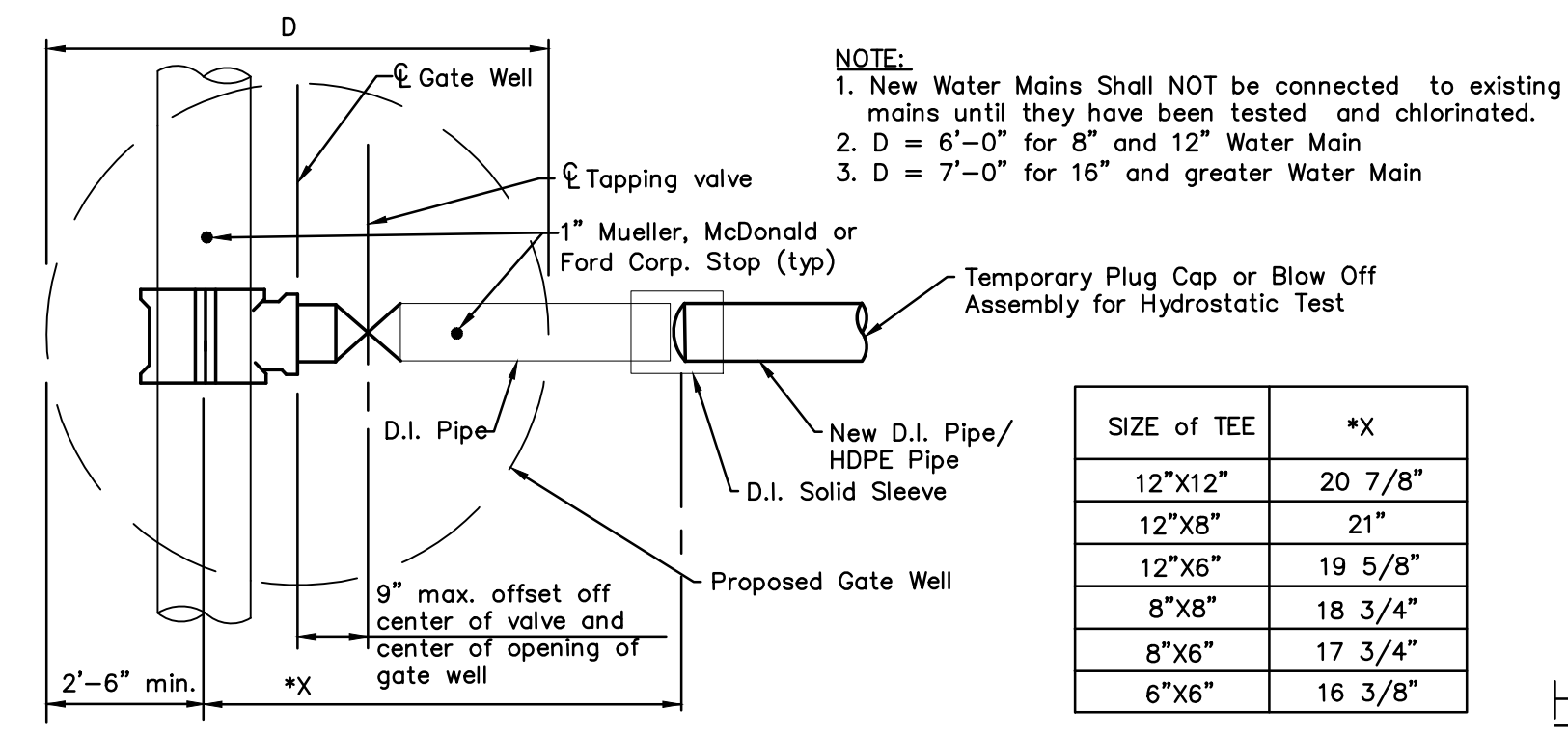
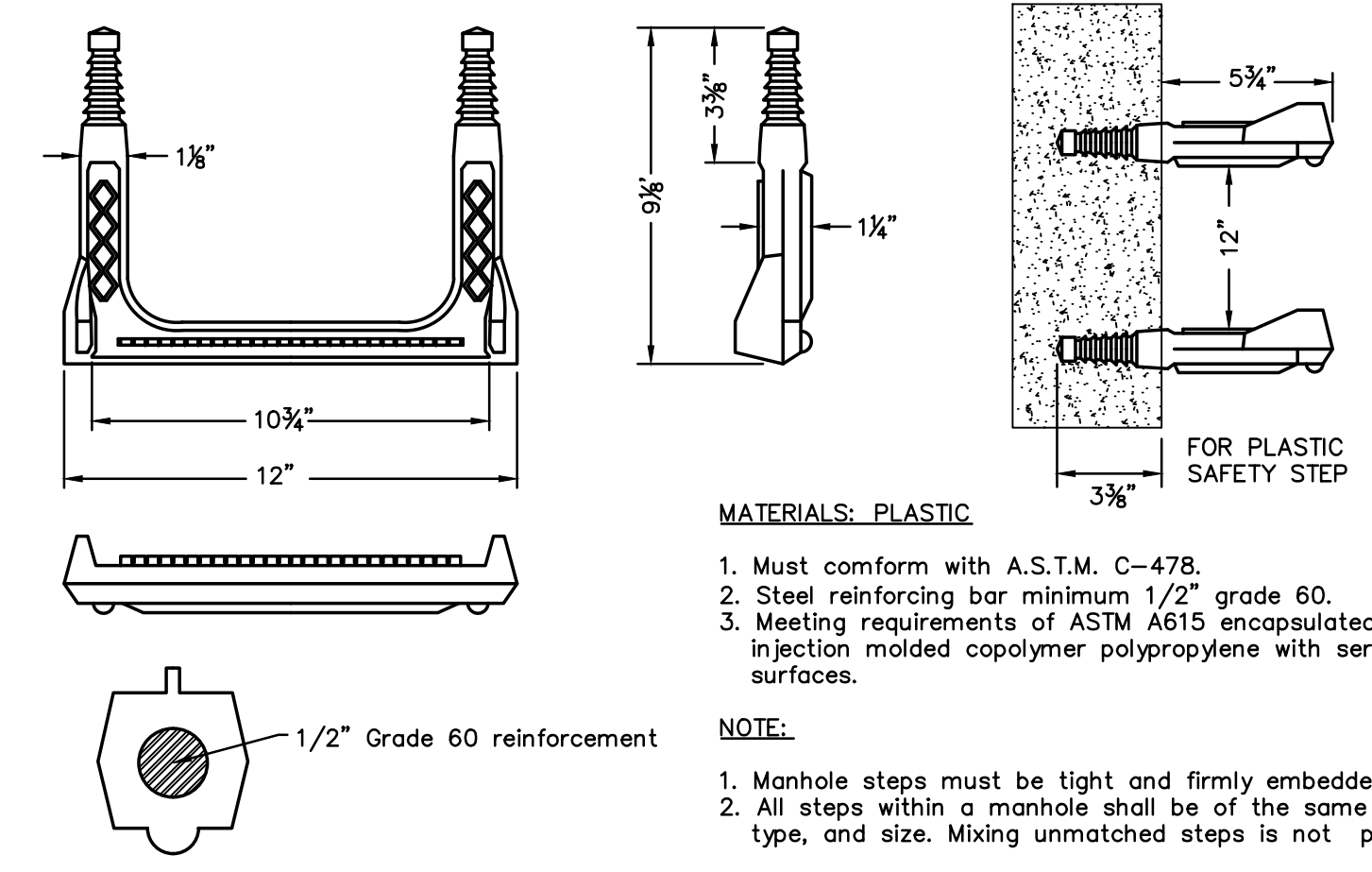
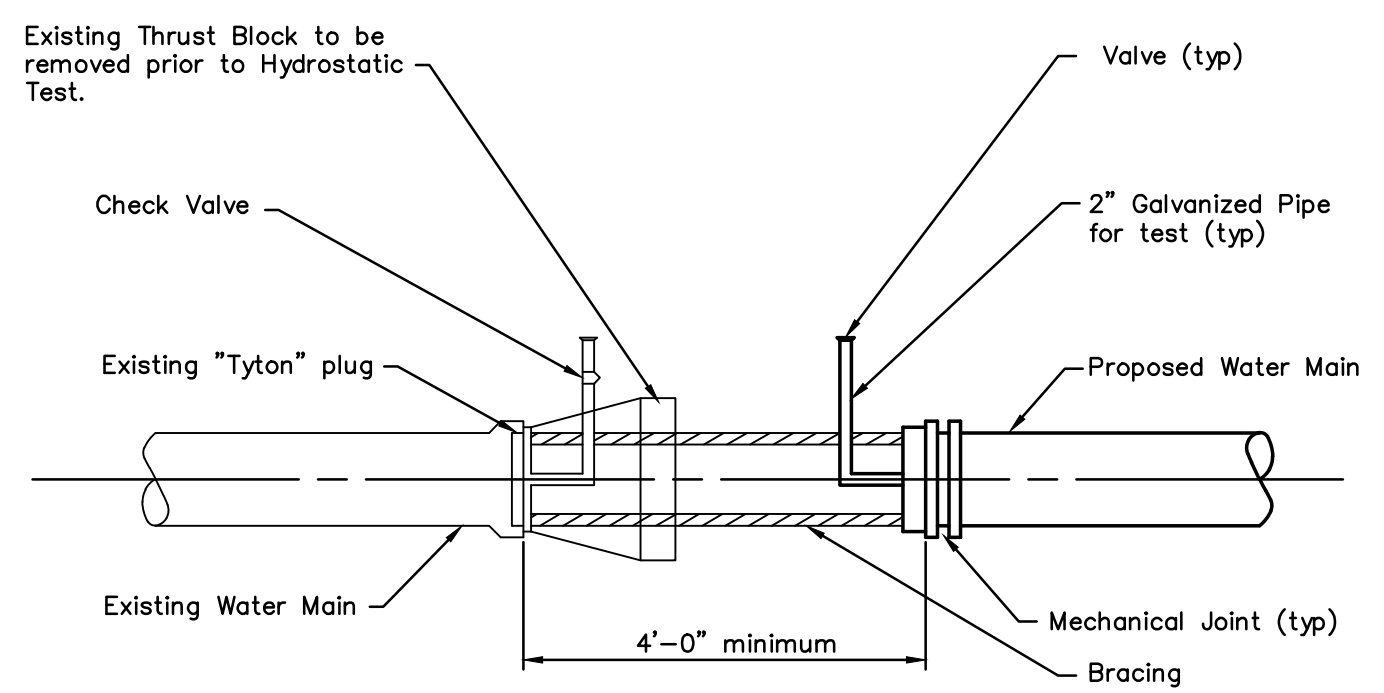
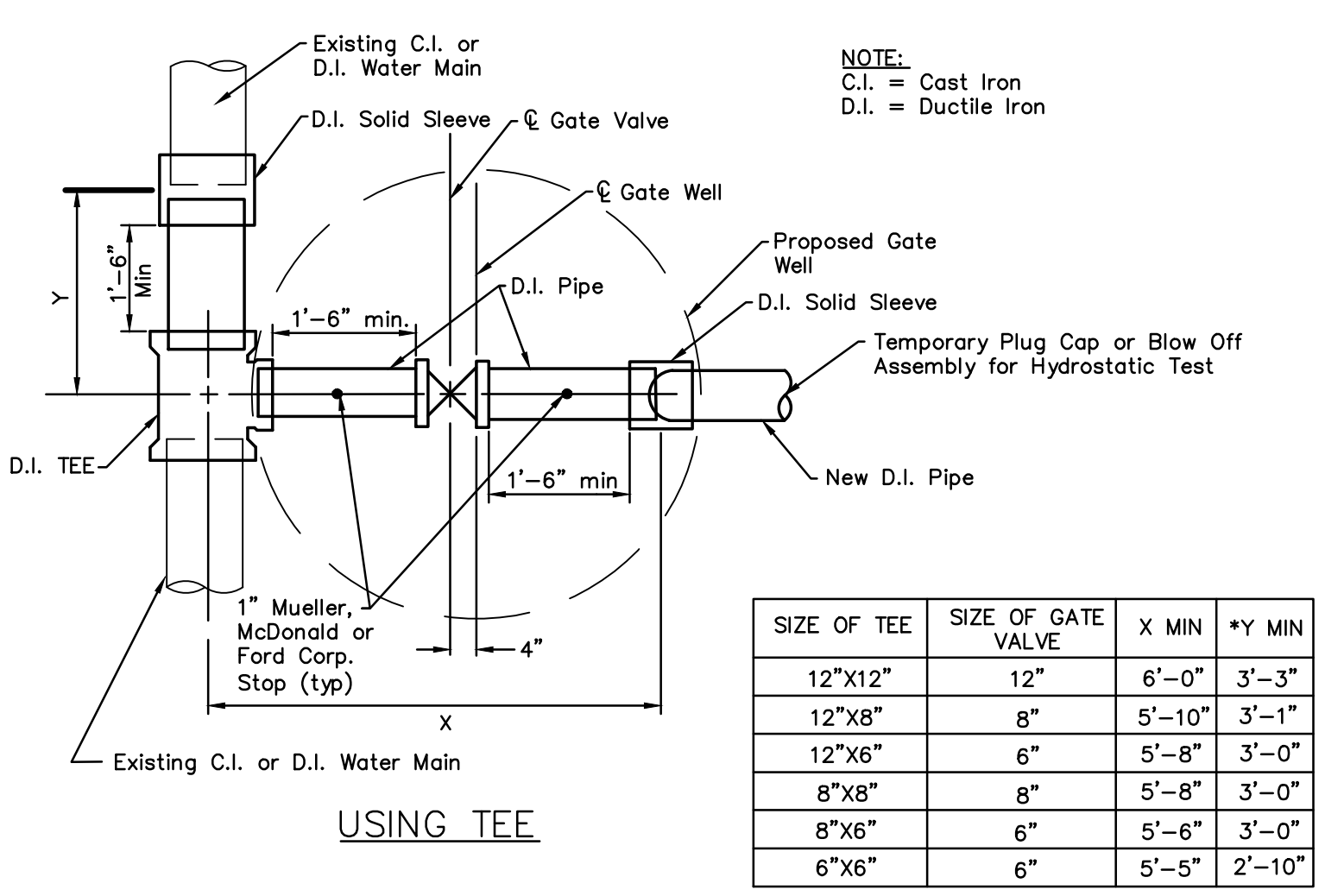


CITY OF LIVONIA
 Department of Public Works, Engineering Division
 35000 Civic Center Drive
 Livonia, Michigan 48154
 (734) 466-2570, (734) 466-2195 Fax

WATER MAIN STANDARD DETAILS
 CITY OF LIVONIA, WAYNE COUNTY, MICHIGAN

CITY OF LIVONIA
 STANDARD WATER MAIN NOTES:

- TAP FEE - A tap fee must be paid and a bond posted with the Water and Sewer Department of the City of Livonia prior to beginning any work. In addition, a meter must be obtained from the Water and Sewer Department to meter all water consumed including, flushing and other normal water installation operations.
- Ductile Iron Pipe (D.I.) - All water main pipe 16" diameter and smaller shall be Class 54, meeting ANSI Spec. A-21.51 and shall be lined with a double thickness of cement-mortar meeting ANSI Spec. 21.4.
- High Density Polyethylene Pipe (HDPE) shall meet AWWA C906 and SDR 11. The pipe shall be blue shelled on the exterior and black on the inside. Tracer wire for water mains to be coated solid 8 gauge copper wire attached to all metal connections (valves, hydrants, house connections, etc.). Directional Drilling for installation shall follow AWWA C600 or AWWA C605 specifications.
- Joints - All ductile iron water pipe and fittings shall have push-on joints either "Tyton" or "Super Bell-Tite", except where otherwise noted. All joints should meet AWWA C111 and/or C115 specifications.
- Fittings shall be Tyler Union or approved equal ductile iron with push-on joints, pressure rating 250 psi, conforming to ANSI Specification 21.10 (AWWA C110) "Gray Iron and Ductile-Iron Fittings," 2" through 48", for Water and other Liquids.
- GATE VALVES - Valves shall be manufactured and tested to meet the requirements of ANSI/AWWA C515. Valves shall meet or exceed the requirements of Underwriters Laboratories Standard UL262 and Factory Mutual Standard 1130 with a working pressure of the valve at 250 psi. Valves shall be E.J.L.W. FlowMaster, Mueller 2360 Series or approved equal. Valves to rotate clockwise to open, include a right resilient wedge, and have a red operating nut.
- Bedding - A minimum of 4" of compacted approved sand (100% passing 3/8" sieve) shall be provided under all water pipe and continued to a level 12" above the pipe.
- POLYETHYLENE ENCASEMENT - All ductile iron water pipe and fittings shall be wrapped in 8 mil thick, black, polyethylene, in accordance with ANSI Spec. A-21.5.
- All new and existing water main structures must be water tight. If work is to be done on an existing structure, the contractor is responsible for ensuring that the structures is water tight upon completion of the work. City Engineer has authority in some specific circumstances to waive this requirement due to existing utility conflicts.
- All horizontal and vertical bends require the use of "Mega-Lug" restraints and thrust blocking.
- All bolts must be "Cor-Blue" T-Bolt Type.
- HYDRANTS shall follow AWWA C502 specifications.
- OPERATING VALVES - The City of Livonia Water Department will open and close all valves on existing lines. No valve on an existing water line is to be operated by anyone other than an authorized Water Department employee.
- FOAM SWABBING (POLYPIG) - Both the initial flushing and the flushing after chlorination will be supplemented by passing foam swab through the water main. The contractor shall be responsible for providing the required foam swab and provide a detailed plan prior to flushing.
- CONNECTIONS TO EXISTING WATER MAINS will not be allowed until the new lines have passed the pressure test (150 p.s.i. for 1 hr. max. loss 50 gal/inch dia./mile/day) and have been satisfactorily disinfected with chlorine (50 ppm-24 hrs).
- NOTIFICATION - Both the Engineering Division and the City of Detroit Water and Sewer Department must be notified at least 24 hours in advance when any connections are to be made to an existing water main. "24 HOURS NOTIFICATION REQUIRED"
- When a PRESSURE TEST is to be made on a new water line, the LIVONIA ENGINEERING DEPT. MUST BE NOTIFIED 24 HOURS IN ADVANCE and be present for the test to verify that all main valves are open and to open all hydrants during the course of the pressure test. The contractor is responsible to provide the necessary equipment and labor to perform this test, and is responsible to provide testing for bacteriologic water samples by an approved Michigan Department of Environmental Quality (MDEQ) certified lab. A hard copy of the approved results shall be provided to the City of Livonia Engineering Division and DPW before the scheduled connection to the main line occurs, along with proper (24 hours) notification to residents and businesses.
- FINAL VERIFICATION - When all connections have been made following chlorination and pressure test, the contractor shall notify the Livonia Water & Engineering Departments, so that they can verify that all valves are left in "OPEN" Position.
- Any new water main tapping an existing line shall be done by using a stainless steel tapping valve and sleeve. All valves 6" and larger shall be placed in a precast gate well.
- For water service leads, no joints or unions will be permitted under existing or proposed pavement.
- All surface structures, such as hydrants, gate wells, and valve boxes must be set to grade or as indicated on the plans.



HORIZONTAL BENDS					
DIA	ANGLE	A	B	C	E
6"	22.5/45°	2'-0"	1'-6"	1'-6"	0'-9"
6"	90°	2'-6"	1'-6"	1'-9"	1'-0"
8"	22.5/45°	2'-6"	2'-0"	1'-9"	1'-0"
8"	90°	3'-6"	2'-6"	1'-9"	1'-3"
12"	22.5°	2'-6"	2'-0"	1'-9"	1'-3"
12"	45°	3'-6"	2'-6"	2'-0"	1'-3"
12"	90°	5'-6"	3'-0"	2'-0"	1'-6"
16"	22.5°	3'-6"	2'-6"	2'-0"	1'-6"
16"	45°	5'-6"	3'-0"	2'-9"	1'-6"
16"	90°	6'-0"	5'-0"	2'-9"	1'-9"
20"	90°	8'-0"	6'-6"	3'-6"	2'-3"

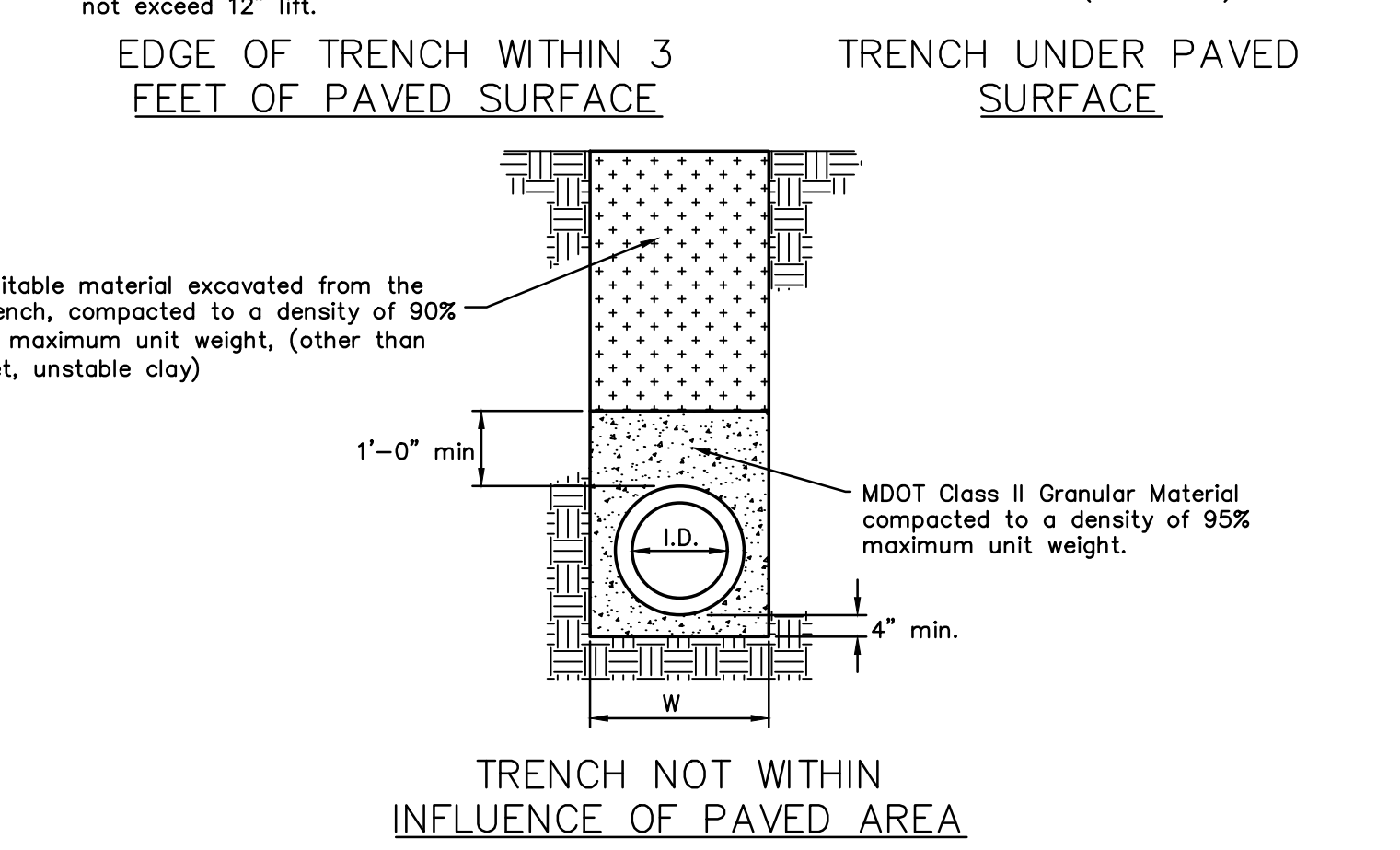
TEES				
DIA	A	B	C	E
6"	2'-6"	1'-6"	2'-0"	1'-4"
8"	3'-0"	2'-0"	2'-3"	1'-6"
12"	4'-0"	3'-0"	2'-9"	2'-0"
16"	5'-0"	4'-0"	3'-6"	2'-6"
20"	6'-6"	4'-6"	4'-0"	3'-0"

PLUGS & CAPS			
DIA	A	B	C
6"	2'-6"	1'-6"	2'-0"
8"	3'-0"	2'-0"	2'-3"
12"	4'-0"	3'-0"	2'-6"
16"	5'-0"	4'-0"	2'-9"
20"	7'-0"	5'-0"	3'-0"

Concrete Thrust Block Shall Extend To Undisturbed Earth

Thrust Block Shall Be Constructed of Grade "B" (3000psi) Concrete.

CONCRETE THRUST BLOCKS



WATER MAIN TRENCH CROSS-SECTIONS

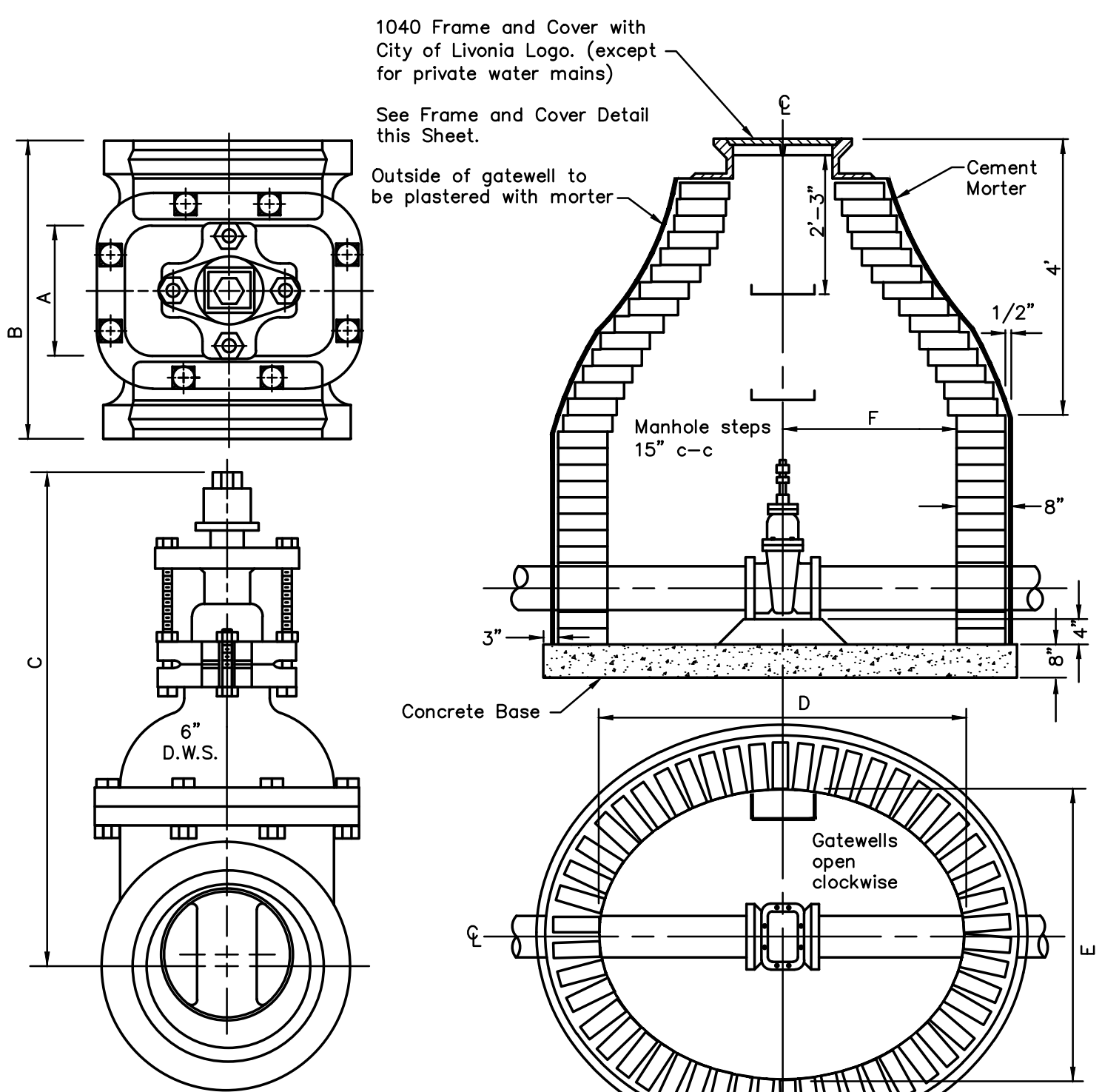
I.D. PIPE SIZE (IN)	< 18	21	24	30	36
"W" TRENCH WIDTH (FT)	3.0	3.5	4.0	5.0	6.0

I.D. PIPE SIZE (IN)	42	48	54	60	66	72
"W" TRENCH WIDTH (FT)	7.0	8.0	9.5	10.0	10.5	11.0

I.D. PIPE SIZE (IN)	78	84	90	96	102	108
"W" TRENCH WIDTH (FT)	11.5	12.0	12.5	13.0	13.5	14.0

MINIMUM UTILITY TRENCH WIDTHS

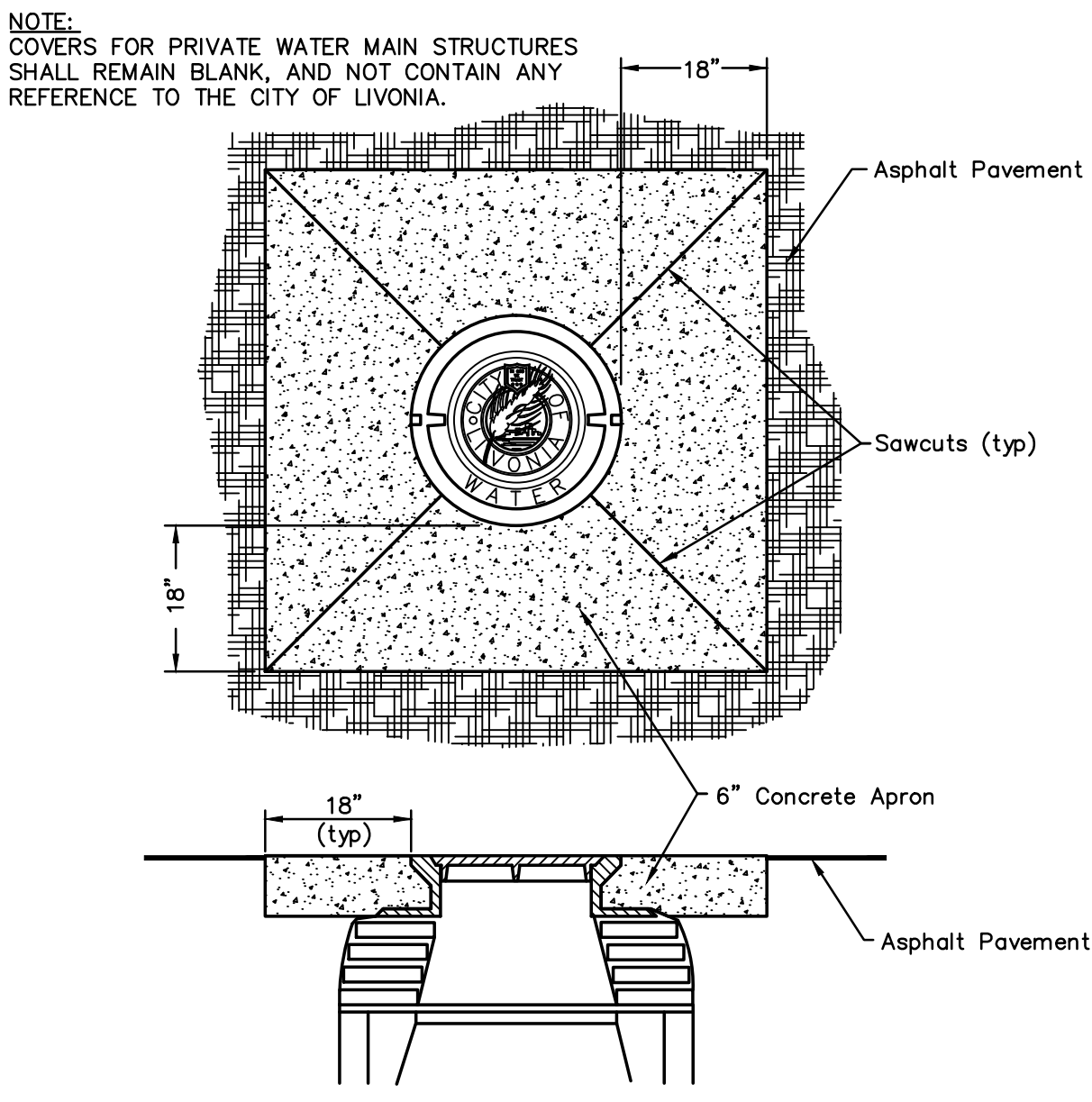
DATE: 10/19/75
 SHEET 1 OF 2
 REV. DATE
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 09/2007 ENG: tz
 02/2008 PM: [blank]
 02/2010 TECH: [blank]
 05/2021 Water Main Detail.dwg
 MISC. Note Revisions



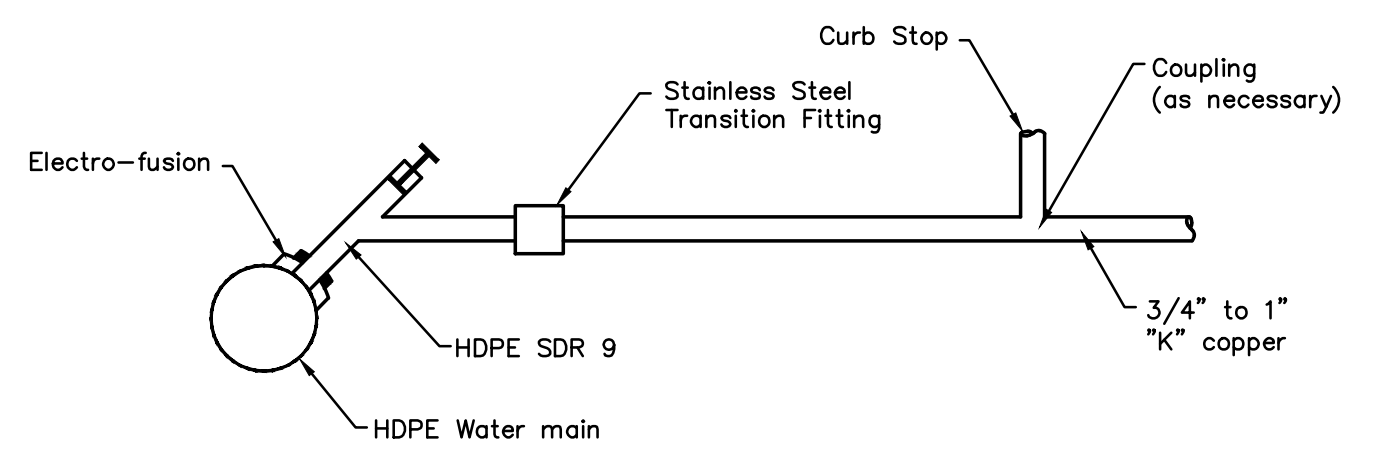
NOTE: Remove and replace old D.W.S. frame and cover with new City of Livonia E.J.I.W. 1040 frame with logo cover, when working in proposed project area or during construction improvements. Adjust structure accordingly with block or concrete grade rings.

SIZE	WEIGHT OF VALVE (lb)	A	B	C	D	E	F
4	120	5 1/2"	11 1/2"	16 3/16"	5'-0"	4'-0"	2'-6"
6	200	5 3/4"	12 3/4"	21 1/16"	5'-0"	4'-0"	2'-6"
8	300	6 3/4"	13 3/4"	27 1/8"	5'-0"	4'-0"	2'-6"
10	378	6 1/2"	14"	29 7/8"	5'-6"	4'-6"	2'-9"
12	547	8"	15 1/2"	33 13/16"	5'-6"	4'-6"	2'-9"
16	1300	10 3/4"	19"	43 3/8"	6'-0"	5'-6"	3'-0"

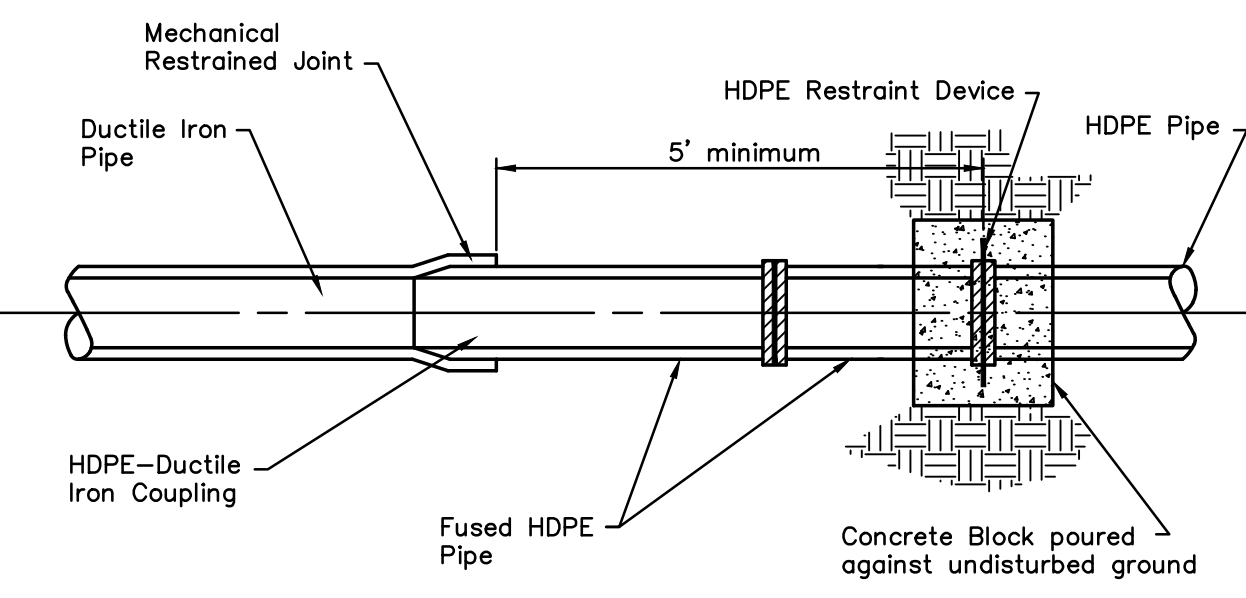
EXISTING BRICK 6" TO 16" GATE-WELLS (REFERENCE DRAWING)



WATER MANHOLE APRON

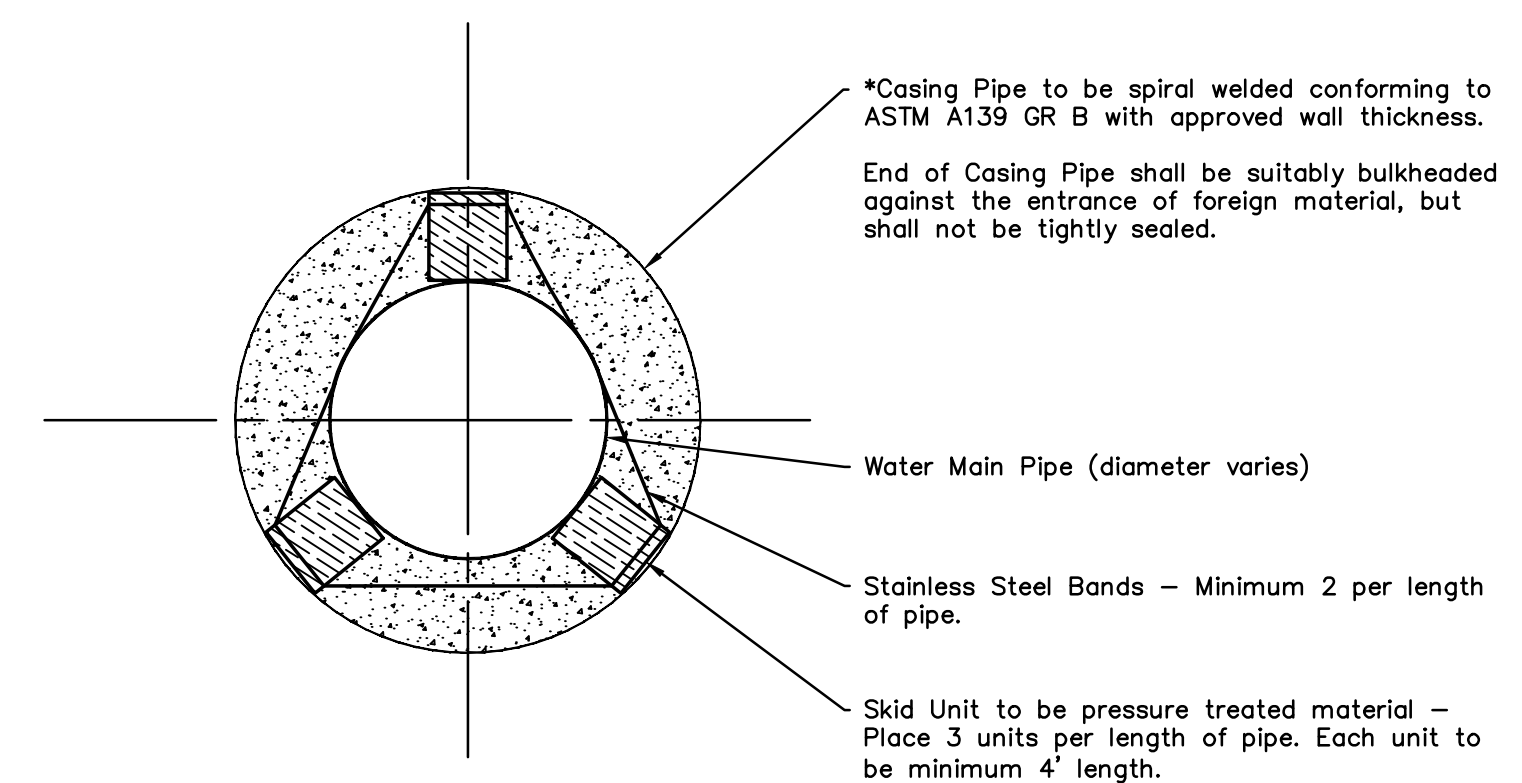


HOUSE LEAD DETAIL (HDPE TO COPPER)



NOTE: Mechanically restrain D.I.P. a minimum of 3' joints down from HDPE transition.

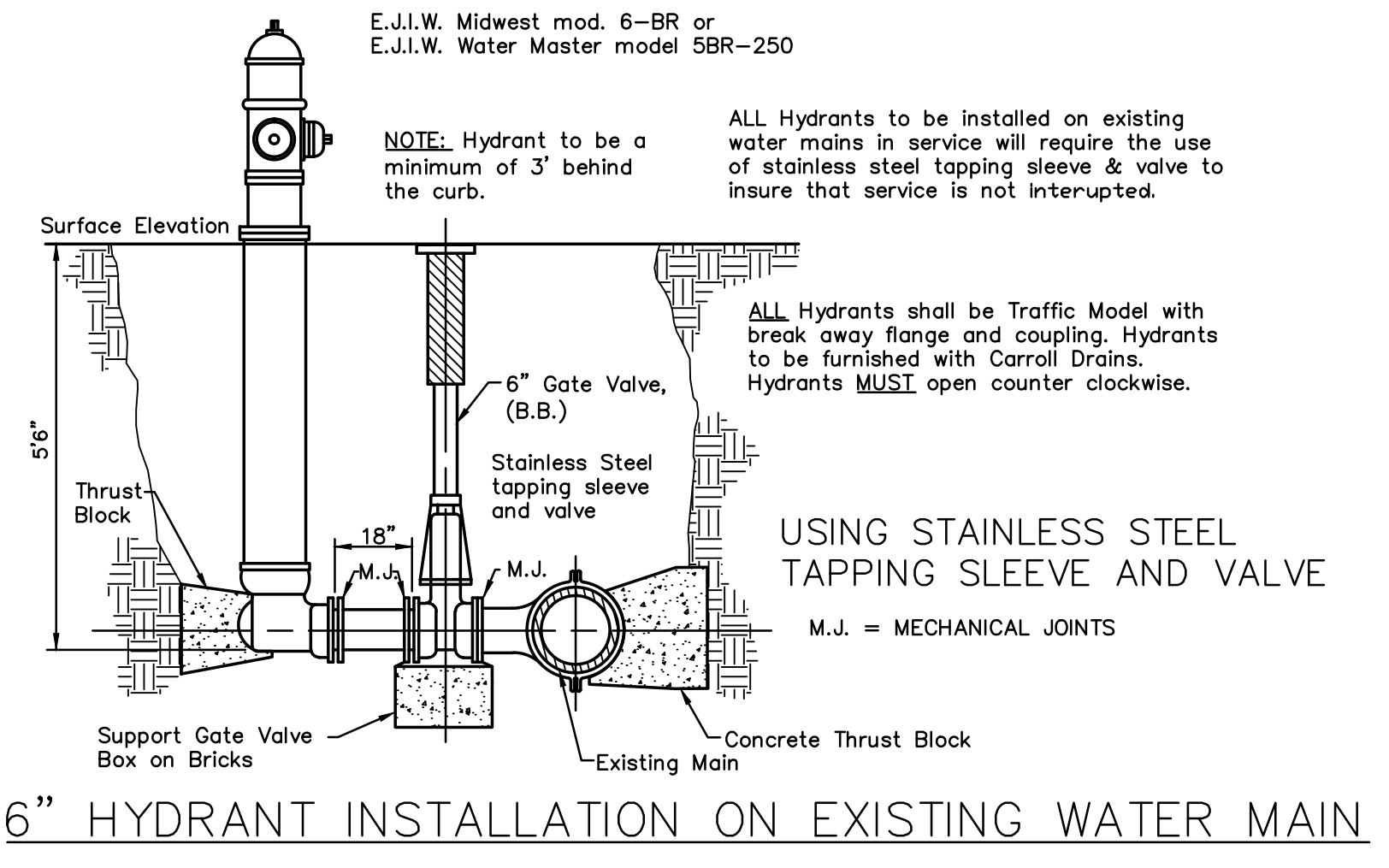
HDPE-DUCTILE IRON PIPE CONNECTION



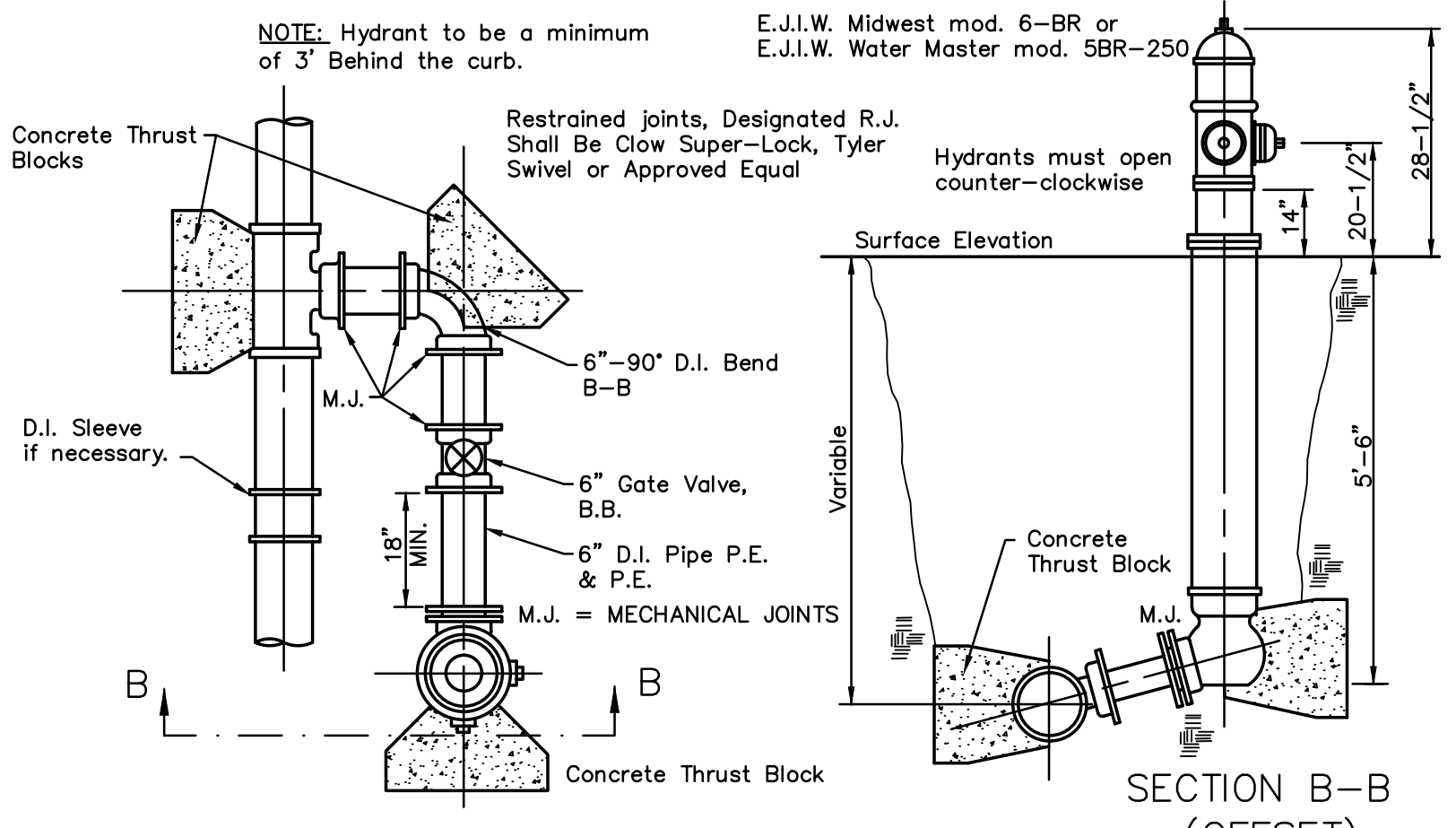
SKID UNIT AND CASING DETAIL FOR WATER MAIN

DIA. OF SANITARY SEWER (IN)	DIA. OF WATER MAIN (IN)	MIN. "A" (IN)	ROAD CROSSING MIN "B" (IN)	RAILROAD CROSSING MIN "B" (IN)
6	6	16	0.375	0.375
8	8	18	0.375	0.375
12	12	24	0.375	0.438
10	10	26	0.375	0.500
12-15	12-15	30	0.375	0.500
18	18	36	0.375	0.500

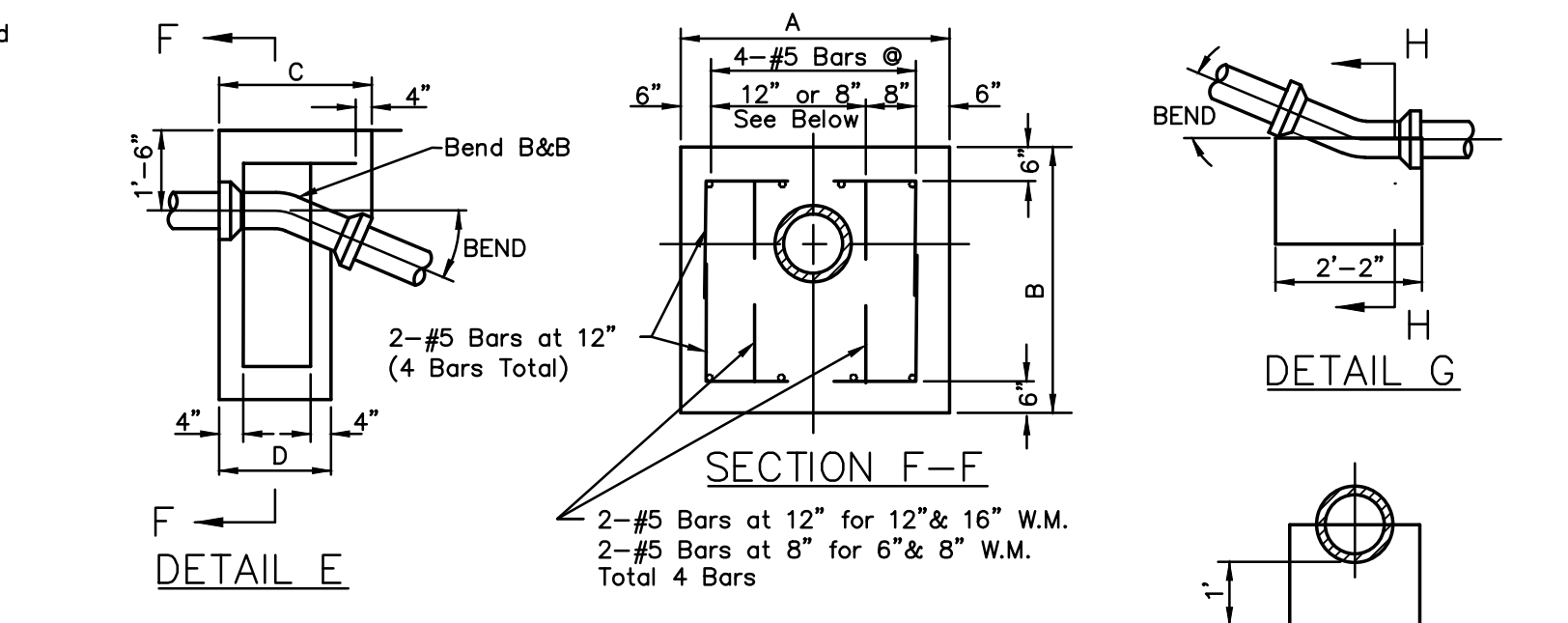
NOTE:
 1. The annular space within the casing pipe shall be filled approximately two thirds full of granular material Class II (M.D.O.T.) or pea pebble. The top of the Water Main or upper spaces, if any, shall not be in contact with the casing pipe.
 2. Casing pipe diameter to be a minimum of 10" larger than water main diameter.



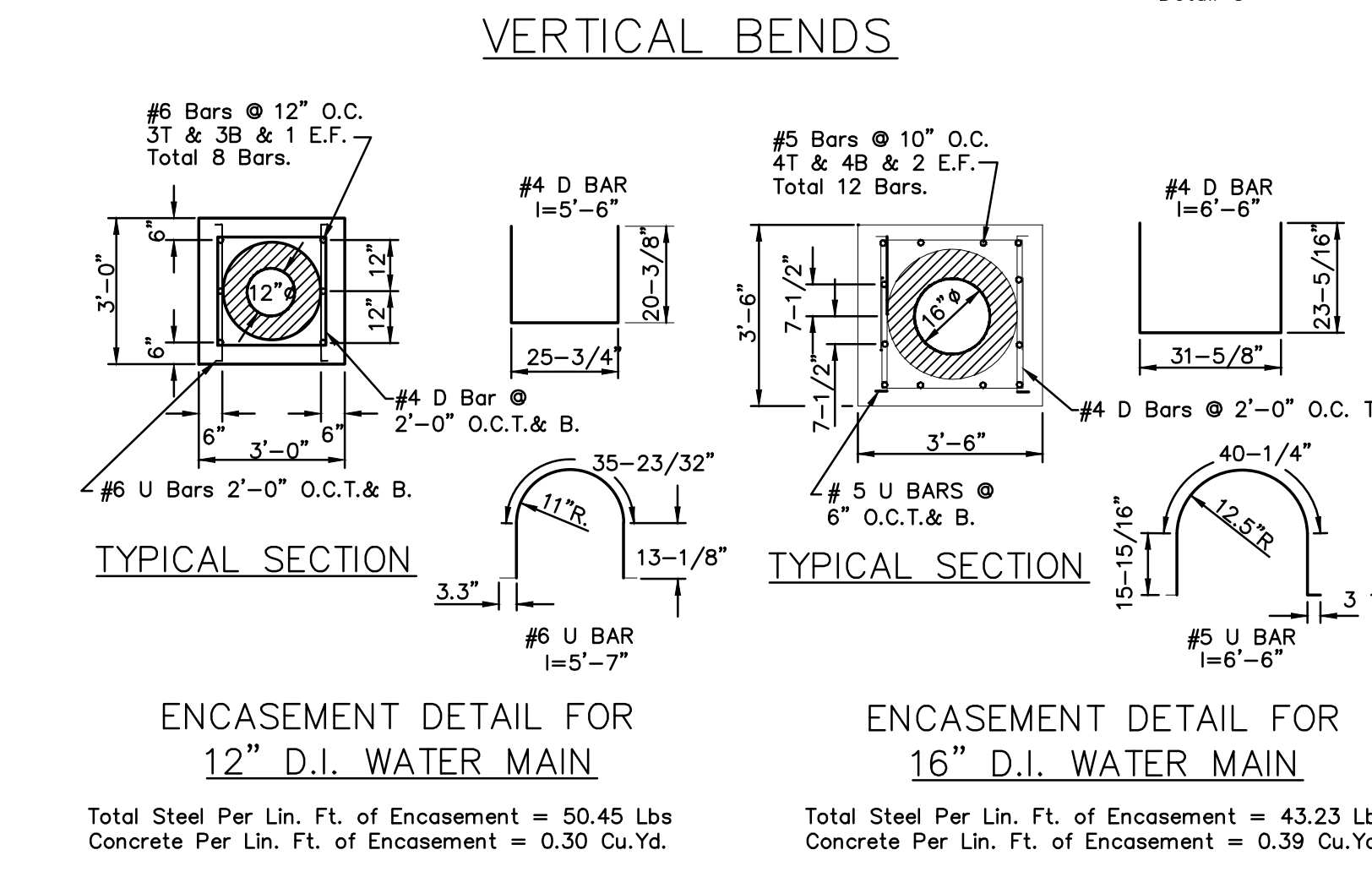
6" HYDRANT INSTALLATION ON EXISTING WATER MAIN



DETAIL OF 6" HYDRANT INSTALLATION

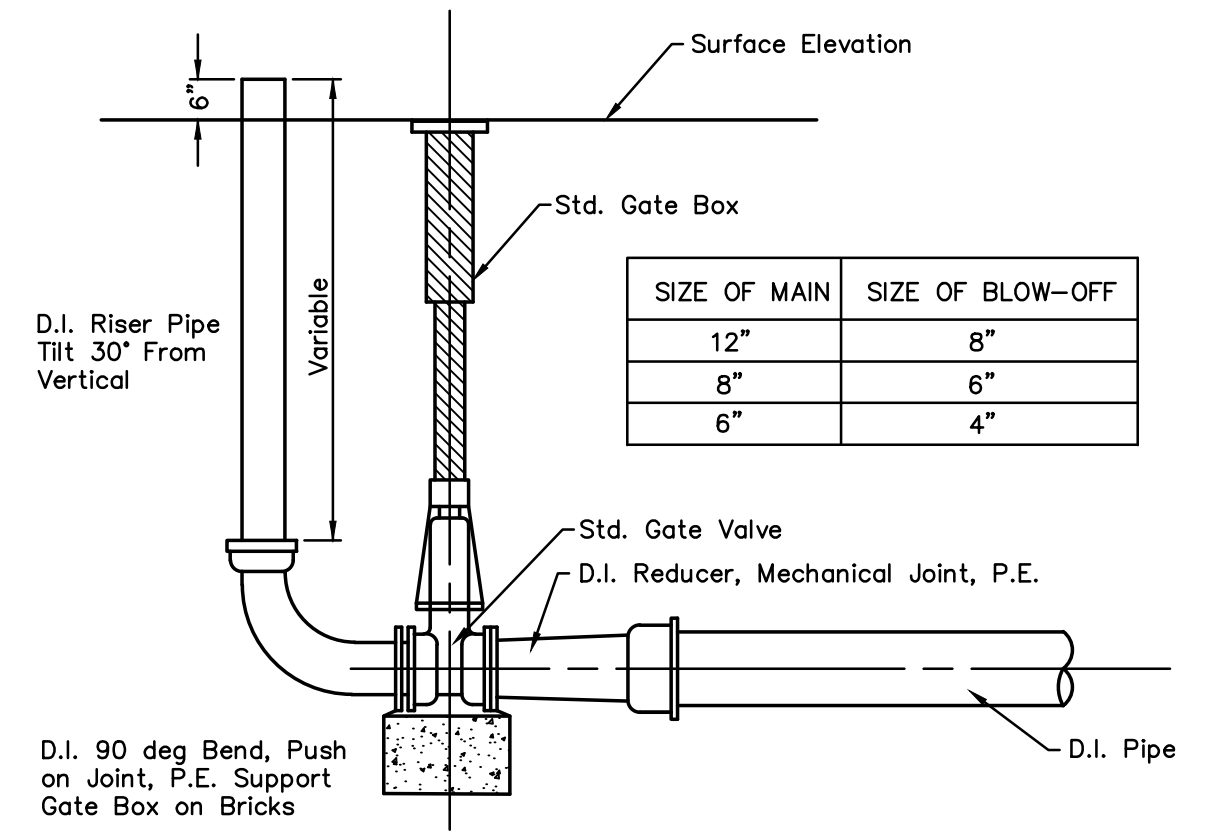


PIPE SIZE	BEND	A	B	C	D
6"	22 1/2"	3'-0"	3'-6"	1'-4"	1'-3"
8"	22 1/2"	3'-0"	3'-6"	1'-7"	1'-5"
12"	22 1/2"	4'-0"	4'-0"	1'-11"	1'-7"
12" - 16"	45'-30"	5'-0"	4'-6"	2'-9"	1'-10"
16"	22 1/2"	4'-0"	4'-0"	2'-1"	1'-8"



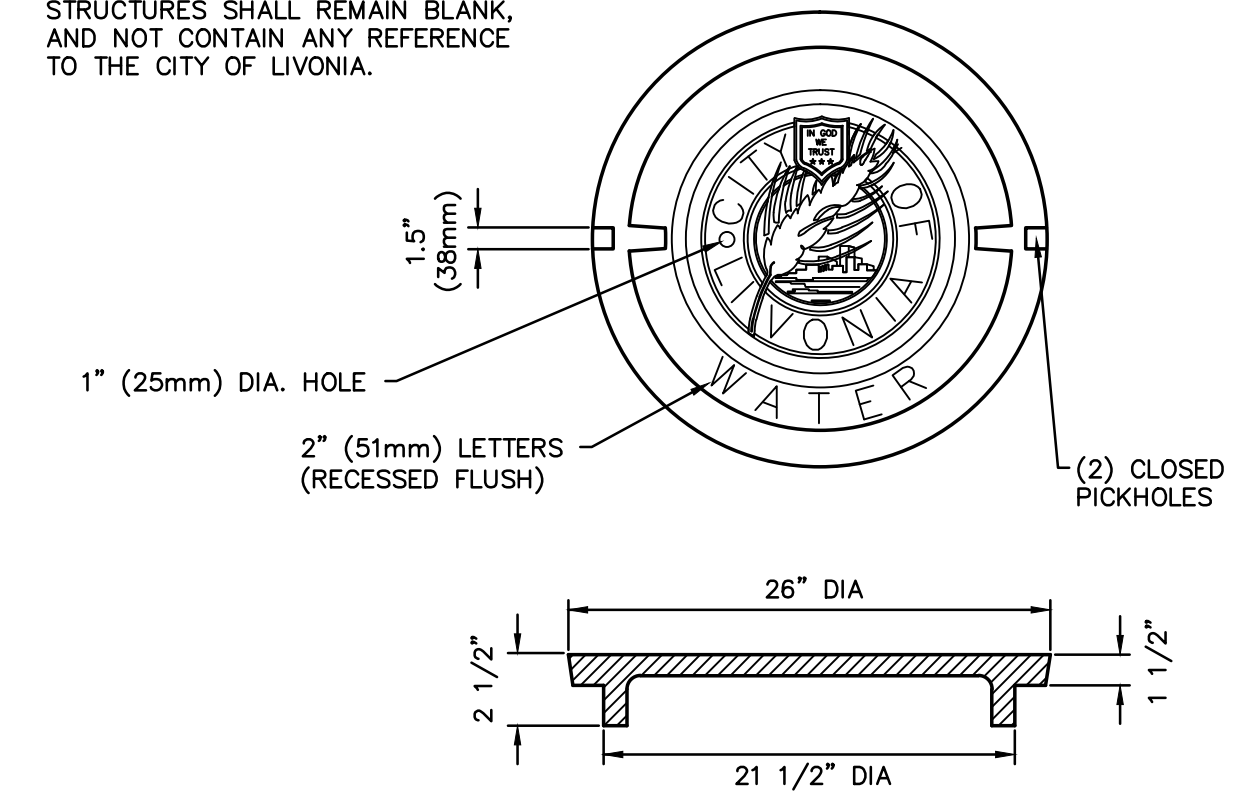
Total Steel Per Lin. Ft. of Encasement = 50.45 Lbs
 Concrete Per Lin. Ft. of Encasement = 0.30 Cu.Yd.
 Total Steel Per Lin. Ft. of Encasement = 43.23 Lbs
 Concrete Per Lin. Ft. of Encasement = 0.39 Cu.Yd.

CONCRETE ENCASEMENT DETAILS

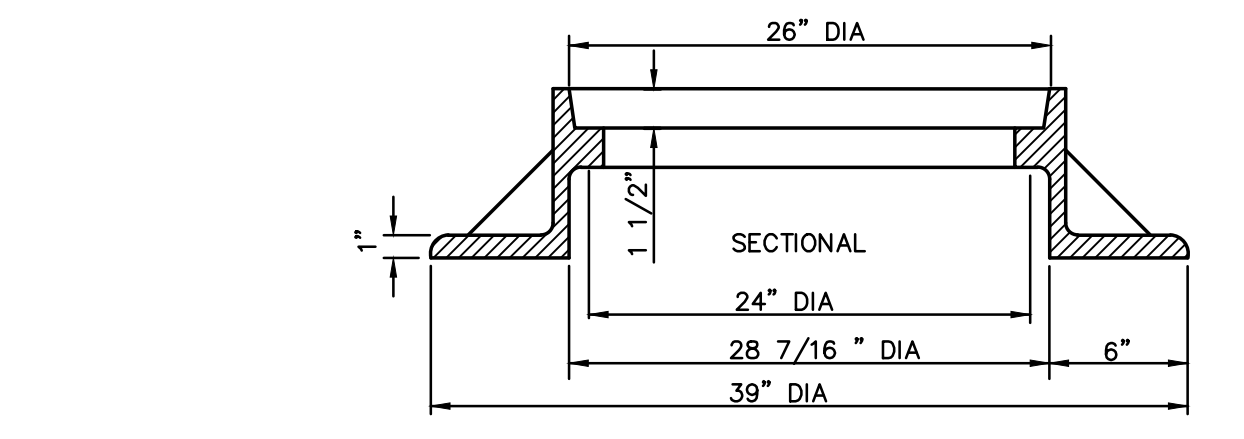


DETAIL OF TEMPORARY BLOW-OFF

NOTE: COVERS FOR PRIVATE WATER MAIN STRUCTURES SHALL REMAIN BLANK, AND NOT CONTAIN ANY REFERENCE TO THE CITY OF LIVONIA.



MATERIAL SPECIFICATION
 COVER GRAY IRON, A.S.T.M. STD. SPEC. A - 48, CL 35B.
 Bearing Surfaces of cover and frame shall be ground to prevent rocking. Casting shall not be coated.



FRAME AND COVER DETAIL (E.J.I.W. 1040)

DATE	REV.	DATE	BY	DESCRIPTION
10/19/75 <td>1 <td></td> <td></td> <td>REVISED</td> </td>	1 <td></td> <td></td> <td>REVISED</td>			REVISED
	2			REVISED
	3			REVISED
	4			REVISED
	5			REVISED
	6			REVISED
	7			REVISED
	8			REVISED
	9			REVISED
	10			REVISED
	11			REVISED
	12			REVISED