

| SYMBOL | DESCRIPTION        |
|--------|--------------------|
| •      | CLEAN OUT          |
| ○      | SAN MANHOLE        |
| —      | SAN MANLINE        |
| ⊗      | SAN SERVICE        |
| ⊕      | FIRE HYDRANT       |
| ⊖      | WATERMAIN          |
| ○      | WATER VALVE        |
| ○      | WATER SERVICE      |
| ○      | STM MANHOLE        |
| ○      | STM CATCH BASIN    |
| ○      | STM SEWER          |
| ○      | ELEC. RIBER        |
| ○      | ELEC. TRANSFORMER  |
| ○      | LIGHT POLE         |
| ○      | ELECTRIC           |
| ○      | POWER POLE         |
| ○      | GAS                |
| ○      | FIBER OPTIC CABLE  |
| ○      | OVERHEAD UTILITIES |
| ○      | SIGN               |
| ○      | SET IRON           |
| ○      | FOUND IRON         |
| ○      | FENCE              |
| ○      | SILT FENCE         |

**SURVEYOR'S NOTES**

PERTAINING TO FIRST AMERICAN TITLE INSURANCE COMPANY  
COMMITMENT NO. NCS-47395-MICH DATED JANUARY 26, 2011

| TITLE COMMITMENT REFERENCE NUMBER | RECORDING REFERENCE | DESCRIPTION                             | STATUS ON PLAT | AFFECT ON PROPERTY |
|-----------------------------------|---------------------|---|----------------|--------------------|
| 6                                 | L. 13944, P. 210    | WATER METER AGREEMENT                   | NOT SHOWN      | AFFECTS PARCEL     |
| 7                                 | L. 6269, P. 701     | DETENTION POND AND STORM SEWER EASEMENT | SHOWN          | AFFECTS PARCEL     |
| 8                                 | L. 6514, P. 596     | DETENTION POND AND STORM SEWER EASEMENT | SHOWN          | AFFECTS PARCEL     |

**LEGAL DESCRIPTION PER TITLE COMMITMENT**

Real property in the City of Rochester Hills, County of Oakland, State of Michigan, described as follows:

Part of the Southeast one quarter of Section 15, Town 3 North, Range 11 East, described as follows:  
Commencing at the Southeast corner of said Section 15, thence North along the East line of said Section 15, 1169.40 feet; thence North 89 degrees, 52 minutes, 23 seconds West, 60 feet to the point of beginning, which point is on the Westerly right-of-way line of State Highway M-150; thence North 89 degrees, 52 minutes, 23 seconds, West, 315.00 feet; thence South 140.04 feet; thence South 89 degrees, 52 minutes, 50 seconds East, 315.00 feet to a point on the Westerly right-of-way line of said State Highway M-150; thence North, 140.00 feet to the point of beginning.

**LEGAL DESCRIPTION PER DIFFIN DEVELOPMENT CONSULTANTS FIELD SURVEY**

Part of the Southeast one quarter of Section 15, Town 3 North, Range 11 East, described as follows:  
Commencing at the Southeast corner of said Section 15, thence North 00 degrees 14 minutes 16 seconds East along the East line of said Section 15, 1169.40 feet; thence North 89 degrees, 52 minutes, 23 seconds West, 64.85 feet to the point of beginning, which point is on the Westerly right-of-way line of State Highway M-150; thence North 89 degrees, 52 minutes, 23 seconds, West, 315.00 feet; thence due South 140.04 feet; thence South 89 degrees, 52 minutes, 50 seconds East, 315.00 feet to a point on the Westerly right-of-way line of said State Highway M-150; thence due North, 140.00 feet to the point of beginning.

Basis of bearing structure was taken from the subdivision plat for "Heatherwood Village No. 1" using the bearing for the East Line of Section 15 as North 00 degrees 14 minutes 16 seconds East.

It appears that numerous deed descriptions within the S.E. 1/4 of Section 15 were prepared without the use or reference to the remonumented East 1/4 Corner of Section 15 and were described as commencing "Due North" from the Southeast Corner of Section 15. Setting the bearing as Due North along the East line of Section 15 as currently monument does not match the as-constructed conditions found during our field survey of the property within the S.E. 1/4 of Section 15. The property description has been rewritten to match the as-construct conditions found in the field.

**ZONED:** B-2 (GENERAL BUSINESS DISTRICT)  
FB-2 FLEXIBLE BUSINESS OVERLAY

**MAX HEIGHT = 30'**  
**FRONT = 50'**  
**SIDE = NONE**  
**REAR = 50'**

**BUILDING SETBACKS:**  
**FRONT = 10'**  
**SIDE = NONE**  
**REAR = NONE**

**PARKING SETBACKS:**  
**FRONT = 10'**  
**SIDE = NONE**  
**REAR = NONE**

72 HOURS  
(3 WORKING DAYS)  
**BEFORE YOU DIG  
CALL MISS DIG  
800-482-7171  
(TOLL FREE)**

!! CAUTION !!  
DANGEROUS AND SENSITIVE UNDERGROUND FACILITIES MAY BE PRESENT THROUGHOUT THE PROJECT AREA THAT DO NOT APPEAR ON THIS DRAWING. ALL UNDERGROUND FACILITIES MUST BE LOCATED AND STAKED BY THE APPROPRIATE AGENCIES PRIOR TO EXCAVATION.

I CERTIFY TO FIRST AMERICAN TITLE INSURANCE COMPANY, MCDONALD'S USA, LLC, A DELAWARE LIMITED LIABILITY COMPANY, MCDONALD'S CORPORATION, A DELAWARE CORPORATION AND MCDONALD'S REAL ESTATE COMPANY, A DELAWARE CORPORATION THAT THE SURVEY MEASUREMENTS WERE MADE IN ACCORDANCE WITH THE "MINIMUM ANGLE, DISTANCE, AND CLOSURE REQUIREMENTS FOR SURVEY MEASUREMENTS WHICH CONTROL LAND BOUNDARIES FOR ALTA/ACSM LAND TITLE SURVEYS"; NO GORES OR GAPS, AND HAVE BEEN COMPILED FROM A SURVEY ACTUALLY MADE ON THE GROUND UNDER MY SUPERVISION ON APRIL 5, 2011; THAT IT IS CORRECT AND COMPLIES WITH THE REQUIREMENTS PROVIDED BY MCDONALD'S USA, LLC.

DATE: 4-5-11  
SIGNED: WES LEE O. UMLOR, P.S.  
L./S. #: 56369



**DIFFIN Development Consultants**  
CIVIL ENGINEERING • SURVEYING • CONSTRUCTION SERVICES  
24353 TARA DRIVE, SOUTH LYON, MICHIGAN 48178  
PH: (248) 943-8244, FAX: (866) 690-4307  
WEB: www.diffindevelopment.com

**DDC**  
REVISIONS  
REVISED PER CITY'S  
3-30-11 COMMENTS

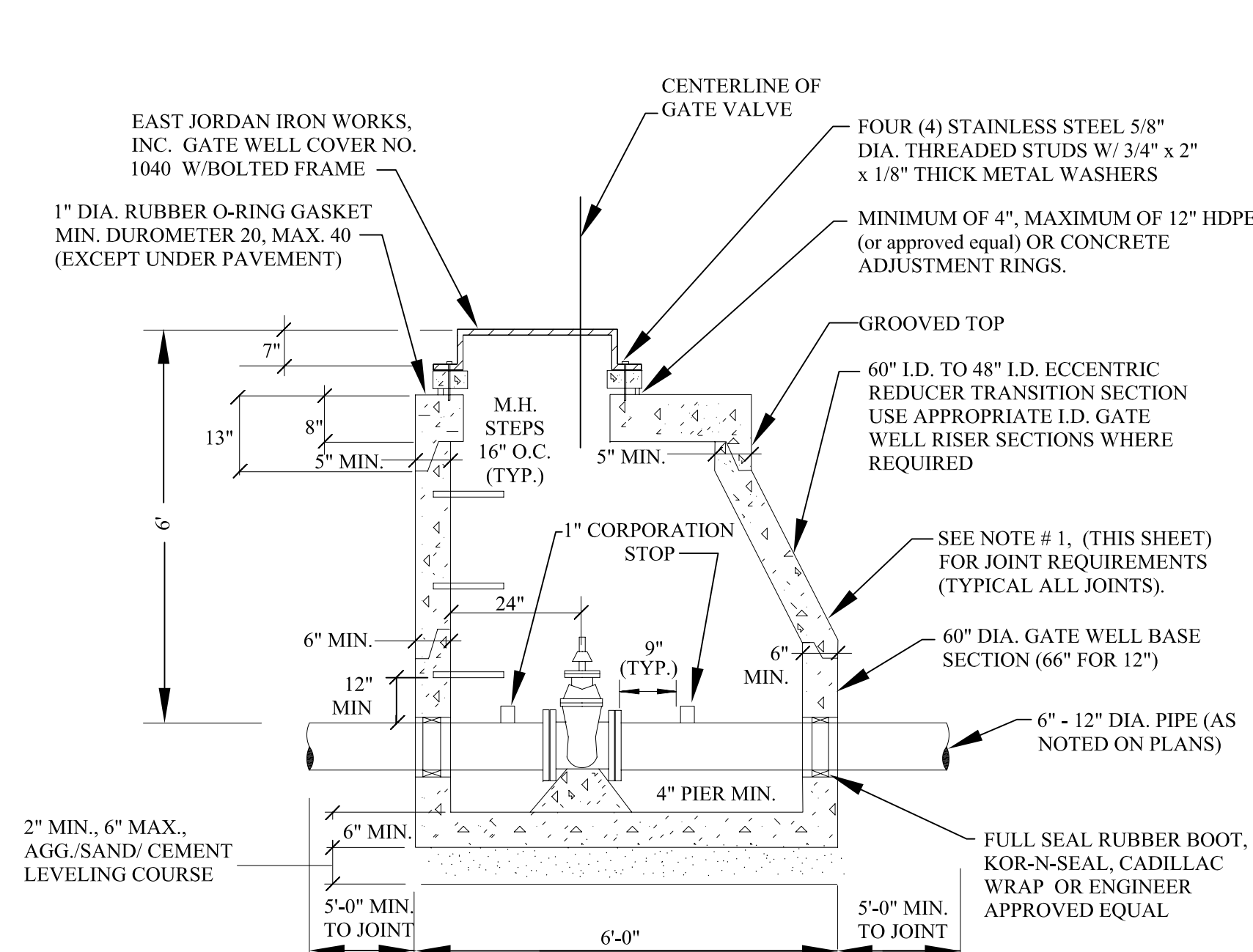
CLIENT: MCDONALD'S USA LLC  
1021 Karl Greimel Drive, Suite 200  
Brighton, Michigan 48116  
ALTA/ACSM LAND TITLE  
SURVEY

These documents are instruments of service in respect of the Project and any reuse without written verification or adaptation by Diffin Development Consultants (DDC) for the specific purposes intended hold harmless DDC from all claims, damages, losses and expenses including attorneys' fees, arising out of and in connection with the use of these documents. Adaptation will entitle DDC to further compensation at rates to be agreed upon by User and DDC.

SECTION 15  
TOWN 3 NORTH, RANGE 11 EAST  
CITY OF ROCHESTER HILLS  
OAKLAND COUNTY, MICHIGAN

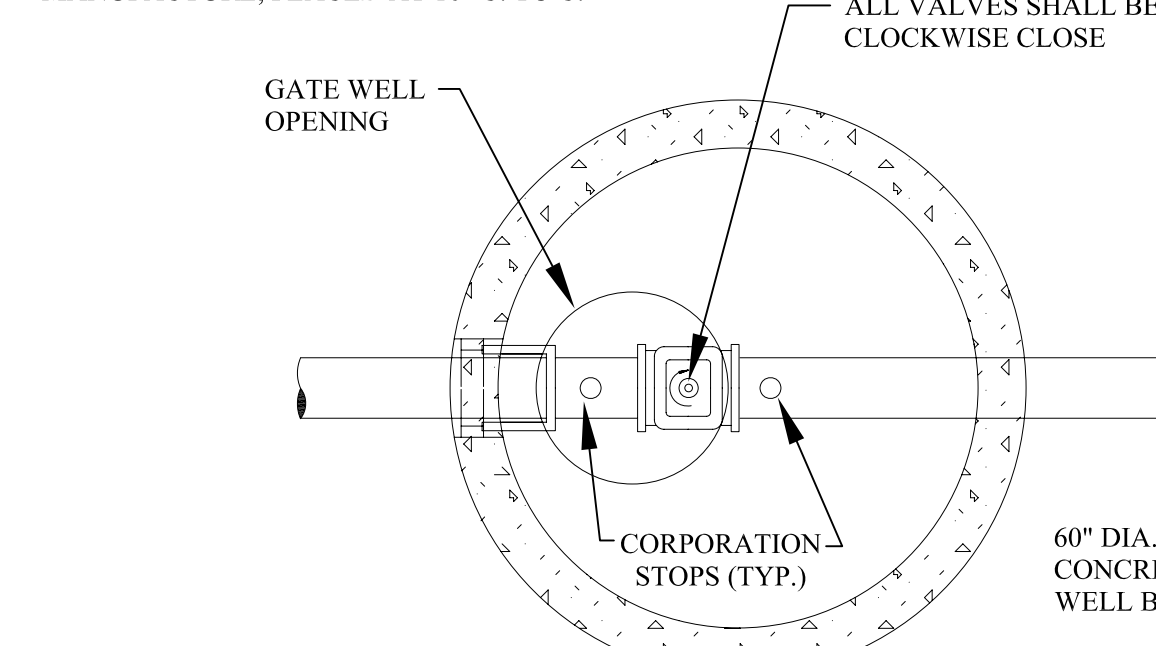
Date: 4-5-11  
Drawn By: MD  
P.E.: Matthew A. Diffin  
SCALE: 1 inch = 20 ft.  
Job No.: 110204  
Sheet No.  
**1 OF 1**



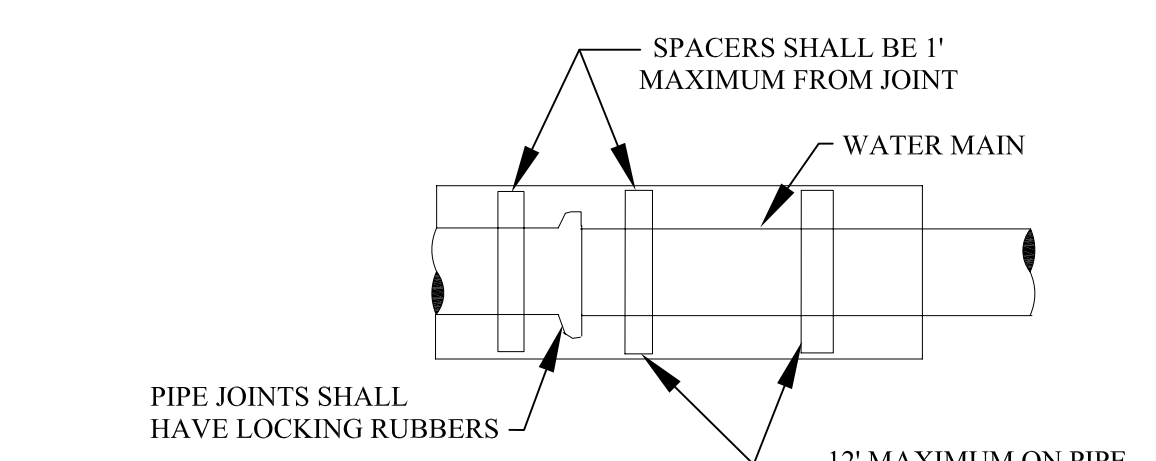


**ALL GATE WELLS**

MANHOLE STEPS TO BE PLASTIC COATED STEEL MEETING THE REQUIREMENTS IN ASTM D 2146, TYPE II, GRADE 49108, MA INDUSTRIES P.S.I. POLYPROPYLENE OR APPROVED EQUAL. STEPS TO BE INSTALLED DURING MANHOLE MANUFACTURE, PLACED AT 16" C. TO C.



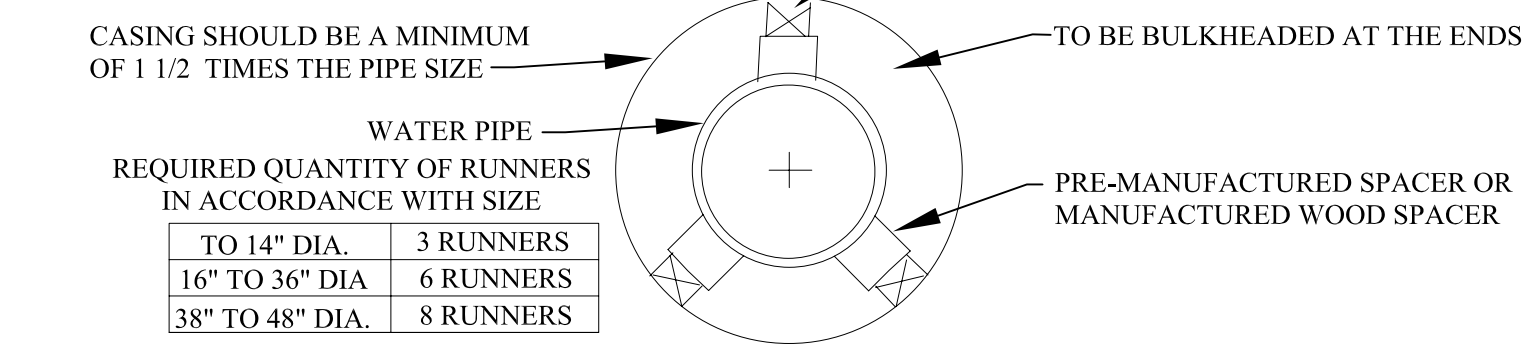
**GATE WELL (TYPICAL)**



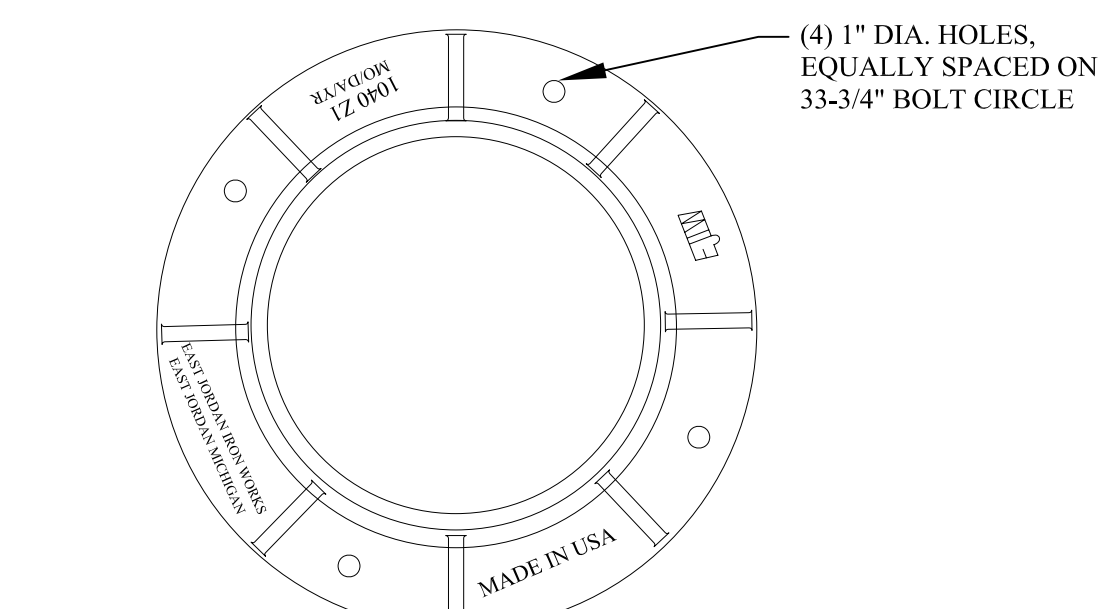
**WATER MAIN IN CASING SECTION**

UNLESS OTHERWISE SPECIFIED, MINIMUM CASING PIPE SHALL BE ASTM A-139 GRADE B, WALL THICKNESS AS FOLLOWS:

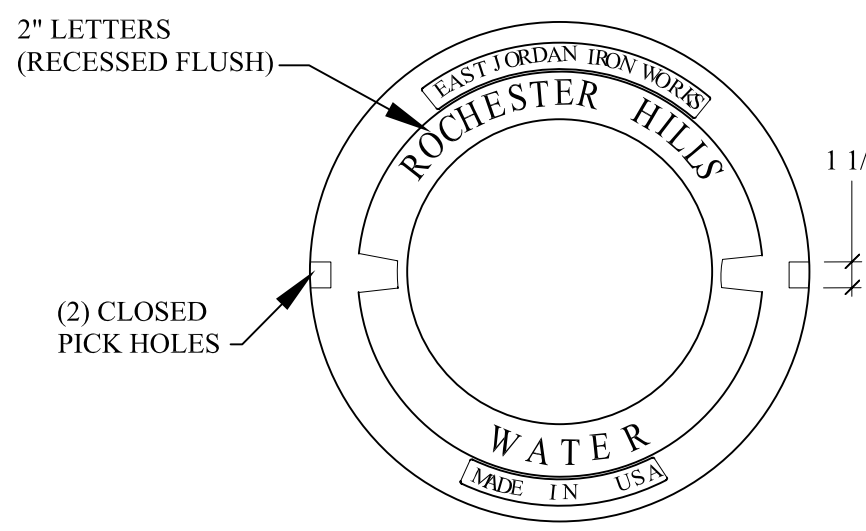
| NOMINAL SIZE | MINIMUM WALL THICKNESS |
|--------------|------------------------|
| 8" - 42"     | 0.375                  |
| 48" - 60"    | 0.500                  |



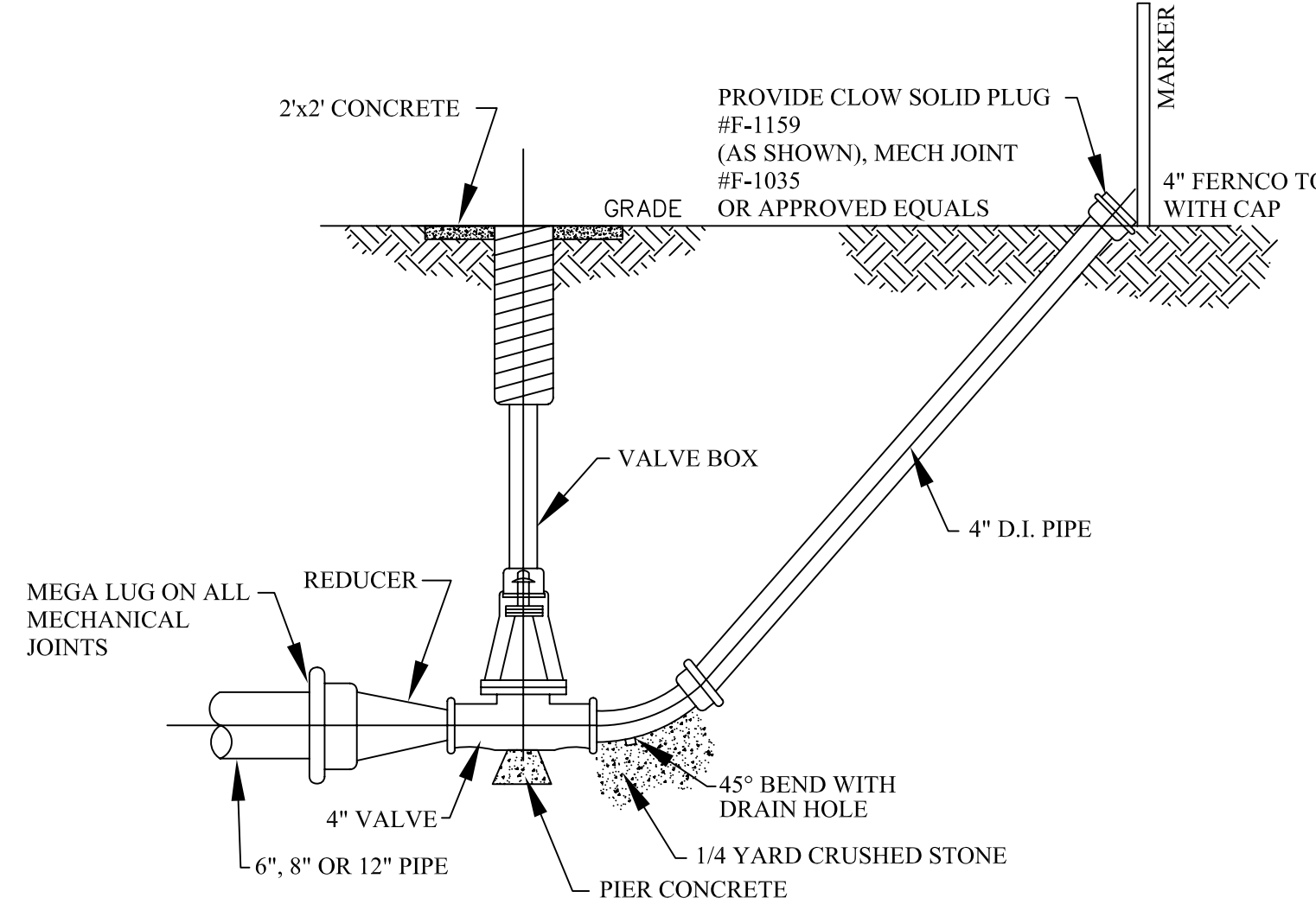
**SUPPORT FOR WATER MAIN CONSTRUCTED IN CASING PIPE**



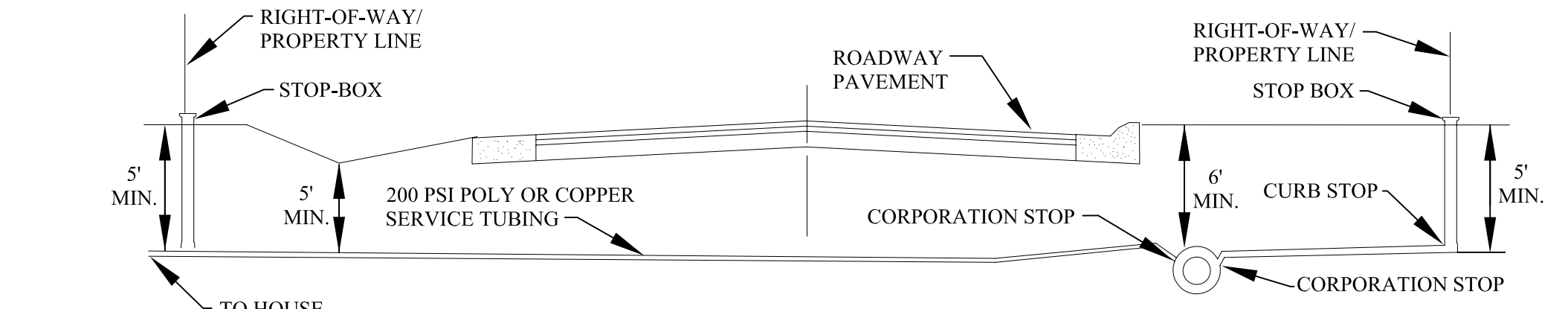
**FRAME**



**LETTERING LAYOUT FOR GATE WELL COVERS**

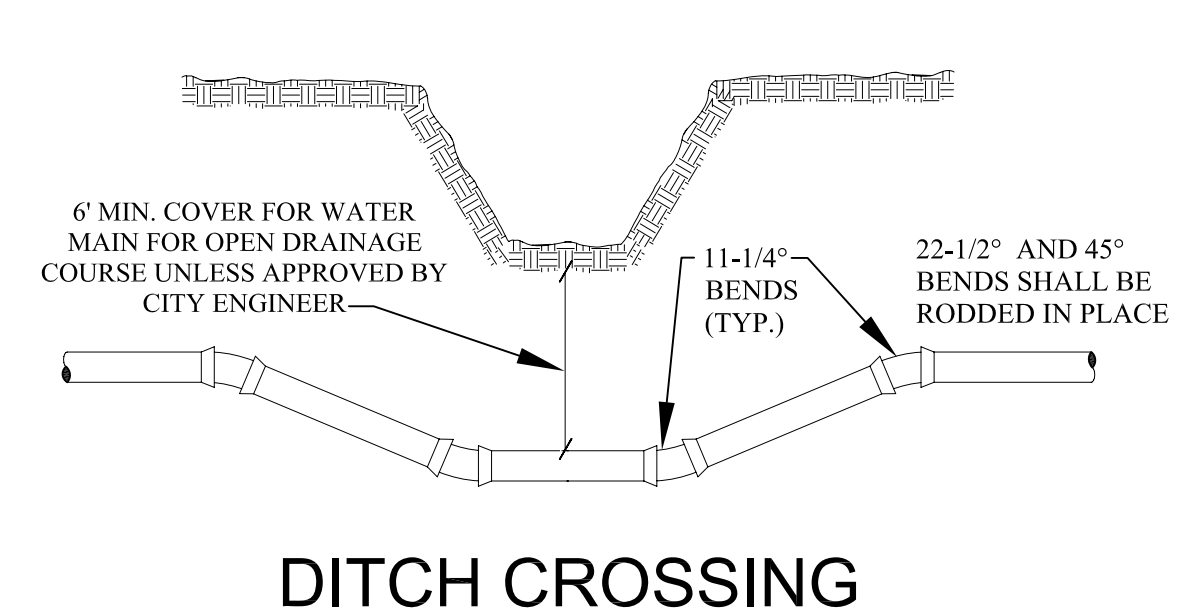


**DETAIL OF 4" BLOWOFF**

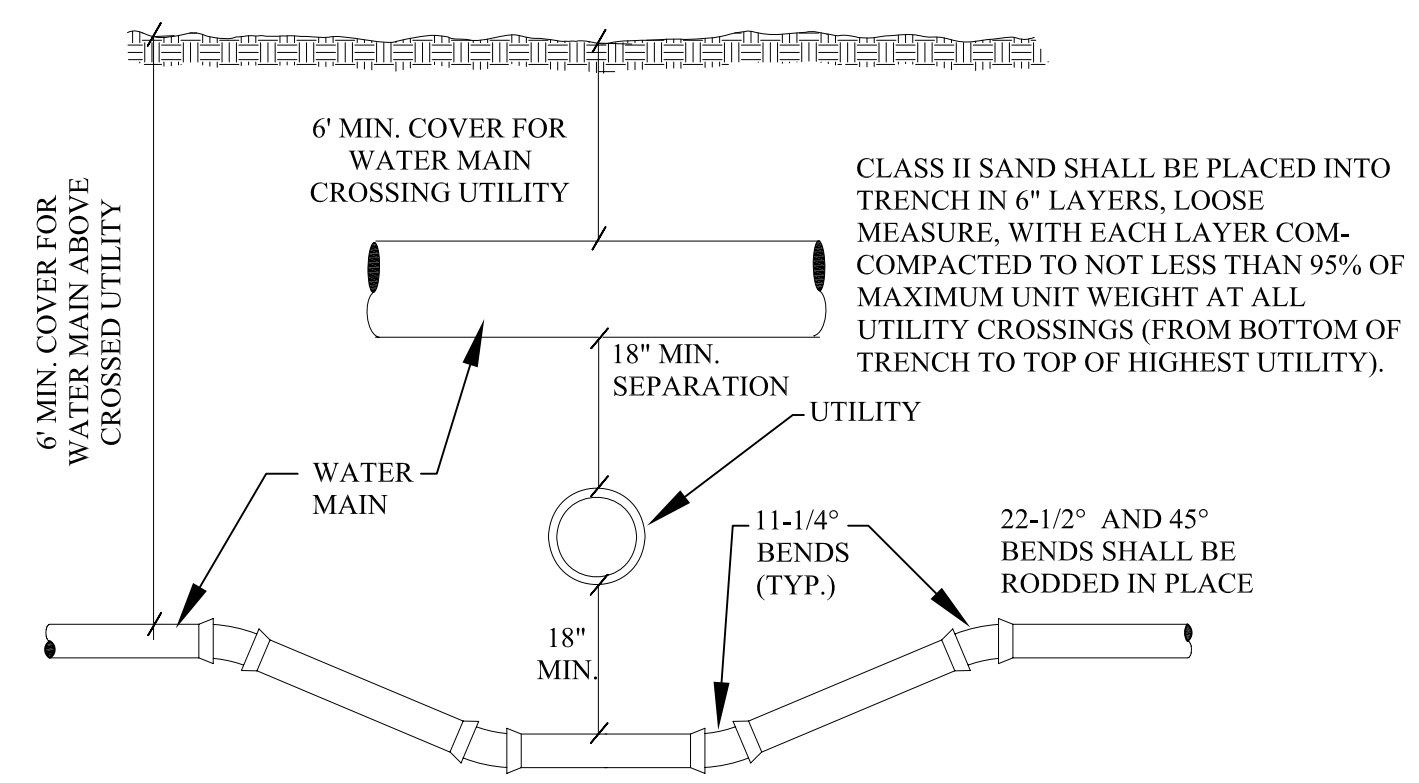


**TYPICAL PUBLIC ROAD WATER SERVICE CONNECTION**

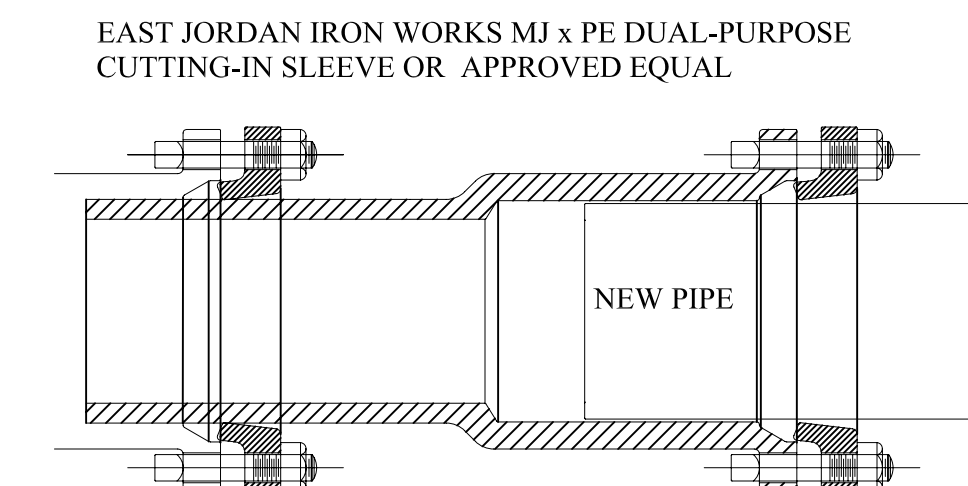
NOTES:  
 1. WATER SERVICE SHUT-OFF TO BE PLACED AT PROPERTY LINE.  
 2. LATERAL LOCATION SHALL BE AS REQUESTED BY THE ABUTTING PROPERTY OWNER.  
 3. ROCHESTER HILLS DPW PERFORMS SERVICE LEAD TAPS UP TO 2" DIAMETER.



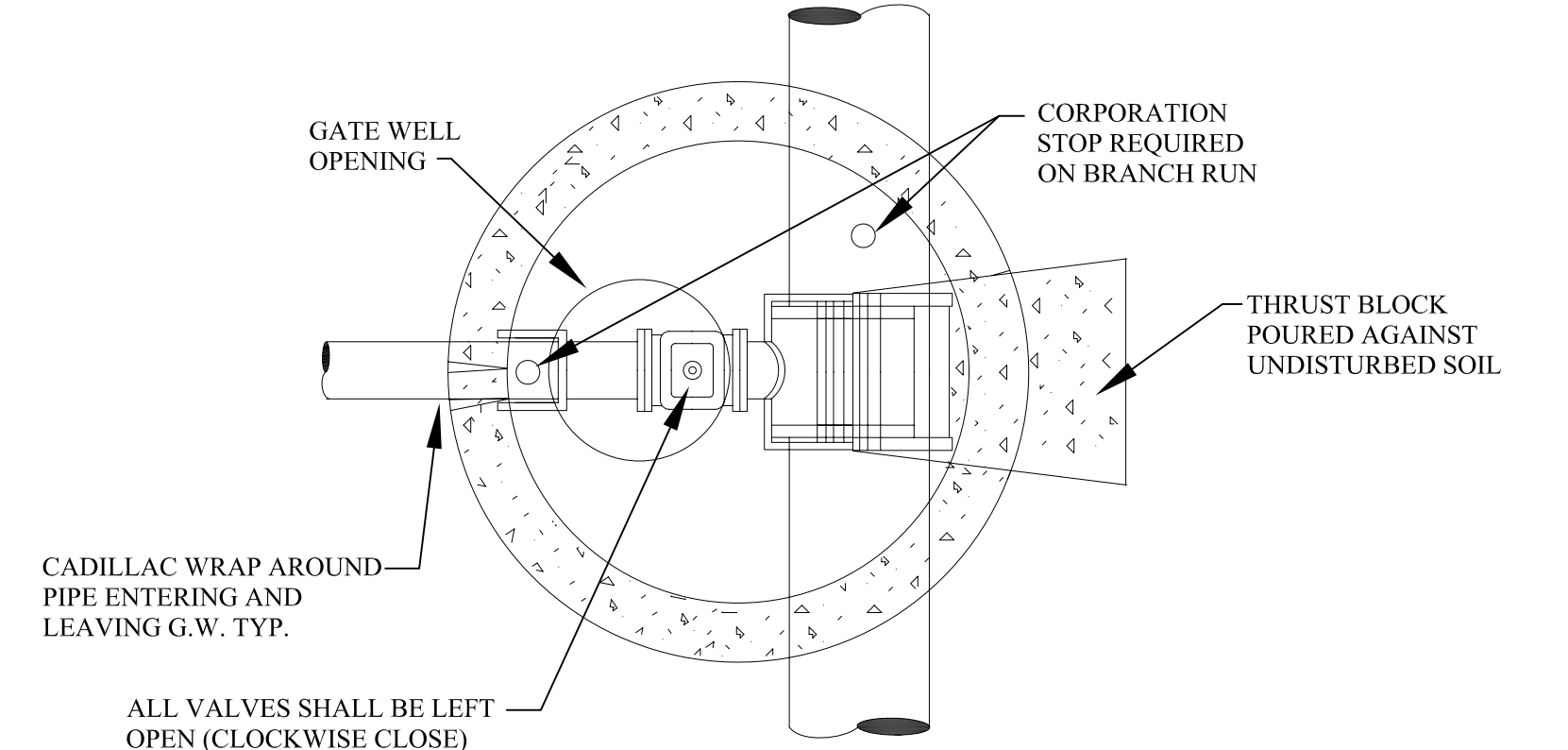
**DITCH CROSSING**



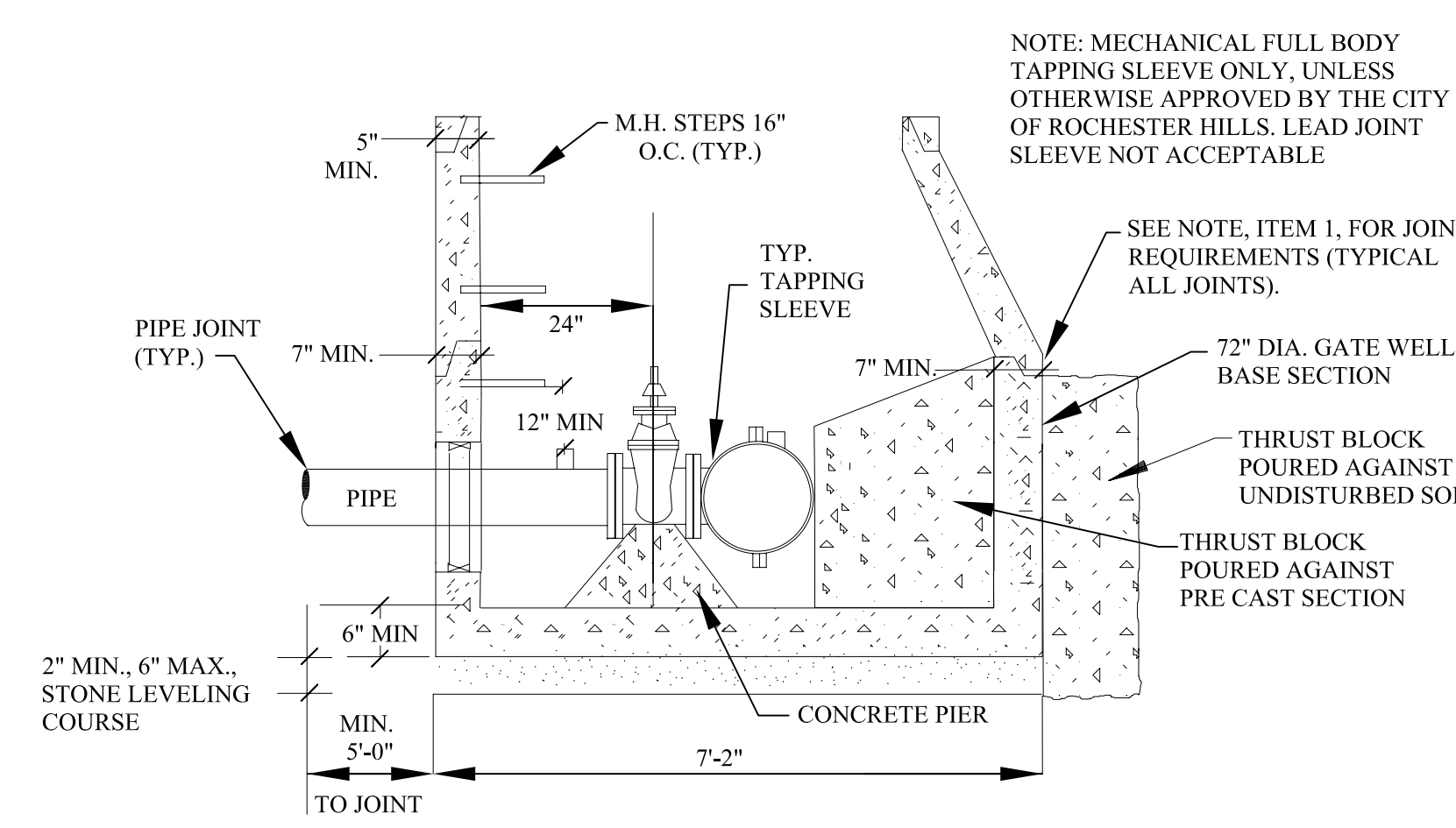
**UTILITY CROSSING**



**BOTTLE SLEEVE**



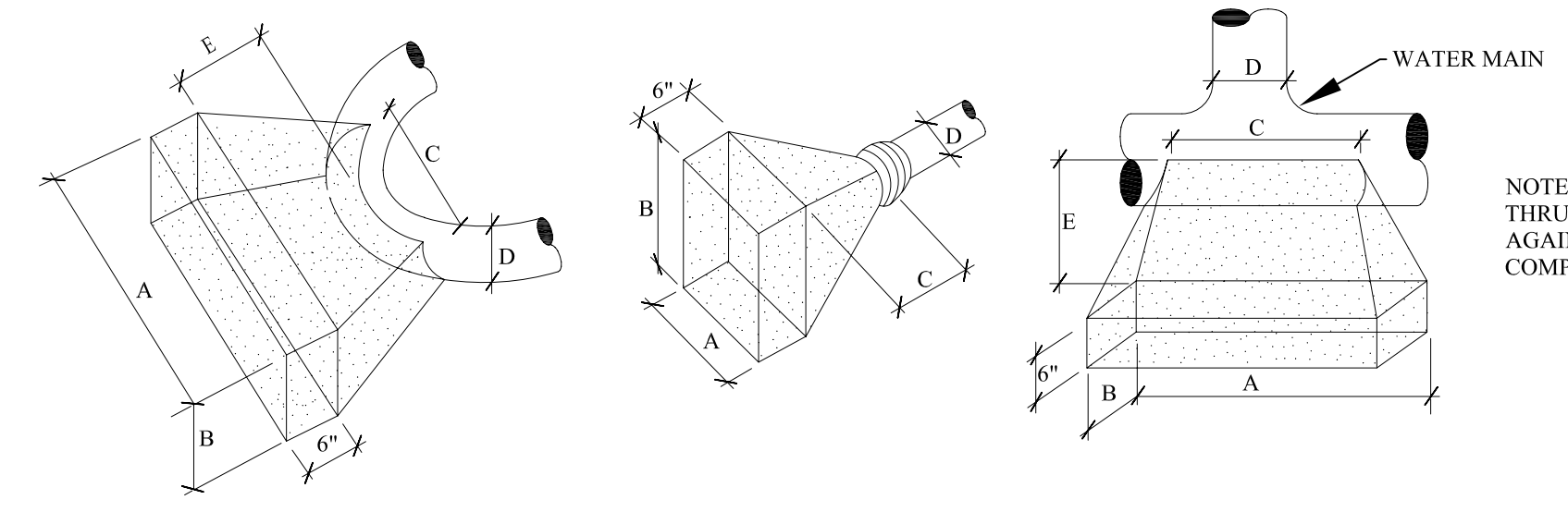
**PLAN TAPPING SLEEVE VALVE & WELL (TYPICAL)**



**TAPPING SLEEVE, VALVE AND WELL (TYPICAL)**

**NOTES:**

- ALL PRECAST CONCRETE GATE WELL SECTIONS SHALL BE MANUFACTURED TO CONFORM WITH A.S.T.M. C478, STANDARD SPECIFICATIONS FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS, EXCEPT WALL THICKNESS SHALL BE AS SHOWN ON THESE DETAILS. ALL JOINTS FOR PRECAST CONCRETE GATE WELL SECTIONS SHALL BE "MODIFIED GROOVE TONGUE" WITH GASKET MANUFACTURED TO CONFORM WITH A.S.T.M. C 443, STANDARD SPECIFICATION FOR JOINTS FOR CIRCULAR CONCRETE SEWER AND CULVERT PIPE USING RUBBER GASKETS.
- CONTRACTOR SHALL INSTALL VALVES, TAPPING SLEEVES AND GATE WELL STRUCTURES IN STRICT COMPLIANCE WITH MEASUREMENTS PROVIDED ON SHEET 1 (i.e. 2'-0" BETWEEN GATE WELL WALL & CENTERLINE OF OPERATING NUT) TO ALLOW PROPER OPERATION OF VALVE THROUGH GATE WELL OPENING. FAILURE TO DO SO WILL REQUIRE CONTRACTOR TO CORRECT AT HIS EXPENSE.
- TAPPING SLEEVES SHALL BE MANUFACTURED BY ROMAC INDUSTRIES; MUELLER; EAST JORDAN; SMITH-BLAIR OR APPROVED EQUAL AND APPROVED BY THE CITY OF ROCHESTER HILLS. FULL BODY SLEEVES MUST BE USED EXCEPT FOR REINFORCED CONCRETE PRESSURE PIPE OR A.C. PIPE.
- FOR ALL PIPE USE A 1" CORPORATION STOP. NO CORPS SHALL BE USED IN CONCRETE PRESSURE PIPE.
- RUBBER O-RINGS SHALL NOT BE USED IN PAVEMENT.



| FOR 90° BENDS OR SMALLER |    |      |      |        | FOR PLUGS |        |        |        | FOR TEES |       |       |      |        |
|--------------------------|----|------|------|--------|-----------|--------|--------|--------|----------|-------|-------|------|--------|
| D                        | A  | B    | C    | E MIN. | D         | A      | B      | C MIN. | D        | A     | B     | C    | E MIN. |
| 20"                      | 8" | 6.5' | 3.5' | 2.5'   | 20"       | 7"     | 5'     | 2.5'   | 20"      | 6.5'  | 4.5'  | 3.5' | 3'     |
| 16"                      | 6" | 4'   | 2.5' | 2'     | 16"       | 4'-10" | 4'-10" | 2'     | 16"      | 4'-8" | 4'-8" | 2.5' | 2.75'  |
| 12"                      | 4" | 3'   | 2'   | 1.75'  | 12"       | 4'-4"  | 3'     | 1'-9"  | 12"      | 4'    | 3'    | 2.5' | 2.5'   |
| 10"                      | 3" | 3'   | 2'   | 1.75'  | 10"       | 3"     | 2'     | 1'-6"  | 10"      | 3'    | 2'    | 2'   | 2.25'  |
| 8"                       | 3" | 2'   | 2'   | 1.5'   | 8"        | 2'-10" | 2'-6"  | 1'-6"  | 8"       | 2'-6" | 2'    | 2'   | 2.25'  |
| 6"                       | 2" | 1.5' | 2'   | 1.25'  | 6"        | 1'-6"  | 1'-6"  | 3'     | 6"       | 2'    | 2'    | 2'   | 2.25'  |

**THRUST BLOCK DETAILS**

City File #73-175.2



| REVISIONS | DATE | APPROVED BY  |
|-----------|------|--|
|           |      | CITY COUNCIL, DATE: JULY 21, 2008                              |
|           |      | PREPARED BY ENGINEERING DIVISION DEPARTMENT OF PUBLIC SERVICES |

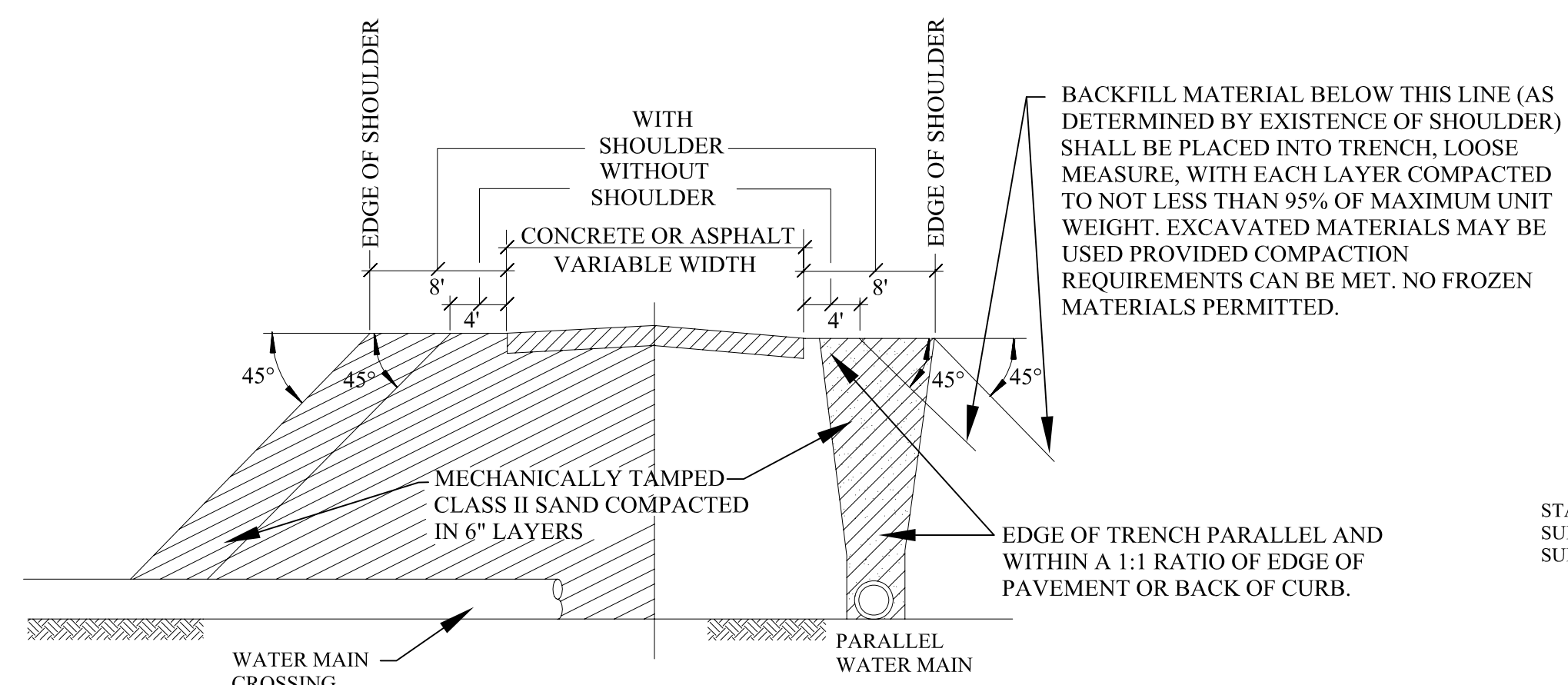
NOTIFY ROCHESTER HILLS ENGINEERING DEPARTMENT @ 248-841-2510 48 HRS. PRIOR TO START OF CONSTRUCTION

**City of Rochester Hills**  
 1000 Rochester Hills Drive, Rochester Hills, Michigan 48309

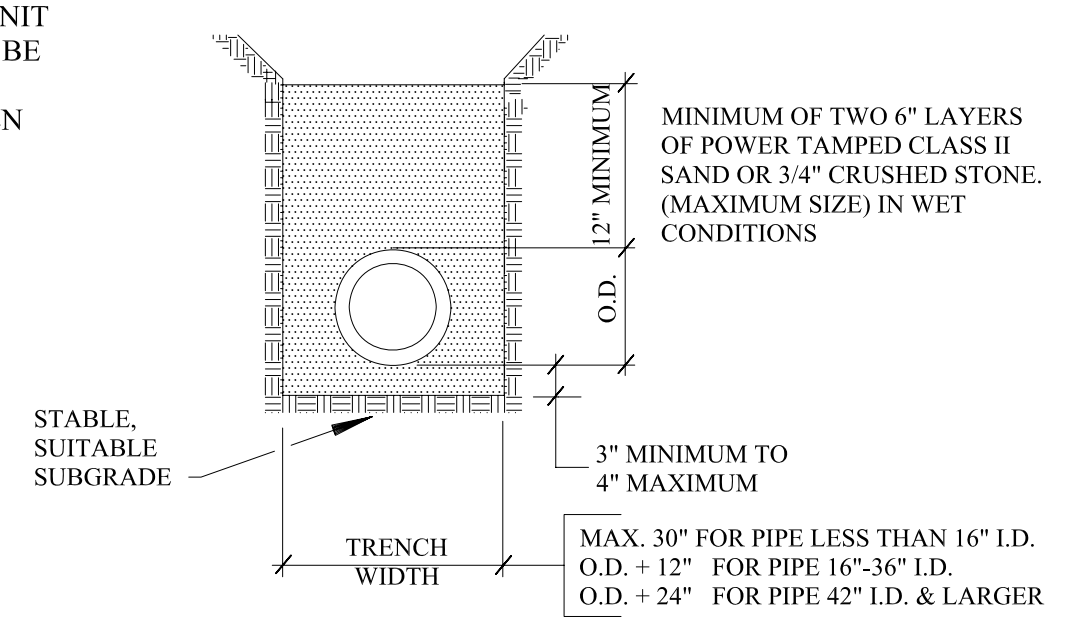
**WATER MAIN STANDARD DETAILS**

|              |                 |
|--------------|-----------------|
| NOT TO SCALE | DATE: 7/21/2008 |
| SHEET 1 OF 2 |                 |

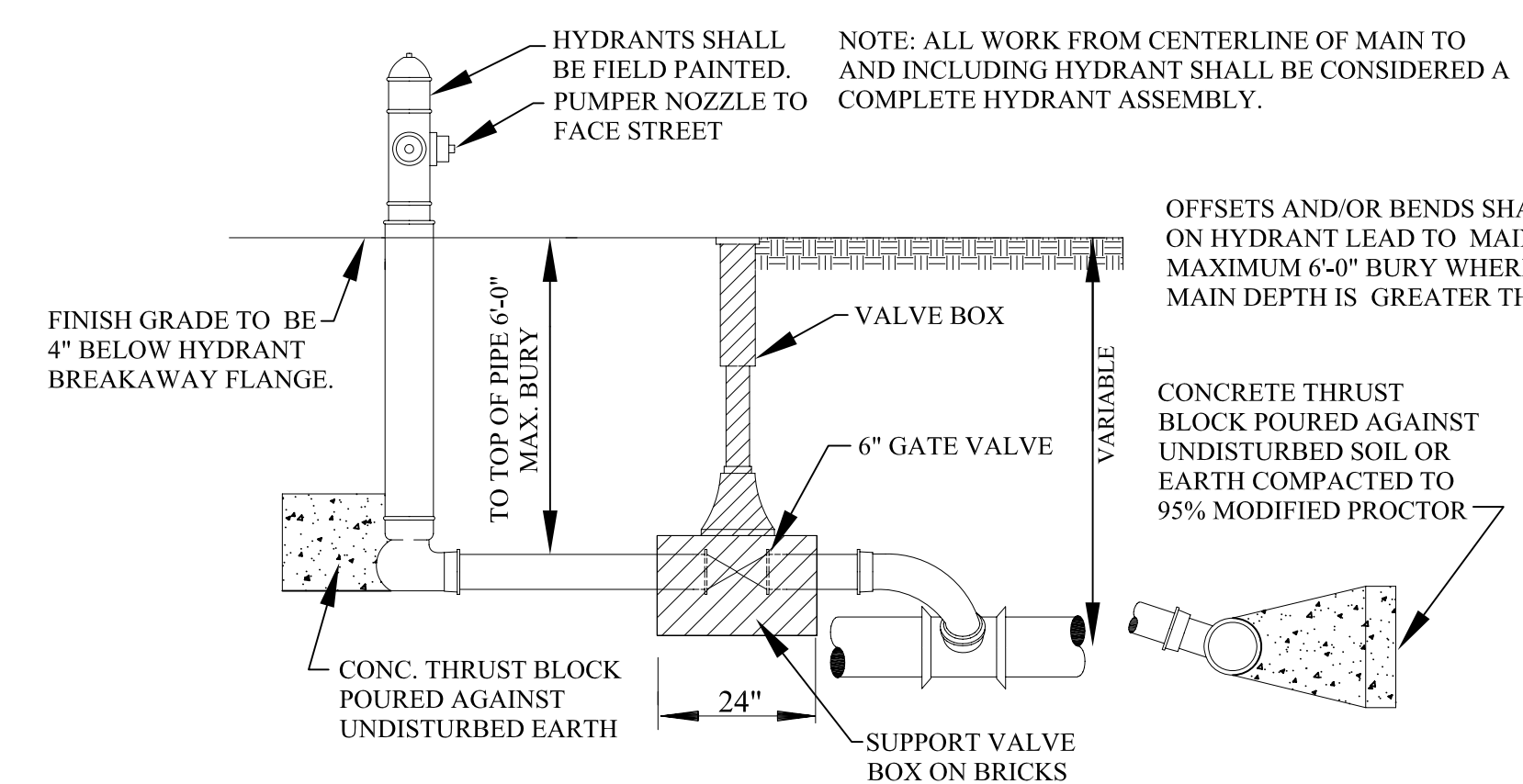




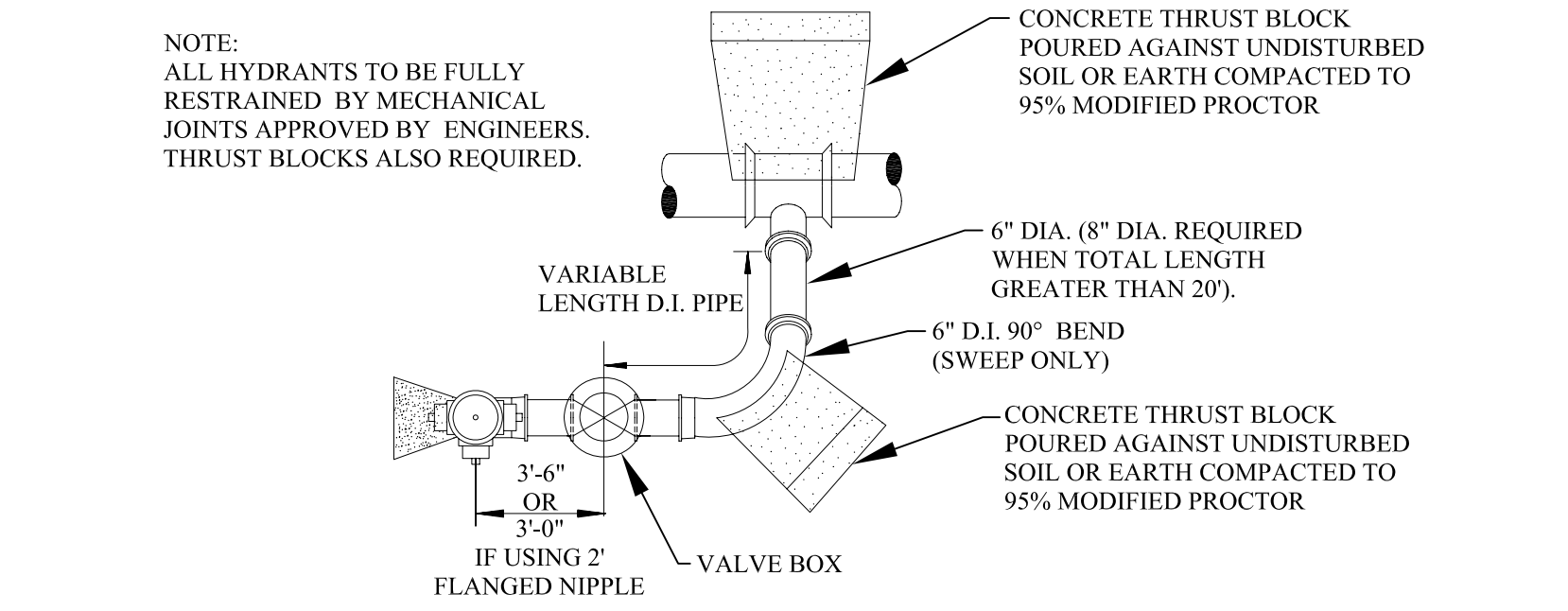
**MINIMUM BACKFILL UNDER OR WITHIN PAVEMENT INFLUENCE**



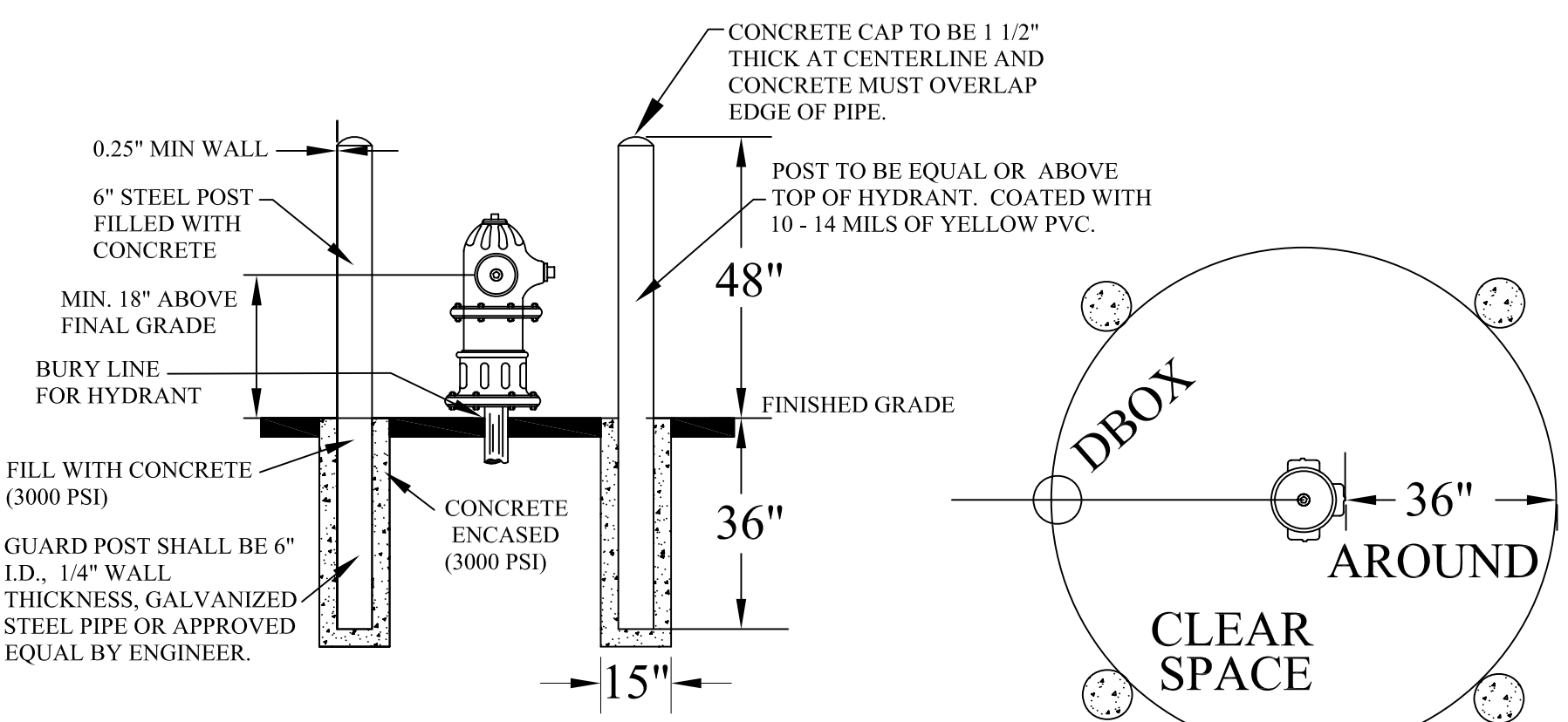
**STANDARD BEDDING FOR WATER MAIN**



**HYDRANT SIDE OUTLET OPTION**

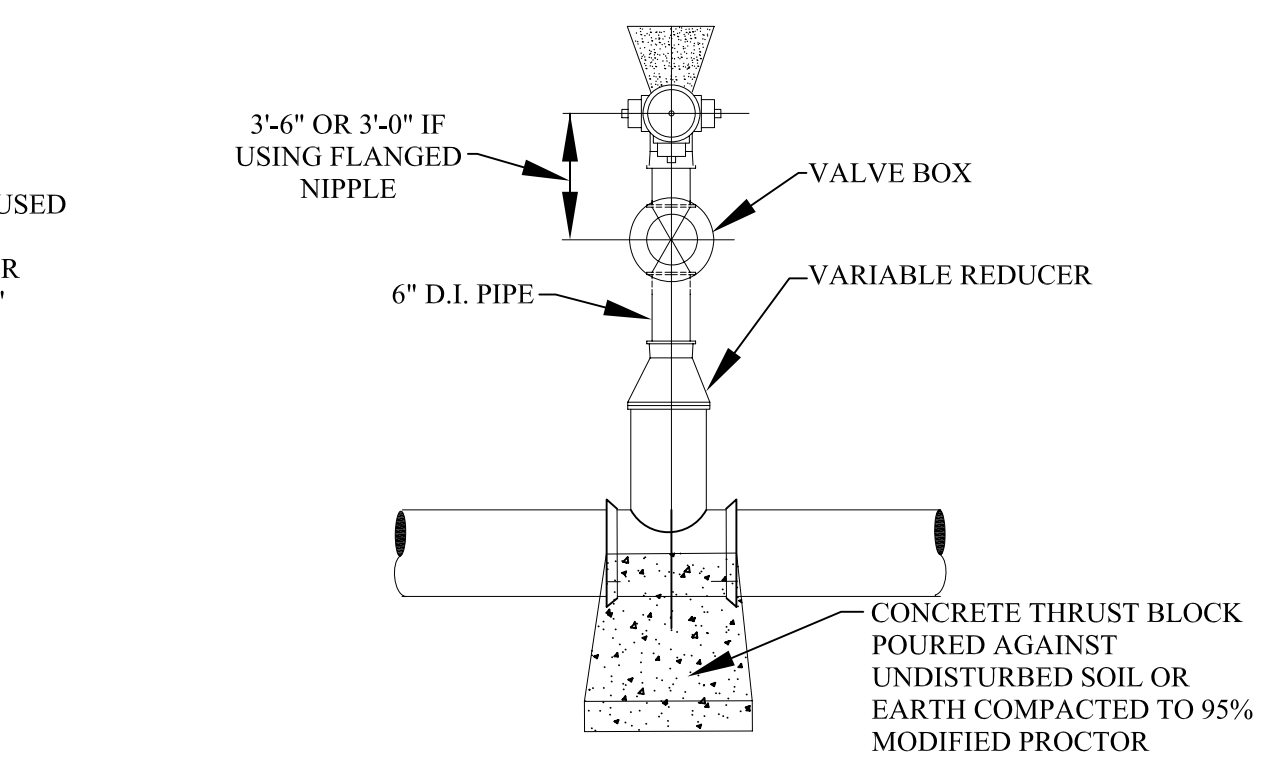


**HYDRANT SIDE OUTLET OPTION**

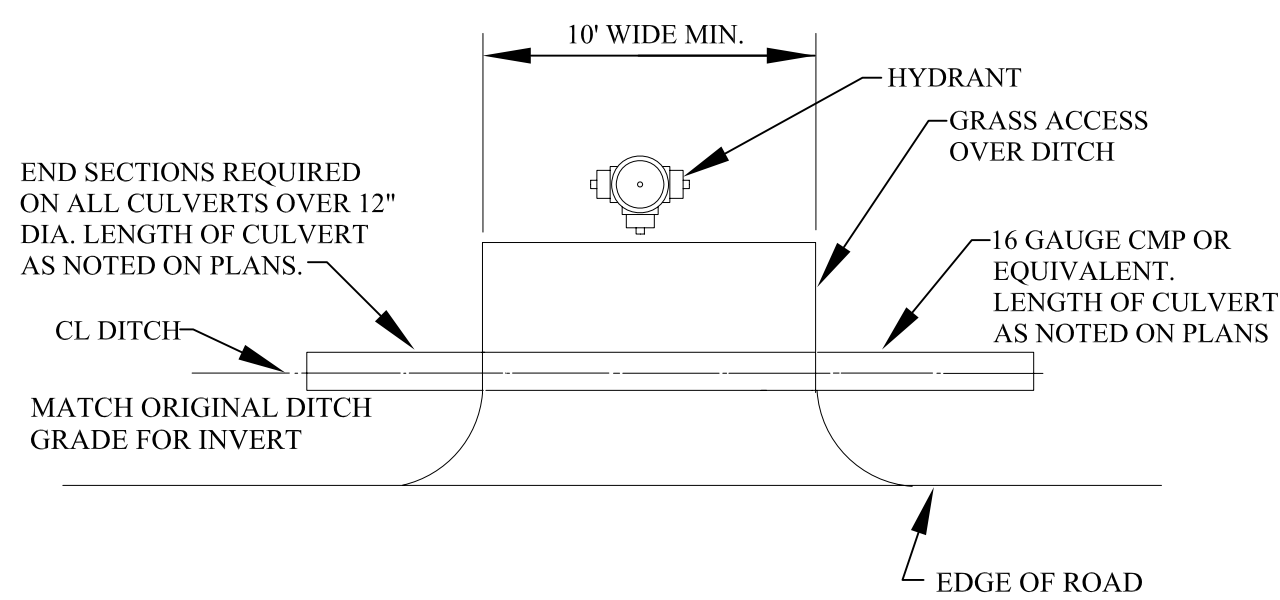


**GUARD POST**

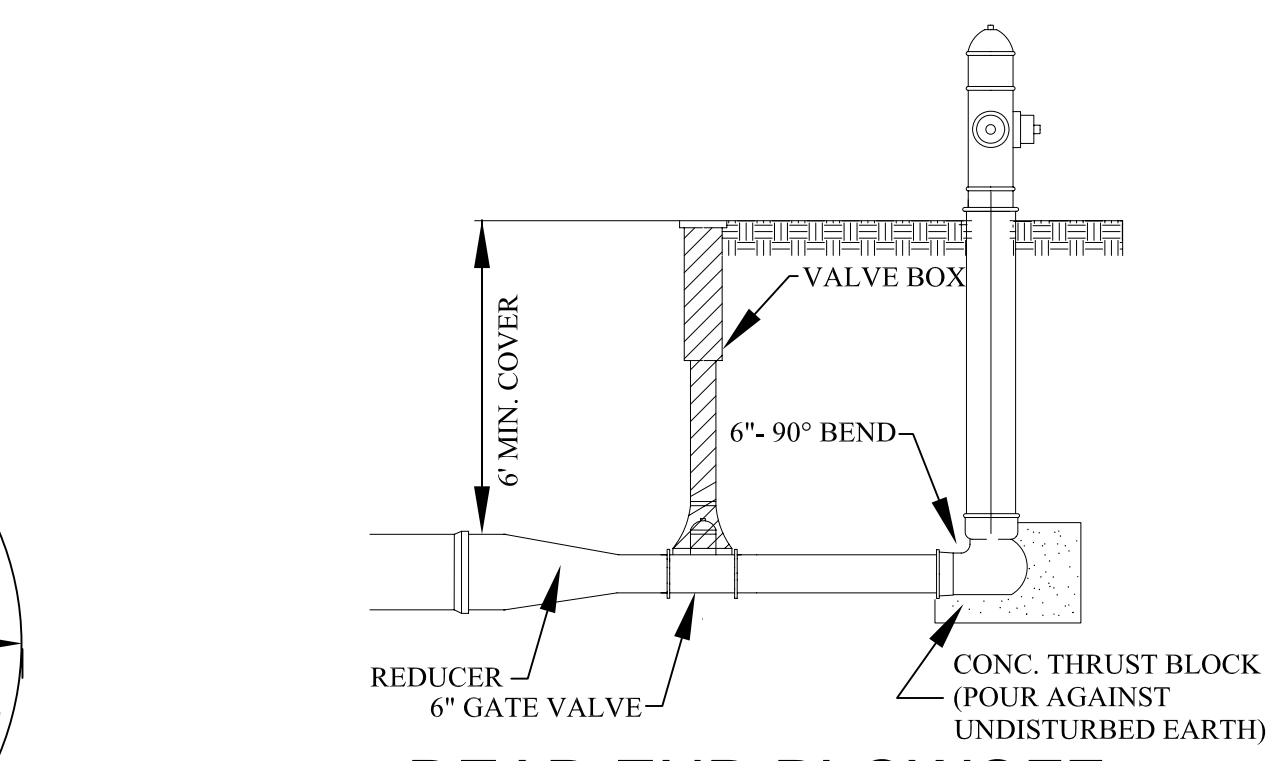
NOTES:  
1. GUARD POST SHALL NOT INTERFERE WITH HYDRANT OPERATION  
2. TO BE INSTALLED IN ALL PAVED AREAS WHERE VEHICLE EQUIPMENT DAMAGE TO HYDRANT IS POSSIBLE.



**HYDRANT CONNECTION (TYPICAL)**



**DITCH ENCLOSURE AT HYDRANT/ GATE WELL**



**DEAD END BLOWOFF CONNECTION**

**HYDRANT & BLOWOFF DETAILS**

**GENERAL NOTES**

- ALL CONSTRUCTION PROCEDURES AND MATERIALS SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CITY OF ROCHESTER HILLS.
- A PRE-CONSTRUCTION MEETING SHALL BE SCHEDULED BY THE CITY OF ROCHESTER HILLS AND HELD PRIOR TO THE START OF CONSTRUCTION.
- CONTRACTOR MUST CONTACT MISS DIG (811) AT LEAST THREE WORKING DAYS PRIOR TO THE START OF CONSTRUCTION FOR UNDERGROUND UTILITY LOCATIONS. ALL UTILITIES SHALL BE STAKED BEFORE CONSTRUCTION BEGINS.
- ALL WATER MAIN EASEMENTS SHALL BE PROVIDED PRIOR TO CONSTRUCTION AND ACCEPTANCE OF THE WATER DISTRIBUTION SYSTEM.
- WATER MAINS SHALL BE CONSTRUCTED WITH A MINIMUM COVER OF 6 FEET BELOW FINISHED GRADES, INCLUDING OPEN DRAINAGE COURSES.
- ALL TRENCHES UNDER OR WITHIN A 1:1 RATIO OF EXISTING OR PROPOSED PAVEMENT OR DRIVEWAYS, SHALL BE BACKFILLED WITH COMPACTED CLASS II SAND TO GRADE (95% MAXIMUM UNIT DENSITY).
- WHERE TWO UTILITIES CROSS, PROVIDE CLASS II BACKFILL MATERIAL IN SIX (6) INCH COMPACTED LAYERS TO TOP OF HIGHEST UTILITY.
- WHERE WATER MAINS DIP UNDER OTHER UTILITIES, THE SECTIONS WHICH ARE DEEPER THAN NORMAL SHALL BE CONSTRUCTED WITH 11-1/4" VERTICAL BENDS, 22 1/2" OR 45" BENDS MUST BE RODDED AND PROPERLY ANCHORED.
- ALL PRECAST CONCRETE GATE WELL SECTIONS SHALL BE IN ACCORDANCE WITH A.S.T.M. C478, STANDARD SPECIFICATIONS FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS. WALL THICKNESS SHALL BE AS SHOWN ON THESE DETAILS. ALL JOINTS FOR PRECAST CONCRETE GATE WELL SECTIONS SHALL BE "MODIFIED GROOVE TONGUE" WITH GASKET MANUFACTURED TO CONFORM WITH A.S.T.M. C 443, STANDARD SPECIFICATION FOR JOINTS FOR CIRCULAR CONCRETE SEWER AND CULVERT PIPE USING RUBBER GASKETS.
- CONTRACTOR SHALL INSTALL VALVES, TAPPING SLEEVES AND GATE WELL STRUCTURES IN STRICT COMPLIANCE WITH MEASUREMENTS PROVIDED ON SHEET 1 (2'-0" BETWEEN GATE WELL WALL & CENTERLINE OF OPERATING NUT) TO ALLOW PROPER OPERATION OF VALVE THROUGH GATE WELL OPENING.
- ALL CROSS-CONNECTION CONTROL DEVICES SHALL BE INSTALLED AS REQUIRED BY THE ROCHESTER HILLS PLUMBING INSPECTOR AND IN ACCORDANCE WITH THE STANDARDS OF THE OAKLAND COUNTY DRAIN COMMISSIONER OPERATION AND MAINTENANCE DIVISION AND THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF DRINKING WATER AND RADIOLOGICAL PROTECTION.
- ALL WATER SERVICE CONNECTIONS TWO (2) INCHES AND SMALLER SHALL BE MADE BY THE CITY OF ROCHESTER HILLS, DEPARTMENT OF PUBLIC SERVICES AFTER WATER MAIN ACCEPTANCE AND APPLICABLE PERMITS ARE OBTAINED.
- ALL FITTINGS AND BENDS SHOULD BE BLOCKED IN ACCORDANCE WITH THRUST BLOCK DETAILS, UNLESS ALTERNATE THRUST RESTRAINT SYSTEM, AS INDICATED PLANS AND SPECIFICATIONS, IS APPROVED BY THE CITY OF ROCHESTER HILLS DEPARTMENT OF PUBLIC SERVICE.

**WATER MAIN MATERIALS NOTES**

- TEMPORARY CONNECTIONS, WHICH MAY BE MADE FOR CHLORINATING AND FLUSHING PURPOSES, SHALL INCLUDE A TESTABLE DOUBLE CHECK VALVE BACKFLOW PREVENTER WITH CURRENT CERTIFICATION.
- CORPORATION STOPS USED FOR INSERTION INTO MAINS SHALL BE FORD TYPE B-44. ALL STOPS SHALL HAVE BRONZE CAST BODIES, KEYS, STEM WASHERS AND NUTS. INLET THREADS SHALL CONFORM TO THE LATEST VERSION OF AWWA C800.
- ALL DUCTILE IRON PIPE (D.I.P.) WATER MAIN SHALL BE DESIGNED FOR 150 PSI MINIMUM WORKING PRESSURE.
- THE DUCTILE IRON PIPE TO BE FURNISHED AND DELIVERED UNDER THIS SPECIFICATION SHALL MEET ALL THE REQUIREMENTS OF THE CURRENT AWWA C151 (ANSI A21.5), EXCEPT AS OTHERWISE SPECIFIED HEREIN. PIPE SHALL BE DOUBLE CEMENT-LINED AND SEAL COATED WITH AN APPROVED BITUMINOUS SEAL COAT IN ACCORDANCE WITH AWWA C104 (ANSI A21.4).
- DUCTILE IRON PIPE SHALL BE CLASS 54 FOR SIZES THREE (3) INCH THROUGH TWENTY (20) INCHES SIZE. TWENTY-FOUR (24) INCH AND LARGER SHALL BE CLASS 55 DUCTILE IRON PIPE.
- PIPES TWENTY-FOUR (24) INCHES AND LARGER IN NOMINAL DIAMETER SHALL MEET ALL THE REQUIREMENTS OF THE CURRENT AWWA C100 FOR DUCTILE IRON WATER PIPE.
- MECHANICAL JOINTS FOR DUCTILE IRON WATER MAIN SHALL BE IN ACCORDANCE WITH AWWA C111 (ANSI A21.11).
- FLANGE JOINTS FOR DUCTILE IRON WATER MAIN SHALL BE IN ACCORDANCE WITH AWWA C110 (ANSI A21.10).
- FITTINGS FOR DUCTILE IRON PIPE SHALL BE DUCTILE IRON AND SHALL MEET REQUIREMENTS OF AWWA C110 (ANSI A21.10) OR AWWA C151 (ANSI A21.5). DUCTILE IRON FITTINGS SHALL BE RATED FOR 350 PSI. PIPE SIZES TWENTY-FOUR (24) INCH DIAMETER AND LESS, AND 250 PSI FOR PIPE SIZES OVER TWENTY-FOUR (24) INCH DIAMETER. DUCTILE IRON FLANGE FITTINGS SHALL BE RATED FOR 250 PSI FOR ALL PIPE DIAMETERS.
- ALL DUCTILE IRON PIPE, FITTINGS AND HYDRANTS SHALL BE ENCASED WITH POLYETHYLENE ENCASEMENT IN ACCORDANCE WITH THE REQUIREMENTS OF A.N.S.I./A.W.A. STANDARD SPECIFICATION D1248 AND AWWA C105. POLYETHYLENE TUBE MATERIAL SHALL HAVE A THICKNESS OF .008" (8-MILS). ADHESIVE TAPE SHALL BE A GENERAL PURPOSE ADHESIVE TAPE 2" WIDE AND APPROXIMATELY 10-MILS THICK, SUCH AS SCOTCHRAP, NO.50, POLYKEN NO. 900, OR TAPECOAT CT.

**VALVE AND SLEEVE NOTES**

- GATE VALVES, SIZES THREE (3) INCH THROUGH SIXTEEN (16) INCH AND TAPPING VALVES SHALL MEET THE CITY OF ROCHESTER HILLS STANDARD AS DETAILED WITH NON-RISING STEM. (EAST JORDAN IRON WORKS, AMERICAN FLOW CONTROL, MUELLER)
- ALL IN LINE GATE VALVES EIGHT (8) INCH AND LARGER SHALL BE IN WELLS. SPECIFICATIONS SHALL INCLUDE THE DIRECTION OF OPERATION OF ALL VALVES (CLOCKWISE CLOSURE). VALVE BOX USE TO BE APPROVED BY ENGINEERING DIVISION.
- ALL GATE WELL COVERS SHALL BE CITY OF ROCHESTER HILLS STANDARD AS DETAILED.
- ALL GATE VALVES WITH OPERATING NUTS AT A DISTANCE GREATER THAN FIVE (5) FEET BELOW GROUND SURFACE SHALL BE PROVIDED WITH AN EXTENSION STEM. THE LENGTH OF THE EXTENSION STEM SHALL REACH WITHIN FIVE (5) FEET FROM THE GROUND SURFACE. WHEN AN EXTENSION STEM IS USED, IT SHALL BE HELD IN PLACE BY AN EXTENSION STEM GUIDE SUITABLY FASTENED TO THE WALL OF THE GATE WELL. THE EXTENSION STEM SHALL BE MECHANICALLY ATTACHED TO THE OPERATING NUT. DETAILS OF THE EXTENSION SYSTEM AND THE METHOD OF INSTALLATION SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
- BUTTERFLY VALVES SHALL BE USED FOR VALVES GREATER THAN 16-INCH DIAMETER AND SHALL BE MODEL 2F11 AS MANUFACTURED BY HENRY PRATT COMPANY OR APPROVED EQUAL.
- TAPPING VALVES SHALL BE SERIES "A" AS MANUFACTURED BY EAST JORDAN IRON WORKS OR RESILIENT SEATED GATE VALVES AS APPROVED BY THE CITY OF ROCHESTER HILLS ENGINEERING SERVICES.
- TAPPING SLEEVES SHALL BE MANUFACTURED BY ROMAC INDUSTRIES; MUELLER; EAST JORDAN; SMITH-BLAIR OR APPROVED EQUAL AND APPROVED BY THE CITY OF ROCHESTER HILLS. FULL BODY SLEEVES MUST BE USED EXCEPT FOR REINFORCED CONCRETE PRESSURE PIPE OR A.C. PIPE.

**HYDRANT REQUIREMENTS**

- ALL HYDRANTS SHALL BE CONSTRUCTED WITH A SIX (6) INCH COMPANION GATE VALVE IN A THREE (3) PIECE, ADJUSTABLE DUCTILE IRON VALVE BOX, WHICH SHALL INCLUDE A FIVE AND ONE-QUARTER (5-1/4) INCH SCREW SHAFT. VALVE BOXES SHALL BE SERIES 6860 AS MANUFACTURED BY TYLER PIPE OR APPROVED EQUAL.
- ALL HYDRANTS SHALL BE EAST JORDAN IRON WORKS NO. 5-BR-250 TRAFFIC MODEL, OR AMERICAN FLOW CONTROL MODEL WB-67250. SELF-DRAINING HYDRANTS SHALL NOT BE USED. HYDRANTS SHALL HAVE BREAKAWAY FLANGE.
- ALL HYDRANTS SHALL BE PAINTED RED ABOVE GROUND AND BLACK BELOW GROUND WITH A FINISH COAT OF GLAMORTEX 501 ENAMEL, COLOR 314 VERMILION OR APPROVED EQUAL. HYDRANT CAPS SHALL BE PAINTED SAME COLOR AS THE HYDRANT.
- ALL FIRE HYDRANT JOINTS SHALL BE TOTALLY RESTRAINED BY THE USE OF RESTRAINED JOINT. THRUST BLOCKS ARE ALSO REQUIRED.

**ACCEPTANCE OF NEW WATER MAINS**

- PRIOR TO WATER MAIN ACCEPTANCE THE FOLLOWING CONDITIONS MUST BE MET: 1) PRESSURE TESTING AND BACTERIA TESTING MUST BE COMPLETED IN ACCORDANCE WITH THE CITY OF ROCHESTER HILLS 2) ALL EASEMENT AND RIGHT-OF-WAY ACQUISITION MUST BE ACCEPTED BY THE CITY OF ROCHESTER HILLS ENGINEERING SERVICES 3) THE CITY OF ROCHESTER HILLS MUST BE PROVIDED WITH THE BILL OF SALE AND 4) ALL MYLAR "AS-BUILT DRAWINGS" MUST BE ACCEPTED AND APPROVED BY THE CITY OF ROCHESTER HILLS, ENGINEERING SERVICES. THE CITY OF ROCHESTER HILLS INSPECTION DIVISION MUST WITNESS THE CONNECTION OF THE WATER MAIN TO THE EXISTING WATER MAIN, AFTER WHICH RESIDENTIAL AND COMMERCIAL TAPS WILL BE ALLOWED.
- THE CONTRACTOR SHALL NOTIFY THE CITY OF ROCHESTER HILLS, INSPECTION DEPARTMENT (248.841.2510) FOR PRESSURE TESTING, BACTERIOLOGICAL SAMPLING, CONNECTIONS TO EXISTING WATER MAIN AND FINAL FIELD REVIEW. A FORTY-EIGHT (48) HOUR ADVANCE NOTICE IS REQUIRED.
- THE CONTRACTOR SHALL DISINFECT AND PRESSURE TEST ALL NEW WATER MAIN IN ACCORDANCE WITH ROCHESTER HILLS STANDARDS. THE WATER MAIN SHALL PASS A 150 PSI PRESSURE TEST FOR A TWO (2) HOUR PERIOD. WATER LOSS SHALL NOT EXCEED A RATE OF 11.65 U.S. GALLONS PER INCH DIAMETER PER MILE OF WATER MAIN IN TWENTY-FOUR (24) HOURS.
- WHERE CONTRACTOR SUPPLIED GAUGES ARE REQUIRED, MINIMUM SIZE SHALL BE 3 1/2" DIAMETER OR LARGER GRADUATED IN ONE (1) OR TWO (2) POUND INCREMENTS FROM 1 TO 160 P.S.I. OR HIGHER AND HAVE CURRENT CERTIFICATION.
- PRESSURE TESTING AND BACTERIA TESTING MUST BE COMPLETED AND APPROVED PRIOR TO CONNECTING TO THE EXISTING WATER MAIN.

**CITY OF ROCHESTER HILLS WATER SYSTEMS AS-BUILT DRAWING SPECIFICATIONS**

IN AREAS WHERE WATER SYSTEMS ARE OPERATED AND MAINTAINED BY THE CITY OF ROCHESTER HILLS DEPARTMENT OF PUBLIC SERVICES, FINAL ACCEPTANCE OF THE WATER SYSTEM MUST BE RENDERED BY THE DEPARTMENT OF PUBLIC SERVICES, BEFORE THE SYSTEM CAN BE USED FOR THE SERVICE INTENDED.

ONE ITEM REQUIRED FOR FINAL ACCEPTANCE SHALL BE THE SUBMISSION OF AS-BUILT DRAWINGS TO THE CITY OF ROCHESTER HILLS, DPS, BY THE DESIGN ENGINEER. AS-BUILT DRAWINGS SHALL BE DEFINED AS AND CONTAIN THE FOLLOWING INFORMATION:

- FINAL AS-BUILT DRAWINGS SHALL BE PROVIDED ON THREE (3) MIL. MYLAR. XEROX OR ANY HEAT PROCESS REPRODUCTIONS WILL NOT BE ACCEPTED.
- ALONG WITH THE MYLAR PLAN SET, PROVIDE THREE (3) SETS OF BLUEPRINTS, PRODUCED FROM THE MYLARS AND THE PLANS ON ELECTRONIC MEDIA IN AUTOCAD FORMAT (LATEST VERSION).
- EACH AND EVERY SHEET SHALL BE SEALED BY THE DESIGN ENGINEER, ALONG WITH THE FOLLOWING CERTIFICATION STATEMENT ON THE COVER SHEET:

I HEREBY CERTIFY THAT OUR FIRM HAS PREPARED THESE AS-BUILT DRAWINGS OF THE IMPROVEMENTS AS CONSTRUCTED, AND THAT TO THE BEST OF MY KNOWLEDGE THOSE IMPROVEMENTS NOTED AS "AS BUILT" WERE CONSTRUCTED IN SUBSTANTIAL CONFORMANCE WITH THE APPROVED CONSTRUCTION PLANS; AND ALSO THAT THE WATER MAIN AND STRUCTURES, AS CONSTRUCTED, LIE WITHIN THE EASEMENT DESCRIPTIONS REQUIRED BY THE CITY OF ROCHESTER HILLS.

\_\_\_\_\_  
(COMPANY NAME)

\_\_\_\_\_  
(ENGINEER'S SIGNATURE)

PROFESSIONAL ENGINEER NO. \_\_\_\_\_

\_\_\_\_\_  
ENGINEER SEAL

- THE MAXIMUM SCALE SHALL BE ONE (1) INCH EQUALS FIFTY (50) FEET.
- THE SIZE, LENGTH, CLASS AND MANUFACTURER OF PIPE INSTALLED SHALL BE INDICATED.
- THE SIZE, BRAND AND MODEL NUMBERS OF ALL VALVES AND HYDRANTS INSTALLED SHALL BE INDICATED.
- A TOTAL AS-BUILT DRAWING QUANTITY LIST SHALL BE INCLUDED, AS WELL AS AN AS-BUILT DRAWING QUANTITY LIST ON EACH INDIVIDUAL SHEET.
- THE LOCATIONS SHALL BE SHOWN ON THE PLANS WITH AN ACCURACY OF ONE (1) FOOT.
- THE OFFSET OF THE WATER MAIN FROM PROPERTY LINES SHALL BE INDICATED.
- ALL GATE VALVE WELLS, HYDRANTS AND ALL WATER SYSTEM APPURTENANCES SHALL BE LOCATED FROM TWO FIXED OBJECTS (MANHOLES, BUILDING CORNERS ECT.).
- ALL UNDERGROUND APPURTENANCES, SUCH AS GATE VALVE WELLS, METER PITS, PRESSURE REDUCING VALVE PITS, ETC. SHALL BE LOCATED FROM THE NEAREST HYDRANT THAT IS CONNECTED TO THE SAME WATER MAIN AS THE APPURTENANCE.
- THE LOCATION AND SIZE OF EVERY RESTRAINED JOINT SHALL BE NOTED.
- THE ACCURATE LOCATION OF ALL UTILITY CROSSINGS WHERE THE VERTICAL SEPARATION, IS LESS THAN 18" SHALL BE NOTED.
- AS-BUILT SHALL BE PREPARED IN ACCORDANCE WITH THE CITY OF ROCHESTER HILLS AS-BUILT GUIDELINES AS PROVIDED AT THE PRE-CONSTRUCTION MEETING.

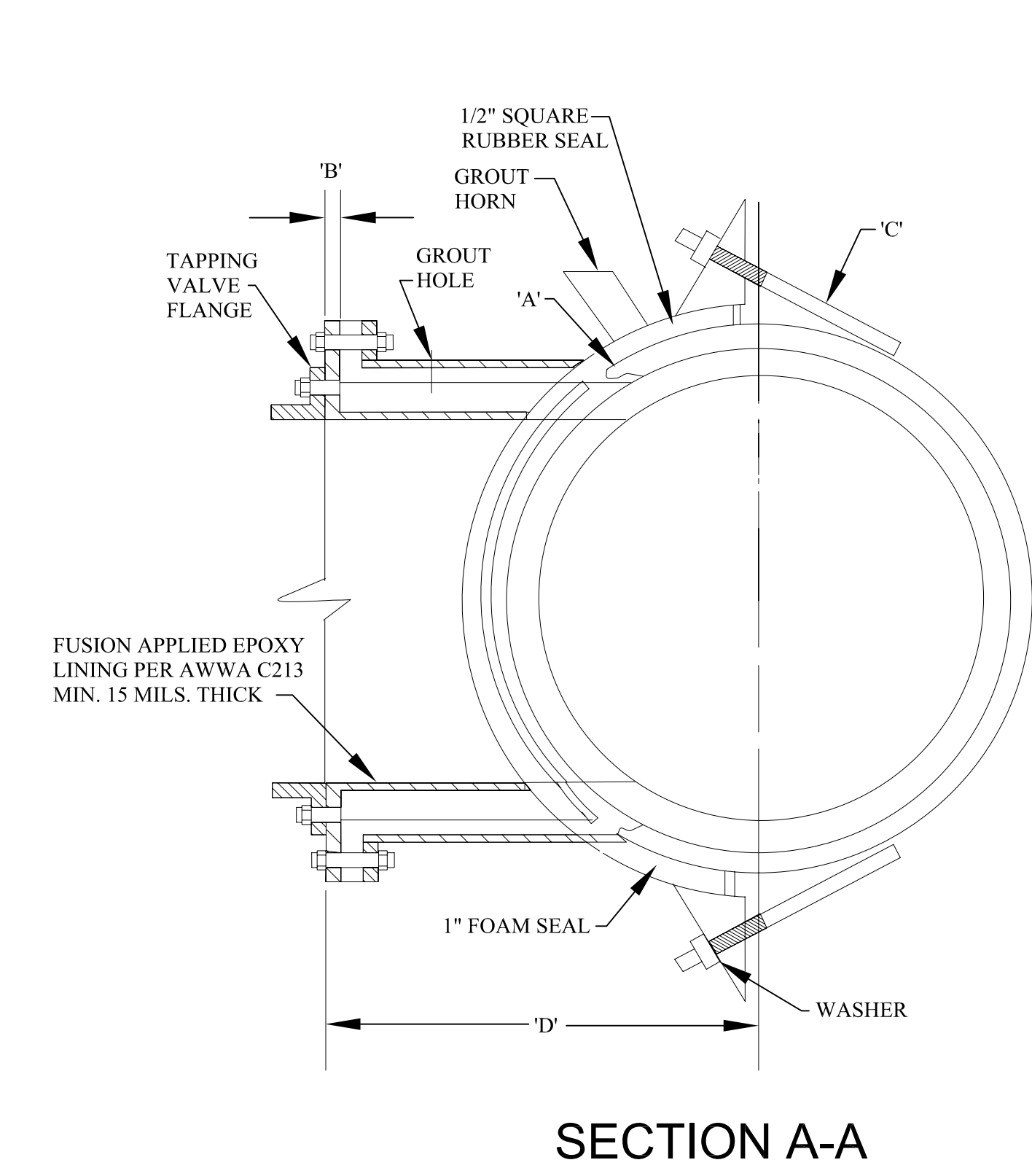
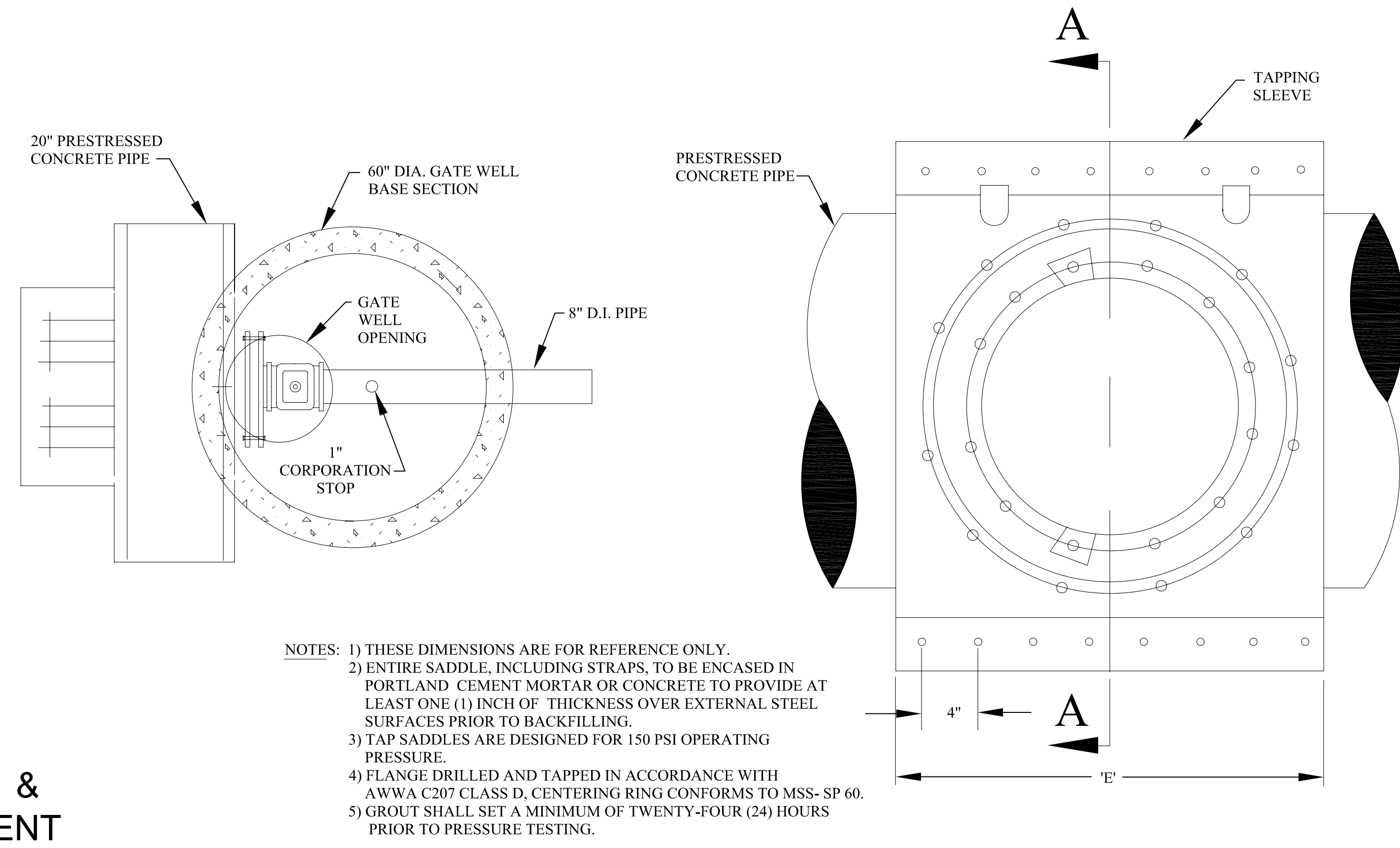
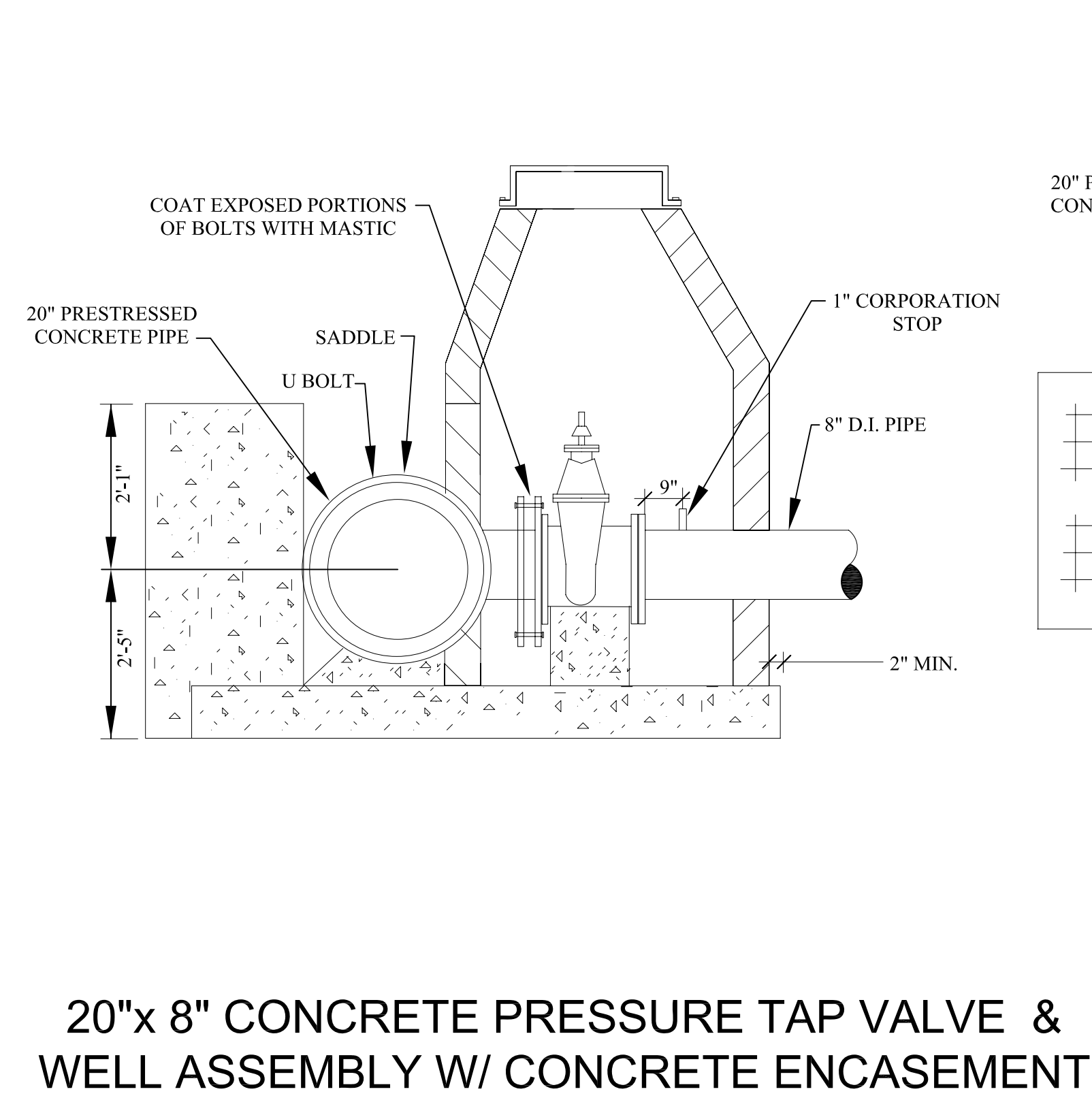
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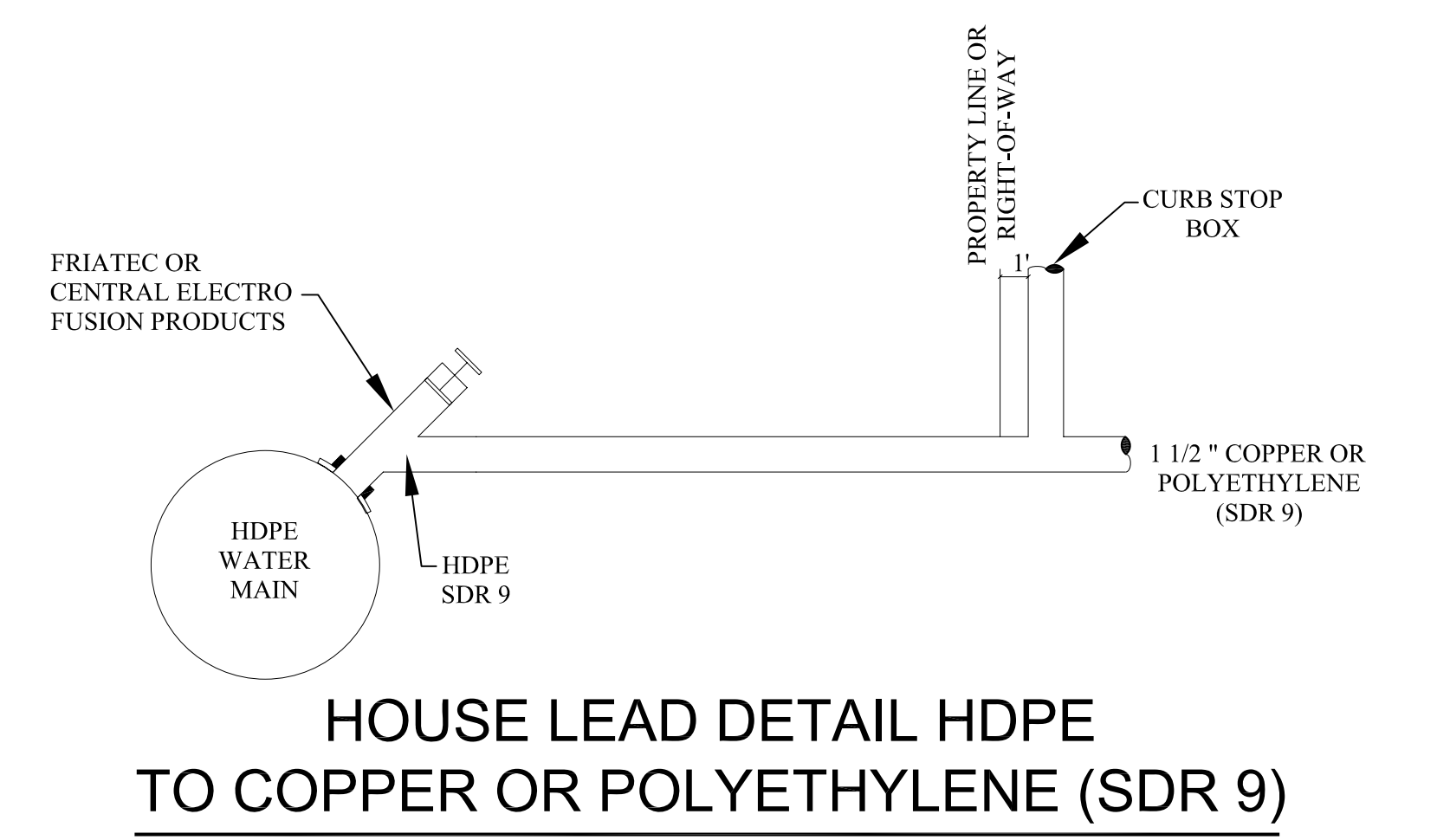
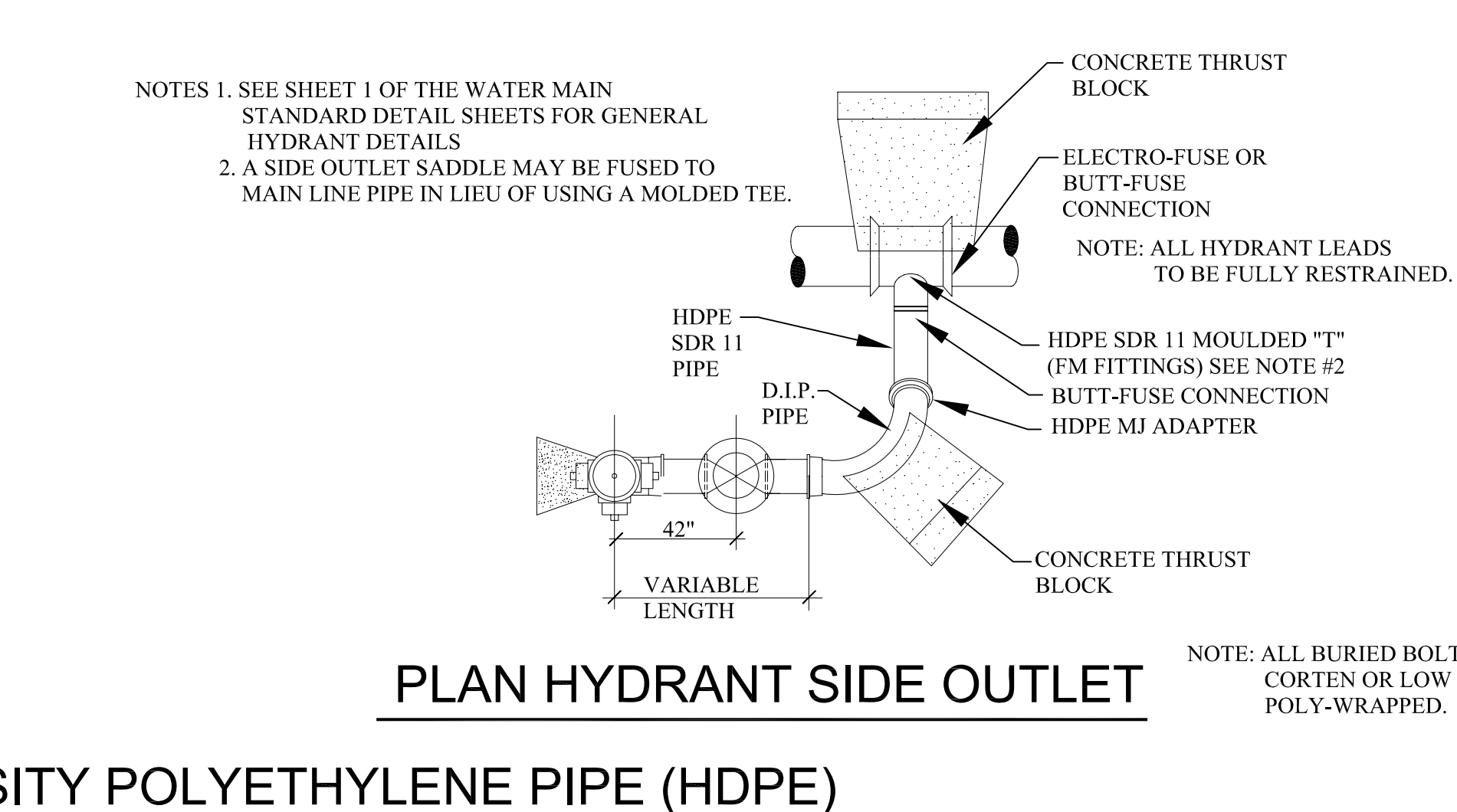
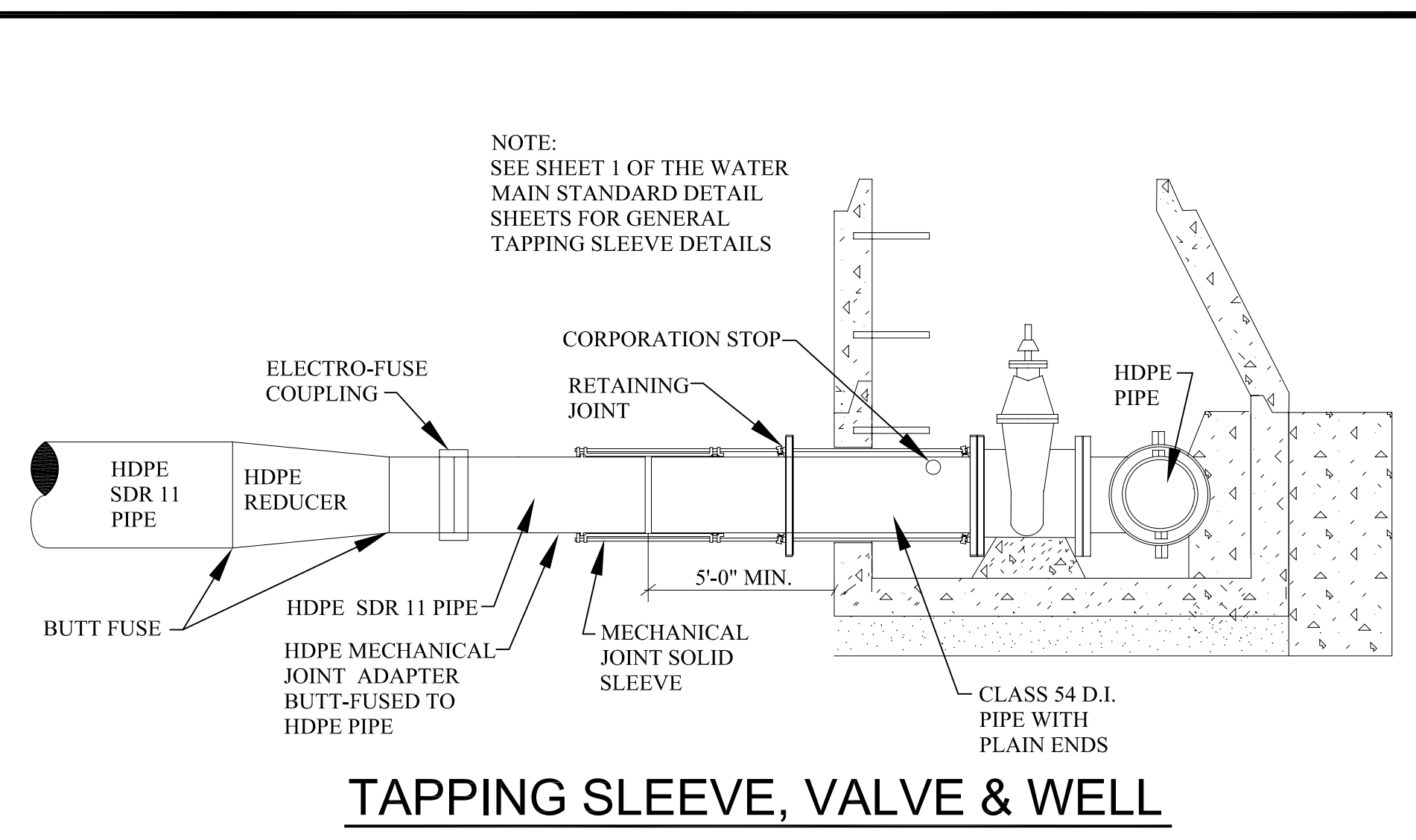
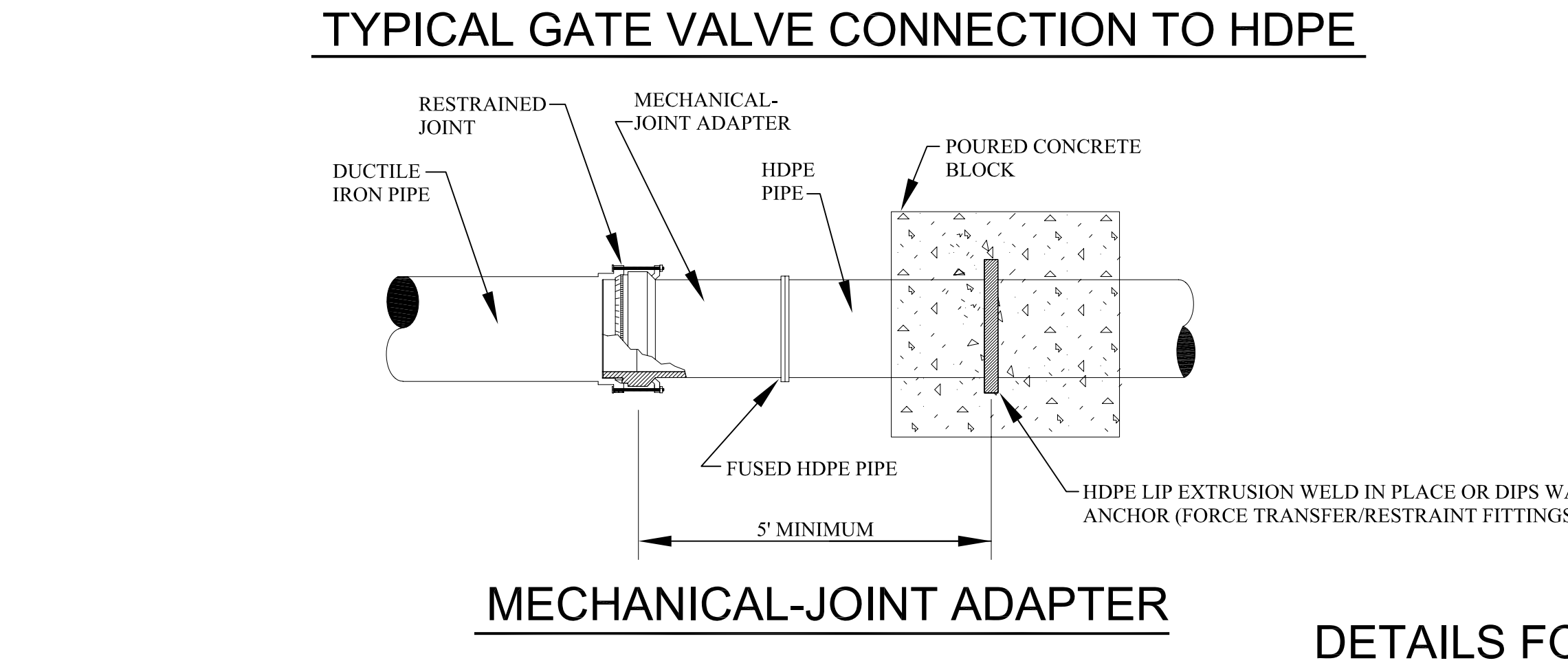
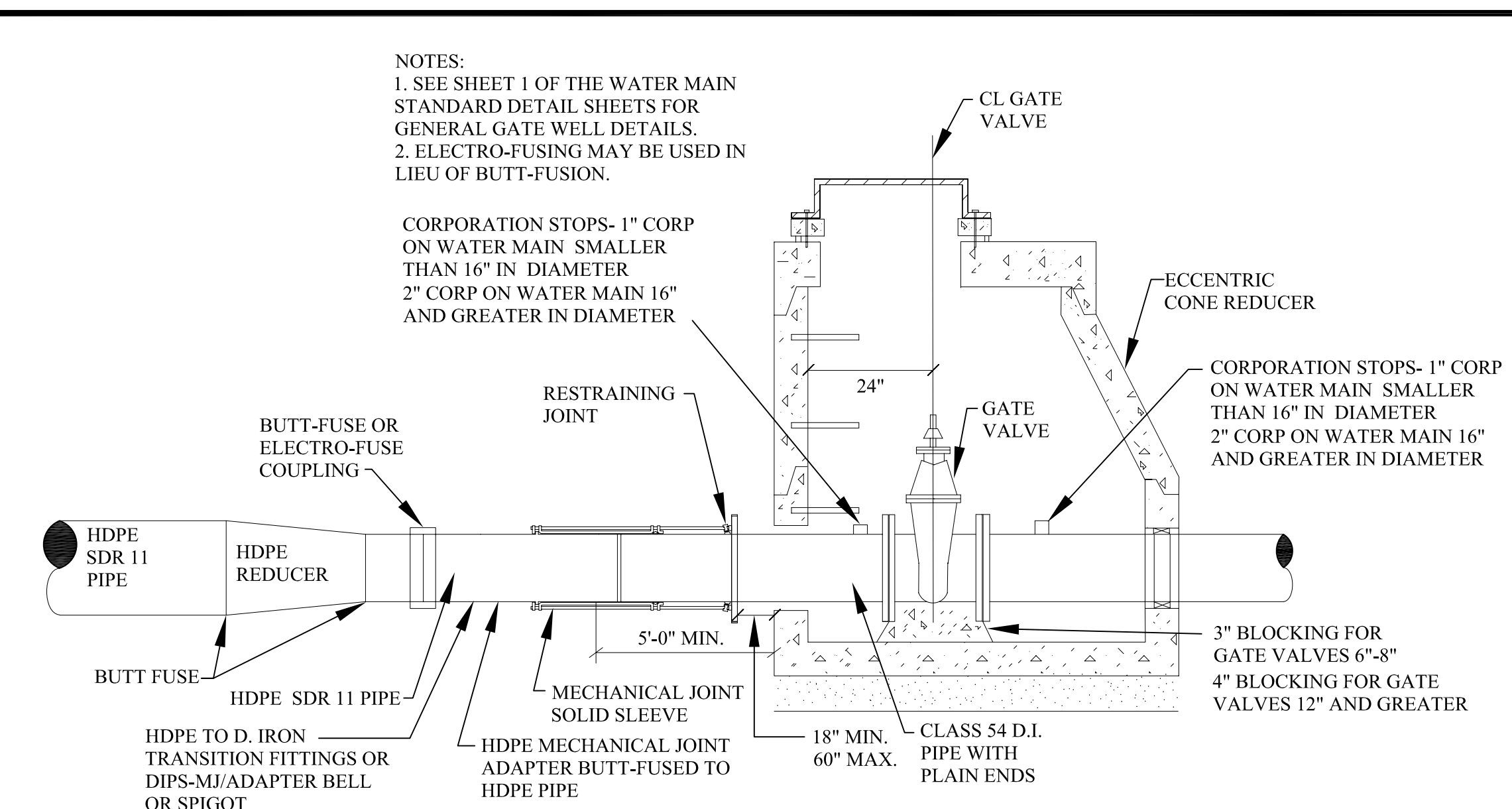
| REVISIONS | DATE | APPROVED BY  | NOTIFY ROCHESTER HILLS ENGINEERING DEPARTMENT @ 248-841-2510 48 HRS. PRIOR TO START OF CONSTRUCTION |
|-----------|------|--|---|
|           |      | CITY COUNCIL, DATE: JULY 21, 2008                              |   |
|           |      | PREPARED BY ENGINEERING DIVISION DEPARTMENT OF PUBLIC SERVICES |   |

**City of Rochester Hills**  
1000 Rochester Hills Drive, Rochester Hills, Michigan 48309

| WATER MAIN STANDARD DETAILS |  | NOT TO SCALE | DATE: 7/21/2008 |
|-----------------------------|--|--------------|-----------------|
|                             |  | SHEET 2 OF 2 |                 |



| PIPE SIZE X TAP SIZE | A    | B      | C   | D        | E   |
|----------------------|------|--------|-----|----------|-----|
| 16" X 4"             | 1/4" | 7/8"   | 6"  | 14-1/16" | 24" |
| 16" X 6"             | 1/4" | 1-1/8" | 6"  | 14-5/16" | 24" |
| 16" X 8"             | 1/4" | 1-1/8" | 6"  | 14-5/16" | 24" |
| 16" X 10"            | 1/4" | 1-3/8" | 7"  | 14-9/16" | 28" |
| 16" X 12"            | 1/4" | 1-3/8" | 8"  | 14-9/16" | 32" |
| 20" X 4"             | 1/4" | 7/8"   | 6"  | 16-1/2"  | 24" |
| 20" X 6"             | 1/4" | 1-1/8" | 6"  | 16-1/2"  | 24" |
| 20" X 8"             | 1/4" | 1-1/8" | 6"  | 16-1/2"  | 24" |
| 20" X 10"            | 1/4" | 1-3/8" | 7"  | 17"      | 28" |
| 20" X 12"            | 1/4" | 1-3/8" | 8"  | 17"      | 32" |
| 24" X 4"             | 1/4" | 7/8"   | 6"  | 18-3/4"  | 24" |
| 24" X 6"             | 1/4" | 1-1/8" | 6"  | 19"      | 24" |
| 24" X 8"             | 1/4" | 1-1/8" | 6"  | 19"      | 24" |
| 24" X 10"            | 1/4" | 1-3/8" | 7"  | 19-1/4"  | 28" |
| 24" X 12"            | 1/4" | 1-3/8" | 8"  | 19-1/4"  | 32" |
| 30" X 4"             | 1/4" | 7/8"   | 6"  | 22-1/8"  | 24" |
| 30" X 6"             | 1/4" | 1-1/8" | 6"  | 22-3/8"  | 24" |
| 30" X 8"             | 1/4" | 1-1/8" | 6"  | 22-3/8"  | 24" |
| 30" X 10"            | 1/4" | 1-3/8" | 7"  | 22-5/8"  | 28" |
| 30" X 12"            | 1/4" | 1-3/8" | 8"  | 22-5/8"  | 32" |
| 36" X 4"             | 1/4" | 7/8"   | 6"  | 25-1/2"  | 24" |
| 36" X 6"             | 1/4" | 1-1/8" | 6"  | 25-3/4"  | 24" |
| 36" X 8"             | 1/4" | 1-1/8" | 7"  | 25-3/4"  | 28" |
| 36" X 10"            | 1/4" | 1-3/8" | 8"  | 26"      | 32" |
| 36" X 12"            | 1/4" | 1-3/8" | 9"  | 26"      | 36" |
| 42" X 4"             | 1/4" | 7/8"   | 6"  | 28-7/8"  | 24" |
| 42" X 6"             | 1/4" | 1-1/8" | 7"  | 29-1/8"  | 28" |
| 42" X 8"             | 1/4" | 1-1/8" | 8"  | 29-1/8"  | 32" |
| 42" X 10"            | 3/8" | 1-3/8" | 9"  | 29-3/8"  | 36" |
| 42" X 12"            | 3/8" | 1-3/8" | 10" | 29-3/8"  | 40" |
| 48" X 4"             | 3/8" | 7/8"   | 7"  | 32-1/4"  | 28" |
| 48" X 6"             | 3/8" | 1-1/8" | 7"  | 32-1/2"  | 28" |
| 48" X 8"             | 3/8" | 1-1/8" | 7"  | 32-1/2"  | 28" |
| 48" X 10"            | 3/8" | 1-3/8" | 7"  | 32-3/4"  | 28" |
| 48" X 12"            | 3/8" | 1-3/8" | 9"  | 32-3/4"  | 36" |



**DETAILS FOR HIGH DENSITY POLYETHYLENE PIPE (HDPE)**

|           |      |   |   |
|-----------|------|---|---|
| REVISIONS | DATE | APPROVED BY<br>CITY COUNCIL, DATE: JULY 21, 2008                  | NOTIFY ROCHESTER HILLS ENGINEERING DEPARTMENT @ 248-841-2510 48 HRS. PRIOR TO START OF CONSTRUCTION |
|           |      | PREPARED BY ENGINEERING DIVISION<br>DEPARTMENT OF PUBLIC SERVICES |   |

**City of Rochester Hills**  
1000 Rochester Hills Drive, Rochester Hills, Michigan 48309

**WATER MAIN SPECIAL DETAILS**

|              |                 |
|--------------|-----------------|
| NOT TO SCALE | DATE: 7/21/2008 |
| SHEET 1 OF 1 |                 |



City File #73-175.2