

CITY OF LIVONIA
STANDARD WATER MAIN NOTES:



CITY OF LIVONIA
Department of Public Works, Engineering Division
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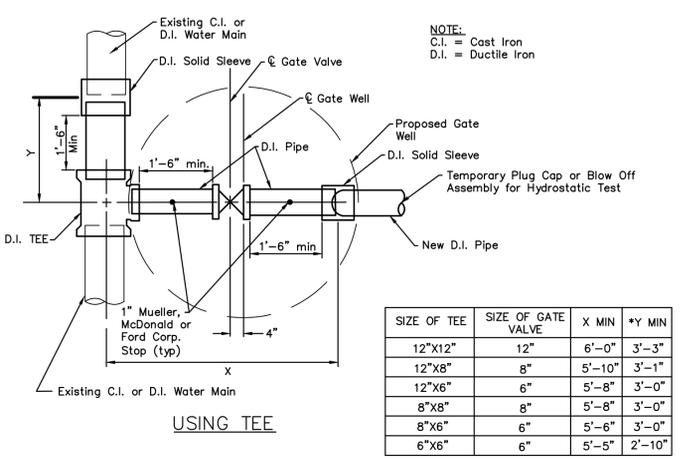
WATER MAIN STANDARD DETAILS
CITY OF LIVONIA, WAYNE COUNTY, MICHIGAN

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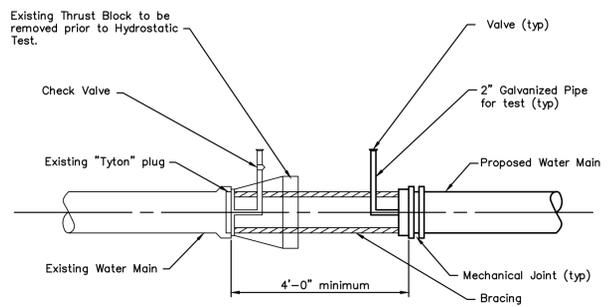
DATE: 10/19/75
SHEET 1 OF 2

REV. NO.	REV. DATE	REV. DESCRIPTION
1	02/20/08	Replaces Push-On Joints
2	02/20/10	ENG. L
3	02/20/13	PM
4	06/20/21	TECH
5	08/20/23	Water Main Detail.dwg
6	08/20/23	Water Main Detail.dwg

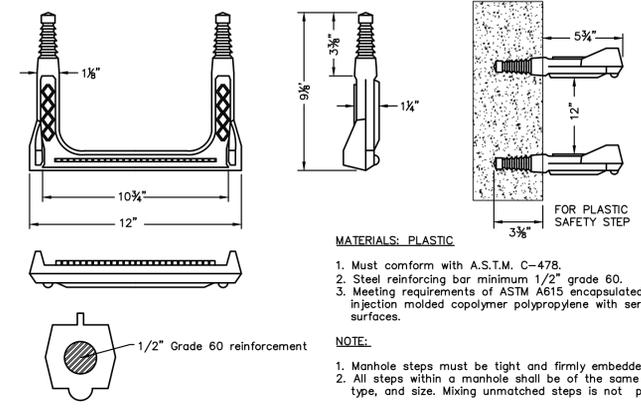
- Tap Fee - A tap fee must be paid and a bond posted with the Water and Sewer Department of the City of Livonia prior to beginning any work. In addition, a meter must be obtained from the Water and Sewer Department to meter all water consumed including, flushing and other normal water installation operations.
- Ductile Iron Pipe (D.I.) - All water main pipe 16" diameter and smaller shall be Class 54, meeting AWWA C151/ANSI A21.51/NSF Standard 61 and shall be lined with a double thickness of cement-mortar meeting ANSI Spec. 21.4. All certifications shall be stamped on the exterior wall of the pipe.
- High Density Polyethylene Pipe (HDPE) shall be constructed from high density PE 4710 polyethylene resin, SDR 11 or less, shall meet AWWA C906, and have a minimum working pressure of 160 psi. All HDPE materials shall be listed and approved for use with potable water under ANSI/NSF Standard 14, and all pipe shall bear the NSF-pw identification on the outside wall. 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.).
- 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 shall meet AWWA Standard C111.
- 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.
- Placement - horizontal separation of 10 foot minimum and vertical separation of 1.5 feet minimum required from water main to storm/sanitary sewers. Minimum burial depth of 5.5 feet. All measurements to outside of 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.
- 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.
- After installation, water mains shall be leakage and pressure tested in accordance with the most current version of the AWWA Standard 900-17 for ductile iron pipe, and per ASTM F2164 for HDPE pipe prior to being put into service. The Hydrostatic pressure test shall be conducted with a maximum loss that meets the latest version of the C600 Standard.
- Water mains shall be disinfected in accordance with AWWA Standard C651 (most current version) prior to being put into service. Bacteriological sampling shall be in accordance with R325.11110 of the administrative rules promulgated under the Michigan Safe Drinking Water Act, 1976 PA 399, as amended.
- Notification - The Engineering Division 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 Environment, Great Lakes, and Energy (EGLE) 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.
- Hydrant drain/weep holes shall be plugged. Hydrants shall meet AWWA Standard C502.
- 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.



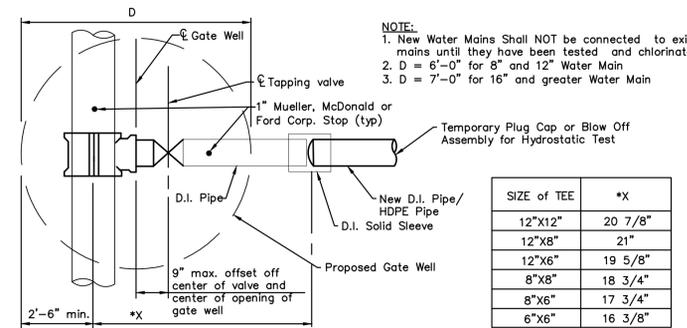
SIZE OF TEE	SIZE OF GATE VALVE	X MIN	*Y MIN
12"X12"	12"	6'-0"	3'-3"
12"X8"	8"	5'-10"	3'-1"
12"X6"	6"	5'-8"	3'-0"
8"X8"	8"	5'-8"	3'-0"
8"X6"	6"	5'-6"	3'-0"
6"X6"	6"	5'-5"	2'-10"



TEMPORARY ARRANGEMENT FOR HYDROSTATIC PRESSURE TEST

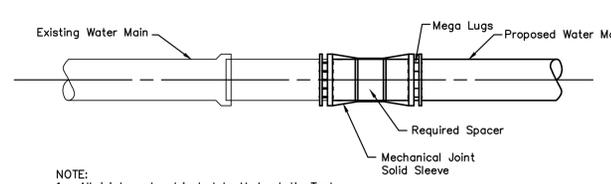


MANHOLE STEP DETAIL



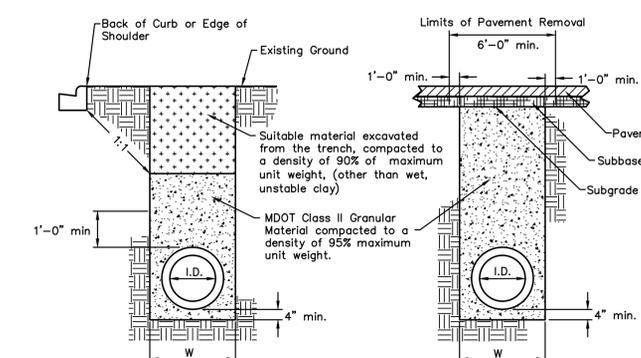
SIZE OF TEE	*X
12"X12"	20 7/8"
12"X8"	21"
12"X6"	19 5/8"
8"X8"	18 3/4"
8"X6"	17 3/4"
6"X6"	16 3/8"

USING STAINLESS STEEL TAPPING SLEEVE AND VALVE
TYPICAL CONNECTION DETAILS



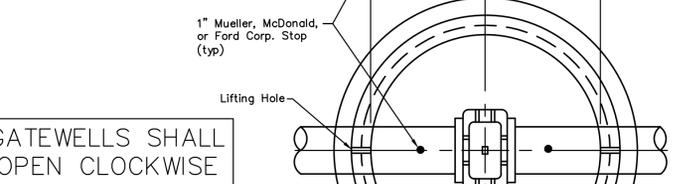
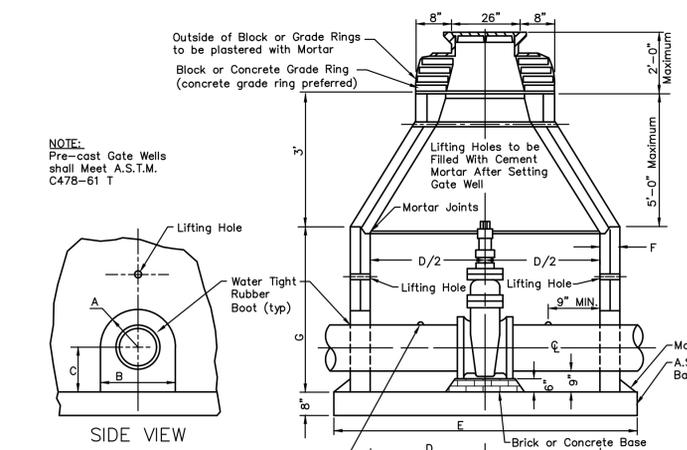
COMPLETED CONNECTION TO EXISTING WATER MAIN

HYDROSTATIC TEST AND MECHANICAL CONNECTION



- NOTE: 1. When water main is placed in a proposed roadbed area, it shall be backfilled with selected excavation material above the future subgrade to existing ground line.
2. Compaction of M.D.O.T. Class II granular material shall not exceed 12" lift.
- NOTE: 1. Estimated pavement removal widths to be trench width "W" plus 1'-0" each side of trench (6'-0" min.)

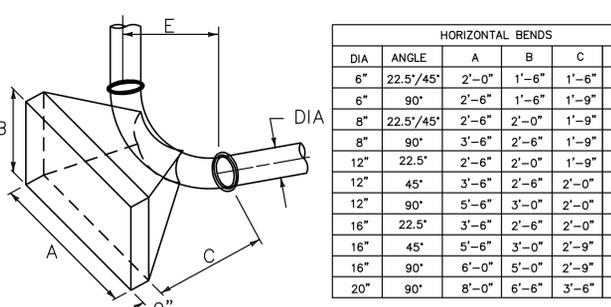
EDGE OF TRENCH WITHIN 3 FEET OF PAVED SURFACE
TRENCH UNDER PAVED SURFACE



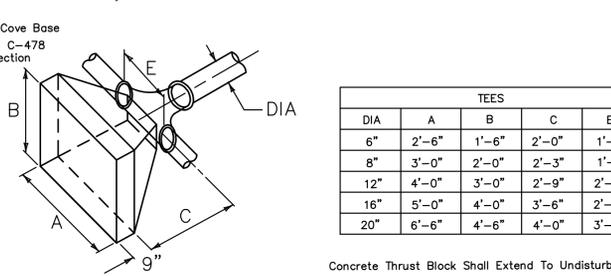
GATEWELLS SHALL OPEN CLOCKWISE
Valves shall be E.J.L.W. FlowMaster, Mueller 2360 Series or approved equal

SIZE	A	B	C	D	E	F	G
6" & 8"	7 1/2"	1'-3"	11 1/2"	5'-0"	7'-0"	5"	2'-8" 4'-0"
12" & 16"	10 1/2"	1'-9"	1'-1 1/2"	6'-0"	8'-0"	7"	3'-0" 6'-0"

PRE-CAST GATE WELLS - 6" TO 16"

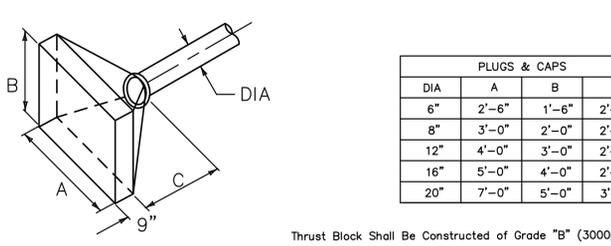


HORIZONTAL BENDS					
DIA	ANGLE	A	B	C	E
6"	22.5/45°	2'-0"	1'-6"	1'-6"	0'-9"
6"	90°	2'-6"	1'-6"	1'-9"	1'-0"
8"	22.5/45°	2'-6"	2'-0"	1'-9"	1'-0"
8"	90°	3'-6"	2'-6"	1'-9"	1'-3"
12"	22.5°	2'-6"	2'-0"	1'-9"	1'-3"
12"	45°	3'-6"	2'-6"	2'-0"	1'-3"
12"	90°	5'-6"	3'-0"	2'-0"	1'-6"
16"	22.5°	3'-6"	2'-6"	2'-0"	1'-6"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

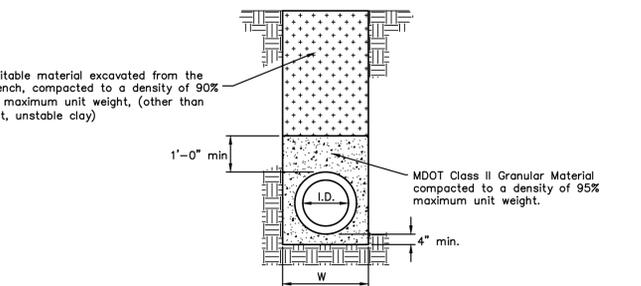
Concrete Thrust Block Shall Extend To Undisturbed Earth



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"

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

CONCRETE THRUST BLOCKS



TRENCH NOT WITHIN INFLUENCE OF PAVED AREA
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