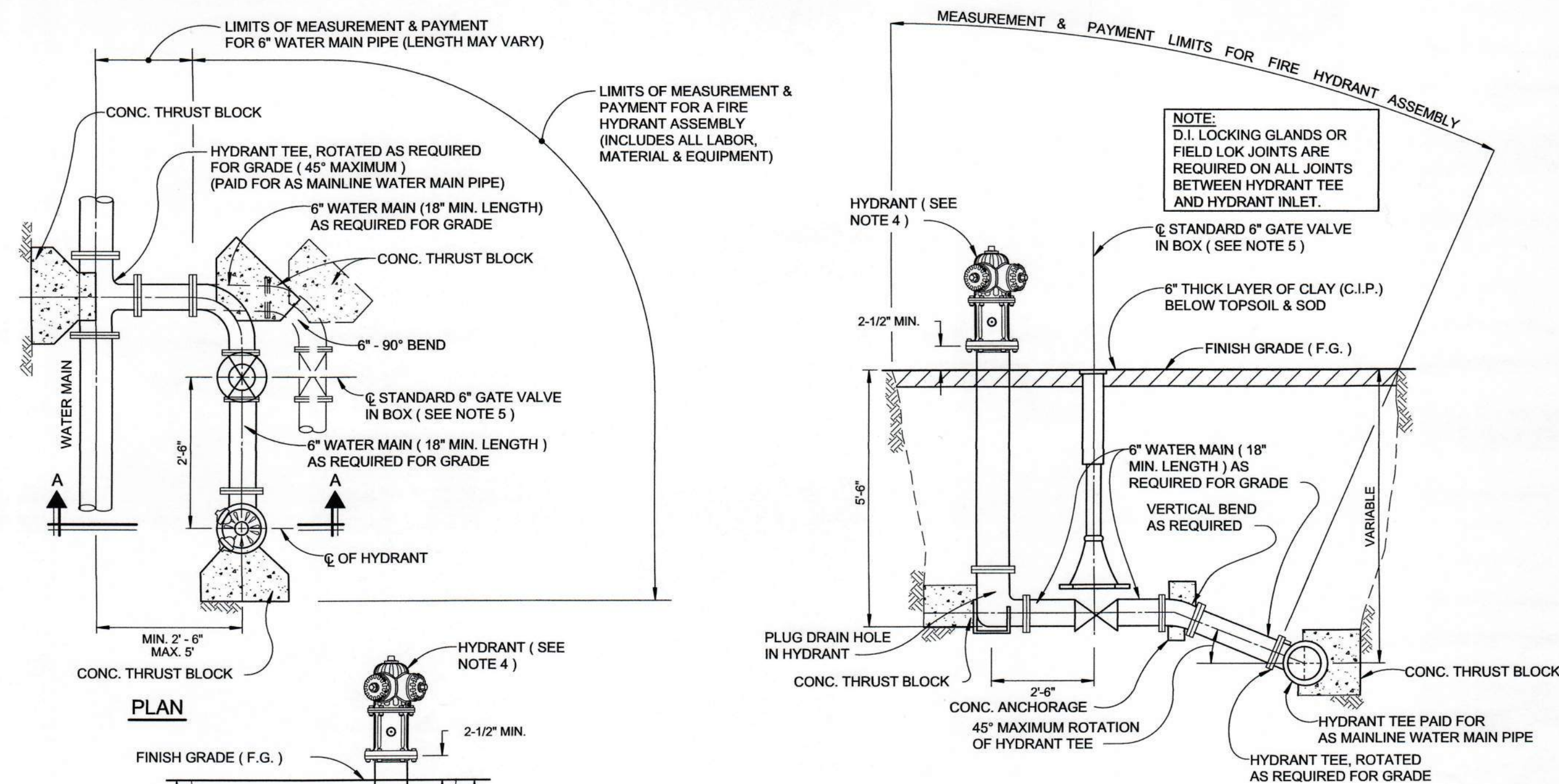
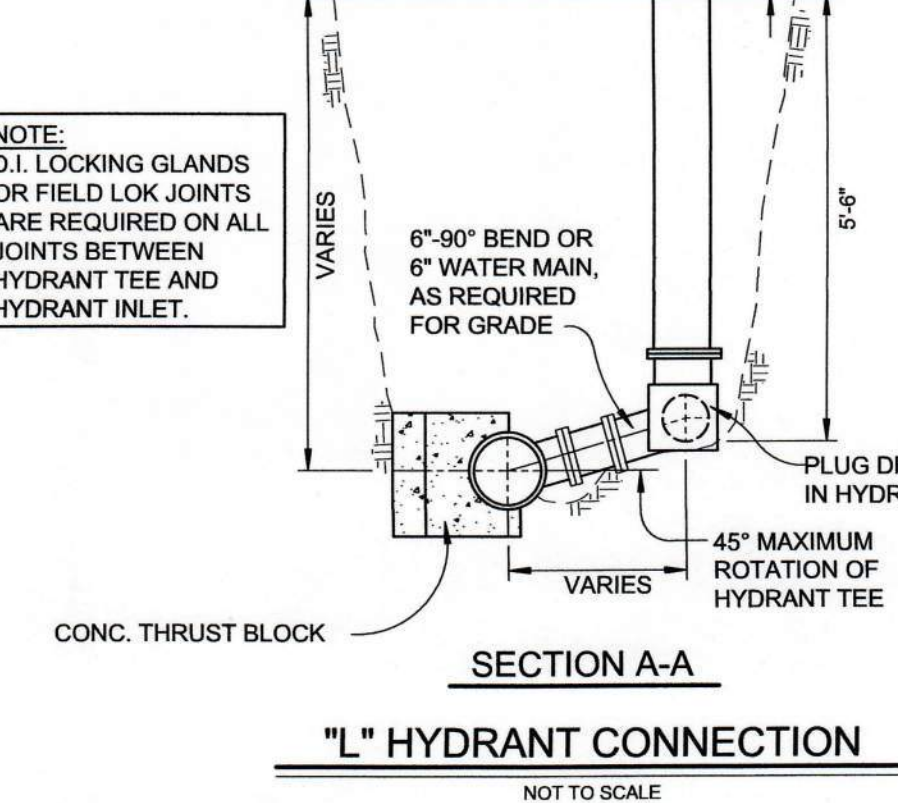




NOTE:
D.I. LOCKING GLANDS OR FIELD LOK JOINTS ARE REQUIRED ON ALL JOINTS BETWEEN HYDRANT TEE AND HYDRANT INLET.

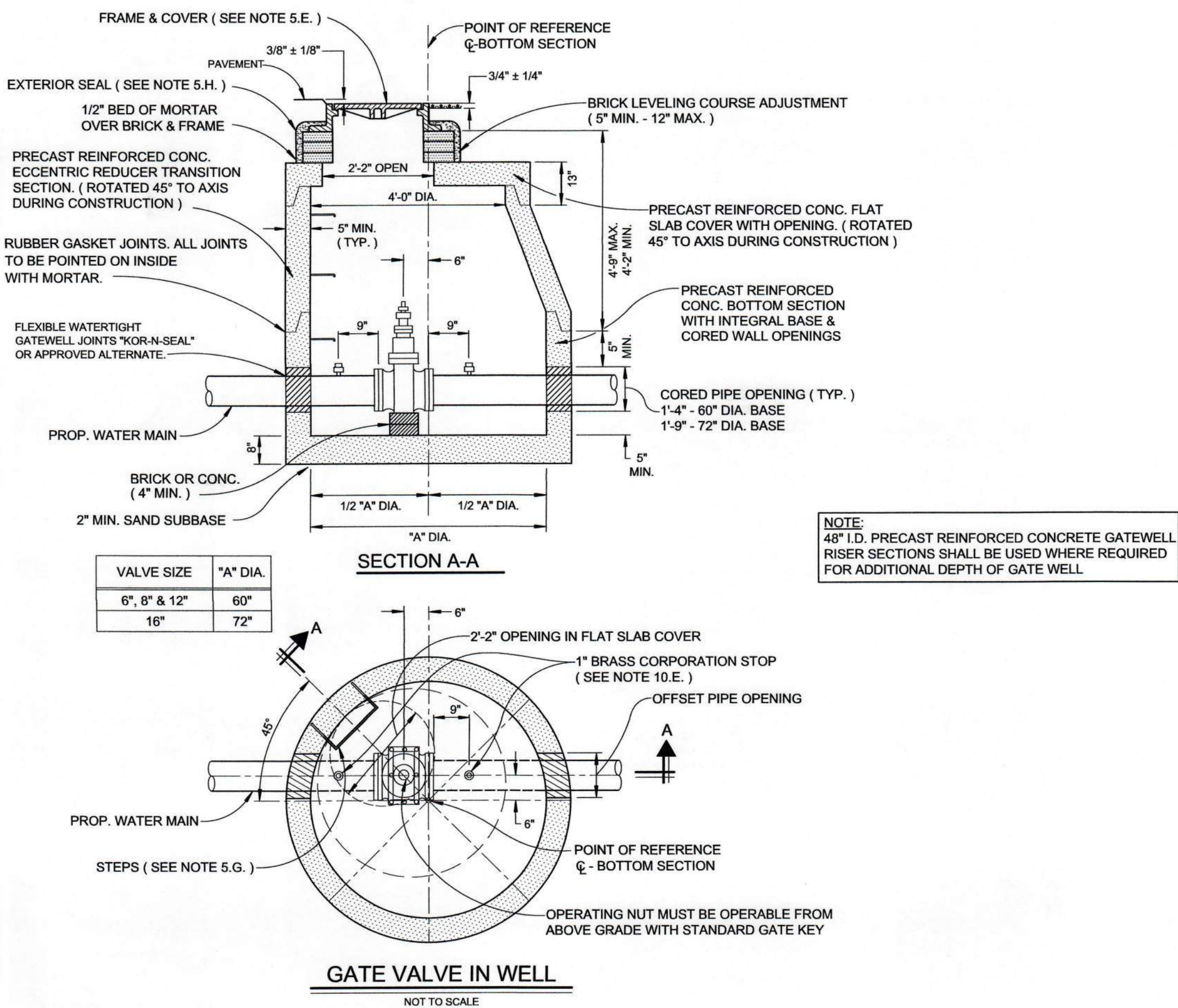


SIZE	ANGLE	A (MIN.)	B (MIN.)	C	D	E	F	G	H (MIN.)	J
6"	45°	1'-8"	0'-9"	0'-9"	1'-6"	0'-9"	1'-6"	0'-9"	1'-8"	0'-10"
8"	90°	1'-8"	0'-9"	0'-9"	2'-0"	1'-0"	2'-0"	1'-0"	1'-8"	0'-10"
8"	45°	1'-9"	0'-9"	1'-0"	2'-4"	1'-2"	2'-0"	1'-0"	1'-11"	1'-4"
8"	90°	1'-9"	0'-9"	1'-0"	3'-4"	1'-8"	2'-6"	1'-3"	1'-11"	1'-2"
12"	22 1/2°	1'-9"	0'-9"	1'-0"	2'-6"	1'-3"	2'-0"	1'-0"	2'-0"	1'-4"
12"	45°	2'-1"	0'-9"	1'-4"	3'-6"	1'-9"	2'-6"	1'-3"	2'-4"	1'-4"
12"	90°	2'-1"	0'-9"	1'-4"	5'-0"	2'-9"	3'-0"	1'-6"	2'-4"	1'-8"
16"	22 1/2°	2'-8"	1'-0"	1'-8"	3'-4"	1'-8"	2'-6"	1'-3"	3'-0"	1'-2"
16"	45°	2'-8"	1'-0"	1'-8"	5'-4"	2'-8"	3'-0"	1'-6"	3'-0"	2'-6"
16"	90°	2'-8"	1'-0"	1'-8"	6'-0"	3'-0"	3'-0"	2'-6"	3'-0"	2'-8"
24"	90°	4'-2"	1'-0"	3'-7"	10'-0"	5'-0"	7'-0"	3'-6"	5'-4"	2'-4"

* 90° BENDS TO BE INSTALLED ONLY WITH WRITTEN APPROVAL OF THE OWNER/ENGINEER

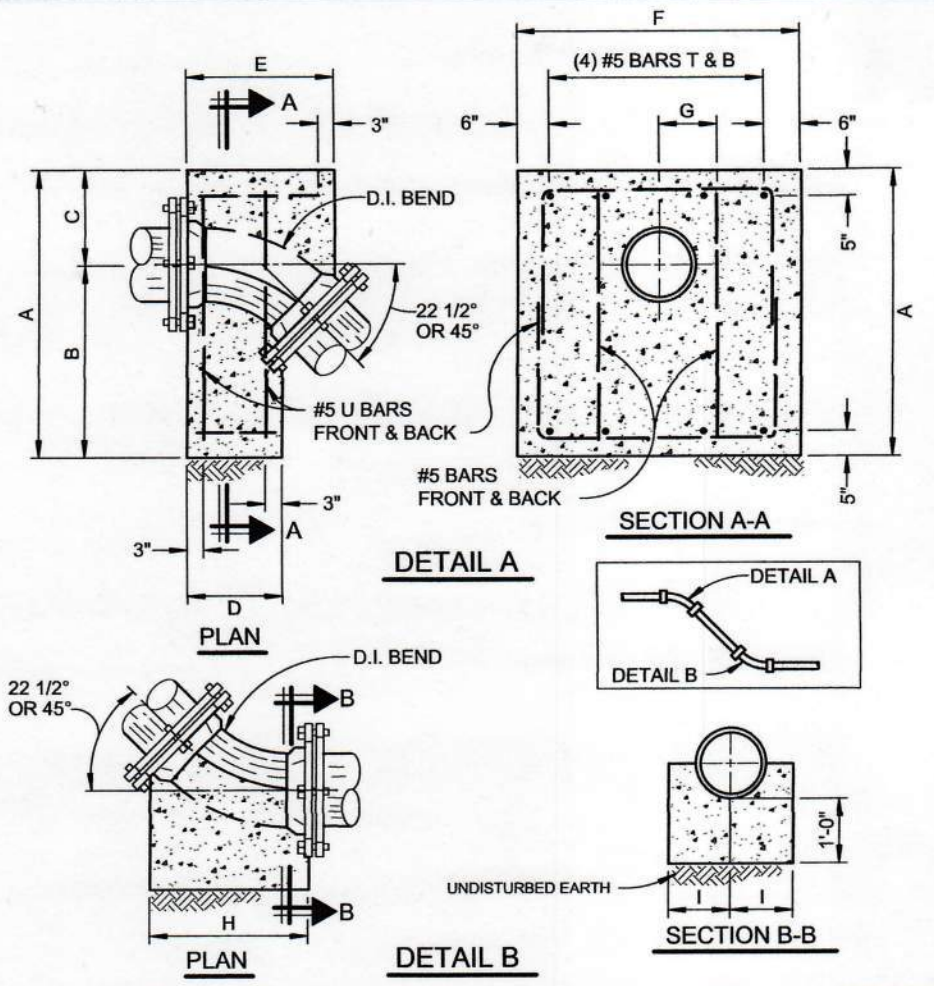
CONCRETE THRUST BLOCKS FOR HORIZONTAL BENDS

NOT TO SCALE



VALVE SIZE	"A" DIA.
6", 8" & 12"	60"
16"	72"

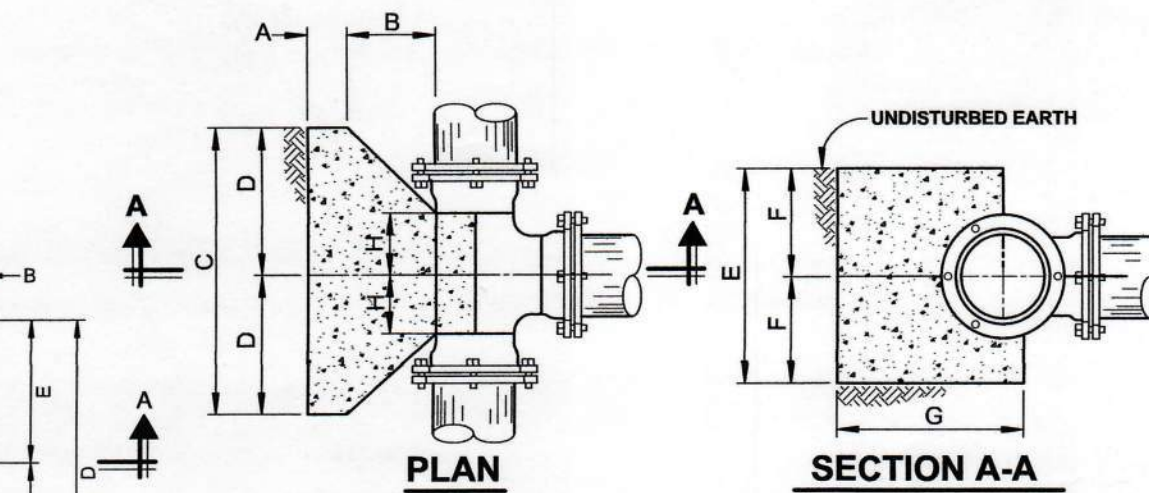
NOTE:
48" I.D. PRECAST REINFORCED CONCRETE GATEWELL RISER SECTIONS SHALL BE USED WHERE REQUIRED FOR ADDITIONAL DEPTH OF GATE WELL



SIZE	ANGLE	A	B	C	D	E	F	G	H	I
8"	22 1/2°	3'-0"	1'-8"	1'-4"	1'-4"	1'-7"	2'-8"	0'-8"	1'-9"	1'-0"
8"	45°	4'-0"	2'-6"	1'-6"	1'-6"	1'-8"	3'-2"	0'-8"	2'-0"	1'-0"
12"	22 1/2°	4'-0"	2'-6"	1'-6"	1'-7"	2'-0"	4'-0"	0'-10"	2'-6"	1'-0"
12"	45°	4'-6"	3'-0"	1'-6"	1'-7"	2'-4"	5'-0"	0'-10"	2'-6"	1'-0"
16"	22 1/2°	4'-6"	3'-0"	1'-8"	1'-7"	2'-4"	5'-0"	0'-12"	2'-4"	1'-6"

ANCHORAGE FOR VERTICAL BENDS

NOT TO SCALE

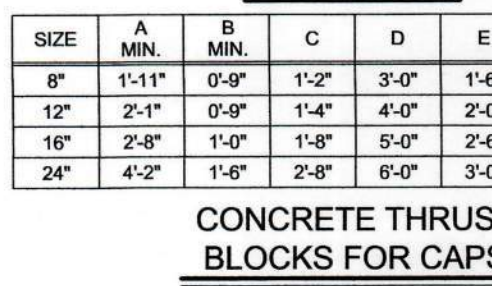


TEE SIZE	A	B	C	D	E	F	G	H
8" X 8"	0'-9"	0'-9"	2'-8"	1'-4"	2'-0"	1'-0"	2'-2"	0'-7"
12" X 8"	0'-9"	0'-9"	2'-8"	1'-4"	2'-0"	1'-0"	2'-6"	0'-8"
16" X 8"	0'-9"	0'-9"	2'-8"	1'-4"	2'-0"	1'-0"	2'-10"	0'-8"
12" X 12"	0'-9"	1'-3"	4'-0"	2'-0"	3'-0"	1'-6"	2'-10"	0'-10"
16" X 12"	0'-9"	1'-3"	4'-0"	2'-0"	3'-0"	1'-6"	3'-4"	0'-10"
16" X 16"	1'-0"	1'-4"	4'-8"	2'-4"	4'-8"	2'-4"	3'-6"	1'-0"

NOTE: THRUST BLOCKS FOR 6" TEES SHALL MATCH THE REQUIREMENTS FOR 8" TEES

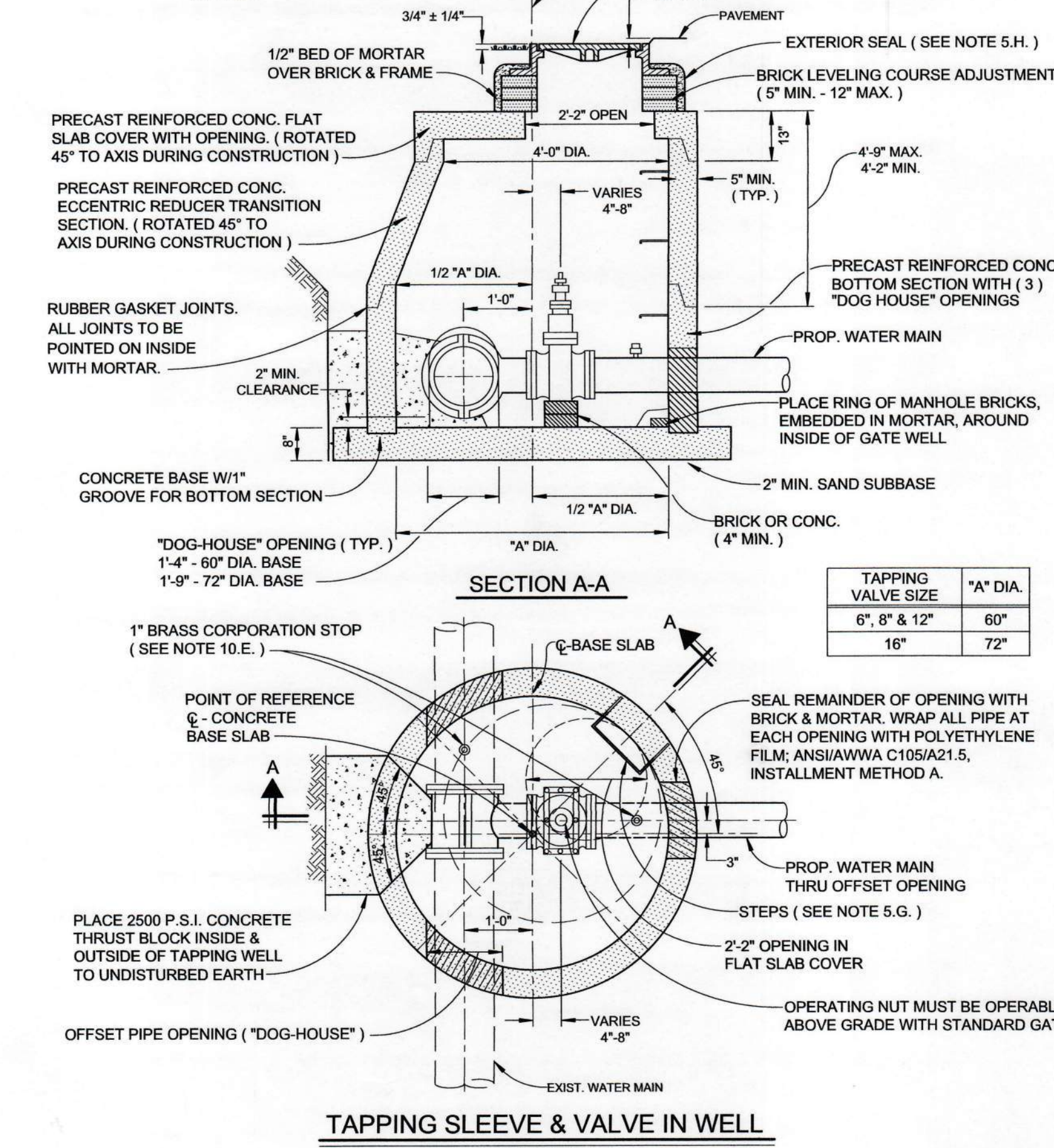
CONCRETE THRUST BLOCKS FOR TEES

NOT TO SCALE



CONCRETE THRUST BLOCKS FOR CAPS

NOT TO SCALE



TAPPING VALVE SIZE	"A" DIA.
6", 8" & 12"	60"
16"	72"

GENERAL NOTES

- STANDARDS AND SPECIFICATIONS**
 - ALL WATER MAIN AND WATER SYSTEM CONSTRUCTION SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CITY OF MOUNT CLEMENS. DETAILED WRITTEN SPECIFICATIONS ARE AVAILABLE UPON REQUEST.
 - ANY MATERIALS OTHER THAN THOSE LISTED ON THE STANDARD DETAIL SHEETS MUST BE APPROVED IN WRITING BY THE CITY OF MOUNT CLEMENS. CONTRACTOR MUST SUBMIT THREE (3) COPIES OF SHOP DRAWINGS AND SPECIFICATIONS FOR PROPOSED ALTERNATE MATERIAL TO THE CITY OF MOUNT CLEMENS UTILITIES DEPARTMENT FOR REVIEW AS AN APPROVED EQUAL. DETERMINATION OF ACCEPTANCE BY THE CITY OF MOUNT CLEMENS UTILITIES DEPARTMENT SHALL BE CONSIDERED FINAL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH REVIEW OF THE PROPOSED ALTERNATE MATERIAL AS AN APPROVED EQUAL.
- PRECONSTRUCTION REQUIREMENTS**
 - PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL ATTEND A PRECONSTRUCTION MEETING AT A TIME AND PLACE AS ARRANGED BY THE CITY OF MOUNT CLEMENS. THE CONTRACTOR SHALL NOTIFY AFFECTED UTILITY COMPANIES AND GOVERNMENTAL AGENCIES A MINIMUM OF THREE (3) WORKING DAYS PRIOR TO THE PRECONSTRUCTION MEETING. THE OWNER'S ENGINEER SHALL SUBMIT APPROVED PLANS TO ALL UTILITY COMPANIES AND GOVERNMENTAL AGENCIES A MINIMUM OF TEN (10) DAYS PRIOR TO PRECONSTRUCTION MEETING.
 - THE CONTRACTOR SHALL NOTIFY MISS DIG AT (800) 482-7171, THE CITY OF MOUNT CLEMENS UTILITIES DEPARTMENT AT (586) 469-6847 AND ANDERSON, ECKSTEIN AND WESTRICK, INC. AT (586) 726-1234 THREE (3) WORKING DAYS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL ALSO NOTIFY REPRESENTATIVES OF ANY OTHER FACILITIES, LOCATED IN THE VICINITY OF THE WORK, WHICH ARE NOT PARTICIPANTS OF THE MISS DIG SYSTEM.
- PIPE MATERIAL**
 - DUCTILE IRON PIPE WITH EXTERIOR ASPHALTIC MATERIAL COATING SHALL MEET THE REQUIREMENTS OF ANSI/AWWA C151/A21.51 CURRENT SPECIFICATIONS FOR DUCTILE-IRON PIPE, CENTRIFUGALLY CAST, FOR WATER. DUCTILE IRON PIPE SHALL BE SPECIAL THICKNESS CLASS 54 FOR PUSH-ON JOINT DUCTILE-IRON PIPE. DUCTILE IRON PIPE SHALL BE DOUBLE CEMENT LINED WITH ASPHALTIC MATERIAL SEAL COATING MEETING THE REQUIREMENTS OF ANSI/AWWA C104/A21.4 CURRENT SPECIFICATIONS FOR CEMENT-MORTAR LINING FOR DUCTILE-IRON PIPE AND FITTINGS FOR WATER. PUSH-ON JOINTS SHALL MEET THE REQUIREMENTS OF ANSI/AWWA C111/A21.11 CURRENT SPECIFICATIONS FOR RUBBER-GASKET JOINTS FOR DUCTILE-IRON PRESSURE PIPE AND FITTINGS. PUSH ON JOINTS SHALL BE TYTON OR SUPER BELLETTE WITH SERRATED BRASS WEDGES. 6" THROUGH 12" PIPE REQUIRES TWO (2) WEDGES PER JOINT, 16" AND LARGER REQUIRES FOUR (4) WEDGES PER JOINT.
 - POLYVINYL CHLORIDE (PVC) PIPE SHALL MEET THE REQUIREMENTS OF ANSI/AWWA C909 CURRENT SPECIFICATIONS FOR PVC PRESSURE PIPE AND FABRICATED FITTINGS, 4 INCH (4") THROUGH 12 INCH (12"), FOR WATER DISTRIBUTION. PVC PIPE SHALL BE PRESSURE CLASS 235 (DR 18) WITH PUSH ON TYPE JOINTS. THE CONTRACTOR SHALL INSTALL TWO (2) NUMBER 12 TRACER WIRES HAVING BLUE COLOR. MATERIAL SHALL BE COPPER CLAD STEEL BY COPPERHEAD INDUSTRIES, LLC, OR SOLID COPPER WIRE BY AGAVE WIRE LTD, OR APPROVED EQUAL. NOTE: C909 WILL BE INSTALLED USING BAR ONLY PUSHING SPIGOT INTO BELL TO HOME ONLY TO ELIMINATE OVERBELLING. PVC WATER MAIN SHALL ONLY BE USED WITH WRITTEN AUTHORIZATION OF THE CITY OF MOUNT CLEMENS UTILITIES DEPARTMENT.
 - HIGH-DENSITY POLYETHYLENE (HDPE) PIPE SHALL MEET THE REQUIREMENTS OF ANSI/AWWA C906 CURRENT SPECIFICATIONS FOR POLYETHYLENE PIPE AND FITTINGS, 4 INCH (4") THROUGH 63 INCH (63"), FOR WATER DISTRIBUTION AND TRANSMISSION, AND NSF 61. HDPE PIPE SHALL BE DIPS, DR 11 (MINIMUM), SOLID BLUE SHELL OR BLUE STRIPE AND MEET THE REQUIREMENTS OF STANDARD PE CODE DESIGNATION PE 3408. HDPE PIPE SHALL BE JOINED BY AN APPROVED BUTT FUSION OR ELECTROFUSION TECHNIQUE ACCORDING TO THE MANUFACTURERS SPECIFICATIONS. THE CONTRACTOR SHALL INSTALL THREE NUMBER 6 TRACER WIRES HAVING "UP" OR "USE" COVER INSULATION AT THE SAME TIME NEW WATER MAIN IS INSTALLED. NOTE: HDPE WATER MAIN WITH TRACER WIRE SHALL ONLY BE USED WITH WRITTEN AUTHORIZATION OF THE CITY OF MOUNT CLEMENS UTILITIES DEPARTMENT. IN NO CASE SHALL THE INSIDE DIAMETER OF THE EQUIVALENT HDPE PIPE BE LESS THAN THE INSIDE DIAMETER OF THE STANDARD DUCTILE IRON PIPE. A BEDDING DETAIL SHALL BE SUBMITTED TO THE CITY ENGINEER FOR APPROVAL.
- HYDRANTS**
 - HYDRANTS SHALL MEET THE REQUIREMENTS OF ANSI/AWWA C502 CURRENT SPECIFICATIONS FOR DRY-BARREL FIRE HYDRANTS. HYDRANTS SHALL BE EAST JORDON IRON WORKS 5-BR 250 WATERMASTER WITH PENTAGON OPERATING NUT MEASURING 1-1/8" POINT TO FLAT AND BREAKAWAY FLANGE. THE CONTRACTOR SHALL PLUG ANY HYDRANT DRAIN HOLES.
 - HYDRANTS SHALL OPEN COUNTER CLOCKWISE. HYDRANTS SHALL BE SUPPLIED WITH ONE (1) THREE AND THREE-QUARTER INCH (3-3/4") PUMPER NOZZLE HAVING DETROIT STANDARD THREAD AND ONE (1) FIVE INCH (5") STORZ NOZZLE.
 - HYDRANTS SHALL HAVE A MINIMUM BURY OF FIVE FEET SIX INCHES (5'-6") FROM FINISH GRADE TO BOTTOM INLET INVERT WITH A GROUND CLEARANCE FROM CENTER OF BASE FLANGE TO FINISH GRADE OF APPROX. TWO AND ONE-HALF INCHES (2'-1/2").
 - PRIOR TO FINAL ACCEPTANCE BY THE MUNICIPALITY, ALL HYDRANTS MUST BE DEWATERED AND PAINTED. PAINT SHALL BE RUST-O-LEUM OR OUTDOOR LATEX WITH TWO APPLICATIONS. HYDRANT BARREL, BONNET AND CAPS SHALL BE SCHOOL BUS YELLOW.
 - HYDRANTS SHALL BE OF THE "L" TYPE CONNECTION UNLESS OTHERWISE SPECIFIED ON THE PLANS OR DIRECTED BY THE CITY OF MOUNT CLEMENS UTILITIES DEPARTMENT. HYDRANT PUMPER NOZZLES SHALL FACE THE ROAD CENTERLINE IN PUBLIC RIGHT-OF-WAYS OR FACE THE DIRECTION OF FIRE EQUIPMENT ACCESS ON PRIVATE DEVELOPMENTS. HYDRANTS SHALL BE SET TO THE PROPOSED PLAN GRADE ELEVATION UNLESS OTHERWISE AUTHORIZED BY THE CITY OF MOUNT CLEMENS UTILITIES DEPARTMENT. ALL VERTICAL EXTENSIONS REQUIRED TO OBTAIN THE DESIRED GRADE SHALL BE INCLUDED IN THE COST OF THE HYDRANT. HYDRANT PUMPER NOZZLES SHALL FACE THE ROAD CENTERLINE IN PUBLIC RIGHT-OF-WAYS OR FACE THE DIRECTION OF FIRE EQUIPMENT ACCESS ON PRIVATE DEVELOPMENTS.
- MEASUREMENT & PAYMENT FOR FIRE HYDRANT ASSEMBLIES INCLUDES ALL 6" PIPE, 6" BENDS, THE 6" VALVE & BOX, THE HYDRANT, THRUST BLOCKS & THE EARTH EXCAVATION & BACKFILL.**
- GATE VALVES**
 - GATE VALVES SHALL MEET THE REQUIREMENTS OF ANSI/AWWA C509 CURRENT SPECIFICATIONS FOR RESILIENT-SEATED GATE VALVES FOR WATER SUPPLY SERVICE OR C515 CURRENT SPECIFICATIONS FOR REDUCED-WALL, RESILIENT-SEATED GATE VALVES FOR WATER SUPPLY SERVICE. THE VALVE SHALL BE CAST WITH AN IRON BODY AND BRONZE MOUNTED WITH A BRONZE NON-RISING STEM, DOUBLE "O"-RING REPLACEABLE SEALS AND MECHANICAL JOINTS. IT SHALL BE FURNISHED WITH A TWO INCH (2") SQUARE OPERATING NUT AND SHALL TURN CLOCKWISE TO OPEN. GATE VALVES SHALL BE MUELLER 2360 SERIES RESILIENT WEDGE GATE VALVES OR EAST JORDON IRON WORKS FLOWMASTER RESILIENT SEATED GATE VALVES.
 - ALL GATE VALVES GREATER THAN SIXTEEN INCH (16") IN DIAMETER SHALL BE SUPPLIED WITH A BYPASS IN ACCORDANCE WITH ANSI/AWWA C500 UNLESS OTHERWISE SPECIFIED BY THE CITY OF MOUNT CLEMENS UTILITIES DEPARTMENT. THE BYPASS VALVE SHALL BE A GATE VALVE CONFORMING TO THE REQUIREMENTS OF THESE STANDARDS. THE BYPASS VALVE SHALL BE INDEPENDENTLY SUPPORTED WITHIN THE VALVE CHAMBER AND THE OPERATING NUT MUST BE OPERABLE FROM ABOVE GRADE WITH A STANDARD GATE KEY.
 - TAPPING VALVES SHALL CONFORM TO THE REQUIREMENTS OF GATE VALVES AS SPECIFIED IN THESE STANDARDS. THE VALVE SHALL BE CONSTRUCTED TO ALLOW A TAPPING MACHINE TO TAP DIRECTLY THROUGH THE OPEN VALVE. THE VALVE SHALL BE SUPPLIED WITH A FLANGED JOINT FOR CONNECTION TO THE TAPPING SLEEVE AND A MECHANICAL JOINT FOR CONNECTION TO THE BRANCH WATER MAIN. THE TAPPING SLEEVES SHALL BE STAINLESS STEEL, SPLIT SLEEVES WITH MECHANICAL JOINTS AND A DUCTILE IRON FLANGED OUTLET.
 - GATE VALVES AND TAPPING VALVES SHALL BE HOUSED WITHIN A PRECAST CONCRETE GATEWELL UNLESS NOTED OTHERWISE ON THE PLANS. PRECAST BOTTOM SECTIONS, ECCENTRIC REDUCER TRANSITION SECTIONS AND FLAT SLAB COVERS SHALL CONFORM TO ASTM SPECIFICATION C478. HYDRANT VALVES SHALL BE HOUSED IN A CAST IRON VALVE BOX. VALVE BOX SHALL BE A THREE (3) PIECE SCREW TYPE BOX (5-1/4" SHAFT) WITH AN ENLARGED BASE.
 - GATEWELL FRAMES AND COVERS SHALL BE EAST JORDON IRON WORKS 1040 FRAME & COVER WITH THE WORDS "DEPARTMENT OF WATER SUPPLY" IN TWO INCH (2") RECESSED FLUSH LETTERS.
 - ALL END-OF-THE-LINE GATEWELLS SHALL HAVE A CAPPED STUB EXTENDING ONE FULL LENGTH OF PIPE BEYOND THE GATEWELL. THE VALVE, PIPE AND CAP SHALL BE INSTALLED WITH RETAINER GLANDS AND A CONCRETE THRUST BLOCK AT THE CAP
 - STEPS SHALL BE M.A. INDUSTRIES P.S.I. POLYPROPYLENE OR MSJ #360 ALU POLY MANHOLE STEPS WITH FOOT RECESS AND INSTALLED BY THE GATEWELL MANUFACTURER AT SIXTEEN INCHES (16") CENTER TO CENTER SPACING. BOTTOM STEP SHALL BE TWENTY FOUR INCHES (24") MAXIMUM ABOVE FLOOR. TOP STEP SHALL BE EIGHTEEN INCHES (18") MAXIMUM BELOW RIM. ALL STEPS SHALL BE SUITABLY SCORED TO PROVIDE A NON-SLIP SURFACE.
 - ALL GATEWELLS SHALL BE REQUIRED TO HAVE EXTERIOR SEAL. EXTERIOR SEAL SHALL BE CANUSA WRAPID SEAL ENCAPSULATION SYSTEM INSTALLED PER MANUFACTURERS SPECIFICATIONS.
- FITTINGS**
 - ALL FITTINGS SHALL BE DUCTILE IRON AND MEET THE REQUIREMENTS OF ANSI/AWWA C153/A21.53 CURRENT SPECIFICATIONS FOR DUCTILE-IRON FITTINGS FOR WATER SERVICE. FITTINGS SHALL BE CEMENT LINED WITH ASPHALTIC MATERIAL SEAL COATING MEETING THE REQUIREMENTS OF ANSI/AWWA C104/A21.4 CURRENT SPECIFICATIONS FOR CEMENT-MORTAR LINING FOR DUCTILE-IRON PIPE AND FITTINGS FOR WATER OR EPOXY COATED MEETING THE REQUIREMENTS OF ANSI/AWWA C116/A21.16 FOR PROTECTIVE FUSION-BONDED EPOXY COATINGS FOR THE INTERIOR AND EXTERIOR SURFACES OF DUCTILE-IRON AND GRAY-IRON FITTINGS FOR WATER SUPPLY SERVICE. FITTINGS SHALL BE 350 PSI PRESSURE RATED WITH MECHANICAL JOINTS AND RETAINING GLANDS. SPLIT RETAINERS ARE NOT ALLOWED.
 - CONCRETE THRUST BLOCKS ARE REQUIRED AT ALL BENDS, TEES, CAPS OR PLUGS. CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF 2500 PSI (MINIMUM) AT 28 DAYS.
 - MECHANICAL JOINTS AND BOLTS FOR ALL FITTINGS SHALL MEET THE REQUIREMENTS OF ANSI/AWWA C111/A21.11 CURRENT SPECIFICATION FOR RUBBER-GASKET JOINTS FOR DUCTILE-IRON PRESSURE PIPE AND FITTINGS. RETAINER GLANDS SHALL BE EBAA IRON MEGALUG 1100 SERIES WITH MANUFACTURER SUPPLIED BOLTS AND TORQUE LIMITING TWIST OFF NUTS. ALL BOLTS, OTHER THAN MANUFACTURER PROVIDED BOLTS AND TORQUE LIMITING TWIST OFF NUTS FOR EBAA IRON MEGALUG 1100 SERIES RETAINING GLANDS, SHALL BE COR LUBE WITH T-HEADS AND HEX NUTS.
 - ALL INSTALLATION OF SERVICE FITTING EG. TEES ARE TO BE INSTALLED WITH CLASS 54 DUCTILE IRON PIPE EXTENDING THREE FEET (3') FROM SIDE OF FITTING CONNECTED BY SOLID SLEEVES TO EXISTING WATER MAIN.



ANDERSON, ECKSTEIN AND
WESTRICK, INC.

CIVIL ENGINEERS SURVEYORS ARCHITECTS

51301 Schoenherr Road Phone 586 726 1234
Shelby Township Fax 586 726 8780
Michigan 48315

www.aewinc.com

ENGINEERING STRONG COMMUNITIES



11/14/22 RO		WATER MAIN UPDATES	
DRAWN BY: KJP	CHECKED BY: KMS	DATE: AUGUST 2017	

M:\COMMITTEES\MOUNT CLEMENS\STANDARD\CURRENT\CAD\MOUNT CLEMENS-WM_1.DWG
Model - 11/23/2022 7:21:18 AM



Kyle M. Seidel
KYLE M. SEIDEL, P.E. NO. 6201048152

DEPARTMENT OF
PUBLIC UTILITIES

APPROVED BY: *Leonard Bertrand*
LEONARD BERTRAND, DIRECTOR

DATE: *November 29, 2022*

CITY OF
MOUNT CLEMENS

STANDARD
WATER MAIN
DETAILS
(1 OF 2)

SHEET NO.

W1

COPYRIGHT, 2022, ANDERSON, ECKSTEIN AND WESTRICK, INC.

GENERAL NOTES

7. CONSTRUCTION

- THE WATER MAIN SHALL BE CONSTRUCTED WITH A MINIMUM COVER OF FIVE FEET (5'), MEASURED FROM THE PAVEMENT CENTERLINE ELEVATION OR THE EXISTING GROUND, WHICHEVER IS LOWER, TO THE TOP OF PIPE. GENERALLY, THE MAXIMUM DEPTH OF COVER SHALL NOT EXCEED SEVEN FEET (7') FROM FINAL FINISH GRADE. A HORIZONTAL SEPARATION OF TEN FEET (10') (MINIMUM) MUST BE MAINTAINED BETWEEN THE WATER MAIN AND THE SANITARY SEWER AND STORM SEWER.
- A MINIMUM VERTICAL CLEARANCE OF ONE AND ONE-HALF FEET (1-1/2') MUST BE MAINTAINED BETWEEN THE WATER MAIN AND ANY UTILITIES. ADJUSTMENTS TO THE WATER MAIN DEPTH IN ORDER TO OBTAIN THE DESIRED CLEARANCES MUST BE ACCOMPLISHED WITH VERTICAL BENDS, THRUST BLOCKS AND ANCHORAGES. A VERTICAL CLEARANCE OF FIVE AND ONE-HALF FEET (5-1/2') (MINIMUM) MUST BE MAINTAINED BELOW THE MASTER PLAN DEPTH OF DITCHES, DRAINS AND OPEN WATER COURSES. A GATE VALVE AND WELL SHALL BE CONSTRUCTED ON EACH SIDE OF A DRAIN OR OPEN WATER COURSE CROSSING. ONE STANDARD PIPE LENGTH BEING CENTERED AT THE CROSSING SO THAT THE NEAREST JOINTS ARE AS FAR AS POSSIBLE FROM THE CROSSING.
- DEFLECTION OF PIPE JOINTS TO OBTAIN THE DESIRED CLEARANCES OR ALIGNMENT SHALL ONLY BE ACCOMPLISHED WITH THE CITY OF MOUNT CLEMENS DEPARTMENT APPROVAL. THE MAXIMUM ALLOWABLE DEFLECTION (FOR 1 FULL LENGTH OF PIPE) IS FOURTEEN INCHES (14") FOR 4" THROUGH 12" DIAMETER PIPE AND EIGHT INCHES (8") FOR 16" AND 24" DIAMETER PIPE.
- THE CONTRACTOR SHALL SUPPLY AND PLACE A TEMPORARY PLUG OR CAP OVER THE END OF THE PIPE AT THE END OF EACH WORK DAY.
- VERTICAL TOLERANCES FOR HYDRANTS AND VALVES SHALL BE:
HYDRANTS (ANY LOCATION): ±0.20 FEET
GATE WELL NOT IN R.O.W.: ±0.20 FEET
GATE WELL IN R.O.W.: ±0.20 FEET
- IN PROPOSED DEVELOPMENTS, WATER MAIN SHALL NOT BE INSTALLED UNTIL ROUGH GRADING IS COMPLETED TO WITHIN SIX INCHES (6") OF PROPOSED FINISH GRADE.

8. CONNECTION TO EXISTING SYSTEM

- A ONE INCH (1") CORPORATION SHALL BE INSTALLED, FOR TESTING PURPOSES, IN ALL STUBS AND POINTS OF CONNECTION TO EXISTING MAINS. SEE NOTE 10 FOR CORPORATION STOP SPECIFICATION. UPON SUCCESSFUL COMPLETION OF THE TESTS AND WITH THE APPROVAL OF THE CITY OF MOUNT CLEMENS UTILITIES DEPARTMENT, THE CONTRACTOR SHALL REMOVE THE TESTING CORPORATION AND INSTALL PLUGS.
- THE TESTING METHODS DESCRIBED ARE SPECIFIC FOR HYDROSTATIC PRESSURE TESTING IN ACCORDANCE WITH AWWA MANUAL M41 FOR DUCTILE IRON PIPE AND/OR AWWA STANDARDS C800 AND C605 FOR PVC PIPE. THE MAXIMUM PERMISSIBLE LEAKAGE, DURING HYDROSTATIC TESTING, SHALL NOT EXCEED 0.16 GALLONS PER INCH DIAMETER OF MAIN PER 1000 FEET OF PIPE IN 2 HOURS AT A TEST PRESSURE OF 150 PSI. THE MAXIMUM TEST LENGTH IS 3000 FEET. THE CITY OF MOUNT CLEMENS UTILITIES DEPARTMENT RESERVES THE RIGHT TO TEST SHORTER LENGTHS. THE CONTRACTOR IS TO SUPPLY ALL TESTING EQUIPMENT AND PERFORM THE TEST. THE CITY OF MOUNT CLEMENS UTILITIES DEPARTMENT WILL WITNESS THE TEST. PRIOR TO TESTING, MAINS SHALL BE APPROPRIATELY FLUSHED ACCORDING TO AWWA STANDARD C651.
- A DOUBLE CHECK VALVE ASSEMBLY, FOR BACKFLOW PREVENTION, SHALL BE UTILIZED ON ALL TEMPORARY LINES USED TO FILL AND FLUSH THE NEWLY INSTALLED MAIN. THE DOUBLE CHECK VALVE ASSEMBLY SHALL MEET THE REQUIREMENTS OF ANSI/AWWA C510 CURRENT SPECIFICATIONS FOR DOUBLE CHECK VALVE BACKFLOW PREVENTION ASSEMBLY.
- 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 MICHIGAN SAFE DRINKING WATER ACT, 1976 PA 399, AS AMENDED.
- ALL WATER USED FOR FLUSHING WATER MAINS MAY BE OBTAINED FROM THE LOCAL WATER SUPPLY. THE CONTRACTOR SHALL SECURE WRITTEN PERMISSION AND/OR PERMIT FROM THE CITY OF MOUNT CLEMENS UTILITIES DEPARTMENT FOR WATER USED, WHERE CONNECTIONS ARE MADE TO HYDRANTS, THE CONTRACTOR SHALL ALSO OBTAIN PERMISSION FOR SUCH CONNECTIONS FROM THE CITY OF MOUNT CLEMENS UTILITIES DEPARTMENT. STANDARD HYDRANT WRENCHES SHALL BE USED FOR OPENING AND CLOSING THE HYDRANT. PIPE WRENCHES SHALL NOT BE USED TO OPEN OR CLOSE HYDRANTS. USE OF ANY HYDRANT SHALL INCLUDE THE REQUIREMENT THAT EACH HYDRANT SO USED BE COMPLETELY PUMPED DRY AFTER EACH USE.
- CONNECTIONS TO THE EXISTING WATER SYSTEM SHALL NOT BE MADE UNTIL THE PROPOSED MAIN HAS BEEN SUCCESSFULLY PRESSURE TESTED AND HAS PASSED BACTERIOLOGICAL TESTING IN ACCORDANCE WITH CITY OF MOUNT CLEMENS UTILITIES DEPARTMENT STANDARDS AND AWWA STANDARD C800 AND A COPY OF BOTH RESULTS ARE SUBMITTED TO THE CITY OF MOUNT CLEMENS UTILITIES DEPARTMENT. FINAL CONNECTIONS SHALL BE COORDINATED WITH THE CITY OF MOUNT CLEMENS UTILITIES DEPARTMENT.
- BEFORE ACCEPTANCE A FINAL REVIEW MUST BE MADE BY THE CITY OF MOUNT CLEMENS UTILITIES DEPARTMENT AND ONE (1) SET OF AS-BUILT PRINTS ALONG WITH ONE (1) DIGITAL SET OF AS-BUILTS IN PDF FORMAT SHALL BE SUBMITTED TO THE COMMUNITY DEVELOPMENT DEPARTMENT AT 1 CROCKER BOULEVARD, MOUNT CLEMENS, MI 48043.

9. MAINTENANCE AND GUARANTEE BOND

- THE CONTRACTOR SHALL PROVIDE A TWO (2) YEAR MAINTENANCE AND GUARANTEE BOND TO THE CITY OF MOUNT CLEMENS FROM A SURETY LICENSED IN THE STATE OF MICHIGAN, DATED FROM THE TIME OF FINAL ACCEPTANCE BY THE CITY OF MOUNT CLEMENS, FOR 100% OF THE CONSTRUCTION COSTS.

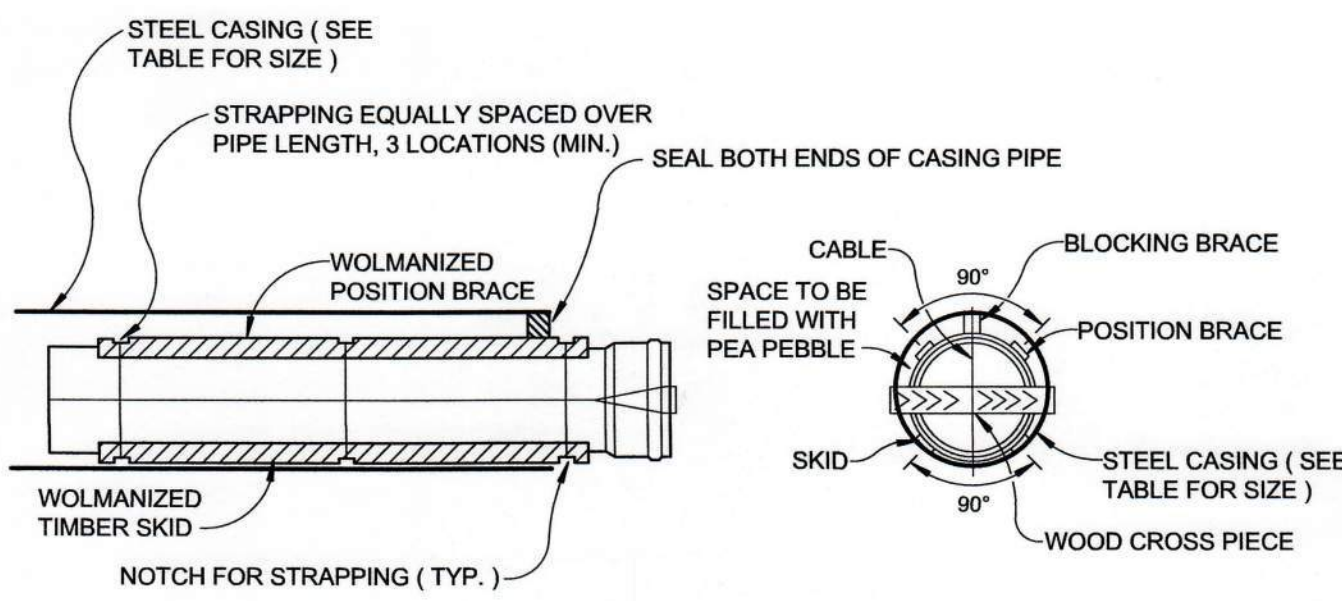
10. WATER SERVICES

- ALL SHORT SIDE WATER SERVICE TRANSFERS SHALL INCLUDE COPPER TUBING OR CTS PE TUBING, CORPORATION STOPS, CURB STOP VALVES, SERVICE BOXES, AND COUPLINGS AS REQUIRED. SEE TYPICAL WATER SERVICE TRANSFER DETAIL.
- ALL WATER SERVICE REPLACEMENTS SHALL INCLUDE COPPER TUBING, OR CTS PE TUBING, CORPORATION STOPS, CURB STOP VALVES, SERVICE BOXES AND COUPLINGS AS REQUIRED. SERVICE REPLACEMENTS SHALL BE FROM THE WATER MAIN TO A CONNECTION POINT ONE FOOT (1') BEYOND THE EXISTING CURB STOP VALVE. IF A LEAD SERVICE IS DISCOVERED, ALL PARTS OF THE LEAD SERVICE IS REQUIRED TO BE REPLACED. NO PARTIAL REPLACEMENT IS ALLOWED. ALL REPLACEMENTS SHALL BE FLUSHED PRIOR TO RESTORING SERVICE IN ACCORDANCE WITH AWWA STANDARD C810. SEE TYPICAL WATER SERVICE REPLACEMENT DETAIL.
- COUPLINGS FOR WATER SERVICE TRANSFERS SHALL BE FORD QUICK JOINT COUPLING OR MUELLER H-15403 STRAIGHT THREE PART COUPLING WITH MUELLER 1100 CONDUCTIVE COMPRESSION CONNECTION (BOTH ENDS). COUPLINGS FOR WATER SERVICE REPLACEMENT SHALL BE MUELLER H-15509 STRAIGHT UNION EXTRA STRONG (XS) WITH LEAD FLANGE THREAD AND MUELLER 1100 CONDUCTIVE COMPRESSION CONNECTION OR AN APPROVED EQUAL FORD COUPLING.
- WATER SERVICES SHALL BE TYPE "K" SEAMLESS COPPER TUBING, OR WATER SERVICES SHALL BE CTS PE TUBING, SDR-9 WITH A BLUE STRIPE, PER AWWA C901, FOR SERVICES UP TO 2 INCHES (2"). TRACER WIRES SHALL BE INSTALLED WITH ALL PE TUBING WITH POSITIVE CONTACTS AT THE WATER MAIN AND THE CURB STOP. COPPER TRACER WIRES ARE TO BE 12 GAUGE WITH "VF" OR "USE" INSULATION. FOR SERVICES LARGER THAN 4 INCHES (4"), DUCTILE IRON CLASS 54 SHALL BE USED IN EVEN INCREMENTS. THE CONTRACTOR SHALL MATCH EXISTING WATER SERVICE SIZE UNLESS OTHERWISE SPECIFIED ON THE PLANS. CONTRACTOR SHALL MATCH EXISTING WATER SERVICE SIZE UNLESS OTHERWISE SPECIFIED ON THE PLANS.
- CORPORATION STOPS SHALL BE FORD F1000-3-Q-NL FOR THREE- QUARTER INCH (3/4") WATER SERVICES, F1000-4-Q-NL FOR ONE INCH (1") WATER SERVICES, FB1000-6-Q-NL FOR ONE AND ONE-HALF INCH (1-1/2") WATER SERVICES AND FB1000-7-Q-NL FOR TWO INCH (2") WATER SERVICES OR MUELLER H-15008-N GROUND KEY CORPORATION VALVE WITH AWWA TAPER (MUELLER "CC") THREAD AND MUELLER 1100 CONDUCTIVE COMPRESSION CONNECTION OUTLET FOR THREE-QUARTER INCH (3/4") AND ONE INCH (1") WATER SERVICES OR MUELLER B-25008-N 300° BALL CORPORATION VALVE WITH AWWA TAPER(MUELLER "CC") THREAD AND MUELLER 1100 CONDUCTIVE COMPRESSION CONNECTION OUTLET FOR ONE AND ONE-HALF INCH (1-1/2") AND TWO INCH (2") WATER SERVICES OR CURB STOP VALVES SHALL BE A.Y. McDONALD #76104Q (OR APPROVED EQUAL) WITH COMPRESSION CONNECTION (BOTH ENDS), QUARTER TURN CHECK AND MINNEAPOLIS THREAD TOP. CURB BOX SHALL BE A.Y. McDONALD #5615 WB (OR APPROVED EQUAL) EXTENSION TYPE CURB BOX WITH MINNEAPOLIS PATTERN BASE AND LIB WITH PLUG FOR THREE QUARTER INCH (3/4") THROUGH FOUR INCH (4") CURB STOP VALVES. A BRONZE DOUBLE STRAP SADDLE IS REQUIRED FOR TWO INCH (2") WATER SERVICES.
- CURB STOP VALVES SHALL BE FORD B44-333M-Q-NL FOR THREE- QUARTER INCH (3/4") WATER SERVICES, B44-444M-Q-NL FOR ONE INCH (1") WATER SERVICES, B44-666M-Q-NL FOR ONE AND ONE- HALF INCH (1-1/2") WATER SERVICES AND B44-777M-Q-NL FOR TWO INCH (2") WATER SERVICES OR MUELLER H-15155-N MARK II CRISAL CURB VALVE WITH MUELLER 1100 CONDUCTIVE COMPRESSION CONNECTION OUTLET (BOTH ENDS) FOR THREE-QUARTER INCH (3/4") AND ONE INCH (1") WATER SERVICES OR MUELLER B-25155-N 300° BALL VALVE WITH MUELLER 1100 CONDUCTIVE COMPRESSION CONNECTION OUTLET (BOTH ENDS) FOR ONE AND ONE-HALF INCH (1-1/2") AND TWO INCH (2") WATER SERVICES. ALL CURB STOP VALVES SHALL BE QUARTER TURN CHECK AND MINNEAPOLIS THREAD TOP. CURB BOXES SHALL BE FORD OR MUELLER, EXTENSION TYPE, WITH MINNEAPOLIS PATTERN BASE.

FORD METER BOX CO.
PL-LID - 1/2" UPPER, BASE TAPPED 1/2" W/O ROD
PL-LID - 1/2" UPPER, BASE TAPPED 2" W/O ROD
PXL-LID - 1/2" UPPER, BASE TAPPED 2" W/O ROD

MUELLER
VALVES - H-15155-N
BOXES VARY IN I.D. FROM 1" - 2"
BASE TAP VARIES 1/2" - 3/2"

- CURB STOPS SHALL ONLY BE INSTALLED IN SIDEWALKS, DRIVES, OR PAVEMENT WITH THE WRITTEN AUTHORIZATION OF THE CITY OF MOUNT CLEMENS UTILITIES DEPARTMENT.
- ALL ABANDONED SERVICES MUST BE ABANDONED AT THE MAIN BY CLOSING THE CORPORATION AND DISCONNECTING THE COPPER FROM THE CORPORATION.



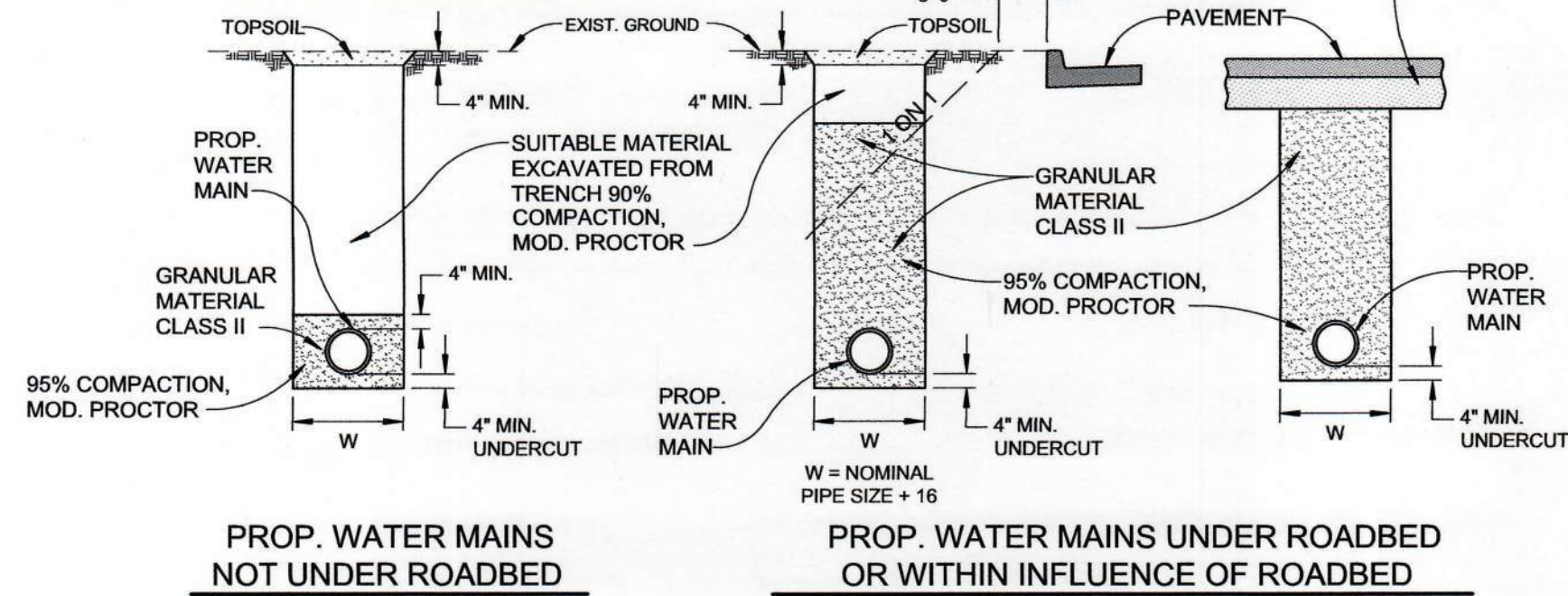
NOTE:
VOID BETWEEN CASING AND WATER MAIN TO BE PRESSURE GROUTED WITH 1:2 MIXTURE UNTIL ALL VOIDS HAVE BEEN FILLED. GROUTING TO BE DONE UPON COMPLETION OF ALL TESTING OF WATER MAIN.

PIPE SIZE	RECOMMENDED MINIMUM CASING DIAMETER (O.D.)	MINIMUM CASING WALL THICKNESS
4"	12.75"	0.375"
6"	14"	0.375"
8"	16"	0.375"
12"	20"	0.375"
16"	24"	0.406"
24"	36"	0.532"

STEEL CASING REQUIREMENTS

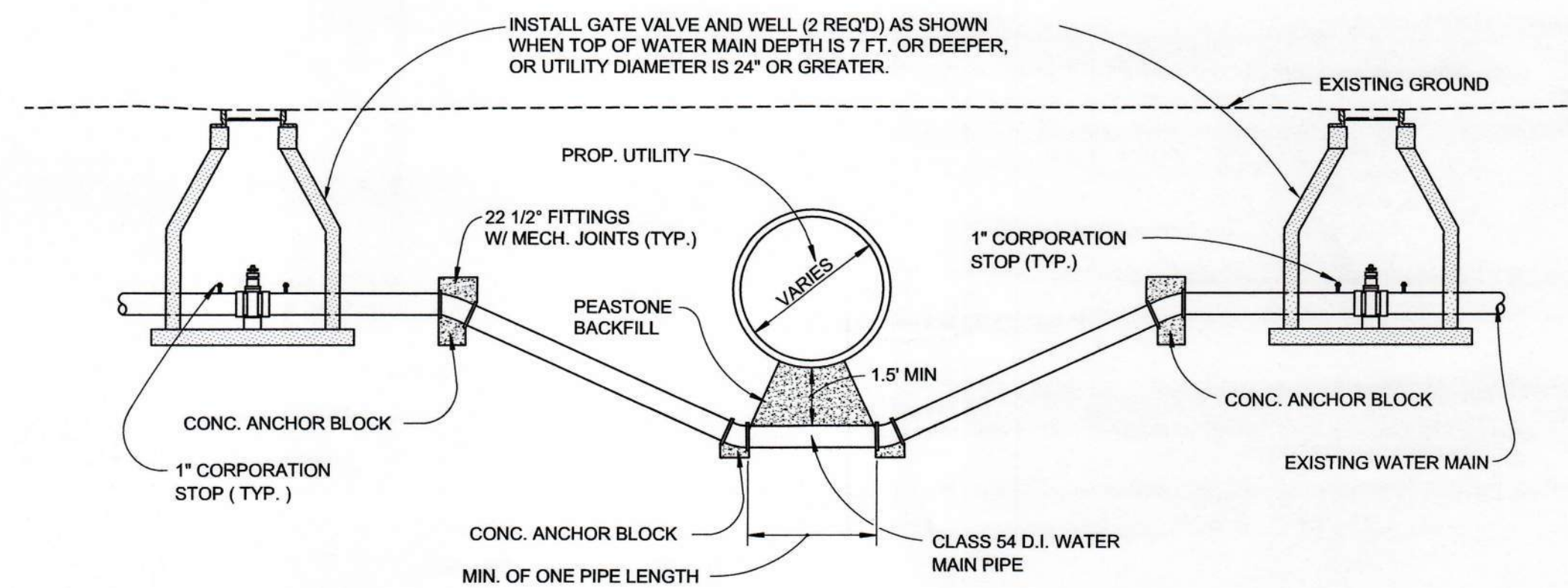
NOT TO SCALE

NOTE:
MATERIAL SPECIFICATIONS SHALL COMPLY WITH M.D.O.T. STANDARD SPECIFICATIONS FOR CONSTRUCTION, CURRENT EDITION.



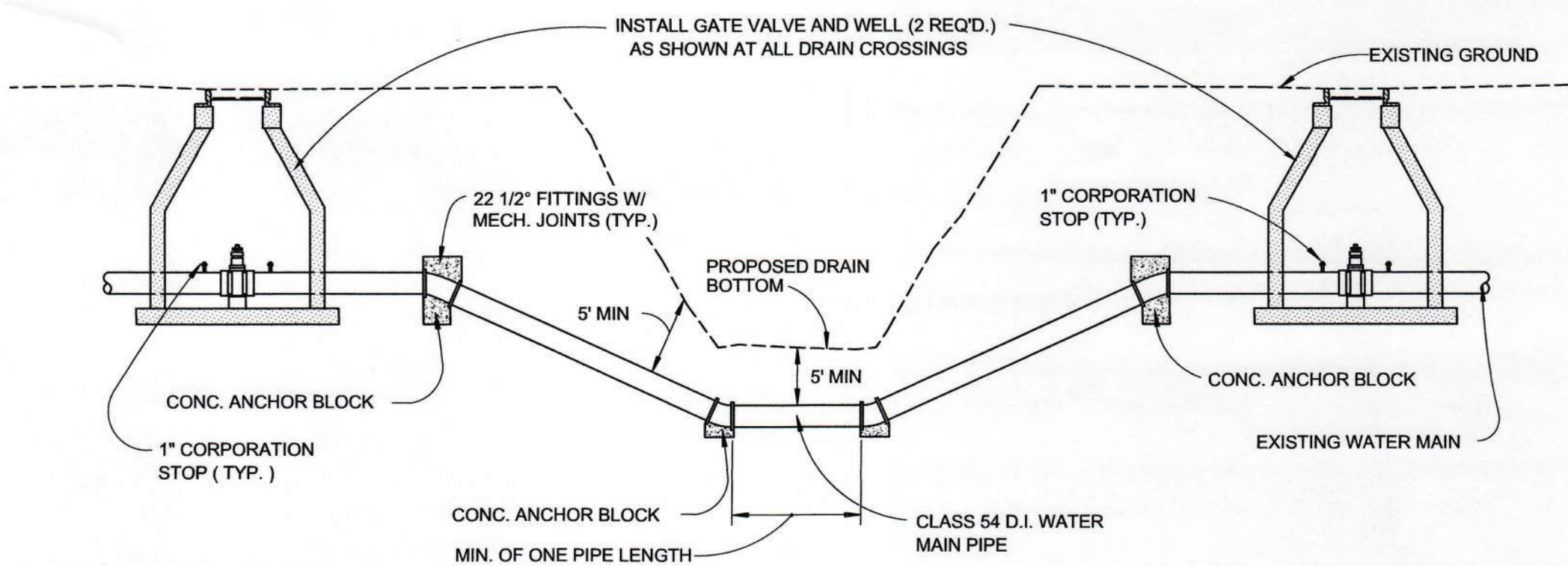
BEDDING & TRENCH DETAILS

NOT TO SCALE



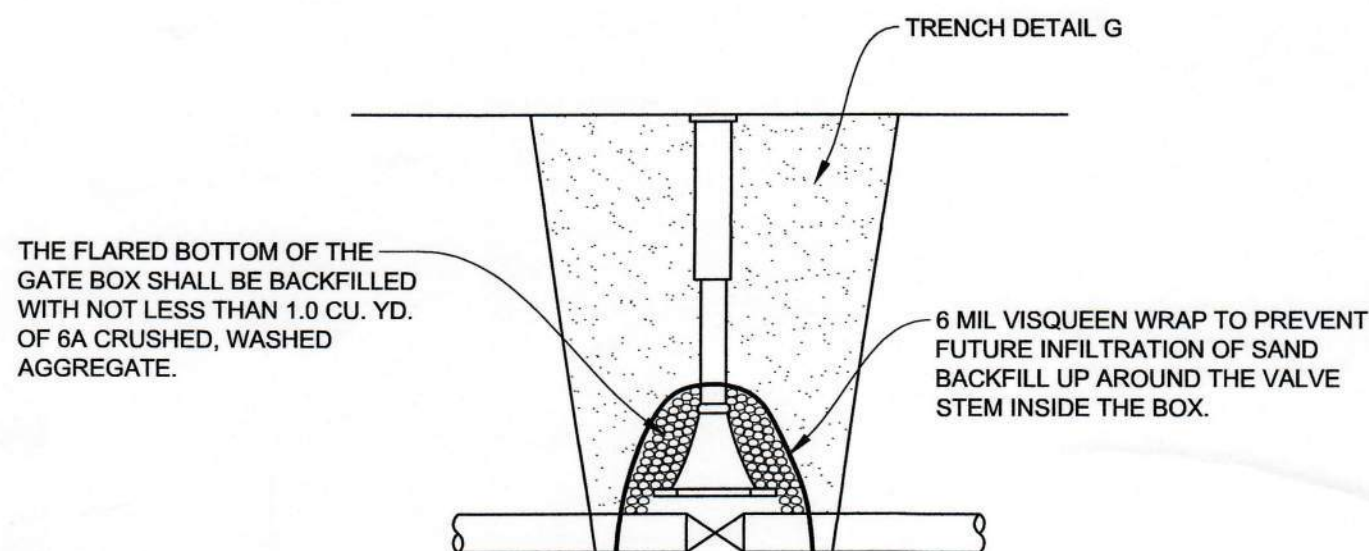
VERTICAL ADJUSTMENT FOR WATER MAIN

NOT TO SCALE



DRAIN CROSSING

NOT TO SCALE

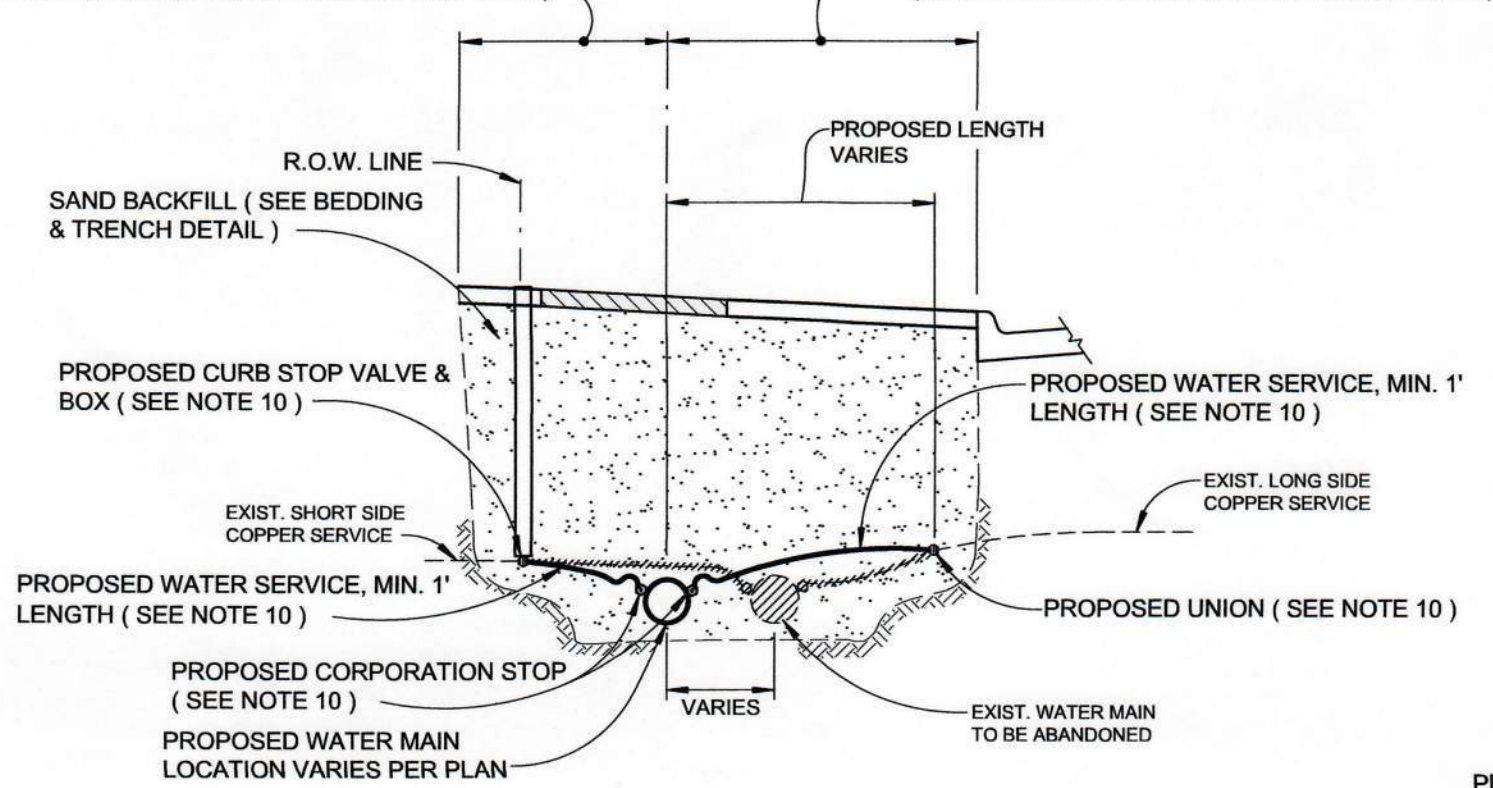


GATE VALVE AND BOX BACKFILL

NOT TO SCALE

LIMITS OF MEASUREMENT & PAYMENT FOR A SHORT SIDE TRANSFER (Water Serv)
(INCLUDES ALL LABOR, MATERIAL & EQUIPMENT)

LIMITS OF MEASUREMENT & PAYMENT FOR A LONG SIDE TRANSFER (Water Serv, Modified)
(INCLUDES ALL LABOR, MATERIAL & EQUIPMENT)

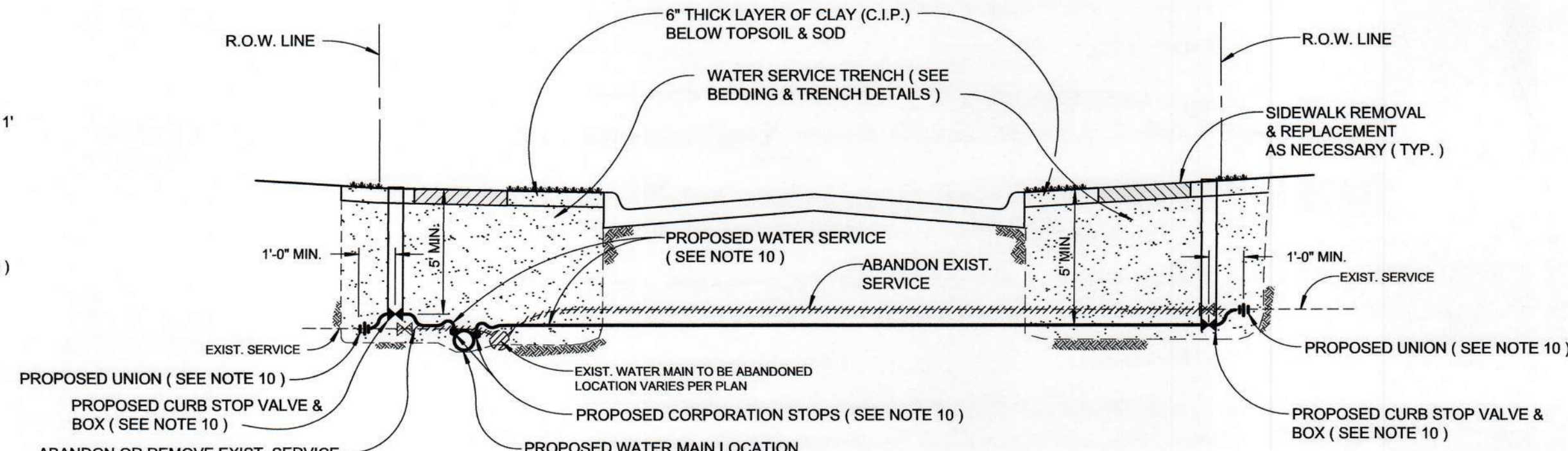


SHORT SIDE

LONG SIDE

TYPICAL WATER SERVICE TRANSFER

NOT TO SCALE



SHORT SIDE

LONG SIDE

TYPICAL WATER SERVICE REPLACEMENT

NOT TO SCALE



ANDERSON, ECKSTEIN AND
WESTRICK, INC.

CIVIL ENGINEERS SURVEYORS ARCHITECTS

51301 Schoenherr Road Phone 586 726 1234
Shelby Township Fax 586 726 8780
Michigan 48315

www.aewinc.com

ENGINEERING STRONG COMMUNITIES



11/14/22 RO	WATER MAIN UPDATES
DRAWN BY: KJP	CHECKED BY: KMS
DATE: AUGUST 2017	

M:\CADD\INTERMOUNT\ENR\ST\DETAILS\CURRENT\CAD\MTCLEMENS-WM-3.DWG
M046-11232022 7:20:09 AM



Kyle M. Seidel, P.E. No. 6201048152

DEPARTMENT OF PUBLIC UTILITIES

APPROVED BY: *Leonard Bertrand*
LEONARD BERTRAND, DIRECTOR

DATE: NOVEMBER 29, 2022

CITY OF MOUNT CLEMENS

STANDARD WATER MAIN DETAILS (2 OF 2)

SHEET NO.

W2

COPYRIGHT, 2022, ANDERSON, ECKSTEIN AND WESTRICK, INC.