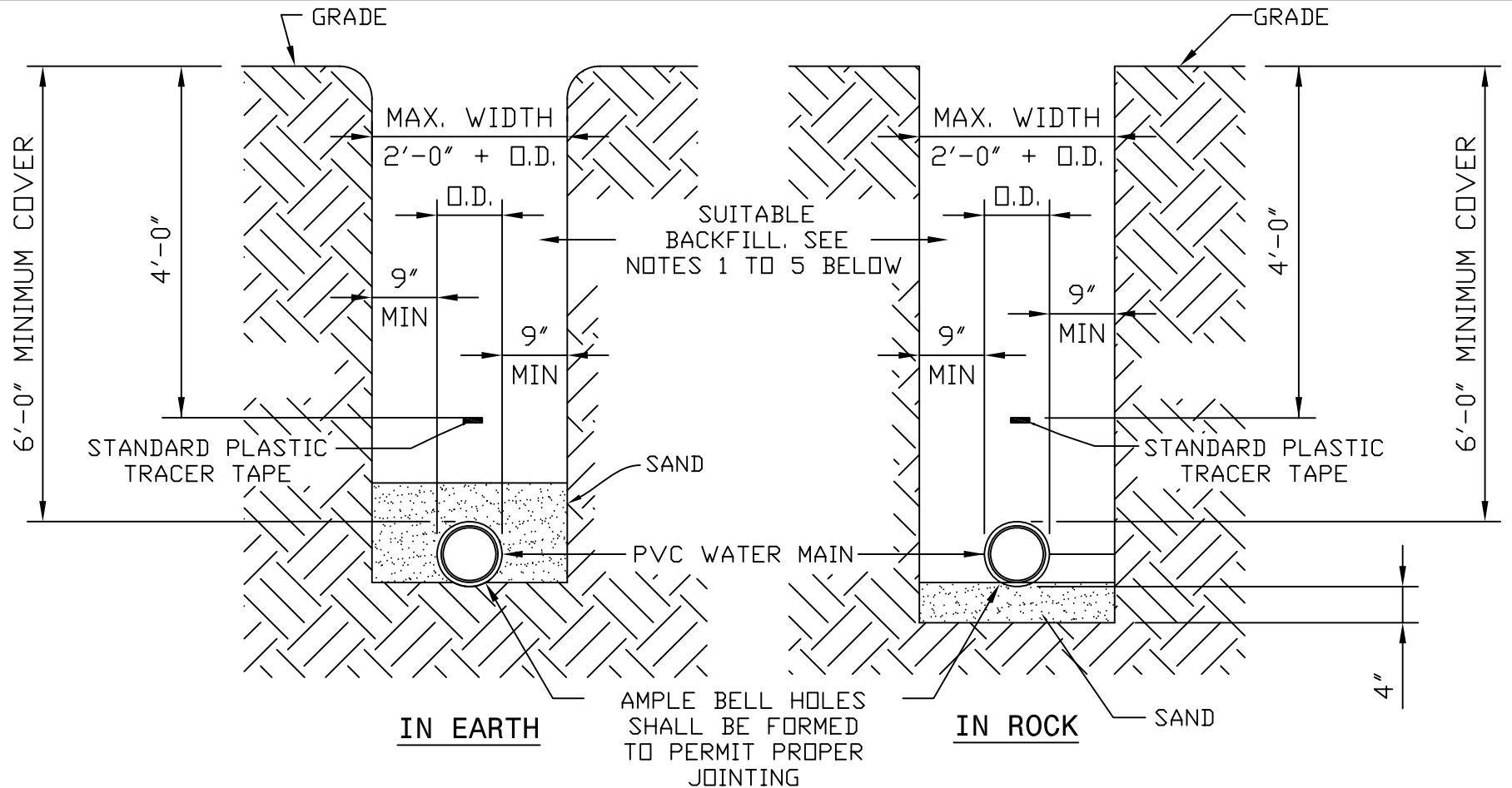


CLEVELAND DIVISION
OF WATER
CONSTRUCTION
STANDARDS

PVC Details

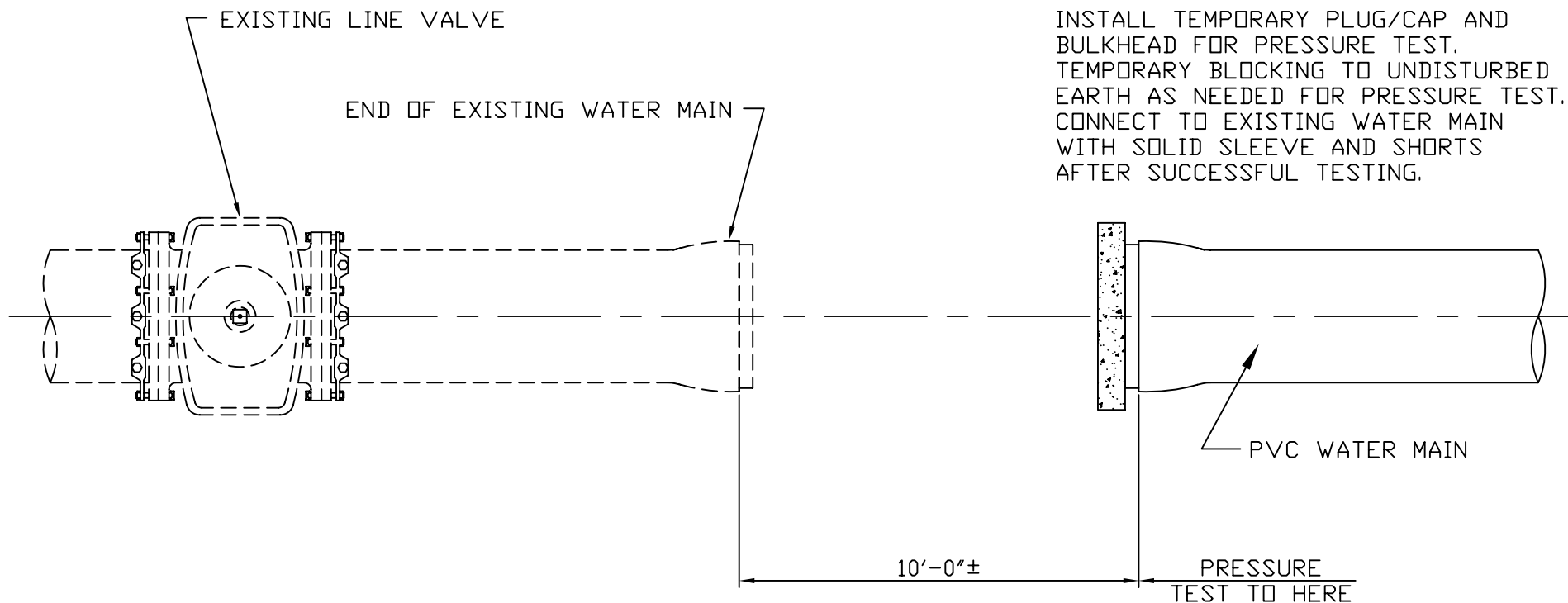


WATER MAIN TRENCH DETAILS

- NOT TO SCALE -

NOTES:

- 1) SUITABLE BACKFILL SHALL CONSIST OF EXCAVATED MATERIAL FREE OF ROCK (>3"), FROZEN EARTH AND DEBRIS. THE BACKFILL SHALL NOT BE ALLOWED TO FREE-FALL ONTO THE PREVIOUSLY PLACED PIPE. THE CONTRACTOR SHALL CONSOLIDATE THE BACKFILL IN SUCH A MANNER TO ENSURE THE MINIMUM POSSIBLE SETTLEMENT. PREMIUM BACKFILL IS REQUIRED UNDER EXISTING OR FUTURE PAVEMENTS, SIDEWALKS, AND/OR DRIVES OR WHEN REQUIRED BY THE LOCAL MUNICIPALITY. PREMIUM BACKFILL SHALL BE FULL DEPTH OF THE TRENCH.
- 2) PREMIUM BACKFILL SHALL BE LIMESTONE SCREENINGS GRADED PER ODOT 304.02 OR ODOT 411. NO SLAG IS PERMITTED.
- 3) CONTRACTOR SHALL USE SPECIAL CARE IN PLACING THE BACKFILL SO AS TO AVOID INJURING THE PIPE, DISTORTING OR MOVING THE PIPE WHEN PLACING THE BACKFILL.
- 4) MINIMUM COMPACTION FOR PREMIUM BACKFILL SHALL BE 95% STANDARD PROCTOR.
- 5) PAVEMENT, SIDEWALK OR DRIVES TO BE INSTALLED IN ACCORDANCE WITH LOCAL MUNICIPALITY'S SPECIFICATIONS.



NOTE:

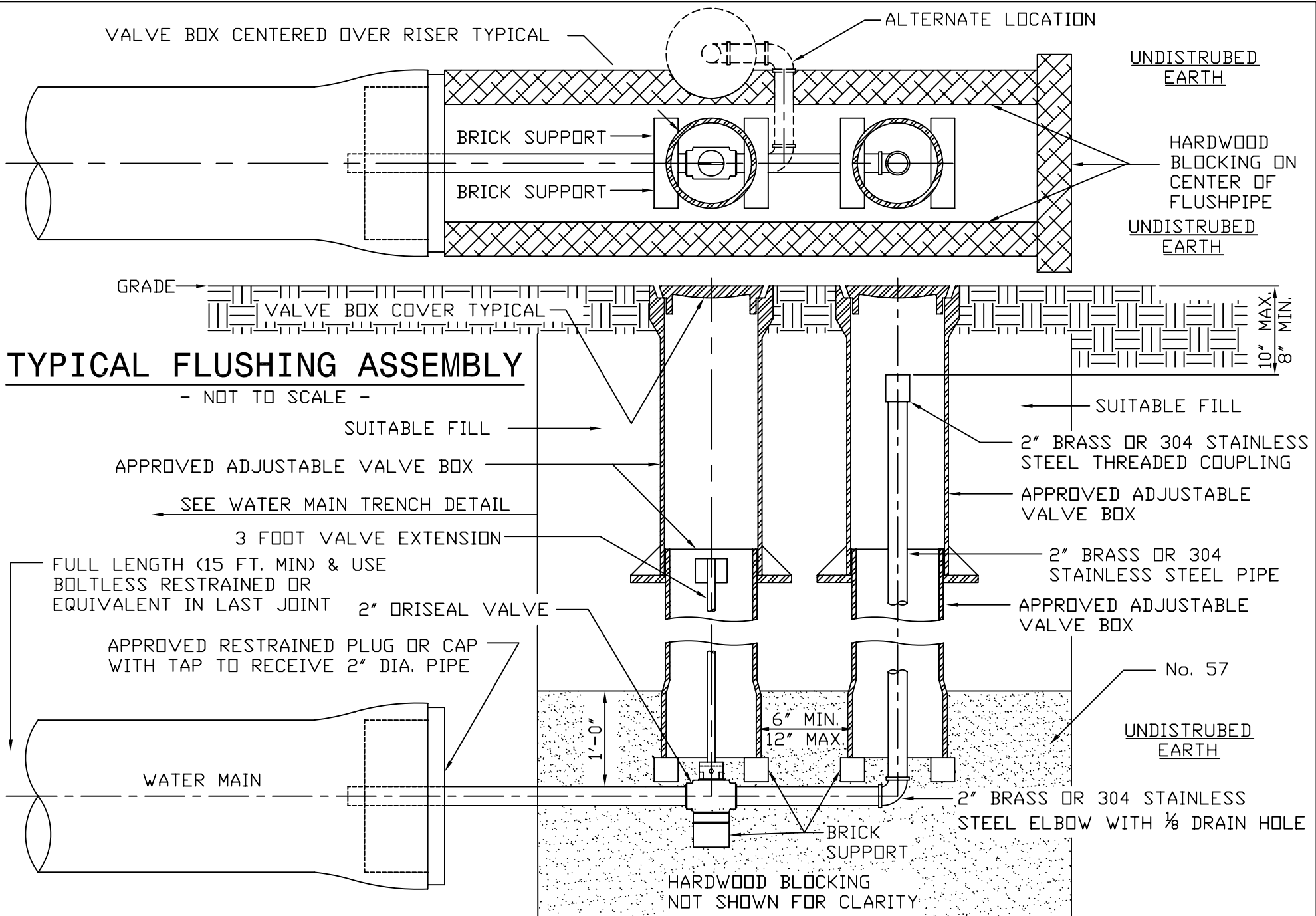
PRESSURE TESTING OF WATER MAINS:

WHERE NEW/EXTENDED WATER MAINS ARE CONNECTED TO AN EXISTING WATER MAIN FOR PRESSURE TEST, RESULTING IN FAILURE OF THE PRESSURE TEST OR ANY DAMAGE TO THE EXISTING WATER MAIN, OR ITS APPURTENANCES, THE REPAIR THEREOF SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

ALL REPAIRS SHALL BE DONE TO THE SATISFACTION OF THE DIVISION OF WATER.

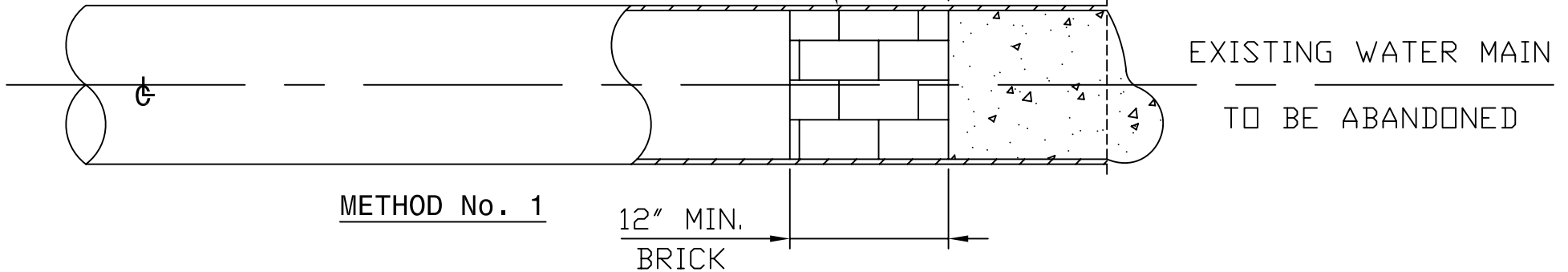
ALTERNATE PRESSURE TESTING DETAIL

- NOT TO SCALE -



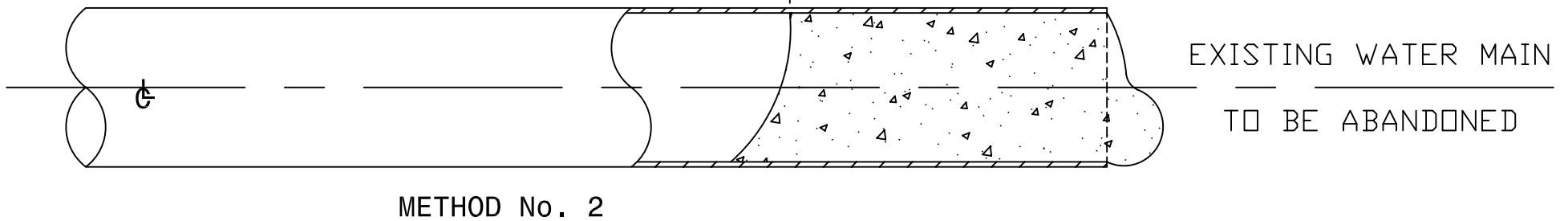
BRICK BULKHEAD -
VOIDS TO BE FILLED
WITH CEMENT MORTAR

12" CONCRETE
OR SAKRETE



NOTE:
PROPERLY DRAIN MAIN
PRIOR TO ABANDONMENT

18" MIN. - 24" MAX.
CONCRETE OR
SAKRETE



PLUGGING ABANDONED WATER MAIN ENDS

- NOT TO SCALE -

*CONNECTION SHALL BE MADE WITH RETAINED MECHANICAL JOINT SOLID SLEEVES (SHORT OR LONG PATTERN) DUCTILE IRON CLASS 350 OR CAST IRON CLASS 250 COMPRESSION COUPLINGS.

COMPRESSION COUPLINGS SHALL BE OF A GASKETED, SLEEVE TYPE WITH DIAMETERS TO PROPERLY FIT PLAIN END IRON PIPE. EACH COUPLING SHALL CONSIST OF ONE (1) MIDDLE RING, WITHOUT STOPS; TWO (2) FOLLOWER GLANDS; TWO (2) RUBBER-COMPOUND BUNA-N BLEND, WEDGE SECTION GASKETS; AND SUFFICIENT TRACKHEAD STAINLESS STEEL BOLTS AND NUTS (ASTM A276/A193/194, TYPE 304, EXTRA HEAVY HEX) TO PROPERLY COMPRESS THE GASKETS.

MIDDLE RING AND FOLLOWER GLANDS SHALL BE OF EITHER STEEL OR DUCTILE IRON (ASTM-A536).

THE COMPRESSION COUPLING SHALL BE WITHOUT STOPS AND BE RATED FOR A MINIMUM WORKING PRESSURE OF 250 PSI AND SHALL BE EQUAL TO THE DRESSER STYLE No's 38, 138 OR 162 (TRANSITION TYPE), OR SMITH-BLAIR 441 STRAIGHT AND TRANSITION COUPLINGS.

ALL BOLTS AND NUTS ON ALL MECHANICAL JOINTS, INCLUDING THOSE ON THE "RETAINED" TYPE, SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINTING FOLLOWED BY AN ENCASEMENT OF POLYETHYLENE WRAPPING IN ACCORDANCE WITH ANSI/AWWA C-105/A21.5-88, CLASS "C", METHOD "B".

THE DIVISION OF WATER WILL DETERMINE THE FIELD LOCATION OF THE CUT-IN-VALVE ASSEMBLY. THE DIVISION OF WATER WILL ALSO SET THE TIME OF INSTALLATION OF THE CUT-IN-VALVE ASSEMBLY.

THE CONTRACTOR SHALL DO ALL PIPE CUTTING AND INSTALLATION. HOWEVER, THE INSTALLATION OF THE CUT-IN-VALVE ASSEMBLY SHALL BE DONE UNDER THE SUPERVISION OF THE DIVISION OF WATER.

C.W.D. SQUARE HEAD RETAINED MECHANICAL JOINT
BELL END GATE VALVE WITH VALVE BOX COMPLETE.
(VALVE BOX NOT SHOWN HERE FOR CLARITY)

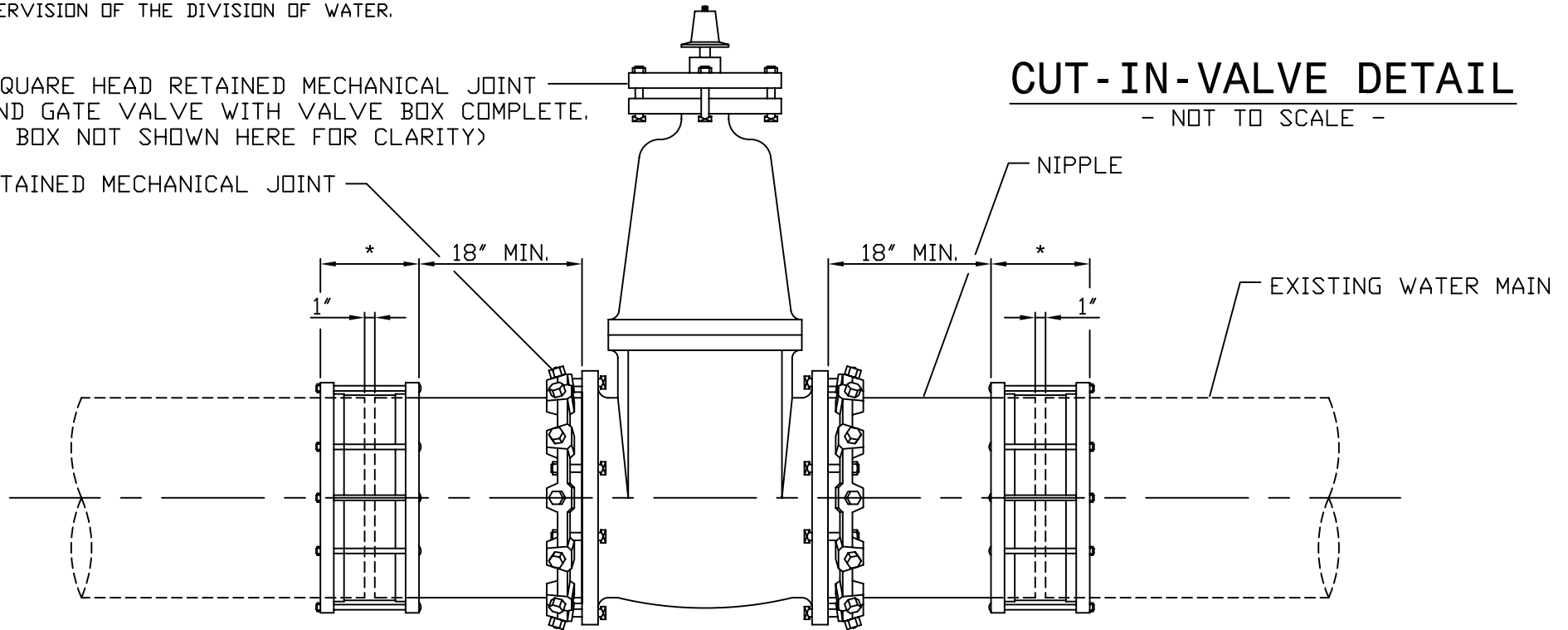
CUT-IN-VALVE DETAIL

- NOT TO SCALE -

RETAINED MECHANICAL JOINT

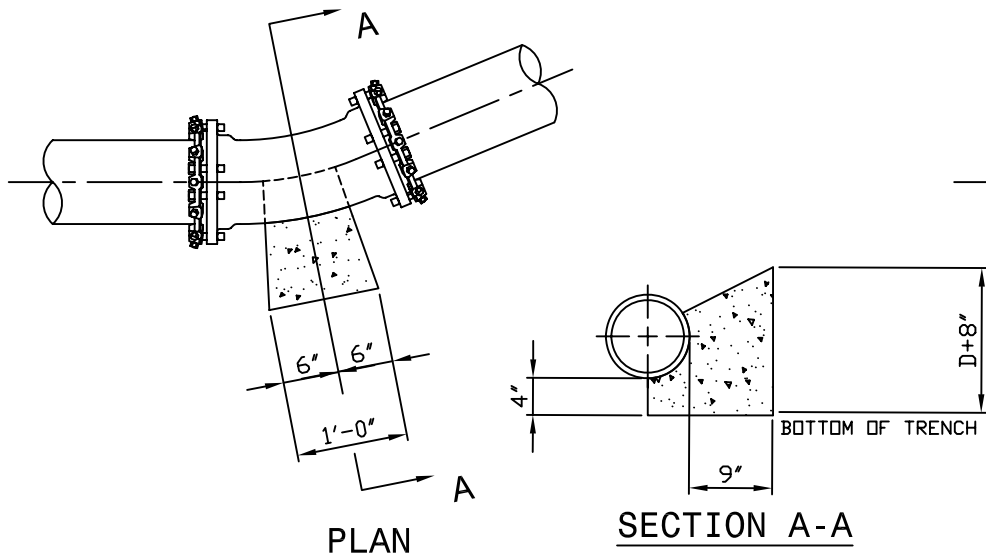
NIPPLE

EXISTING WATER MAIN

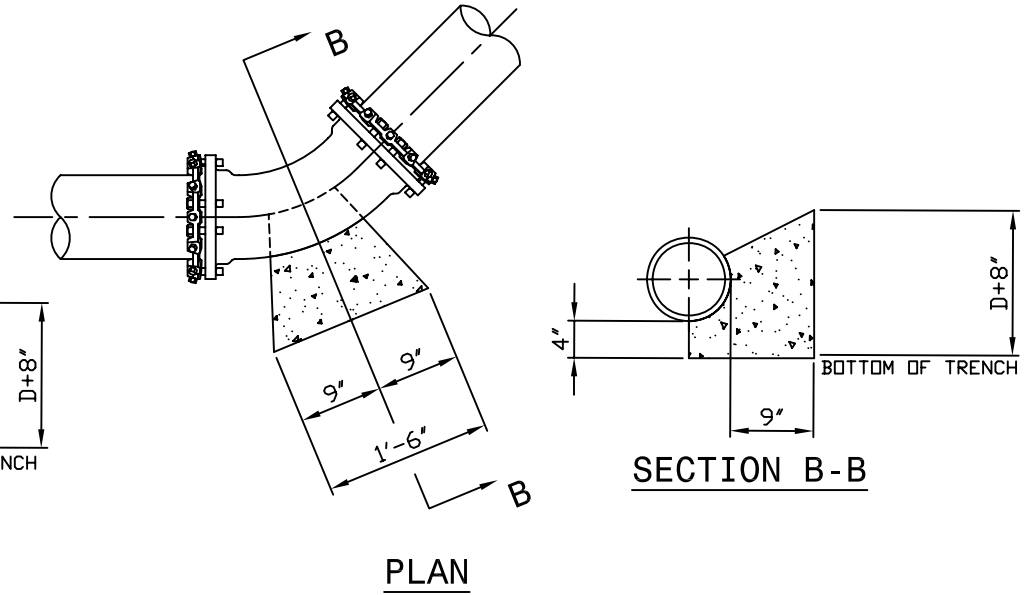


NOTE:

BEFORE CUTTING EXISTING WATER MAIN, THE NIPPLES SHALL BE CONNECTED TO THE MECHANICAL JOINT BELL END GATE VALVE. AFTER CUTTING PIPE, FINAL CONNECTIONS SHALL BE MADE WITH COUPLINGS/SOLID SLEEVES AS SPECIFIED.



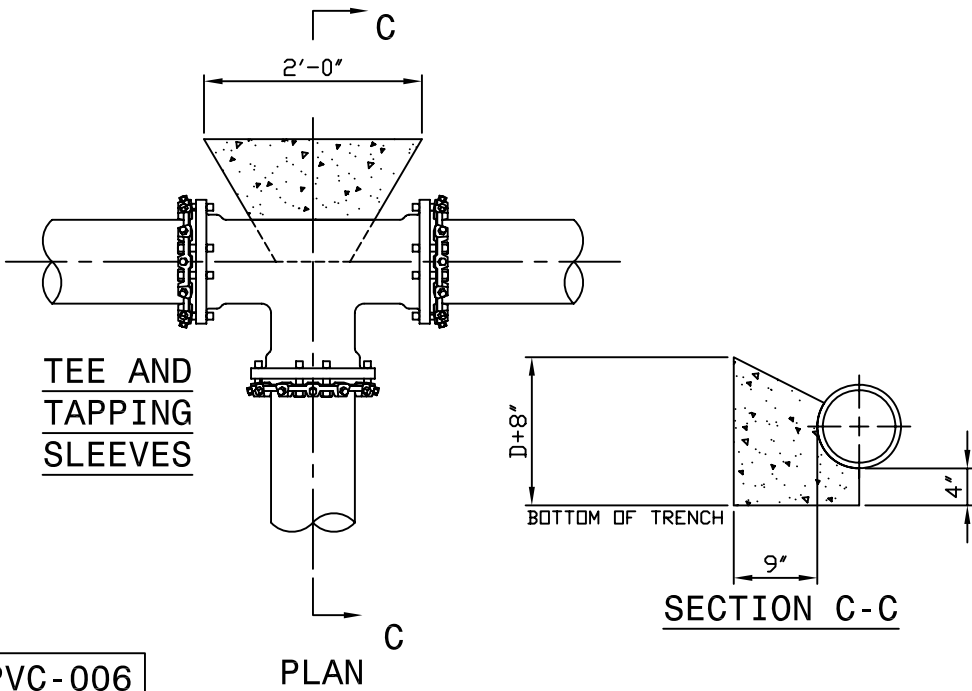
(22-1/2 DEGREE) BEND



(45 DEGREE) BEND

TYPICAL THRUST BLOCK DETAIL
FOR HORIZONTAL DEFLECTION
FOR PIPE UP TO 16" DIAMETER

- NOT TO SCALE -
D = PIPE DIAMETER

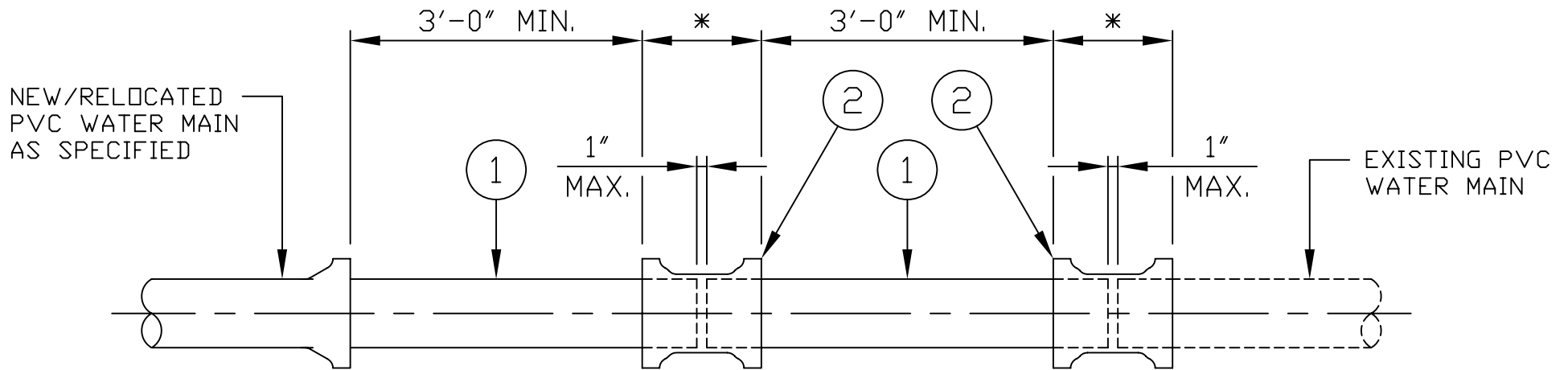


NOTE 1: ALL DIMENSIONS SHOWN HEREON ARE MINIMUM;
THRUST BLOCK SHALL BE POURED TO UNDISTURBED
EARTH.

NOTE 2: ALL CONCRETE FOR THRUST BLOCKS SHALL BE
CLASS "C" HAVING 4,000 PSI 28 DAY COMPRESSIVE
STRENGTH.

NOTE 3: DO NOT COVER BOLTS WITH CONCRETE ON
MECHANICAL JOINTS.

NOTE 4: USE FORMS WHEN POURING CONCRETE TO MAINTAIN
SHAPE AND DIMENSIONS OF THRUST BLOCKS.



SLEEVE-IN INSTALLATION DETAIL

- NOT TO SCALE -

1) PLAIN END x PLAIN END PVC PIPE AS SPECIFIED (CUT TO SUIT).

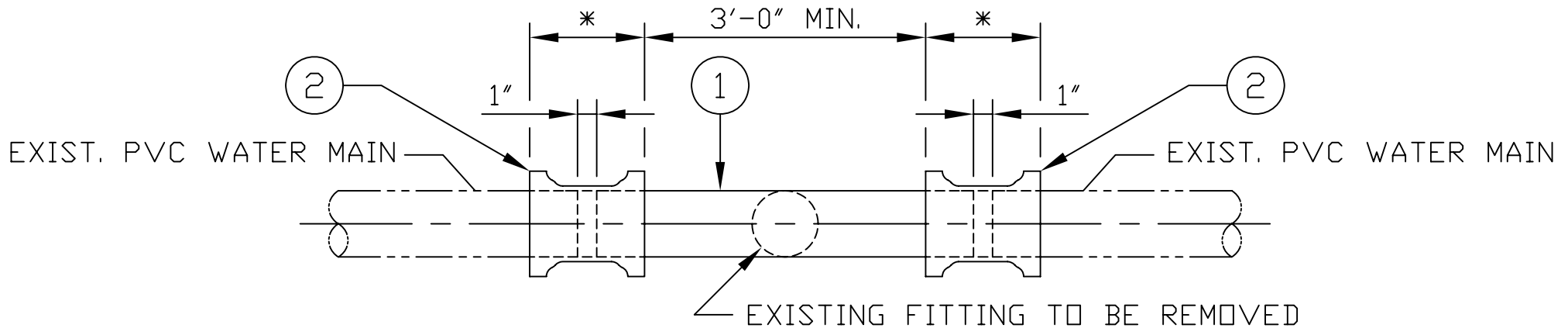
2) *CONNECTION SHALL BE MADE WITH RETAINED MECHANICAL JOINT SOLID SLEEVES (SHORT OR LONG PATTERN) DUCTILE IRON CLASS 350 OR CAST IRON CLASS 250 OR COMPRESSION COUPLINGS.

COMPRESSION COUPLINGS SHALL BE OF A GASKETED, SLEEVE TYPE WITH DIAMETERS TO PROPERLY FIT PLAIN END IRON PIPE. EACH COUPLING SHALL CONSIST OF ONE (1) MIDDLE RING, WITHOUT STOPS; TWO (2) FOLLOWER GLANDS; TWO (2) RUBBER-COMPOUND BUNA-N BLEND, WEDGE SECTION GASKETS; AND SUFFICIENT TRACKHEAD STAINLESS STEEL BOLTS AND NUTS (ASTM A276/A193/194, TYPE 304, EXTRA HEAVY HEX) TO PROPERLY COMPRESS THE GASKETS.

MIDDLE RING AND FOLLOWER GLANDS SHALL BE OF EITHER STEEL OR DUCTILE IRON (ASTM-A536).

THE COMPRESSION COUPLING SHALL BE WITHOUT STOPS AND BE RATED FOR A MINIMUM WORKING PRESSURE OF 250 PSI AND SHALL BE EQUAL TO THE DRESSER STYLE No's 38, 138 OR 162 (TRANSITION TYPE), OR SMITH-BLAIR 441 STRAIGHT AND TRANSITION COUPLINGS.

3) ALL BOLTS AND NUTS ON ALL MECHANICAL JOINTS, INCLUDING THOSE ON THE "RETAINED" TYPE, SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINTING FOLLOWED BY AN ENCASEMENT OF POLYETHYLENE WRAPPING IN ACCORDANCE WITH ANSI/AWWA C-105/A21.5-88, CLASS "C", METHOD "B".



SPOOL PIECE INSTALLATION DETAIL

NOT TO SCALE

1) PLAIN END x PLAIN END PVC C-900 PIPE AS SPECIFIED (CUT TO SUIT).

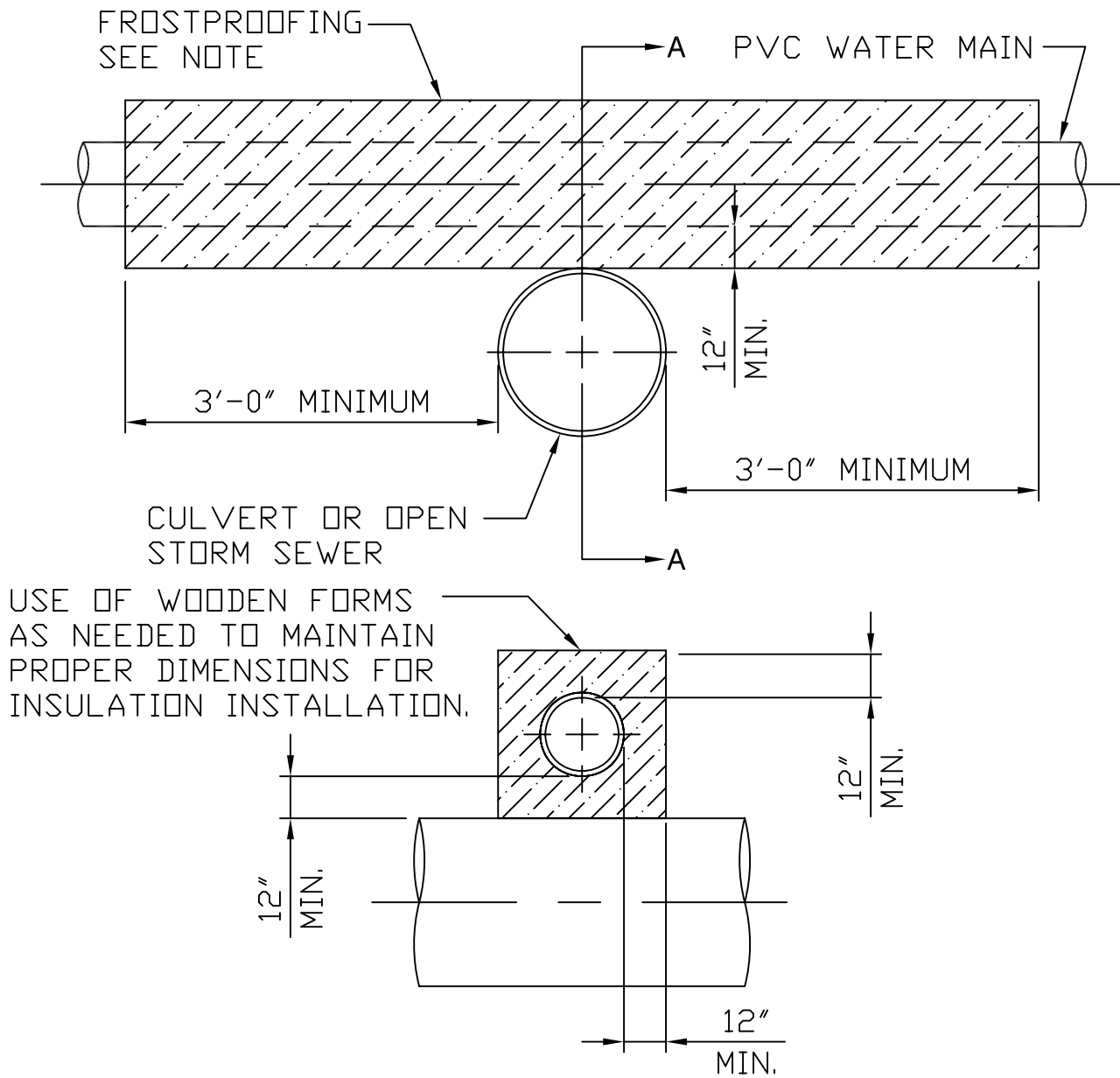
2) *CONNECTION SHALL BE MADE WITH RETAINED MECHANICAL JOINT SOLID SLEEVES (SHORT OR LONG PATTERN) DUCTILE IRON CLASS 350 OR CAST IRON CLASS 250 OR COMPRESSION COUPLINGS.

COMPRESSION COUPLINGS SHALL BE OF A GASKETED, SLEEVE TYPE WITH DIAMETERS TO PROPERLY FIT PLAIN END IRON PIPE. EACH COUPLING SHALL CONSIST OF ONE (1) MIDDLE RING, WITHOUT STOPS; TWO (2) FOLLOWER GLANDS; TWO (2) RUBBER-COMPOUND BUNA-N BLEND, WEDGE SECTION GASKETS; AND SUFFICIENT TRACKHEAD STAINLESS STEEL BOLTS AND NUTS (ASTM A276/A193/194, TYPE 304, EXTRA HEAVY HEX) TO PROPERLY COMPRESS THE GASKETS.

MIDDLE RING AND FOLLOWER GLANDS SHALL BE OF EITHER STEEL OR DUCTILE IRON (ASTM-A536).

THE COMPRESSION COUPLING SHALL BE WITHOUT STOPS AND BE RATED FOR A MINIMUM WORKING PRESSURE OF 250 PSI AND SHALL BE EQUAL TO THE DRESSER STYLE No's 38, 138 OR 162 (TRANSITION TYPE), OR SMITH-BLAIR 441 STRAIGHT AND TRANSITION COUPLINGS.

3) ALL BOLTS AND NUTS ON ALL MECHANICAL JOINTS, INCLUDING THOSE ON THE "RETAINED" TYPE, SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINTING FOLLOWED BY AN ENCASUREMENT OF POLYETHYLENE WRAPPING IN ACCORDANCE WITH ANSI/AWWA C-105/A21.5-88, CLASS "C", METHOD "B".



SECTION A-A

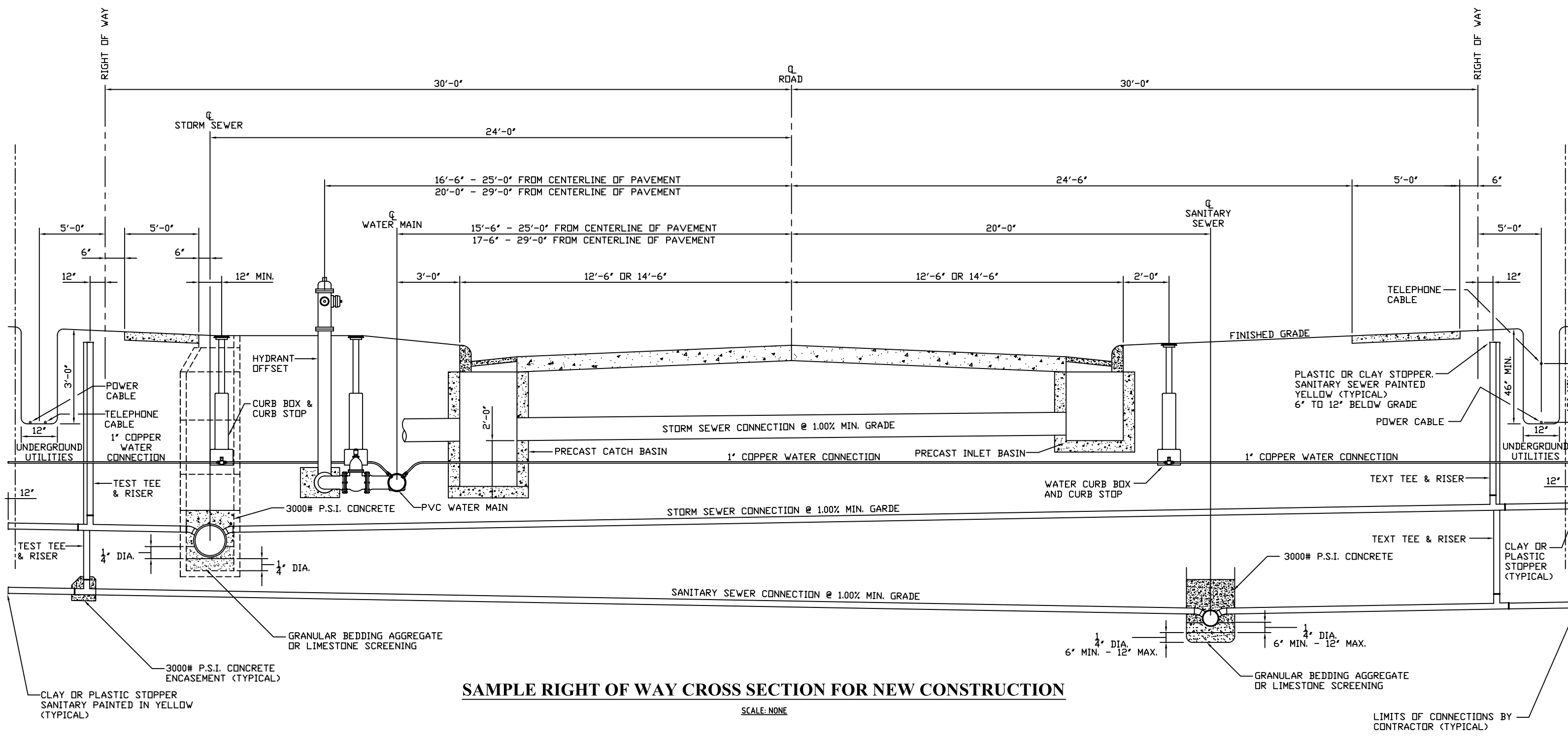
MINIMUM ONE (1) FOOT FROSTPROOFING INSULATION ENVELOPE REQUIRED WITH WATER MAIN LAID WITH LESS THAN FIVE (5) FT. COVER; CROSSING OVER STORM SEWERS 24" AND LARGER; OR CROSSING UNDER OPEN END CULVERTS, OR OTHERWISE DIRECTED BY C.W.D.

IN NO CASE SHALL THE MAINS BE LAID WITH LESS THAN 3'-6" OF COVER IN UNPAVED AREAS & 3'-0" TO BOTTOM OF SLAB IN PAVED AREAS.

NOTE:
 COMPACTED "WITCOLITE" INSULATION AS MANUFACTURED BY PIONEER PRODUCTS, DIVISION OF WITCO CHEMICAL COMPANY, INC. OR "GILSULATE 500 XR" AS MANUFACTURED BY AMERICAN THERMAL PRODUCTS, INC.

TYPICAL FROSTPROOFING DETAIL

- NOT TO SCALE -



SAMPLE RIGHT OF WAY CROSS SECTION FOR NEW CONSTRUCTION
 SCALE: NONE

LIMITS OF CONNECTIONS BY CONTRACTOR (TYPICAL)

CLEVELAND DIVISION OF WATER NOTES FOR NEW PVC WATER MAIN INSTALLATION

GENERAL:

1. ALL WATER WORK REQUIRED, WHETHER SHOWN ON THE PLANS OR AS DIRECTED BY THE CLEVELAND DIVISION OF WATER, SHALL BE AT THE EXPENSE OF THE PROJECT.
2. THE INFORMATION SHOWN ON THE CLEVELAND DIVISION OF WATER'S SUMMARY OF WORK/CHARGE LETTER AND STRIP MAPS ARE TAKEN FROM EXISTING AVAILABLE RECORDS, AND THEIR ACCURACY IS NOT GUARANTEED.
3. CALL THE INSPECTION AND ENFORCEMENT UNIT AT 216-664-2342 TO SCHEDULE A PRECONSTRUCTION MEETING. THE OPERATION OF ANY VALVE OR ALTERATION OF ANY PART OF THE WATER SYSTEM BY CONTRACTORS OR THEIR EMPLOYEES IS PROHIBITED WITHOUT THE SUPERVISION OF THE CLEVELAND DIVISION OF WATER INSPECTOR.
4. THE MUNICIPALITY SHALL REQUIRE THAT THE PROJECT'S PROFESSIONAL ENGINEER OBTAIN ACTUAL FIELD MEASUREMENTS OF THE MAIN DURING INSTALLATION AND SHALL FURNISH THE CWD INSPECTOR WITH RECORD PRINTS IN A FORM ACCEPTABLE TO THE DIVISION OF WATER. THE CLEVELAND DIVISION OF WATER WILL REQUIRE THE DELIVERY AND ACCEPTANCE OF TWO COPIES OF RECORD (AS BUILT) PRINTS BEFORE THE PRESSURE TEST AND CHLORINATION OF THE MAIN.
5. FOR THE PURPOSES OF CHLORINATION AND BACTERIOLOGICAL TESTING OF THE WATER MAINS THE CONTRACTOR SHALL PROVIDE AND INSTALL, AT EACH OF THE CHLORINATION PIT LOCATIONS SHOWN AND AT OTHER LOCATIONS DETERMINED BY THE DIVISION OF WATER, FLUSHING/SAMPLING TAPS OF SIZES TO BE DETERMINED BY THE DIVISION OF WATER. CHLORINATION PITS SHALL BE SIX (6) FOOT SQUARE MEETING OSHA STANDARDS.
6. A TWO YEAR WARRANTY, COMMENCING FROM THE DATE OF ACCEPTANCE OF THE FINAL CHLORINATION OF THE WATER MAIN INSTALLATION, SHALL BE PROVIDED BY THE BUILDER/DEVELOPER AND/OR CONTRACTOR FOR ALL WATER MAINS AND SERVICE CONNECTION WORK PERFORMED BY THE CONTRACTOR, INCLUDING RETAPS, SHOULD ANY LEAKS OCCUR AND REPAIRS BE REQUIRED DUE TO DEFECTIVE MATERIAL OR POOR WORKMANSHIP.
7. USE BACKFILL MATERIAL AS SPECIFIED AND COMPACT SUFFICIENTLY IN THOSE AREAS WHERE EXISTING MAINS AND WATER SERVICE CONNECTIONS ARE EXPOSED. (SEE DIVISION OF WATER STANDARD DETAIL PVC-001).
8. ALL MATERIALS, INCLUDING BUT NOT LIMITED TO WATER MAINS, FIRE HYDRANTS, VALVES, CONNECTION MATERIALS AND OTHER WATER APPURTENANCES, SHALL BE NEW AND UNUSED AND SHALL CONFORM TO THE MOST CURRENT DIVISION OF WATER SPECIFICATIONS. ALL MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH DIVISION OF WATER'S STANDARDS.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO EXISTING WATER MAINS AND APPURTENANCES THEREOF WHEN CONNECTING THE NEW WATER MAIN FOR THE HYDROSTATIC TEST. ALL REPAIRS TO DAMAGED EXISTING FACILITIES SHALL BE MADE BY THE CONTRACTOR, AT THE CONTRACTOR'S EXPENSE, TO THE SATISFACTION OF THE DIVISION OF WATER. (REFER TO THE THE ALTERNATE TEST DETAIL PVC-002 AS NEEDED).
10. ALL HYDROSTATIC PRESSURE TESTING SHALL BE DONE BY THE CONTRACTOR IN THE PRESENCE OF THE DIVISION OF WATER'S INSPECTOR. THE HYDROSTATIC TEST PRESSURE SHALL BE 75 PSI ABOVE THE STATIC PRESSURE PREVAILING AT THE SITE, BUT IN NO CASE LESS THAN 150 PSI. THE PRESSURE TEST SHALL BE FOR A DURATION OF TWO (2) HOURS WITH THE PRESSURE BEING MAINTAINED WITHIN 5 PSI OF THE REQUIRED TEST PRESSURE. SHOULD THE PRESSURE TEST FAIL THE CONTRACTOR SHALL FIND AND CORRECT THE DEFICIENCY(IES) TO THE SATISFACTION OF THE DIVISION OF WATER AND REPEAT THE TWO (2) HOUR PRESSURE TEST.

WATER MAINS:

- 11A. ALL PIPE, UNLESS OTHERWISE CALLED FOR, SHALL BE POLYVINYL CHLORIDE (PVC) PRESSURE PIPE IN ACCORDANCE AWWA C-900-97 CLASS 200 OR C-909-98 200 PSI OR BETTER. JOINTS SHALL BE MADE UTILIZING A STAB TYPE, RUBBER GASKETED BELL & SPIGOT, SOLVENT CEMENT TYPE JOINTS WILL NOT BE PERMITTED. STANDARD PLASTIC TRACER TAPE IS TO BE BURIED 4'-0" AND LOCATED DIRECTLY ABOVE THE WATERMAIN.
- 11B. ALL FITTINGS, UNLESS OTHERWISE CALLED FOR, SHALL BE APPROVED DUCTILE IRON, CLASS 350, CEMENT LINED OR FUSION BONDED EPOXY COATED. ALL FITTINGS AND PIPE CONNECTED TO FITTINGS SHALL BE RESTRAINED USING A "RETAINED" MECHANICAL JOINT CONFORMING TO THE MATERIAL AND PERFORMANCE REQUIREMENTS OF ANSI/AWWA C-110/A21.10 AND ANSI/AWWA C-111/A21.11, OR "COMPACT" FITTINGS IN ACCORDANCE WITH ANSI/AWWA C-153/A21.53. EXCEPT FOR ANCHOR TEES, REDUCERS OR OTHER SPECIAL CIRCUMSTANCES WHEN DIRECTED BY CLEVELAND DIVISION OF WATER, ALL FITTINGS ARE TO HAVE BELL ENDS.
- 11C. ALL BOLTS AND NUTS ON ALL "RETAINED" MECHANICAL JOINTS SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINTING FOLLOWED BY AN ENCASEMENT OF POLYETHYLENE WRAPPING IN ACCORDANCE WITH ANSI/AWWA C-105/A21.5-88, CLASS "C", METHOD "B".
- 11D. WHERE SHOWN ON THE PLANS, OR WHEN OTHERWISE CALLED FOR, DUCTILE IRON PIPE AND FITTINGS SHALL HAVE AN APPROVED "TYPE I" OR "TYPE II" BOLTLESS RESTRAINED PUSH-ON JOINTS TO THE LIMITS SHOWN ON THE DRAWINGS. WHERE NOTED (AWWA C-900 RJ) PVC BOLTLESS RESTRAINED PIPE MAY USED.
- 11E. AT THE END OF EACH WORKDAY, THE CONTRACTOR SHALL PLUG ALL OPEN PIPE ENDS WITH WATER TIGHT PLUGS AS PER THE "PREVENTITIVE AND CORRECTIVE MEASURES DURING CONSTRUCTION" SECTION OF THE MOST CURRENT REVISION OF AWWA C-651 AS TO PREVENT THE INFILTRATION OR INTRUSION OF ANY FOREIGN OBJECTS OR MATERIALS. DATE STAMPED DIGITAL PHOTOS SHALL BE PROVIDED FOR EACH WORKDAY DEMONSTRATING THAT PROPER AWWA C-651 METHODS WERE USED TO PLUG ALL OPEN WATER MAIN ENDS. EACH PHOTO SHALL CLEARLY IDENTIFY THE STATION AT WHICH THE PIPE IS PLUGGED. THE STATIONING SHALL BE SHOWN BY THE USE OF A STATION MARKER PLACED AT THE PLUGGED PIPE END.

PHOTOS SHALL BE SUBMITTED ON A DAILY BASIS UNLESS OTHERWISE DEFINED BY THE CWD INSPECTOR OR ENGINEER. ALL PHOTOS TAKEN OVER THE COURSE OF THE PROJECT SHALL BE SUBMITTED BY THE CONTRACTOR AS PART OF THE AS-BUILT SUBMITTAL. AS-BUILTS SHALL BE CONSIDERED INCOMPLETE WITHOUT SAID COLLECTION OF DIGITAL PHOTOS.
- 11F. ALL PVC PIPE SHALL BE INSTALLED WITH A CONTINUOUS RUN OF INSULATED #12 GAUGE COPPER WIRE TAPED TO THE TOP OF THE PIPE EVERY 5 FEET. BRING TRACE WIRE TO THE SURFACE AT EVERY VALVE BOX, OR HYDRANT (SEE DETAILS). ALL SPLICES OR CONNECTIONS TO THE WIRE ARE TO BE MADE USING APPROVED DIRECT BURY LUGS OR NUTS. SHOULD THE TYPE OF PIPE CHANGE TO DUCTILE IRON PIPE, THEN TRACE WIRE SHOULD BE TERMINATED AT THE FIRST VALVE BOX OR HYDRANT AFTER THE TRANSITION IS MADE.

HYDRANTS:

- 12A. IN ALL HYDRANT INSTALLATIONS THE CONTRACTOR SHALL FACE ALL HYDRANT'S 4" (STEAMER) NOZZLE TOWARD THE PAVEMENT PRIOR TO TESTING AND CHLORINATION OF WATER MAINS. CONTRACTOR SHALL CONSULT WITH THE LOCAL MUNICIPALITY'S ENGINEERING OR SERVICE DEPARTMENT TO OBTAIN HYDRANT MODEL AND NOZZLE THREAD REQUIREMENTS IF NOT INDICATED ON THE APPROVED PLANS.
- 12B. HYDRANT ASSEMBLIES SHALL BE CONSTRUCTED OF DUCTILE IRON (CL. 52) CEMENT LINED PIPE.

VALVES

13. ALL VALVES SHALL BE AN APPROVED MODEL RESILIENT SEATED GATE VALVES AS PER THE MOST CURRENT VERSION OF AWWA C509 OR C515.

CONNECTIONS:

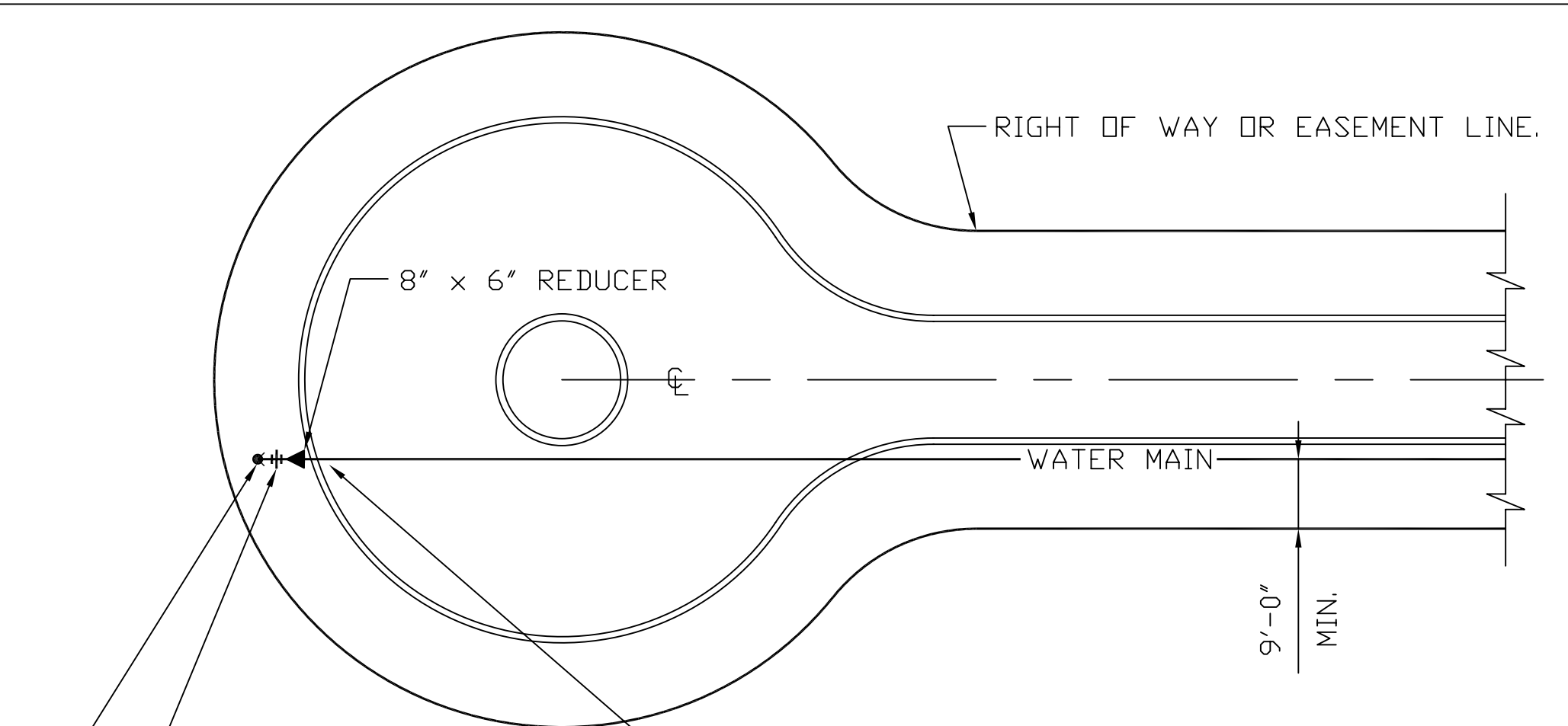
14. WATER CONNECTIONS SHOWN ON THESE DRAWINGS ARE FOR REFERENCE ONLY AND ARE NOT PART OF THE WATER MAIN APPROVAL. ADDITIONAL PERMITS FOR SERVICE CONNECTIONS MUST BE OBTAINED FROM THE DIVISION OF WATER PRIOR TO INSTALLATION OF ANY PORTION OF THE SERVICE CONNECTION(S). IT IS THE CONTRACTORS RESPONSIBILITY TO ARRANGE FOR PERMITS FOR ALL SIZE WATER SERVICE CONNECTIONS BEFORE PERFORMING ANY WORK. THE AMOUNT OF THE CHARGES CAN BE OBTAINED FROM THE DIVISION OF WATER, PERMITS AND SALES SECTION AT 216-664-2444 X5203.
15. ONE INCH SERVICE CONNECTIONS SHALL BE PERMITTED TO SERVICE HOMES BASED ON THE FOLLOWING CRITERIA:
- * PEAK FLOW DEMANDS DO NOT EXCEED 25 GPM FOR AN INDIVIDUAL HOME/UNIT. INCLUSIVE OF ALL USAGE (FIRE, DOMESTIC AND/OR IRRIGATION) AND
 - * LENGTH OF ONE INCH CONNECTION DOES NOT EXCEED 50 FEET AS MEASURED FROM THE MAIN TO THE CURB VALVE.

ANY SERVICE REQUESTS DIFFERING FROM THE STATED CRITERIA SHALL REQUIRE THE SUBMITTAL OF A COMPLETE WATER SERVICE APPLICATION. PEAK DEMANDS ARE TO BE ASSESSED ON APPLICATION AND SETBACKS ARE TO SHOWN ON AN ACCOMPANYING SITE PLAN. SITE PLANS SHALL SHOW WATER METER VAULTS IN THE RIGHT OF WAY OR IN AN EASEMENT CONTIGUOUS TO THE RIGHT OF WAY FOR ANY HOMES/UNITS WITH SETBACKS GREATER THAN 150 FEET. EASEMENTS ARE TO BE PROVIDED WITH THE SERVICE CONNECTION APPLICATION SUBMITTAL.

16. ALL WATER MAIN CURB VALVE BOXES & METER VAULTS WILL BE INSTALLED IN GRASS AREAS WHEN POSSIBLE.
17. SERVICE SADDLES SHALL BE USED FOR ALL SERVICE CONNECTIONS. THE OUTLET SHALL BE TAPPED WITH EITHER A.W.W.A. TAPER (C.C.) OR A.W.W.A. F.I.P.T. THREADS. SADDLES SHALL BE MANUFACTURED IN ACCORDANCE WITH ALL APPLICABLE PARTS OF ANSI/AWWA C800-NSF 61 CERTIFIED, AND BE APPROVED BY THE DIVISION OF WATER.

EMERGENCIES:

18. IF A WATER MAIN OR SERVICE CONNECTION BREAK OCCURS DURING CONSTRUCTION AND EMERGENCY ASSISTANCE IS REQUIRED, PLEASE NOTIFY THE DIVISION OF WATER AT 216-664-3060.



6" LINE VALVE AND BOX

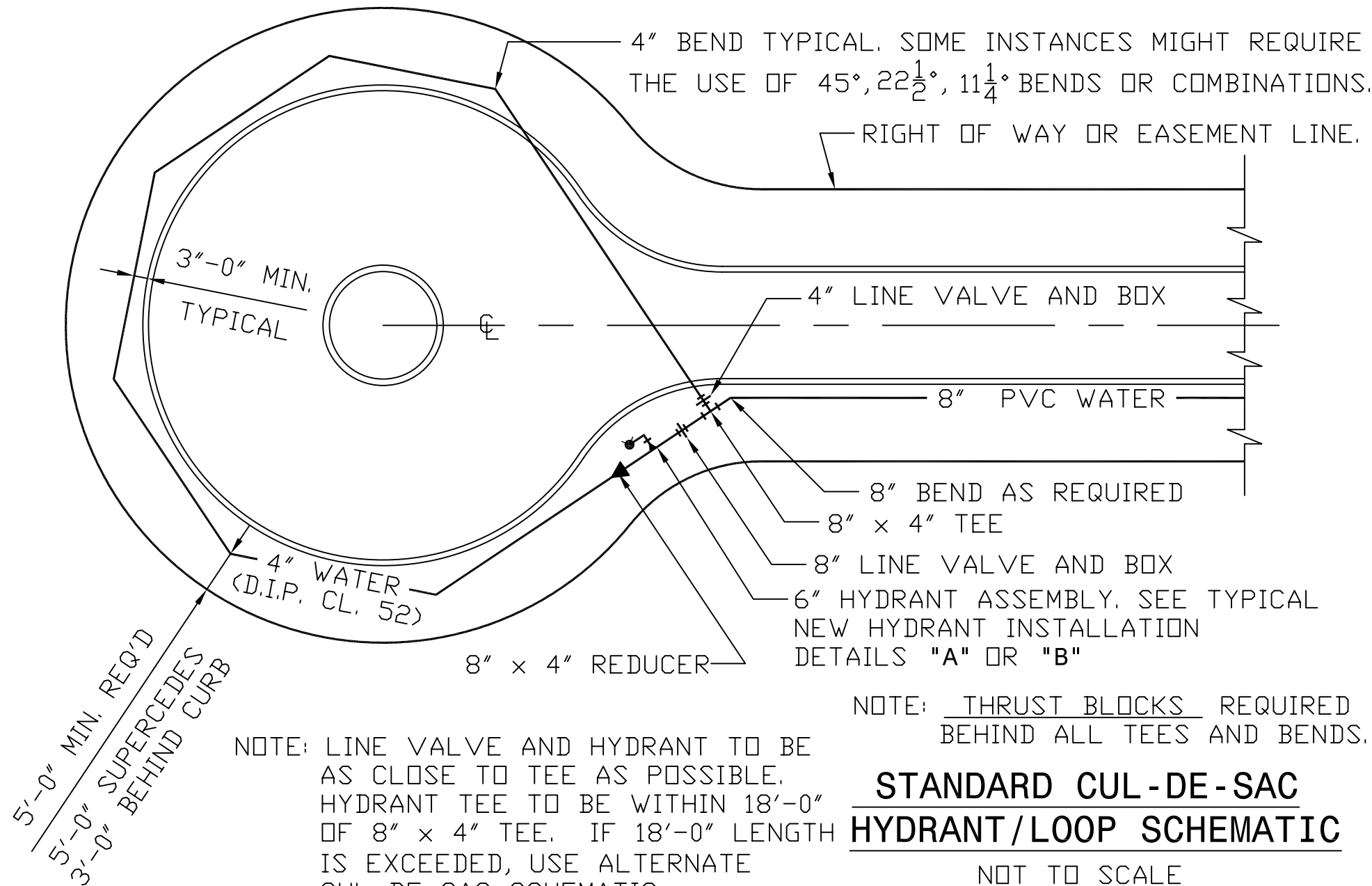
6" HYDRANT ASSEMBLY.
SEE TYPICAL NEW HYDRANT
INSTALLATION DETAIL "C"

ON 8" MAIN USE TWO FULL LENGTHS OF D.I. (CL. 52) BOLTLESS RESTRAINED PUSH-ON JOINT PIPE, WITH TYPE II JOINTS, FOR THE LAST TWO JOINTS. ON 12" MAIN USE THREE FULL LENGTHS OF D.I. (CL. 52) BOLTLESS RESTRAINED PUSH-ON JOINT PIPE, TYPE II JOINTS, ON THE LAST THREE JOINTS.

STRAIGHT CUL-DE-SAC SCHEMATIC
NOT TO SCALE

NOTE: THRUST BLOCKS REQUIRED BEHIND ALL TEE AND BENDS.

ALL PUSH ON JOINTS BETWEEN BENDS TO BE BOLTLESS RESTRAINED TYPE II (UNLESS OTHERWISE NOTED).
 ALL 4" WATER MAIN TO BE DUCTILE IRON (CLASS 52) CEMENT LINED PIPE (UNLESS OTHERWISE NOTED).

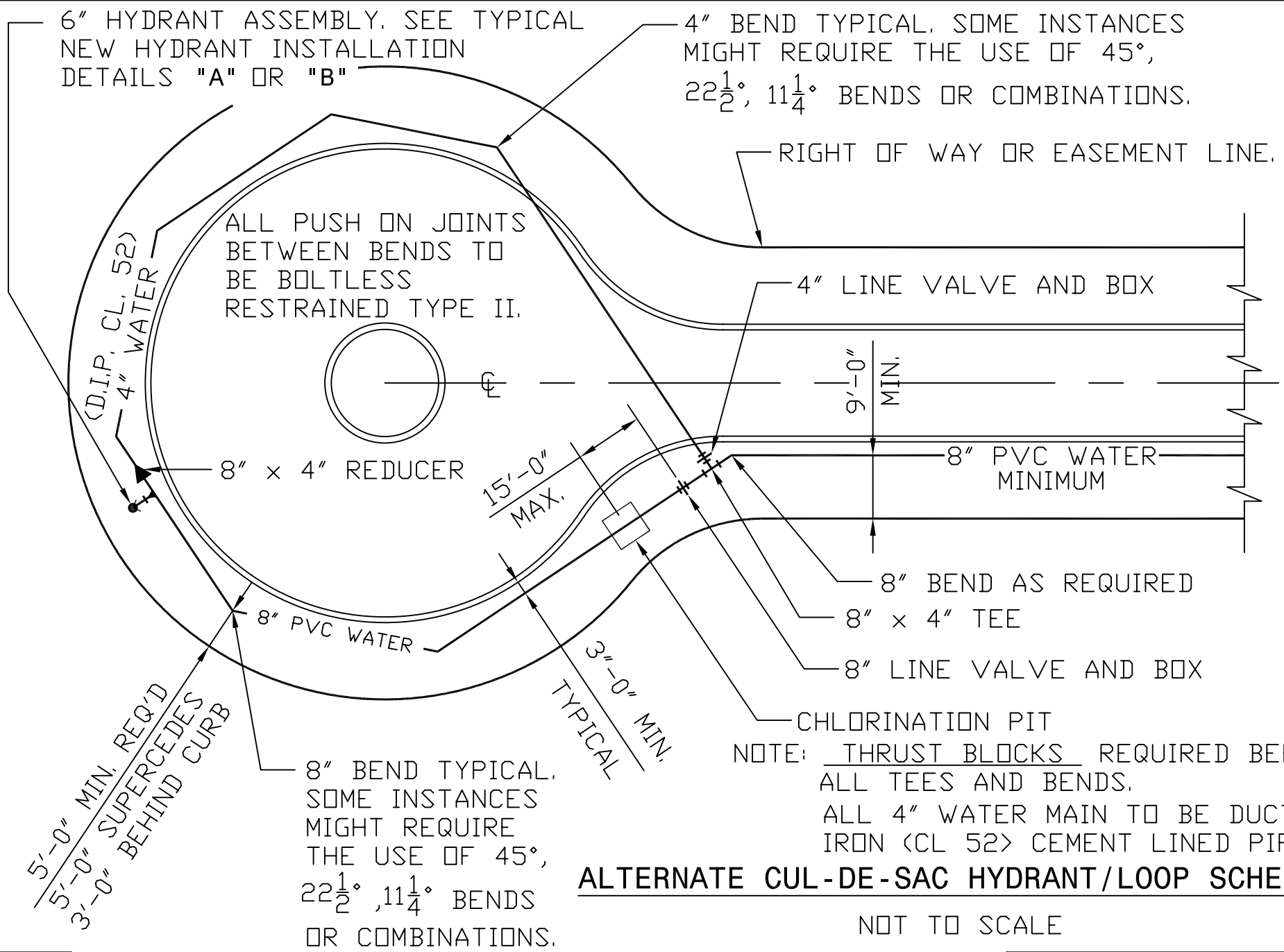


NOTE: LINE VALVE AND HYDRANT TO BE AS CLOSE TO TEE AS POSSIBLE. HYDRANT TEE TO BE WITHIN 18'-0" OF 8" x 4" TEE. IF 18'-0" LENGTH IS EXCEEDED, USE ALTERNATE CUL-DE-SAC SCHEMATIC.

NOTE: THRUST BLOCKS REQUIRED BEHIND ALL TEES AND BENDS.

**STANDARD CUL-DE-SAC
 HYDRANT/LOOP SCHEMATIC**

NOT TO SCALE



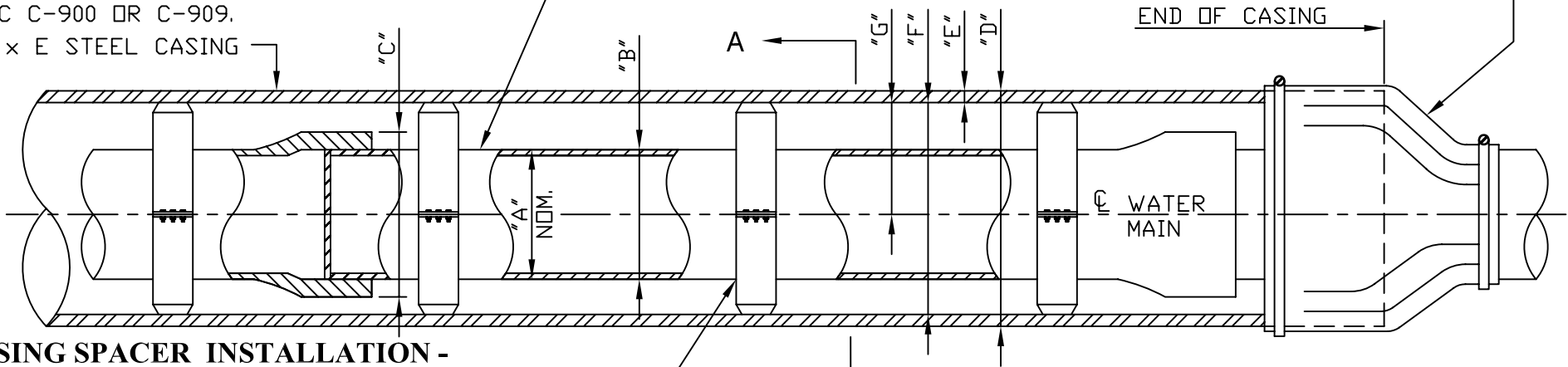
ALTERNATE CUL-DE-SAC HYDRANT/LOOP SCHEMATIC

NOT TO SCALE

DUCTILE IRON CLASS 52 CEMENT LINED
BOLTLESS RESTRAINED PUSH-ON JOINT PIPE
(TYPE I NEW CONSTRUCTION)
(TYPE II EXISTING CONSTRUCTION) OR
PVC C-900 OR C-909.

WRAP AROUND RUBBER END SEALS ARE TO BE USED FOR SINGLE
CARRIER PIPES, OR MOLDED END SEALS FOR CLUSTER CARRIER
PIPES. ALL FASTENERS ARE TO BE STAINLESS STEEL. BRICK
BULKHEADS ARE NOT ALLOWED.

D x E STEEL CASING

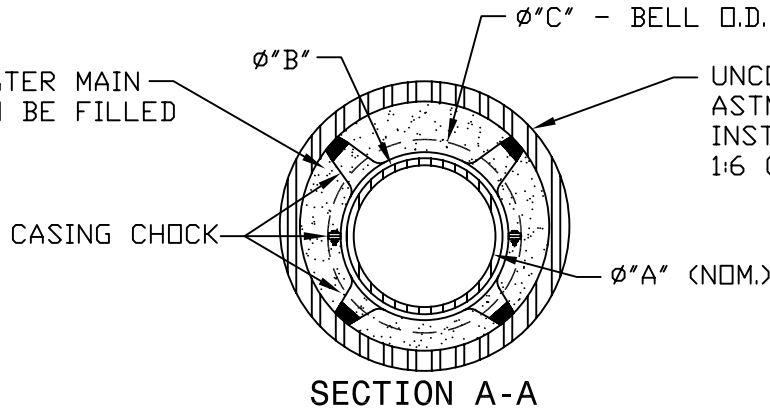


- CASING SPACER INSTALLATION -

THREE CASING SPACER PER 18FT. OR 20FT. PIPE JOINTS ARE
TO BE USED FOR MAXIMUM CARRIER PIPE SUPPORT; ONE BEHIND
THE BELL, ONE AT THE SPIGOT END MAKE-UP LINE, AND ONE
CENTERED BETWEEN THE AFOREMENTIONED TWO SPACERS.
CASING SPACERS SHOULD CENTER & RESTRAIN THE CARRIER PIPE.
WOODEN SKIDS ARE NOT ALLOWED.

A	B	C*	D	E	F	G
8"	9.05"	11.89"	16"	$\frac{3}{8}$ "	15 $\frac{1}{4}$ "	8.00"
12"	13.20"	16.35"	20"	$\frac{3}{8}$ "	19 $\frac{1}{4}$ "	10.00"
16"	17.40"	20.84"	24"	$\frac{1}{2}$ "	23"	12.00"

SPACE BETWEEN WATER MAIN
AND STEEL PIPE TO BE FILLED
WITH SAND.



UNCOATED - UNPROTECTED STEEL CASING
ASTM A-53-89a (AWWA SPEC. C-200-91)
INSTALLED BY JACKING OR BORING METHOD.
1:6 GROUT IF ORDERED AROUND CASING.

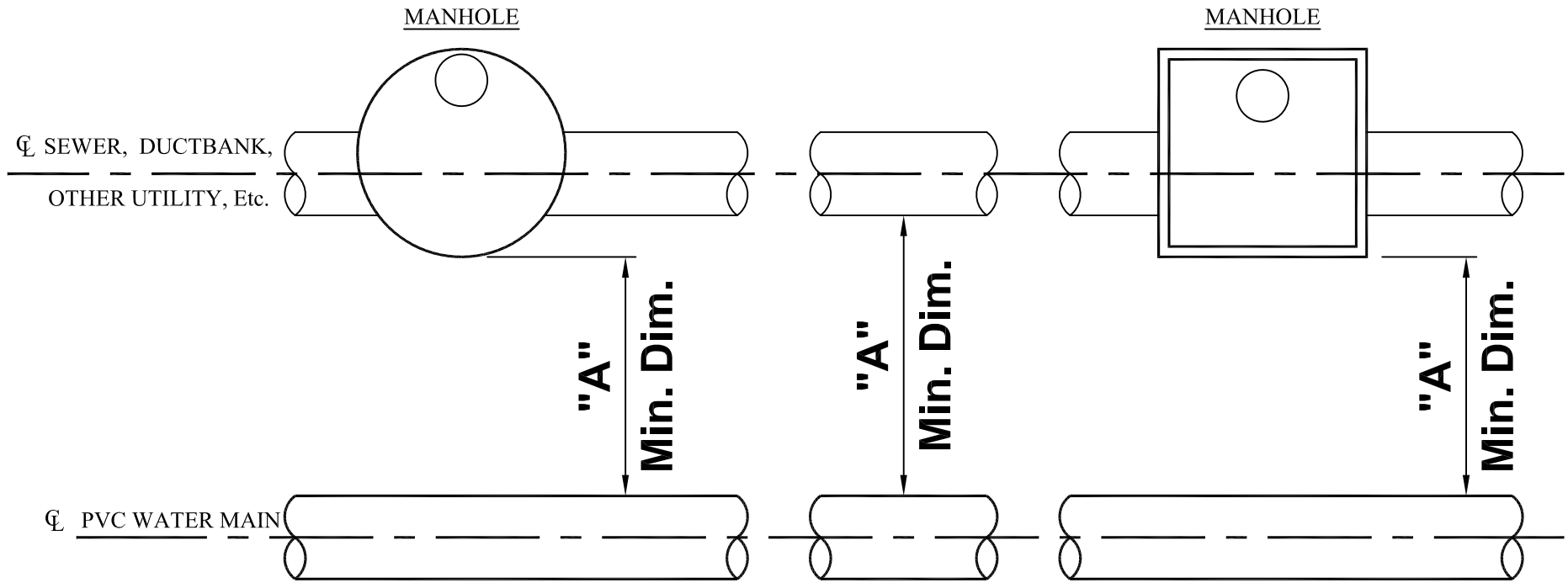
- CASING SPACER DETAIL -

CASING SPACERS ARE TO BE STAINLESS STEEL, OR POLYMER
COATED CARBON STEEL. STAINLESS STEEL IS NOT ALLOWED IF
GROUTING IS REQUIRED. SPACER BAND WIDTHS ARE TO BE 8"
CARRIER PIPES THROUGH 24" AND 21" FOR 26" AND LARGER.
RUNNERS ARE TO BE GLASS-FILLED POLYMER PLASTIC AND
LINER IS TO BE EPDM OR PVC.

NOTES:

1. CONTRACTOR'S FAILURE TO MAINTAIN THE CASING PIPE ON THE LINE AND GRADE AS SHOWN OR DIRECTED,
RESULTING IN THE USE OF ADDITIONAL PIPE AND/OR FITTINGS TO MAKE CONNECTIONS TO EXISTING WATER MAIN
WILL BE CAUSE FOR REJECTION OF CASING INSTALLATION.

*2. OUTSIDE DIAMETER OF BELL OF BOLTLESS RESTRAINED PIPE MAY VARY WITH MANUFACTURE,
THEREFORE, CONTRACTOR SHALL VERIFY D.D. OF BELL AND INCREASE SIZE OF STEEL CASING AS REQUIRED.



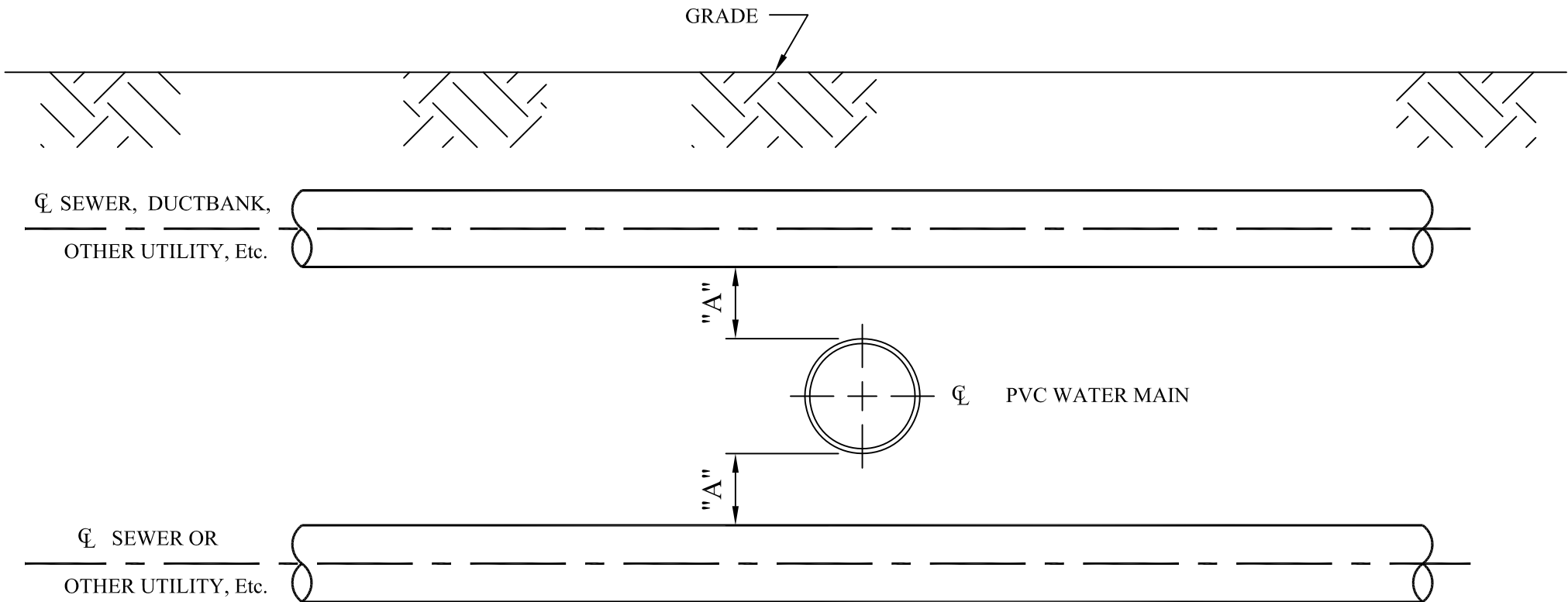
PLAN VIEW

- SEE STD-018 FOR PROFILE VIEW -

HORIZONTAL CLEARANCE	STORM SEWER	SANITARY SEWER	GAS, DUCTBANK, OTHER UTILITY, Etc.
"A"	10'-0" MIN.	10'-0" MIN.	5'-0" MIN.

HORIZONTAL CLEARANCE FOR UTILITIES

NOT TO SCALE



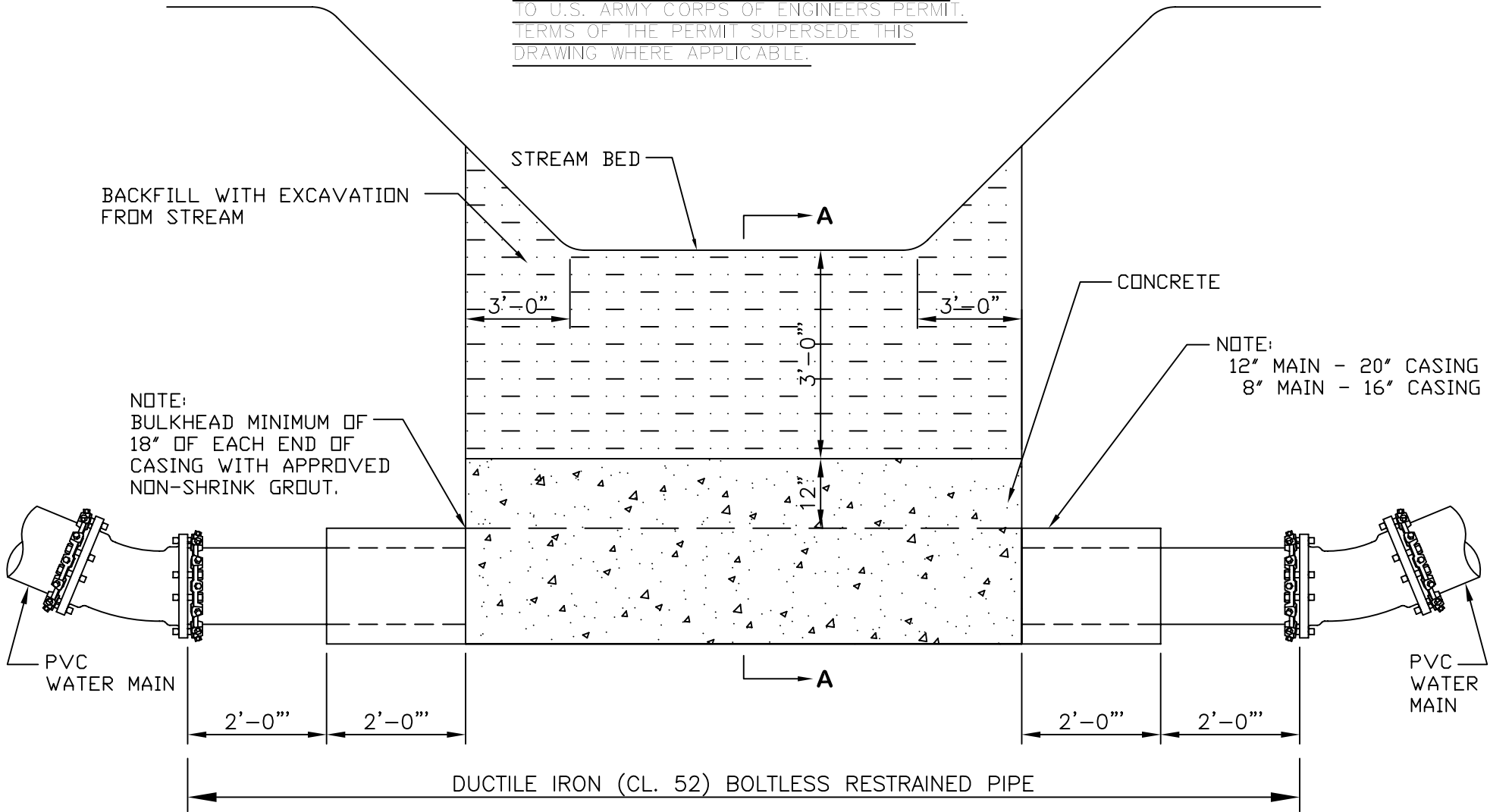
PROFILE VIEW
 - SEE PVC-017 FOR PLAN VIEW -

VERTICAL CLEARANCE	SANITARY SEWER LESS THAN 24"	SANITARY SEWER 24" & LARGER	STORM SEWER, DUCTBANK, GAS, OTHER UTILITY LESS THAN 24"	STORM SEWER, DUCTBANK, GAS, OTHER UTILITY 24" & LARGER	REMARKS
"A"	18" Min.	18" Min.	18" Min.	18" Min.	IF CANNOT ACHIEVE MIN. CLEARANCE WATER MAIN TO BE LOWERED

VERTICAL CLEARANCE FOR UTILITIES

NOT TO SCALE

NOTE: CONTRACTOR TO OBTAIN & ADHERE TO U.S. ARMY CORPS OF ENGINEERS PERMIT. TERMS OF THE PERMIT SUPERSEDE THIS DRAWING WHERE APPLICABLE.



CROSSING LARGE DITCHES OR SMALL STREAMS PROFILE - OPEN CUT METHOD

- NOT TO SCALE -

NOTE: BULKHEAD MINIMUM OF 18" OF EACH END OF CASING WITH APPROVED NON-SHRINK GROUT.

STREAM BED

VARIES

VARIES

BACKFILL WITH EXCAVATION FROM STREAM

NOTE: CONTRACTOR TO OBTAIN & ADHERE TO U.S. ARMY CORPS OF ENGINEERS PERMIT. TERMS OF THE PERMIT SUPERSEDE THIS DRAWING WHERE APPLICABLE.

NOTE: 12" MAIN - 20" CASING
8" MAIN - 16" CASING

CONCRETE

DUCTILE IRON (CL. 52)
BOLTLESS RESTRAINED PIPE

PRESSURE TREATED WOOD BLOCKING
BANDED TO DUCTILE IRON PIPE.
SEE CASING DETAIL FOR MORE DETAIL.

3'-0"

12"

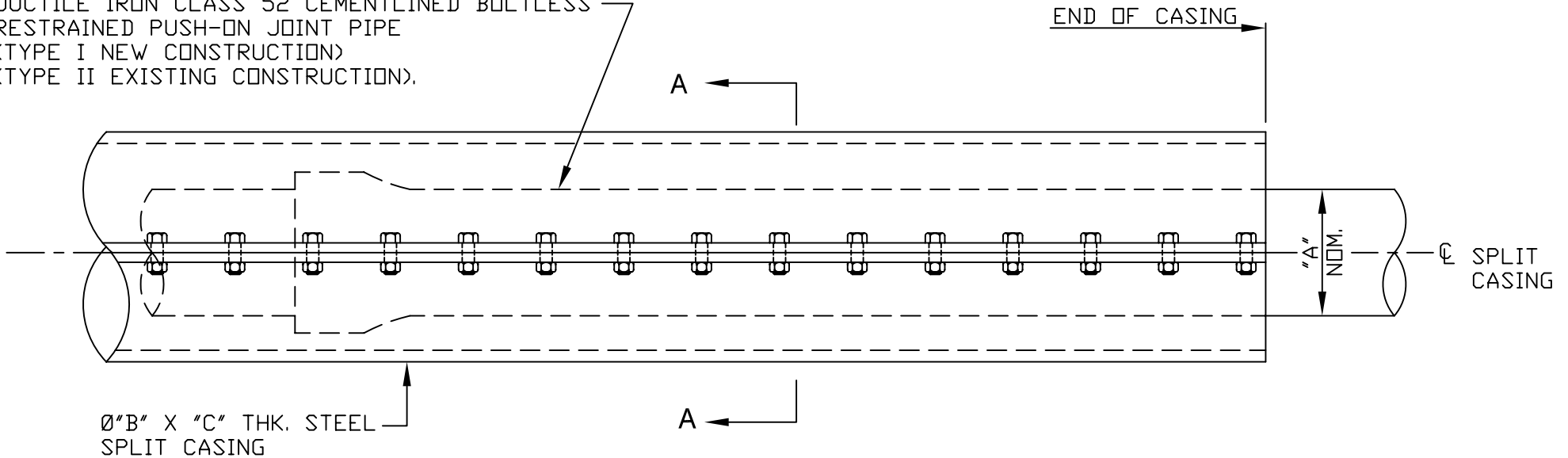
12"

12"

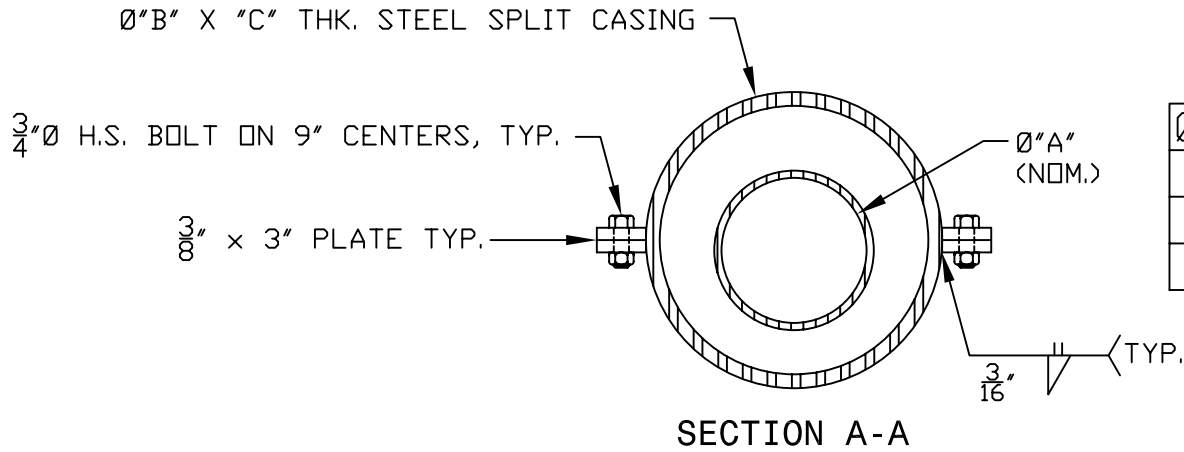
CROSSING LARGE DITCHES OR SMALL STREAMS SECTION A-A - OPEN CUT METHOD

- NOT TO SCALE -

DUCTILE IRON CLASS 52 CEMENTLINED BOLTLESS
RESTRAINED PUSH-ON JOINT PIPE
(TYPE I NEW CONSTRUCTION)
(TYPE II EXISTING CONSTRUCTION).



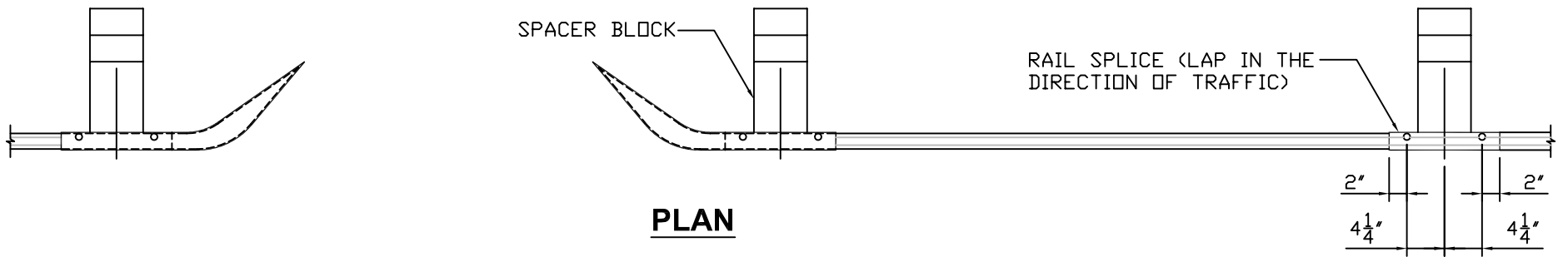
SEE STD-015 & STD-016 FOR DETAILED CASING INFORMATION.



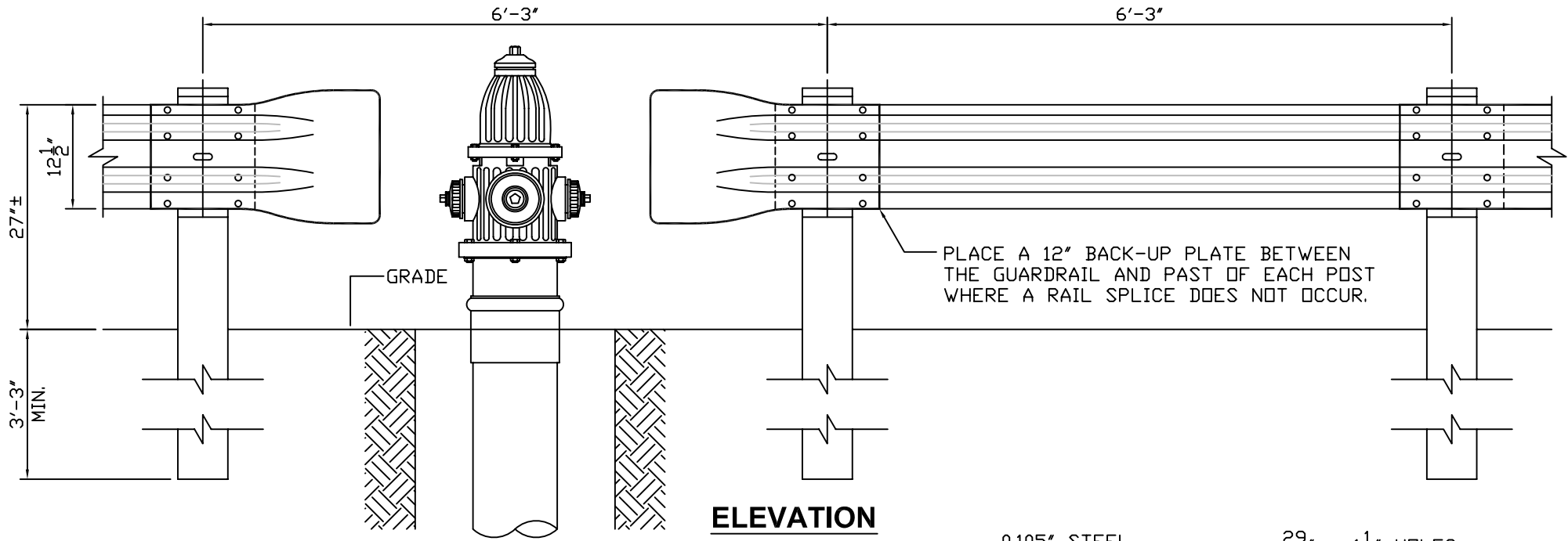
Ø" A"	Ø" B"	" C" THK.
8"	16"	3/8"
12"	20"	3/8"
16"	24"	1/2"

SPLIT CASING DETAIL

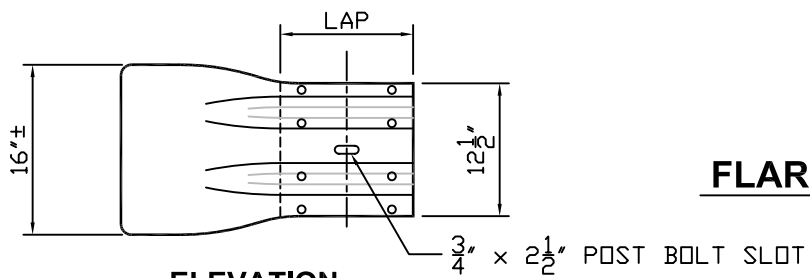
- NOT TO SCALE -



PLAN

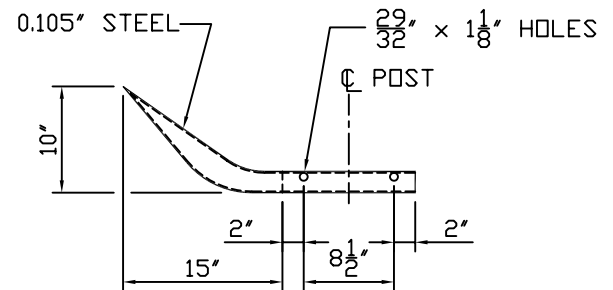


ELEVATION



ELEVATION

FLARED END SECTIONS



PLAN

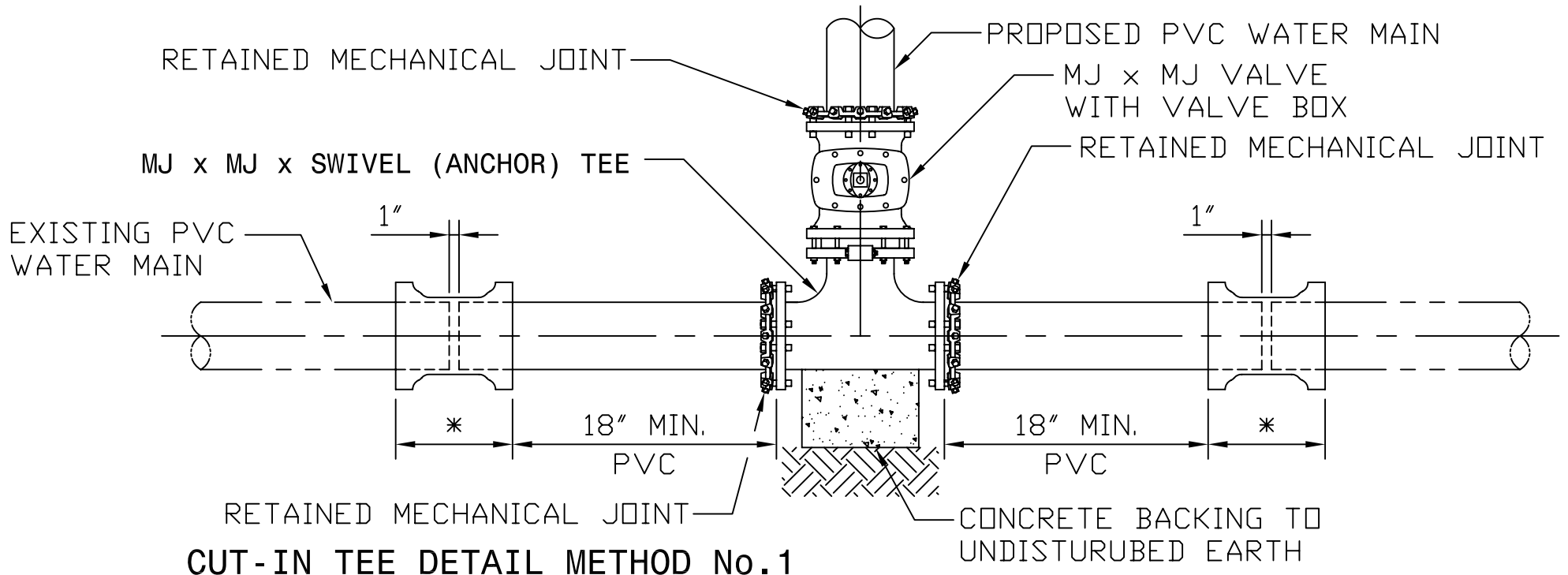
* CONNECTION SHALL BE MADE WITH RETAINED MECHANICAL JOINT SOLID SLEEVES (SHORT OR LONG PATTERN) DUCTILE IRON CLASS 350 OR CAST IRON CLASS 250 OR COMPRESSION COUPLINGS.

COMPRESSION COUPLINGS SHALL BE OF A GASKETED, SLEEVE TYPE WITH DIAMETERS TO PROPERLY FIT PLAIN END IRON PIPE. EACH COUPLING SHALL CONSIST OF ONE (1) MIDDLE RING, WITHOUT STOPS; TWO (2) FOLLOWER GLANDS; TWO (2) RUBBER-COMPOUND BUNA-N BLEND, WEDGE SECTION GASKETS; AND SUFFICIENT TRACKHEAD STAINLESS STEEL BOLTS AND NUTS (ASTM A276/A193/A194, TYPE 304, EXTRA HEAVY HEX) TO PROPERLY COMPRESS THE GASKETS.

MIDDLE RING AND FOLLOWER GLANDS SHALL BE OF EITHER STEEL OR DUCTILE IRON (ASTM-A536).

THE COMPRESSION COUPLING SHALL BE WITHOUT STOPS AND BE RATED FOR A MINIMUM WORKING PRESSURE OF 250 PSI AND SHALL BE EQUAL TO THE DRESSER STYLE No's 38, 138 OR 162 (TRANSITION TYPE), OR SMITH-BLAIR 441 STRAIGHT AND TRANSITION COUPLINGS.

ALL BOLTS AND NUTS ON ALL MECHANICAL JOINTS, INCLUDING THOSE ON THE "RETAINED" TYPE, SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINTING FOLLOWED BY AN ENCASEMENT OF POLYETHYLENE WRAPPING IN ACCORDANCE WITH ANSI/AWWA C-105/A21.5-88, CLASS "C", METHOD "B".



CUT-IN TEE DETAIL METHOD No. 1

* CONNECTION SHALL BE MADE WITH RETAINED MECHANICAL JOINT SOLID SLEEVES (SHORT OR LONG PATTERN) DUCTILE IRON CLASS 350 OR CAST IRON CLASS 250 OR COMPRESSION COUPLINGS.

COMPRESSION COUPLINGS SHALL BE OF A GASKETED, SLEEVE TYPE WITH DIAMETERS TO PROPERLY FIT PLAIN END IRON PIPE. EACH COUPLING SHALL CONSIST OF ONE (1) MIDDLE RING, WITHOUT STOPS; TWO (2) FOLLOWER GLANDS; TWO (2) RUBBER-COMPOUND BUNA-N BLEND, WEDGE SECTION GASKETS; AND SUFFICIENT TRACKHEAD STAINLESS STEEL BOLTS AND NUTS (ASTM A276/A193/194, TYPE 304, EXTRA HEAVY HEX) TO PROPERLY COMPRESS THE GASKETS.

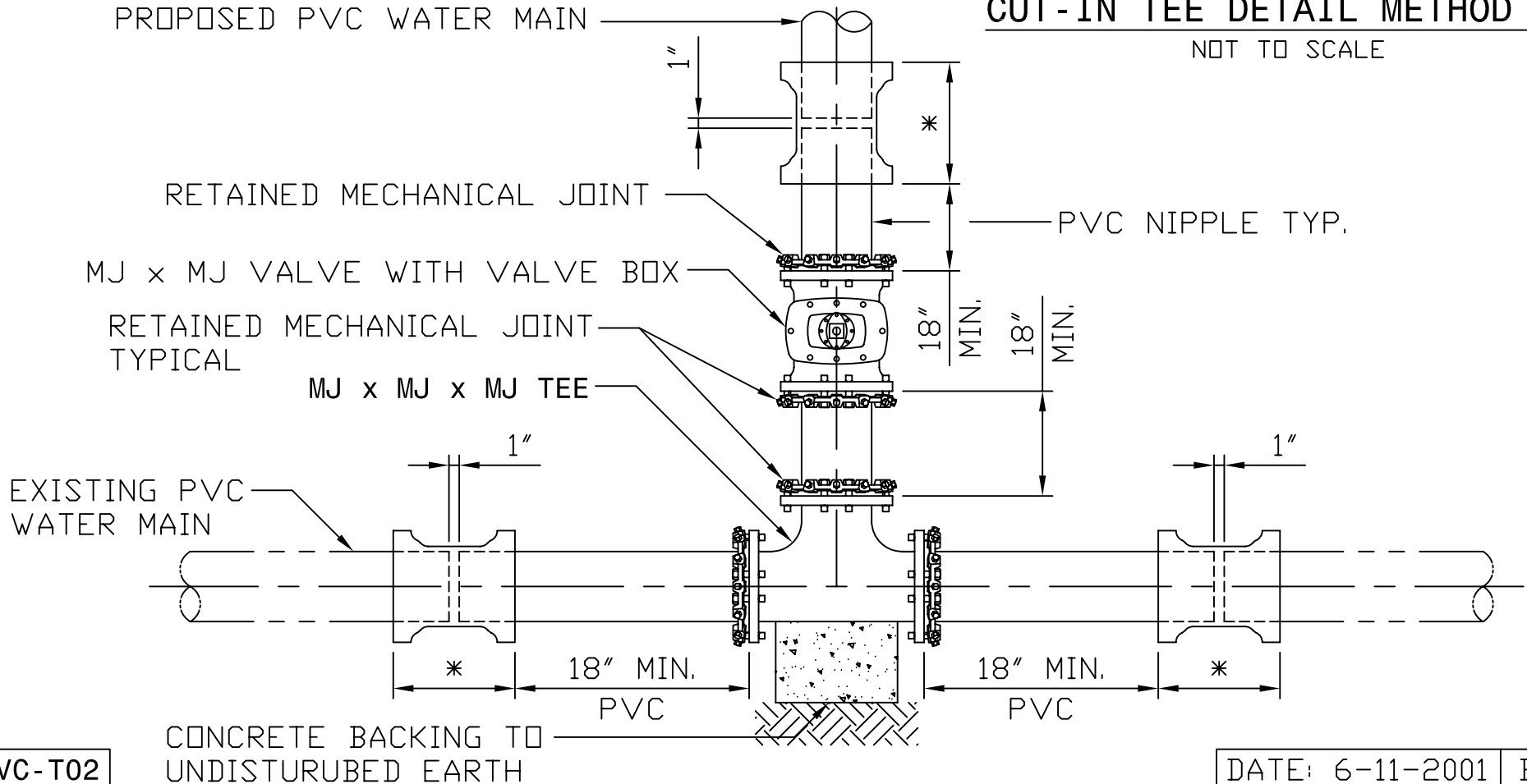
MIDDLE RING AND FOLLOWER GLANDS SHALL BE OF EITHER STEEL OR DUCTILE IRON (ASTM-A536).

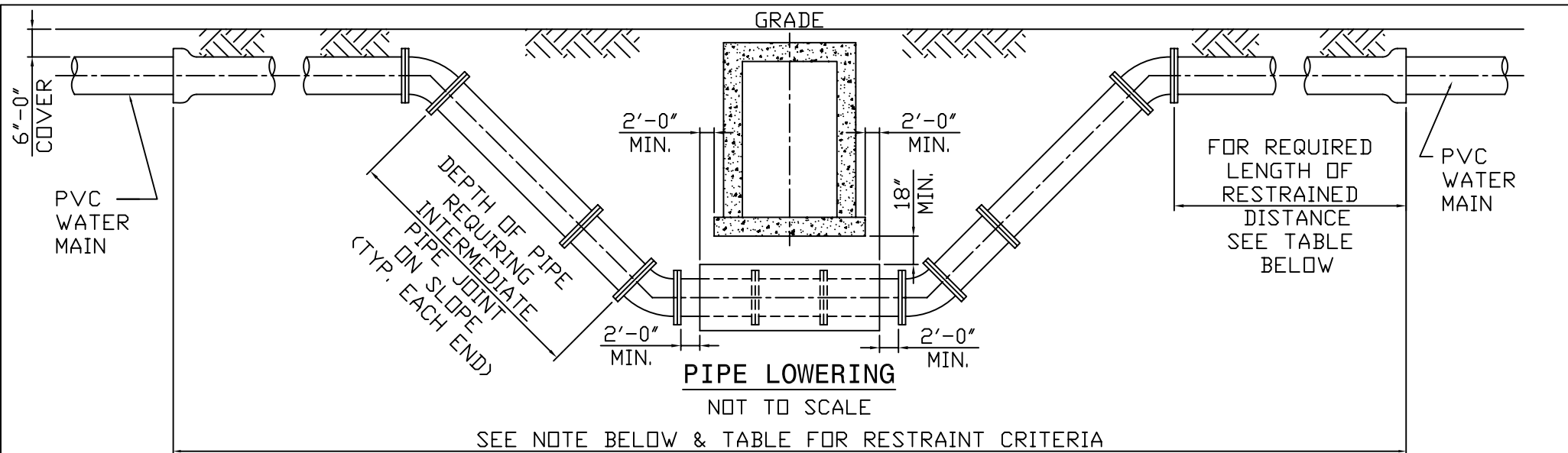
THE COMPRESSION COUPLING SHALL BE WITHOUT STOPS AND BE RATED FOR A MINIMUM WORKING PRESSURE OF 250 PSI AND SHALL BE EQUAL TO THE DRESSER STYLE No's 38, 138 OR 162 (TRANSITION TYPE), OR SMITH-BLAIR 441 STRAIGHT AND TRANSITION COUPLINGS.

ALL BOLTS AND NUTS ON ALL MECHANICAL JOINTS, INCLUDING THOSE ON THE "RETAINED" TYPE, SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINTING FOLLOWED BY AN ENCASEMENT OF POLYETHYLENE WRAPPING IN ACCORDANCE WITH ANSI/AWWA C-105/A21.5-88, CLASS "C", METHOD "B".

CUT-IN TEE DETAIL METHOD No. 2

NOT TO SCALE

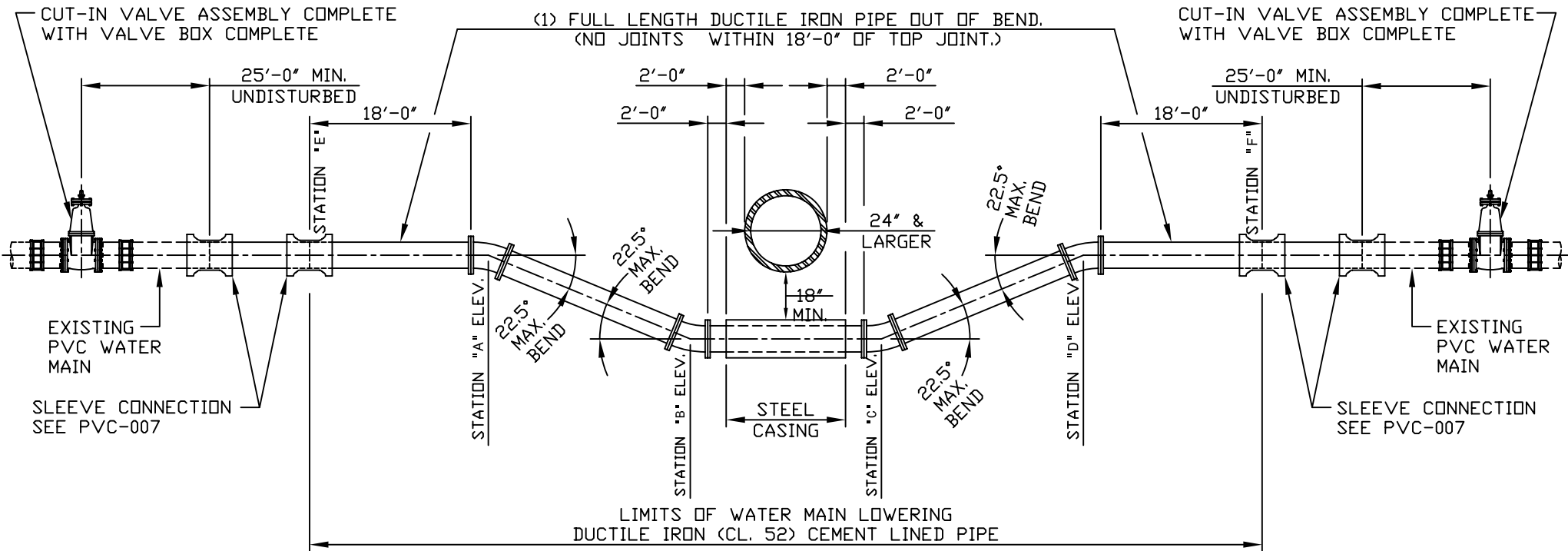




TO LOWER WATER MAIN TO CLEAR OBSTACLE WHERE DEPTH OF PIPE LOWERING REQUIRES AN INTERMEDIATE JOINT ON SLOPE THE ENTIRE OFFSET SHALL HAVE DUCTILE IRON CLASS 52 BOLTLESS RESTRAINED PUSH-ON JOINT PIPE & FITTINGS OR AWWA C-900 RJ PIPE. JOINT RESTRAINT SHALL EXTEND BEYOND TOP VERTICAL BEND TO THE LIMITS SHOWN IN TABLE.

① CALCULATIONS FOR RESTRAINED LENGTHS INCLUDE 75 PSI FOR TESTING.

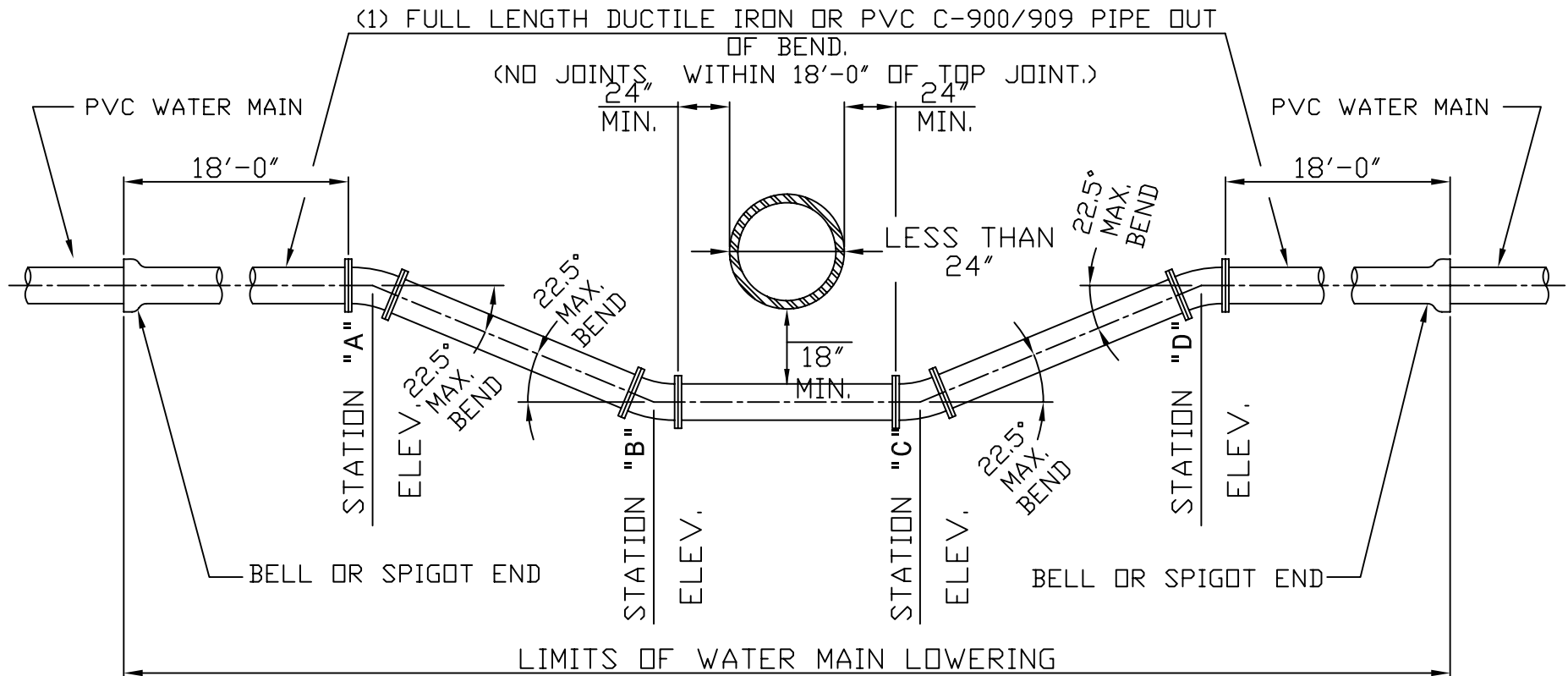
DIAMETER	BEND	STATIC PRESSURE ①	* RESTRAINED LENGTHS
8"	11°15'	0 to 275 PSI	ONE (1)
	22°30'	0 to 250 PSI	ONE (1)
		251 to 275 PSI	TWO (2)
	45°	0 to 125 PSI	ONE (1)
126 to 275 PSI		TWO (2)	
12"	11°15'	0 to 275 PSI	ONE (1)
	22°30'	0 to 165 PSI	ONE (1)
		216 to 275 PSI	TWO (2)
	45°	0 to 65 PSI	ONE (1)
		66 to 215 PSI	TWO (2)
		216 to 275 PSI	THREE (3)
16"	11°15'	0 to 275 PSI	ONE (1)
	22°30'	0 to 115 PSI	ONE (1)
		116 to 275 PSI	TWO (2)
	45°	0 to 45 PSI	ONE (1)
		46 to 165 PSI	TWO (2)
		166 to 275 PSI	THREE (3)



NOTE:

- 1) WATER MAIN LOWERING SHALL BE DUCTILE IRON, MINIMUM CLASS 52, CEMENT LINED PUSH-ON JOINT PIPE WITH RETAINED MECHANICAL JOINT DUCTILE IRON CLASS 350, CEMENT LINED FUSION BONDED EPOXY COATED RETAINED MECHANICAL JOINT FITTINGS.
- 2) WHERE DEPTH OF LOWERING REQUIRES AN INTERMEDIATE JOINT BETWEEN STATIONS "A" & "B" AND/OR "C" & "D" THE ENTIRE LOWERING SHALL BE MADE WITH DUCTILE IRON, MINIMUM CLASS 52, CEMENT LINED PIPE AND DUCTILE IRON CLASS 350, CEMENT LINED FITTINGS ALL HAVING BOLTLESS RESTRAINED PUSH-ON JOINTS, TYPE II.
- 3) WHERE LENGTH OF LOWERING UNDER OBSTRUCTION(S) REQUIRES AN INTERMEDIATE JOINT ONLY BETWEEN STATIONS "B" & "C", THAT INTERMEDIATE JOINT(S) SHALL BE MADE WITH A BOLTLESS RESTRAINED PUSH-ON JOINT, TYPE II.
- 4) WHERE EXISTING WATER MAIN IS SIX (6)-INCHES IN DIAMETER THE PIPE LOWERING SHALL BE MADE WITH PIPE AND FITTINGS NO LESS THAN EIGHT (8)-INCH IN DIAMETER WITH REDUCERS INSTALLED AT STATIONS "E" AND "F". THE REDUCERS SHALL BE RETAINED MECHANICAL JOINT WITH SMALL END OF REDUCER PLAIN END FOR CONNECTION WITH SLEEVES OR COMPRESSION COUPLINGS.
- 5) ALL EXISTING WATER SERVICE CONNECTIONS BETWEEN THE CUT-IN-VALVE ASSEMBLIES SHALL BE MAINTAINED BY "TEMPORARY SERVICE CONNECTIONS" PROVIDED AND MAINTAINED BY THE CONTRACTOR.
- 6) EXISTING WATER SERVICE CONNECTIONS NEEDED TO BE RETAPPED AND RECONNECTED WILL ONLY BE PERMITTED BETWEEN STATIONS "A" AND "E" AND STATIONS "D" AND "F". NO RETAPPING OF SERVICE CONNECTIONS WILL BE ALLOWED BETWEEN STATIONS "A" AND "D".

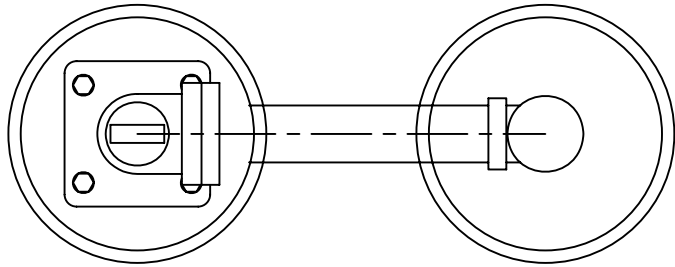
DETAIL FOR WATER MAIN LOWERING UNDER OBSTRUCTIONS 24" & LARGER IN DIAMETER OR WIDTH FOR "EXISTING CONSTRUCTION"



NOTE:

- 1) WATER MAIN SHALL BE DUCTILE IRON, MINIMUM CLASS 52, CEMENT LINED PUSH-ON JOINT PIPE WITH RETAINED MECHANICAL JOINT DUCTILE IRON CLASS 350, CEMENT LINED RETAINED MECHANICAL JOINT FITTINGS.
- 2) WHERE DEPTH OF LOWERING REQUIRES AN INTERMEDIATE JOINT BETWEEN STATIONS "A" & "B" AND/OR "C" & "D" THE ENTIRE LOWERING SHALL BE MADE WITH DUCTILE IRON, MINIMUM CLASS 52, CEMENT LINED PIPE AND DUCTILE IRON CLASS 350, CEMENT LINED FITTINGS ALL HAVING BOLTLESS RESTRAINED PUSH-ON JOINTS, TYPE I OR CERTA-LOK™ RESTRAINED JOINT SYSTEM BY CERTAINTEED.
- 3) WHERE LENGTH OF LOWERING UNDER OBSTRUCTION(S) REQUIRES AN INTERMEDIATE JOINT ONLY BETWEEN STATIONS "B" & "C", AND PIPE JOINTS ARE AS INDICATED IN NOTE "1" ABOVE, THAT INTERMEDIATE JOINT(S) SHALL BE MADE WITH A BOLTLESS RESTRAINED PUSH-ON JOINT, TYPE II OR CERTA-LOK™ RESTRAINED JOINT SYSTEM BY CERTAINTEED.
- 4) WHERE LENGTH OF LOWERING UNDER OBSTRUCTION(S) REQUIRES AN INTERMEDIATE JOINT ONLY BETWEEN "B" AND "C" AND PIPE JOINTS ARE AS INDICATED IN NOTE "2" ABOVE, THAT INTERMEDIATE JOINT(S) SHALL BE MADE WITH A BOLTLESS RESTRAINED PUSH-ON JOINT, TYPE I CERTA-LOK™ RESTRAINED JOINT SYSTEM BY CERTAINTEED.

**DETAIL FOR WATER MAIN LOWERING UNDER OBSTRUCTIONS
LESS THAN 24" IN DIAMETER OR WIDTH FOR "NEW CONSTRUCTION"**



GRADE OR
TOP OF
PAVEMENT

VALVE BOXES CUT
TOP TO SUIT

2" MALLEABLE
IRON COUPLING

8" MIN.

2" EXTRA STRONG
GALVANIZED BLACK
IRON PIPE LENGTH
BOTH ENDS THREADED

2" AIR RELIEF
ASSEMBLY,
SEE ENLARGED
DETAIL

2" TAPPING
SADDLE FOR
PVC WATER MAIN

2" GALVANIZED M.I.
90° STREET ELBOW
1/4" HOLE FOR DRIP

PLACE BRICK OR MORTAR
AROUND AIR RELIEF ASSEMBLY
TO SUPPORT VALVE BOX AND
TO STABILIZE THE GRAVEL

2" EXTRA STRONG
GALVANIZED BLACK
IRON PIPE LENGTH
BOTH ENDS THREADED

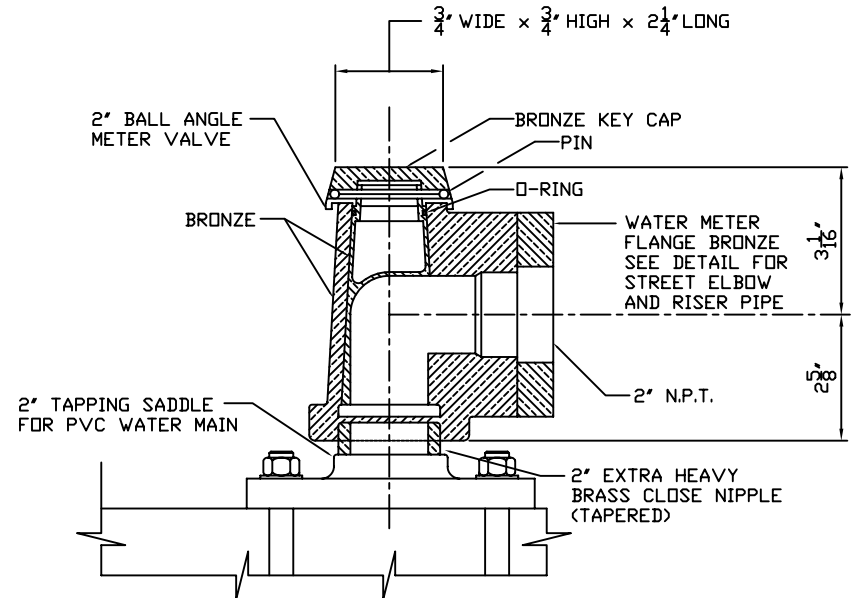
1 CU. FT. GRAVEL

∅ PVC WATER MAIN

PIPE DIAMETER

VARIABLE

DOUBLE VALVE BOX ASSEMBLY



3/4" WIDE x 3/4" HIGH x 2 1/4" LONG

2" BALL ANGLE
METER VALVE

BRONZE KEY CAP

PIN

O-RING

BRONZE

WATER METER
FLANGE BRONZE
SEE DETAIL FOR
STREET ELBOW
AND RISER PIPE

3 1/8"

2" TAPPING SADDLE
FOR PVC WATER MAIN

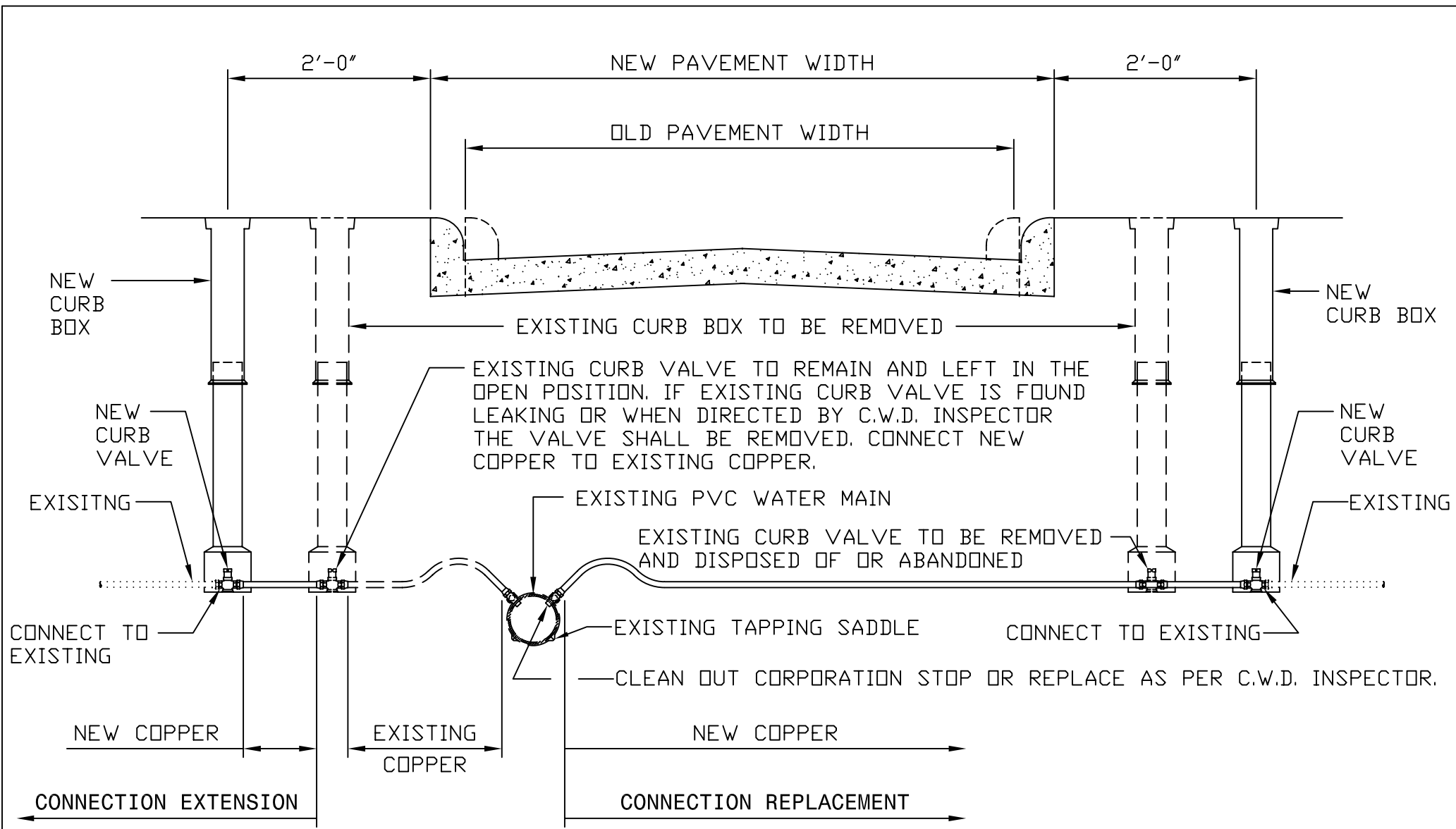
2" N.P.T.

2 5/8"

2" EXTRA HEAVY
BRASS CLOSE NIPPLE
(TAPERED)

AIR RELIEF VALVE ASSEMBLY

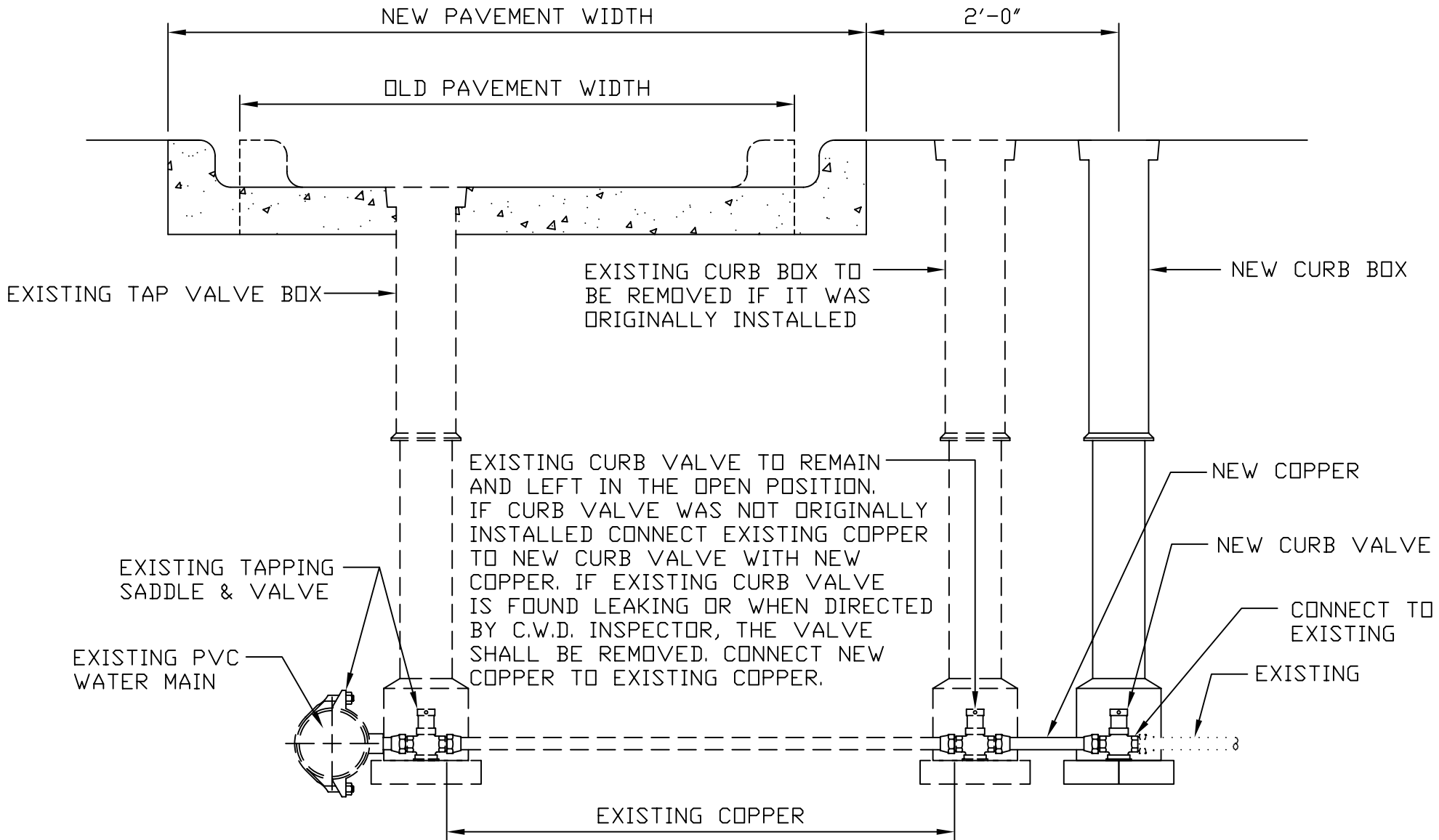
**2" AIR RELIEF/FLUSHING OUTLET VALVE
FOR PVC WATER MAINS**



NOTE: IF EXISTING SERVICE CONNECTION IS FOUND TO BE GALVANIZED OR LEAD REPLACE FROM CORPORATION STOP TO CURB VALVE.

WATER SERVICE CONNECTION EXTENSION OR REPLACEMENT FOR 1" & SMALLER

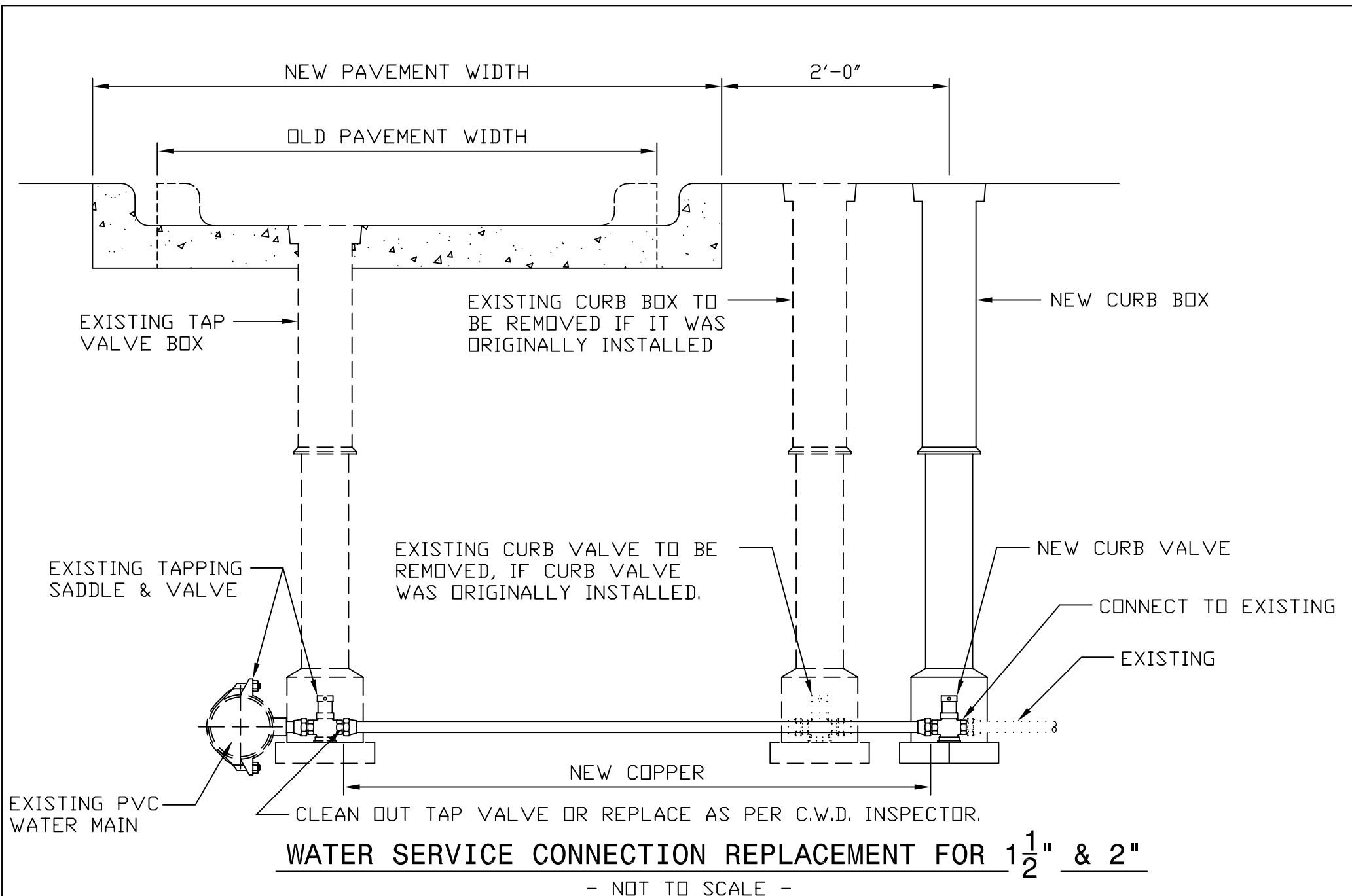
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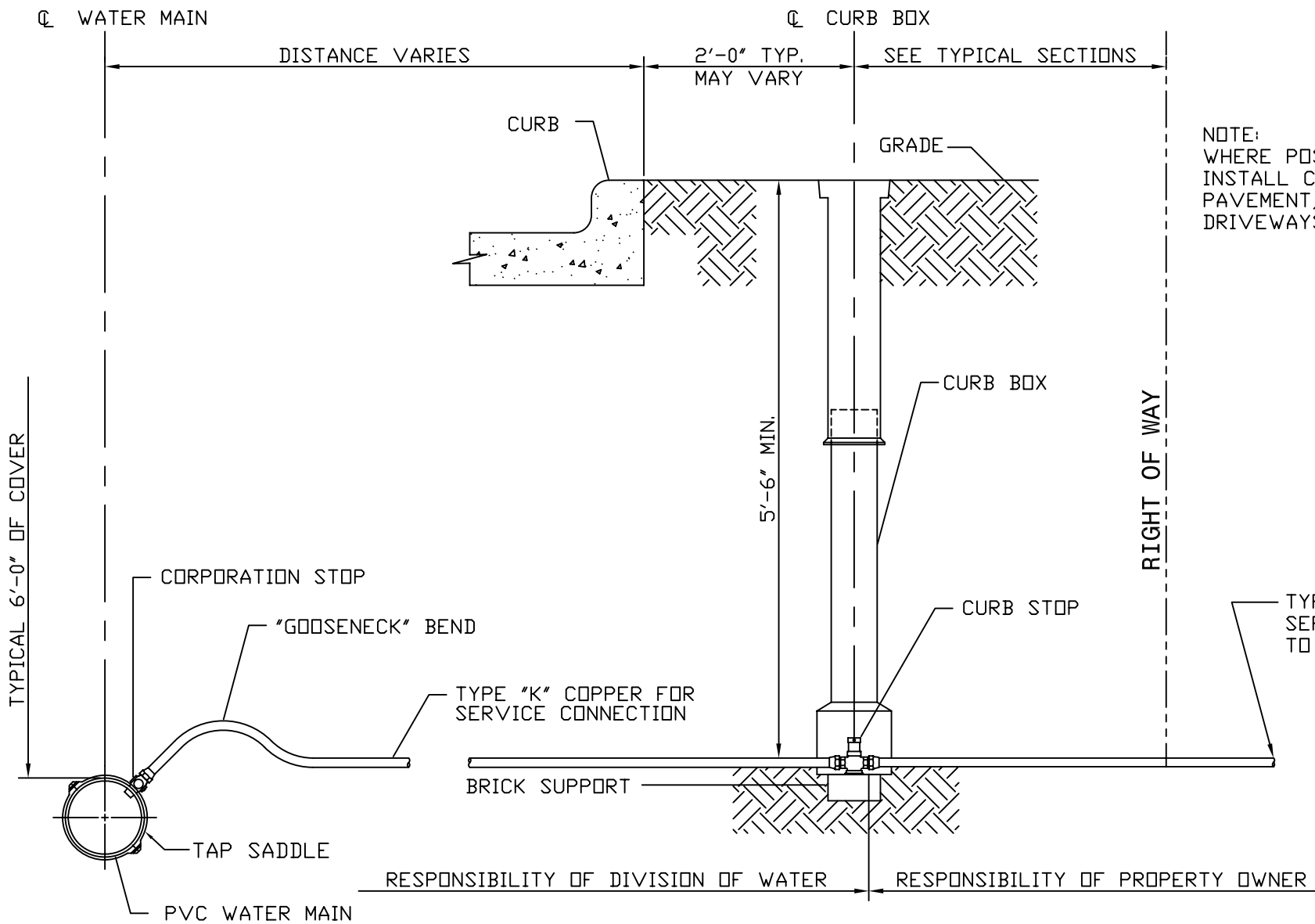


NOTE: IF EXISTING SERVICE CONNECTION IS FOUND TO BE GALVANIZED OR LEAD REPLACE FROM TAP VALVE TO CURB VALVE.

WATER SERVICE CONNECTION EXTENSION FOR 1 1/2" & 2"

- NOT TO SCALE -

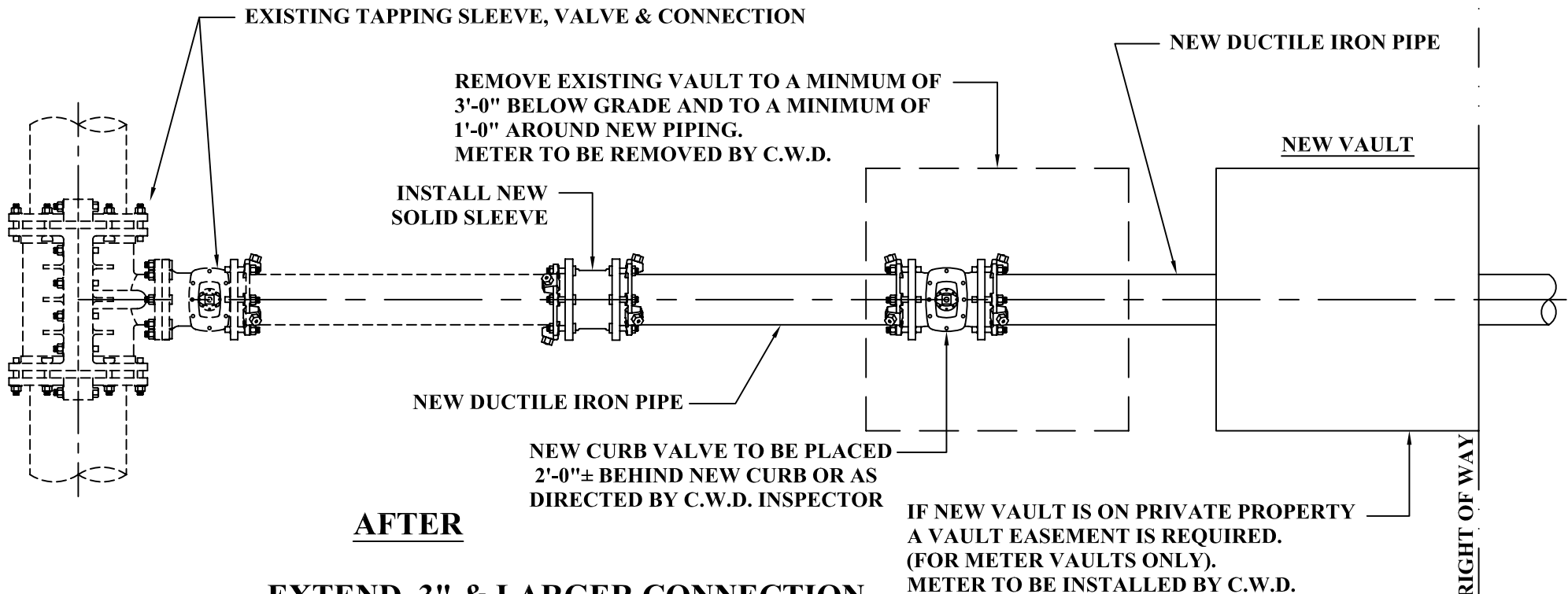
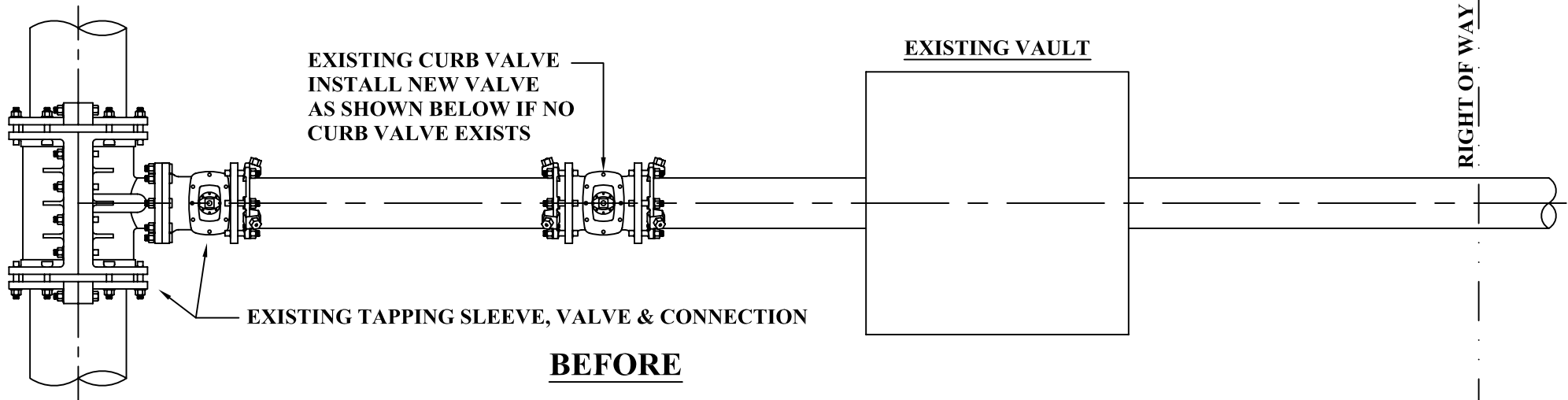




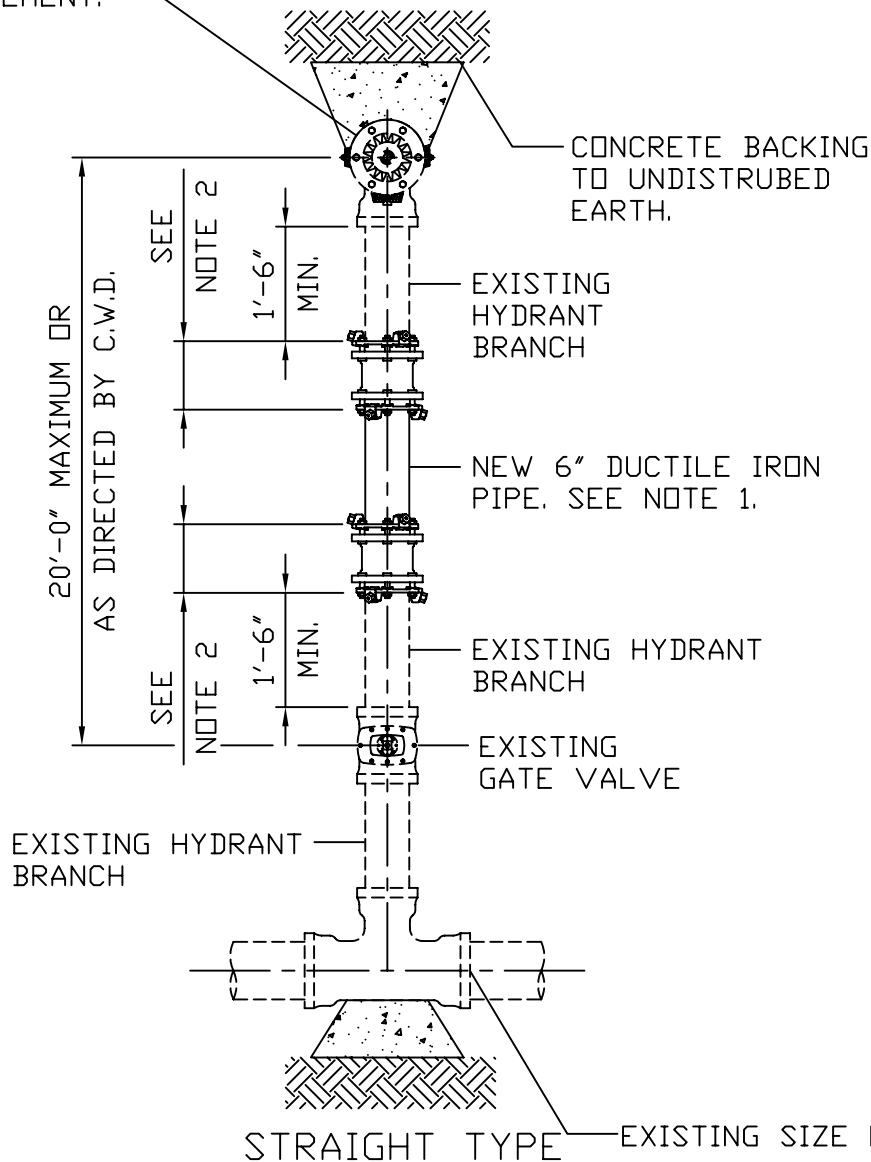
NOTE:
 WHERE POSSIBLE DO NOT
 INSTALL CURB BOX IN
 PAVEMENT, SIDEWALKS,
 DRIVEWAYS, APRONS.

NEW 1" SERVICE CONNECTION DETAIL IN PUBLIC RIGHT OF WAY

- NOT TO SCALE -



RELOCATED EXISTING 6" HYDRANT.
ADJUST HYDRANT TO GRADE TO MEET FIELD
CONDITIONS. TURN STEAMER NOZZLE TOWARD
PAVEMENT.



- 1) PLAIN END x PLAIN END DUCTILE IRON PIPE AS SPECIFIED (CUT TO SUIT).
- 2) CONNECTION SHALL BE MADE WITH RETAINED MECHANICAL JOINT SOLID SLEEVES (SHORT OR LONG PATTERN) DUCTILE IRON CLASS 350 OR CAST IRON CLASS 250 OR COMPRESSION COUPLINGS WITH ROD AND CLAMPS AS DIRECTED BY C.W.D. INSPECTOR.

COMPRESSION COUPLINGS SHALL BE OF A GASKETED, SLEEVE TYPE WITH DIAMETERS TO PROPERLY FIT PLAIN END IRON PIPE. EACH COUPLING SHALL CONSIST OF ONE (1) MIDDLE RING, WITHOUT STOPS; TWO (2) FOLLOWER GLANDS; TWO (2) RUBBER-COMPOUND BUNA-N BLEND, WEDGE SECTION GASKETS; AND SUFFICIENT TRACKHEAD STAINLESS STEEL BOLTS AND NUTS (ASTM A276/A193/194, TYPE 304, EXTRA HEAVY HEX) TO PROPERLY COMPRESS THE GASKETS.

MIDDLE RING AND FOLLOWER GLANDS SHALL BE OF EITHER STEEL OR DUCTILE IRON (ASTM-A536).

THE COMPRESSION COUPLING SHALL BE WITHOUT STOPS AND BE RATED FOR A MINIMUM WORKING PRESSURE OF 250 PSI AND SHALL BE EQUAL TO THE DRESSER STYLE No's 38, 138 OR 162 (TRANSITION TYPE), OR SMITH-BLAIR 441 STRAIGHT AND TRANSITION COUPLINGS.

IF THE BRANCH IS TO BE SHORTENED, USE ONLY (1) SLEEVE OR COUPLING WITH NO NEW PIPE REQUIRED.

- 3) ALL BOLTS AND NUTS ON ALL MECHANICAL JOINTS, INCLUDING THOSE ON THE "RETAINED" TYPE, SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINTING FOLLOWED BY AN ENCASEMENT OF POLYETHYLENE WRAPPING IN ACCORDANCE WITH ANSI/AWWA C-105/A21.5-88, CLASS "C", METHOD "B".
- 4) IF EXISTING HYDRANT IS DAMAGED, INSTALL NEW MECHANICAL JOINT HYDRANT.

EXTEND, SHORTEN AND ADJUST EXISTING 6" HYDRANT TO GRADE

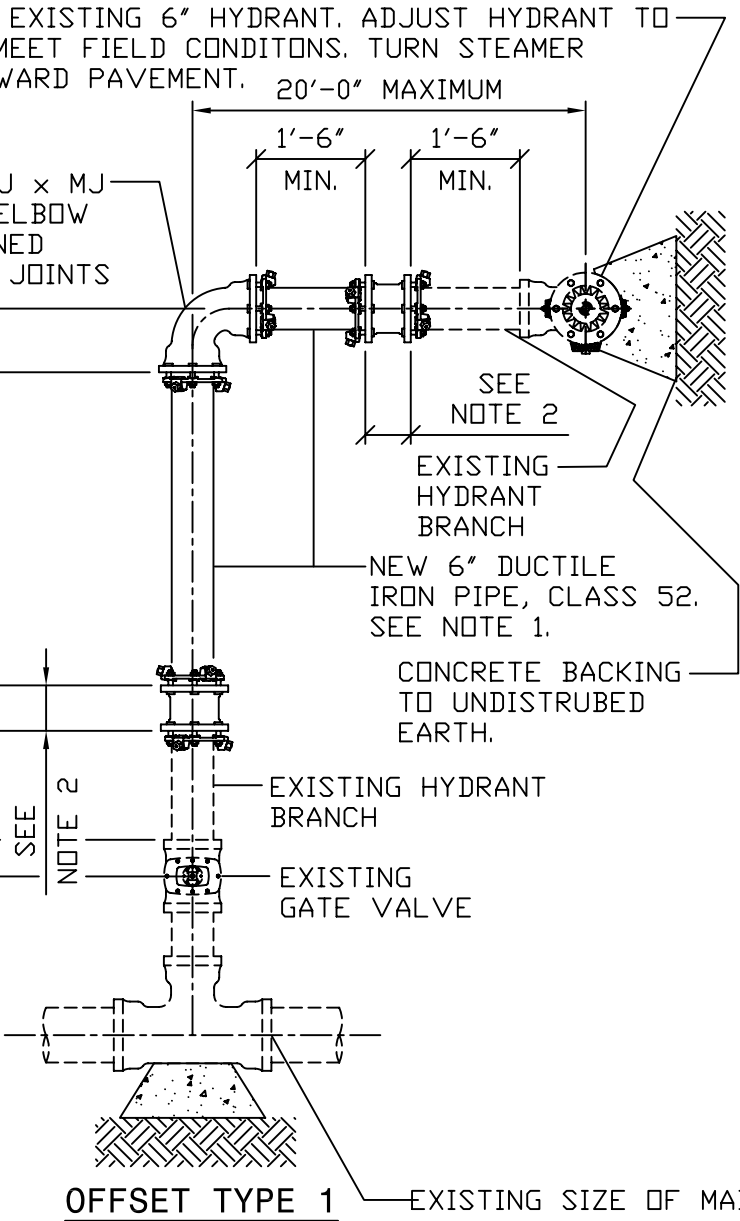
RELOCATED EXISTING 6" HYDRANT. ADJUST HYDRANT TO GRADE TO MEET FIELD CONDITIONS. TURN STEAMER NOZZLE TOWARD PAVEMENT. 20'-0" MAXIMUM

NEW 6" - MJ x MJ 90 DEGREE ELBOW WITH RETAINED MECHANICAL JOINTS

20'-0" MAXIMUM OR AS DIRECTED BY C.W.D.

1'-6" MIN.

1'-6" MIN.



1'-6" MIN.

1'-6" MIN.

SEE NOTE 2

EXISTING HYDRANT BRANCH

NEW 6" DUCTILE IRON PIPE, CLASS 52. SEE NOTE 1.

CONCRETE BACKING TO UNDISTURBED EARTH.

EXISTING HYDRANT BRANCH

EXISTING GATE VALVE

OFFSET TYPE 1

EXISTING SIZE OF MAIN x 6" TEE

EXTEND, SHORTEN AND ADJUST EXISTING 6" HYDRANT TO GRADE

- NOT TO SCALE -

1) PLAIN END x PLAIN END DUCTILE IRON PIPE AS SPECIFIED (CUT TO SUIT).

2) CONNECTION SHALL BE MADE WITH RETAINED MECHANICAL JOINT SOLID SLEEVES (SHORT OR LONG PATTERN) DUCTILE IRON CLASS 350 OR CAST IRON CLASS 250 OR COMPRESSION COUPLINGS WITH ROD AND CLAMPS AS DIRECTED BY C.W.D. INSPECTOR.

COMPRESSION COUPLINGS SHALL BE OF A GASKETED, SLEEVE TYPE WITH DIAMETERS TO PROPERLY FIT PLAIN END IRON PIPE. EACH COUPLING SHALL CONSIST OF ONE (1) MIDDLE RING, WITHOUT STOPS; TWO (2) FOLLOWER GLANDS; TWO (2) RUBBER-COMPOUND BUNA-N BLEND, WEDGE SECTION GASKETS; AND SUFFICIENT TRACKHEAD STAINLESS STEEL BOLTS AND NUTS (ASTM A276/A193/194, TYPE 304, EXTRA HEAVY HEX) TO PROPERLY COMPRESS THE GASKETS.

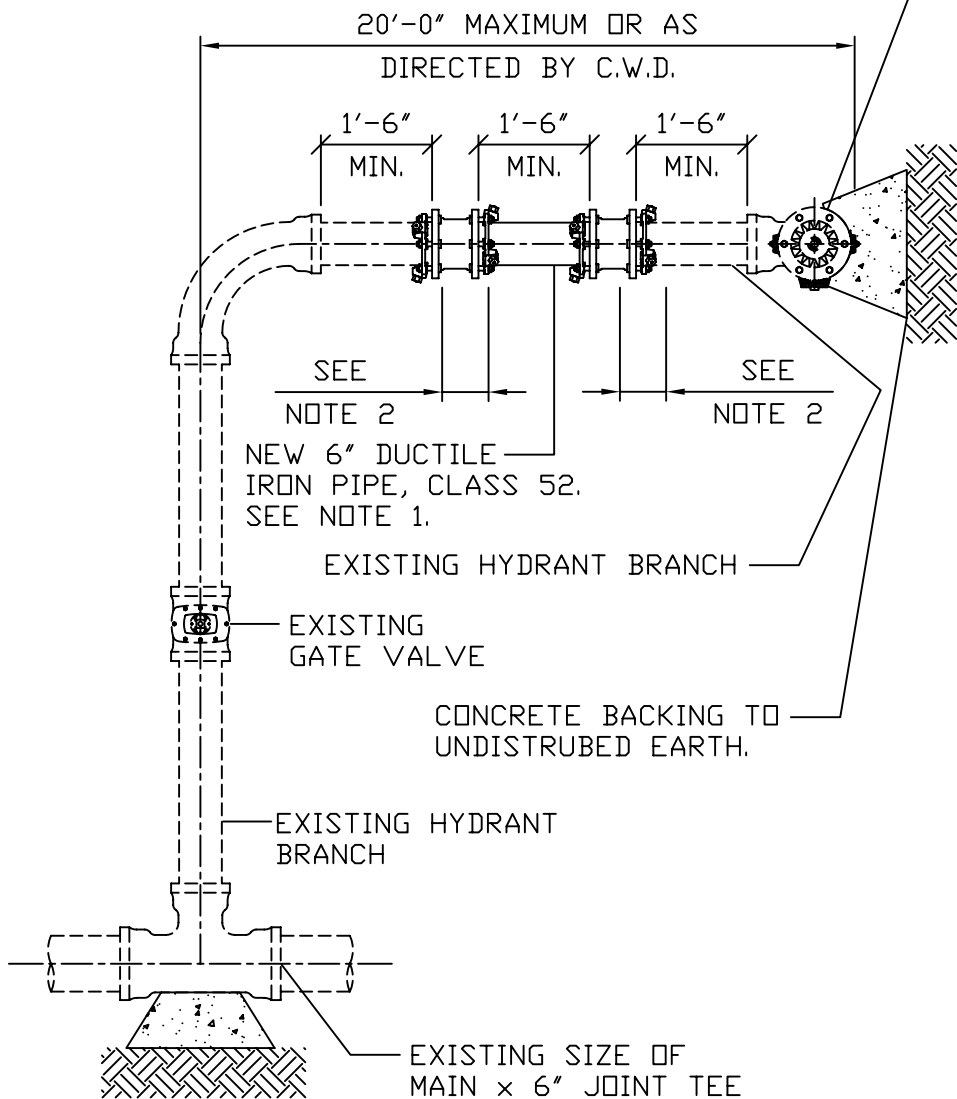
MIDDLE RING AND FOLLOWER GLANDS SHALL BE OF EITHER STEEL OR DUCTILE IRON (ASTM-A536).

THE COMPRESSION COUPLING SHALL BE WITHOUT STOPS AND BE RATED FOR A MINIMUM WORKING PRESSURE OF 250 PSI AND SHALL BE EQUAL TO THE DRESSER STYLE No's 38, 138 OR 162 (TRANSITION TYPE), OR SMITH-BLAIR 441 STRAIGHT AND TRANSITION COUPLINGS.

3) ALL BOLTS AND NUTS ON ALL MECHANICAL JOINTS, INCLUDING THOSE ON THE "RETAINED" TYPE, SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINTING FOLLOWED BY AN ENCASEMENT OF POLYETHYLENE WRAPPING IN ACCORDANCE WITH ANSI/AWWA C-105/A21.5-88, CLASS "C", METHOD "B".

4) IF EXISTING HYDRANT IS DAMAGED, INSTALL NEW MECHANICAL JOINT HYDRANT.

RELOCATED EXISTING 6" HYDRANT. ADJUST HYDRANT TO GRADE TO MEET FIELD CONDITIONS. TURN STEAMER NOZZLE TOWARD PAVEMENT.



- 1) PLAIN END x PLAIN END DUCTILE IRON PIPE AS SPECIFIED (CUT TO SUIT).
- 2) CONNECTION SHALL BE MADE WITH RETAINED MECHANICAL JOINT SOLID SLEEVES (SHORT OR LONG PATTERN) DUCTILE IRON CLASS 350 OR CAST IRON CLASS 250 OR COMPRESSION COUPLINGS WITH ROD END CLAMPS AS DIRECTED BY C.W.D. INSPECTOR.

COMPRESSION COUPLINGS SHALL BE OF A GASKETED, SLEEVE TYPE WITH DIAMETERS TO PROPERLY FIT PLAIN END IRON PIPE. EACH COUPLING SHALL CONSIST OF ONE (1) MIDDLE RING, WITHOUT STOPS; TWO (2) FOLLOWER GLANDS; TWO (2) RUBBER-COMPOUND BUNA-N BLEND, WEDGE SECTION GASKETS; AND SUFFICIENT TRACKHEAD STAINLESS STEEL BOLTS AND NUTS (ASTM A276/A193/194, TYPE 304, EXTRA HEAVY HEX) TO PROPERLY COMPRESS THE GASKETS.

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THE COMPRESSION COUPLING SHALL BE WITHOUT STOPS AND BE RATED FOR A MINIMUM WORKING PRESSURE OF 250 PSI AND SHALL BE EQUAL TO THE DRESSER STYLE No's 38, 138 OR 162 (TRANSITION TYPE), OR SMITH-BLAIR 441 STRAIGHT AND TRANSITION COUPLINGS.

IF THE BRANCH IS TO BE SHORTENED USE ONLY (1) SLEEVE OR COUPLING WITH NO NEW PIPE REQUIRED.

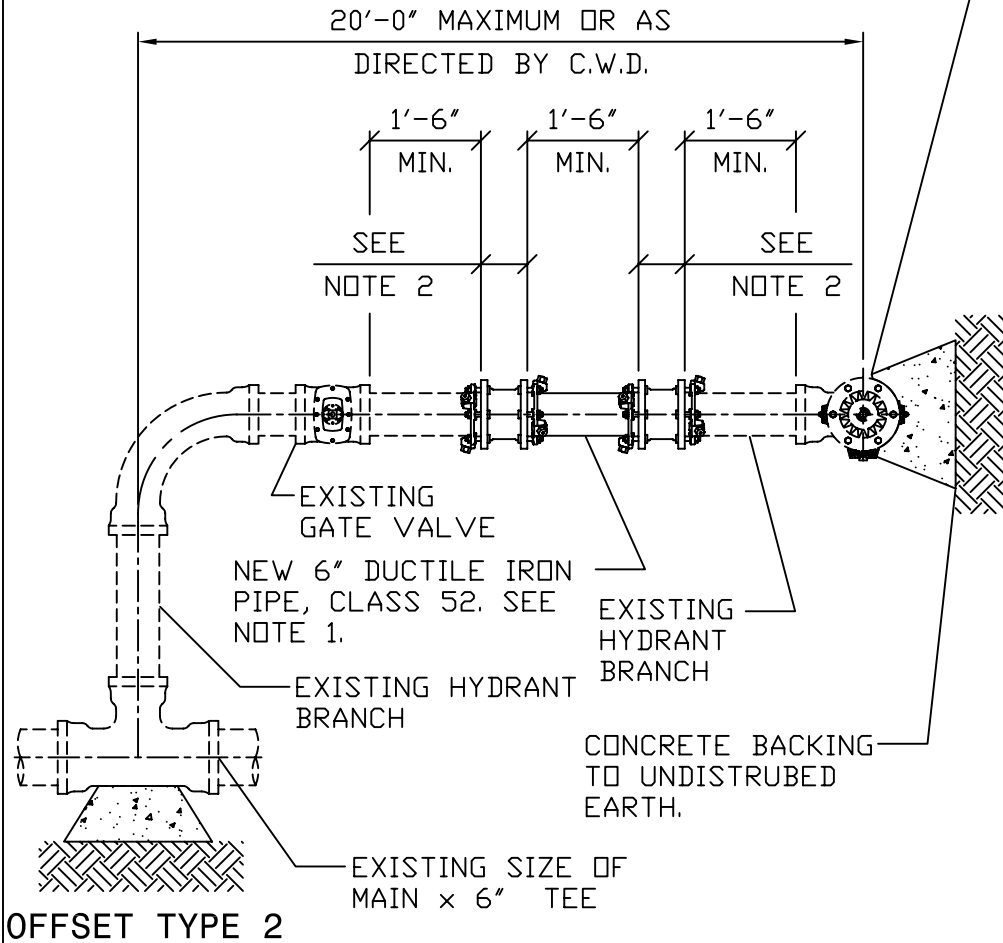
- 3) ALL BOLTS AND NUTS ON ALL MECHANICAL JOINTS, INCLUDING THOSE ON THE "RETAINED" TYPE, SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINTING FOLLOWED BY AN ENCASEMENT OF POLYETHYLENE WRAPPING IN ACCORDANCE WITH ANSI/AWWA C-105/A21.5-88, CLASS "C", METHOD "B".
- 4) IF EXISTING HYDRANT IS DAMAGED, INSTALL NEW MECHANICAL JOINT HYDRANT.

OFFSET TYPE 1

EXTEND, SHORTEN AND ADJUST EXISTING 6" HYDRANT TO GRADE

- NOT TO SCALE -

RELOCATED EXISTING 6" HYDRANT. ADJUST HYDRANT TO GRADE TO MEET FIELD CONDITIONS. TURN STEAMER NOZZLE TOWARD PAVEMENT.



- 1) PLAIN END x PLAIN END DUCTILE IRON PIPE AS SPECIFIED (CUT TO SUIT).
- 2) CONNECTION SHALL BE MADE WITH RETAINED MECHANICAL JOINT SOLID SLEEVES (SHORT OR LONG PATTERN) DUCTILE IRON CLASS 350 OR CAST IRON CLASS 250 OR COMPRESSION COUPLINGS WITH ROD AND CLAMPS AS DIRECTED BY C.W.D. INSPECTOR.

COMPRESSION COUPLINGS SHALL BE OF A GASKETED, SLEEVE TYPE WITH DIAMETERS TO PROPERLY FIT PLAIN END IRON PIPE. EACH COUPLING SHALL CONSIST OF ONE (1) MIDDLE RING, WITHOUT STOPS; TWO (2) FOLLOWER GLANDS; TWO (2) RUBBER-COMPOUND BUNA-N BLEND, WEDGE SECTION GASKETS; AND SUFFICIENT TRACKHEAD STAINLESS STEEL BOLTS AND NUTS (ASTM A276/A193/194, TYPE 304, EXTRA HEAVY HEX) TO PROPERLY COMPRESS THE GASKETS.

MIDDLE RING AND FOLLOWER GLANDS SHALL BE OF EITHER STEEL OR DUCTILE IRON (ASTM-A536).

THE COMPRESSION COUPLING SHALL BE WITHOUT STOPS AND BE RATED FOR A MINIMUM WORKING PRESSURE OF 250 PSI AND SHALL BE EQUAL TO THE DRESSER STYLE No's 38, 138 OR 162 (TRANSITION TYPE), OR SMITH-BLAIR 441 STRAIGHT AND TRANSITION COUPLINGS.

IF THE BRANCH IS TO BE SHORTENED USE ONLY (1) SLEEVE OR COUPLING WITH NO NEW PIPE REQUIRED.

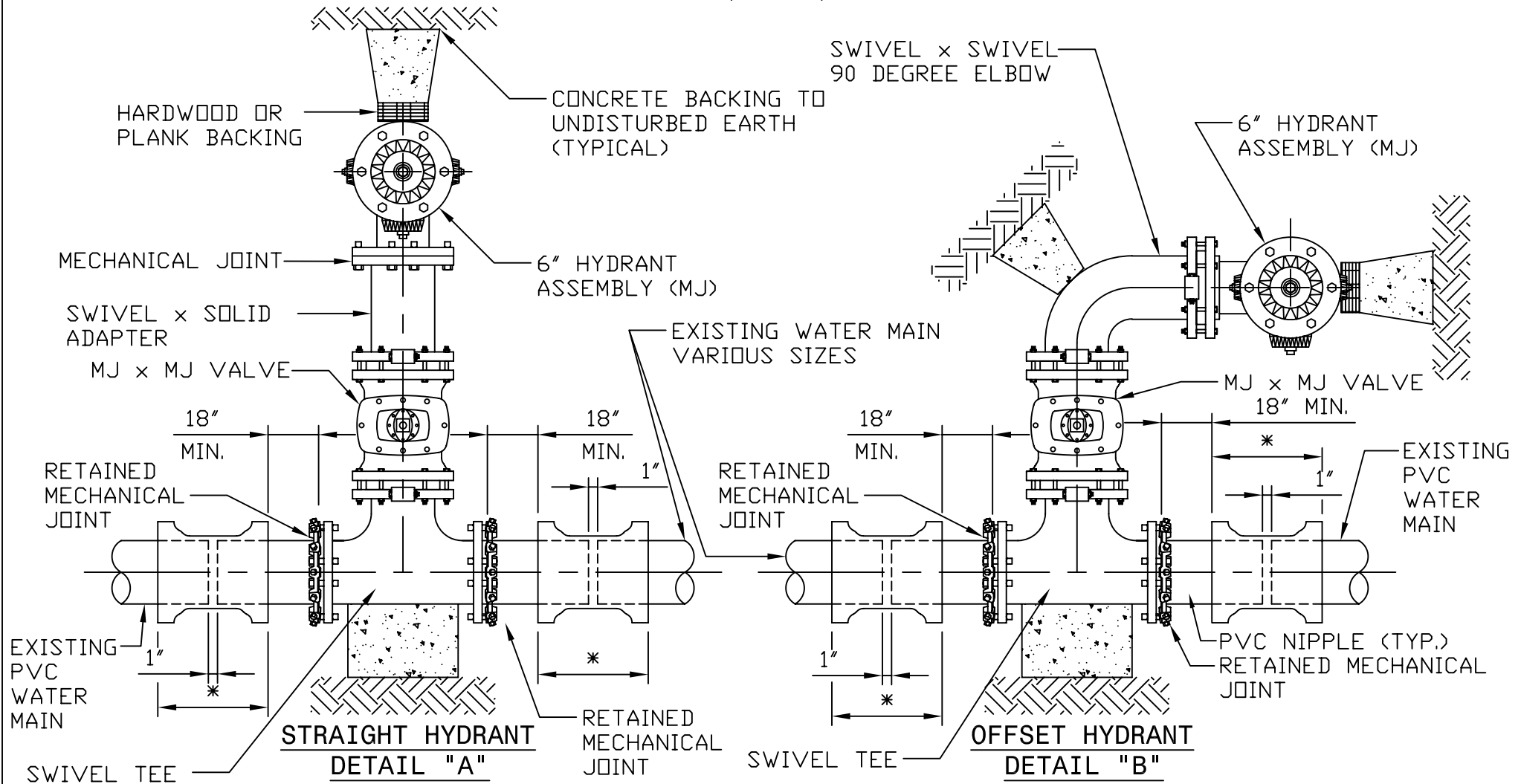
- 3) ALL BOLTS AND NUTS ON ALL MECHANICAL JOINTS, INCLUDING THOSE ON THE "RETAINED" TYPE, SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINTING FOLLOWED BY AN ENCASEMENT OF POLYETHYLENE WRAPPING IN ACCORDANCE WITH ANSI/AWWA C-105/A21.5-88, CLASS "C", METHOD "B".

- 4) IF EXISTING HYDRANT IS DAMAGED, INSTALL NEW MECHANICAL JOINT HYDRANT.

EXTEND, SHORTEN AND ADJUST EXISTING 6" HYDRANT TO GRADE

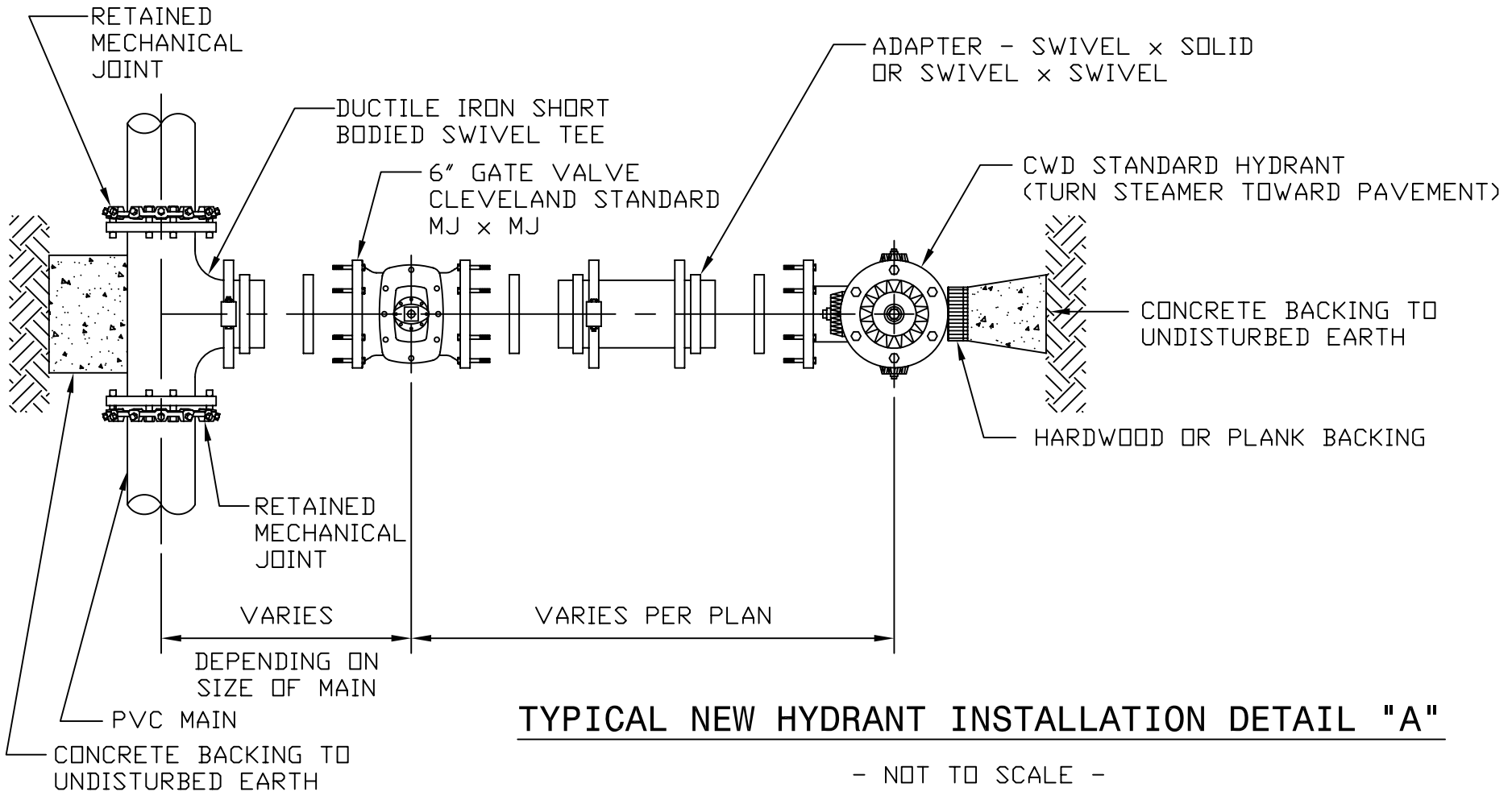
- NOT TO SCALE -

*CONNECTION SHALL BE MADE WITH RETAINED MECHANICAL JOINT SOLID SLEEVES (SHORT OR LONG PATTERN) DUCTILE IRON CLASS 350 OR CAST IRON CLASS 250 OR COMPRESSION COUPLINGS. COMPRESSION COUPLINGS SHALL BE OF A GASKETED, SLEEVE TYPE WITH DIAMETERS TO PROPERLY FIT PLAIN END PVC PIPE. EACH COUPLING SHALL CONSIST OF ONE (1) MIDDLE RING, WITHOUT STOPS; TWO (2) FOLLOWER GLANDS; TWO (2) RUBBER-COMPOUND BUNA-N BLEND, WEDGE SECTION GASKETS; AND SUFFICIENT TRACKHEAD STAINLESS STEEL BOLTS AND NUTS (ASTM A276/A193/194, TYPE 304, EXTRA HEAVY HEX) TO PROPERLY COMPRESS THE GASKETS. MIDDLE RING AND FOLLOWER GLANDS SHALL BE OF EITHER STEEL OR DUCTILE IRON (ASTM-A536). THE COMPRESSION COUPLING SHALL BE WITHOUT STOPS AND BE RATED FOR A MINIMUM WORKING PRESSURE OF 250 PSI AND SHALL BE EQUAL TO THE DRESSER STYLE No's 38, 138 OR 162 (TRANSITION TYPE), OR SMITH-BLAIR 441 STRAIGHT AND TRANSITION COUPLINGS. ROD AND CLAMP COMPRESSION COUPLING AS DIRECTED BY C.W.D. INSPECTOR. ALL BOLTS AND NUTS ON ALL MECHANICAL JOINTS, INCLUDING THOSE ON THE 'RETAINED' TYPE, SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINTING FOLLOWED BY AN ENCASEMENT OF POLYETHYLENE WRAPPING IN ACCORDANCE WITH ANSI/AWWA C-105/A21.5-88, CLASS 'C', METHOD 'B'.



CUT-IN TEE FOR NEW HYDRANT INSTALLATION ON EXISTING WATER MAIN

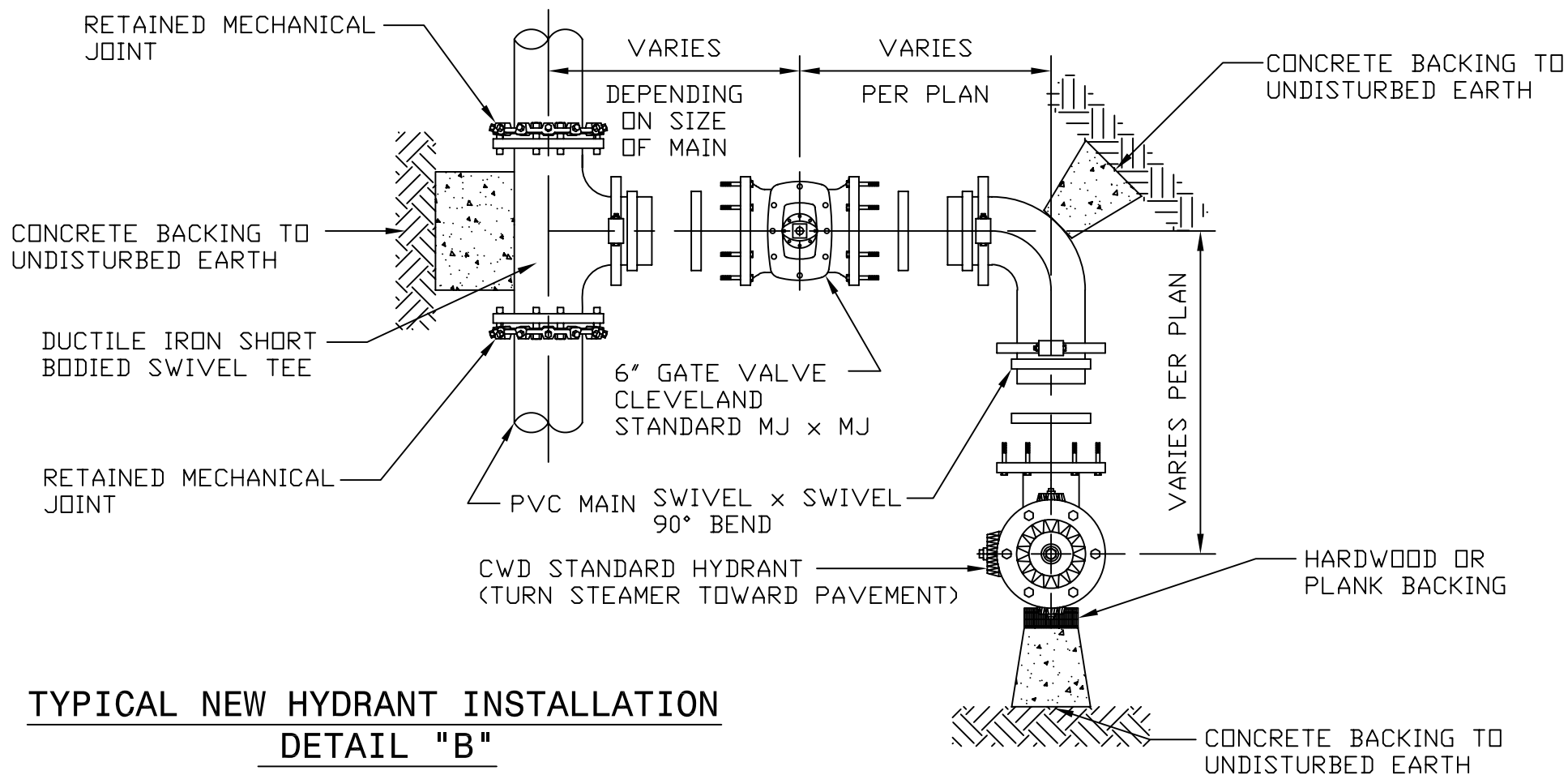
FOR EXPLODED VIEW OF HYDRANT BRANCH SEE (PVC-H09 OR PVC-H10).



NOTE: ALL MATERIAL SHALL BE DUCTILE IRON (CL. 52) CEMENT LINED PIPE.

IN LIEU OF SWIVEL BRANCH TEES AND ADAPTERS CONTRACTORS MAY FURNISH HYDRANT BRANCHES HAVING RETAINED MECHANICAL JOINTS INCLUDING HYDRANT SHOE. ALL MECHANICAL JOINTS SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINT. ALL MECHANICAL JOINTS SHALL BE POLYETHYLENE WRAPPED IN ACCORDANCE WITH AWWA C-1-5/A21.5-88 CLASS "C" METHOD "B".

ALL BOLTS AND NUTS FURNISHED WITH RETAINED MECHANICAL JOINTS INCLUDING RETAINER OR WEDGE ACTION TYPE GLANDS SHALL BE COPPER-BEARING DUCTILE IRON, OR EQUIVALENT HIGH STRENGTH, LOW ALLOY CORROSION RESISTANT STEEL.



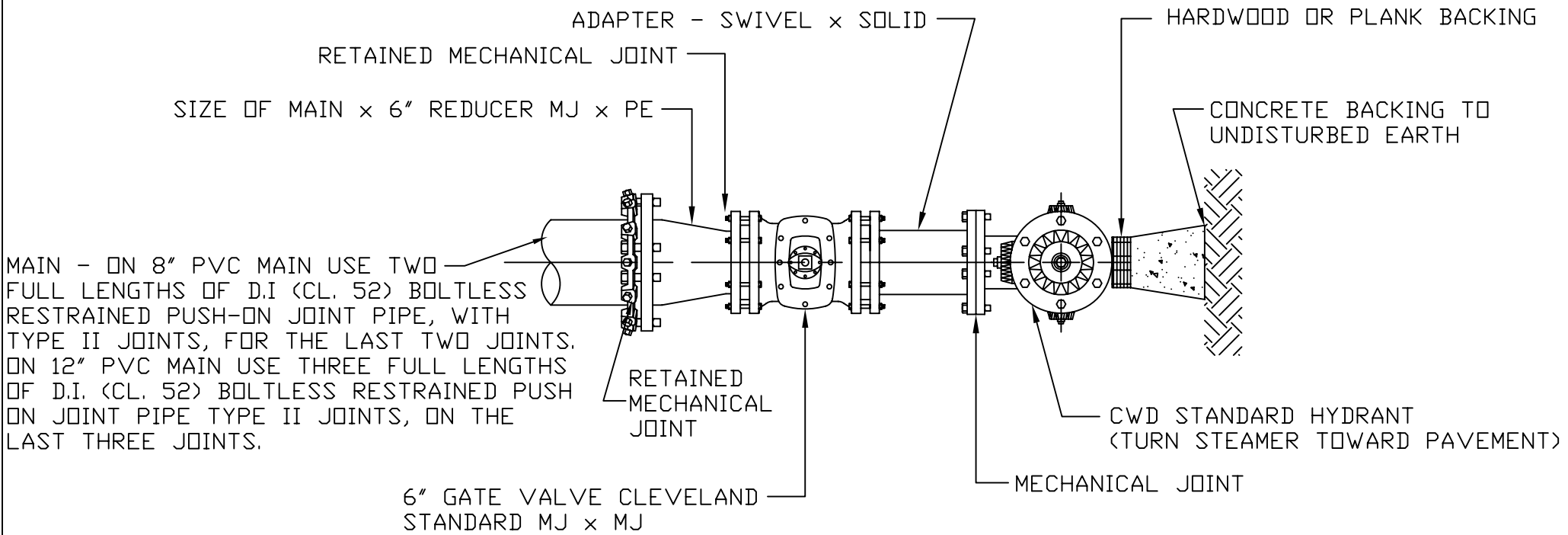
TYPICAL NEW HYDRANT INSTALLATION DETAIL "B"

- NOT TO SCALE -

NOTE: ALL MATERIAL SHALL BE DUCTILE IRON (CL. 52) CEMENT LINED PIPE.

IN LIEU OF SWIVEL BRANCH TEES AND ADAPTERS CONTRACTORS MAY FURNISH HYDRANT BRANCHES HAVING RETAINED MECHANICAL JOINTS INCLUDING HYDRANT SHOE. ALL MECHANICAL JOINTS SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINT. ALL MECHANICAL JOINTS SHALL BE POLYETHYLENE WRAPPED IN ACCORDANCE WITH AWWA C-1-5/A21.5-88 CLASS "C" METHOD "B".

ALL BOLTS AND NUTS FURNISHED WITH RETAINED MECHANICAL JOINTS INCLUDING RETAINER OR WEDGE ACTION TYPE GLANDS SHALL BE COPPER-BEARING DUCTILE IRON, OR EQUIVALENT HIGH STRENGTH, LOW ALLOY CORROSION RESISTANT STEEL.



TYPICAL NEW HYDRANT INSTALLATION DETAIL "C"

NOT TO SCALE

NOTE: ALL MATERIAL SHALL BE DUCTILE IRON (CL. 52) CEMENT LINED PIPE.

IN LIEU OF SWIVEL BRANCH TEES AND ADAPTERS CONTRACTORS MAY FURNISH HYDRANT BRANCHES HAVING RETAINED MECHANICAL JOINTS INCLUDING HYDRANT SHOE. ALL MECHANICAL JOINTS SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINT. ALL MECHANICAL JOINTS SHALL BE POLYETHYLENE WRAPPED IN ACCORDANCE WITH AWWA C-1-5/A21.5-88 CLASS "C" METHOD "B".

ALL BOLTS AND NUTS FURNISHED WITH RETAINED MECHANICAL JOINTS INCLUDING RETAINER OR WEDGE ACTION TYPE GLANDS SHALL BE COPPER-BEARING DUCTILE IRON, OR EQUIVALENT HIGH STRENGTH, LOW ALLOY CORROSION RESISTANT STEEL.

NOTE:
 IN LIEU OF SWIVEL BRANCH TEES AND ADAPTERS CONTRACTORS MAY FURNISH HYDRANT BRANCHES HAVING RETAINED MECHANICAL JOINTS INCLUDING HYDRANT SHOE. ALL MECHANICAL JOINTS SHALL HAVE FIELD APPLIED ONE (1) COAT OF BITUMASTIC PAINT. ALL MECHANICAL JOINTS SHALL BE POLYETHYLENE WRAPPED IN ACCORDANCE WITH AWWA C-1-5/A21.5-88 CLASS "C" METHOD "B".

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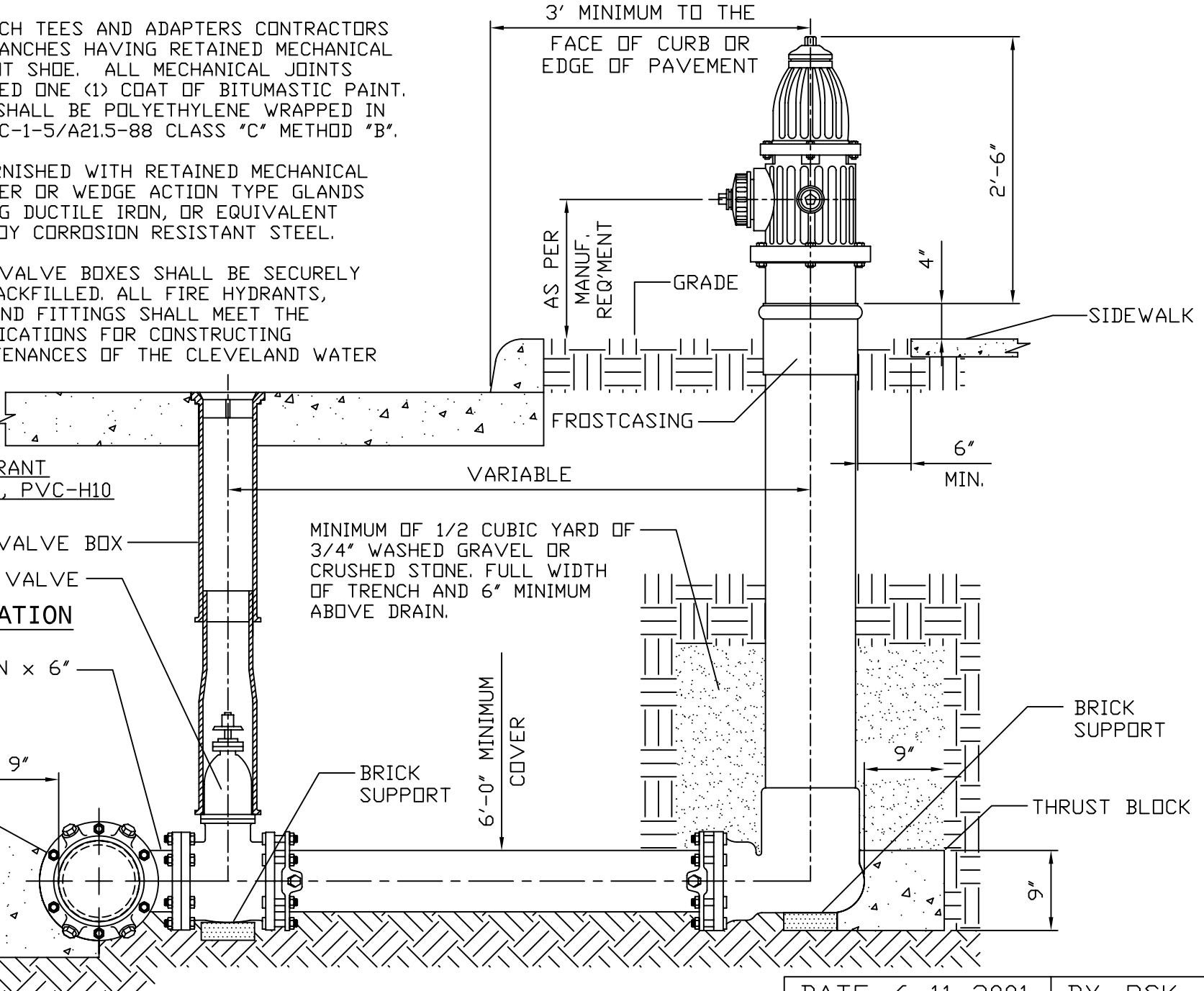
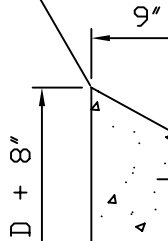
ALL FIRE HYDRANTS AND VALVE BOXES SHALL BE SECURELY BRACED WHEN SET AND BACKFILLED. ALL FIRE HYDRANTS, VALVES, VALVE BOXES AND FITTINGS SHALL MEET THE LATEST STANDARD SPECIFICATIONS FOR CONSTRUCTING WATER MAINS AND APPURTENANCES OF THE CLEVELAND WATER DEPARTMENT.

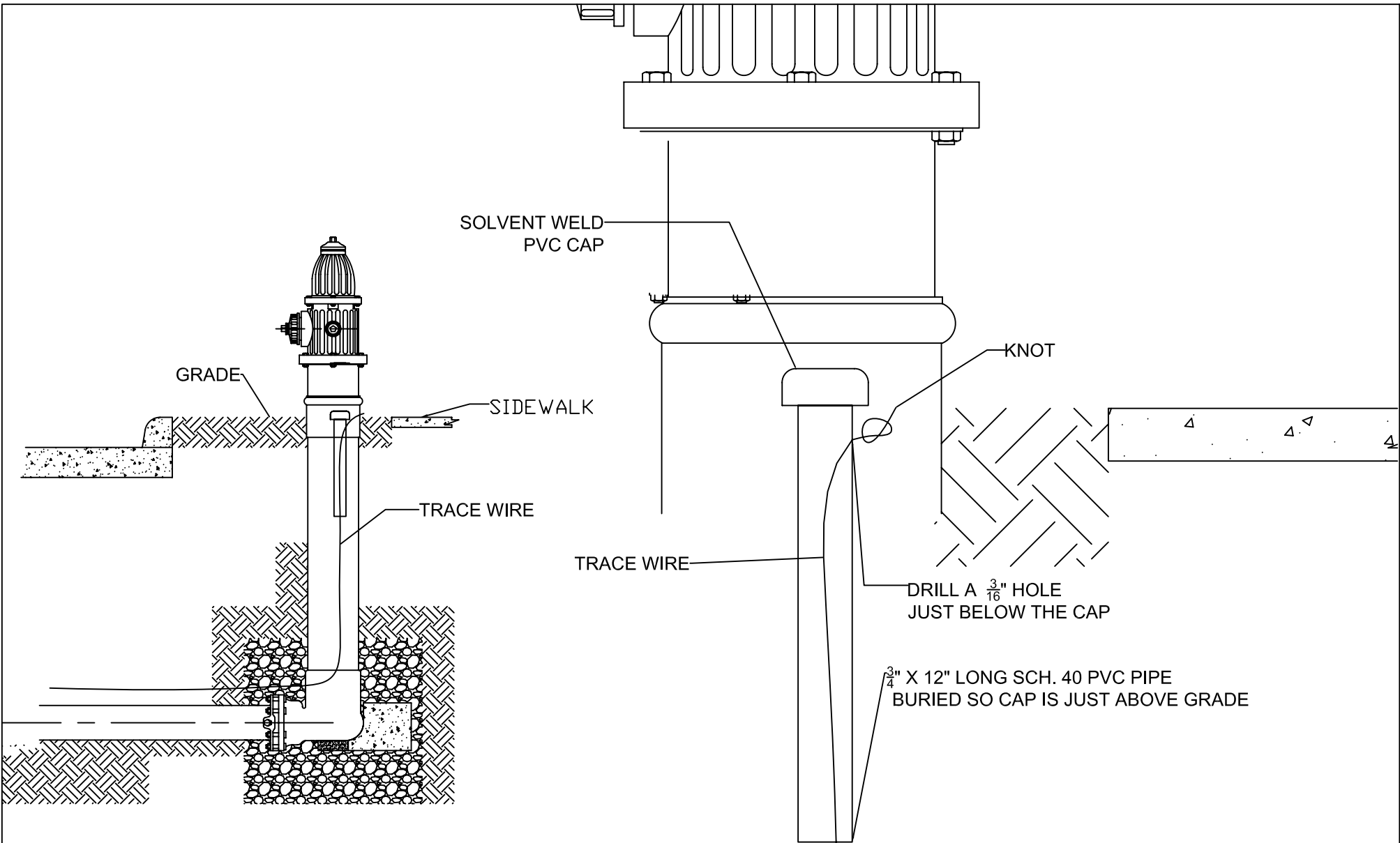
NOTE:
 SEE TYPICAL NEW HYDRANT
 INSTALLATION PVC-H09, PVC-H10
 OR PVC-H11

HYDRANT VALVE BOX
 6" HYDRANT GATE VALVE
6" HYDRANT ELEVATION

SIZE OF MAIN x 6"
 ANCHOR TEE

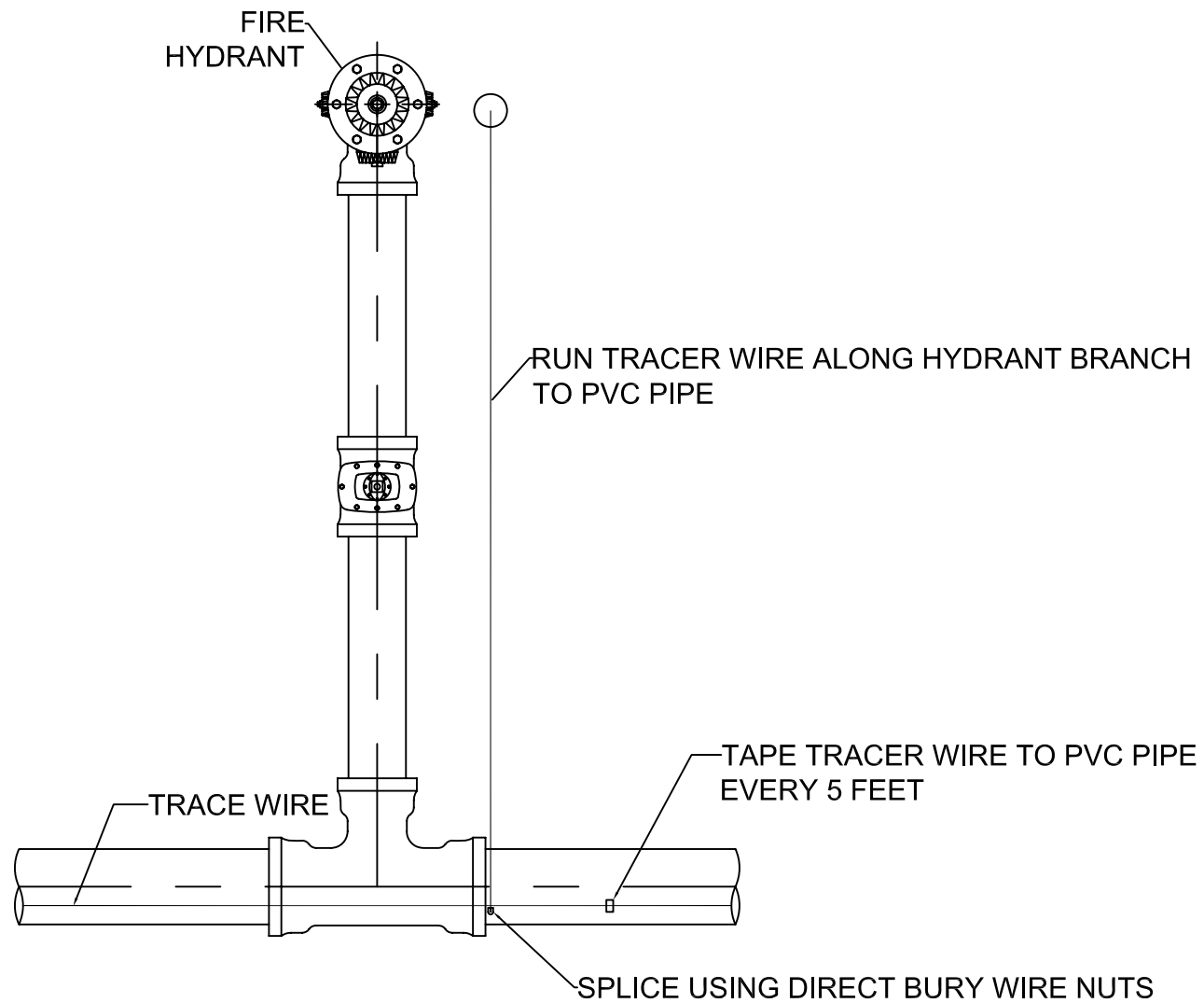
THRUST BLOCK





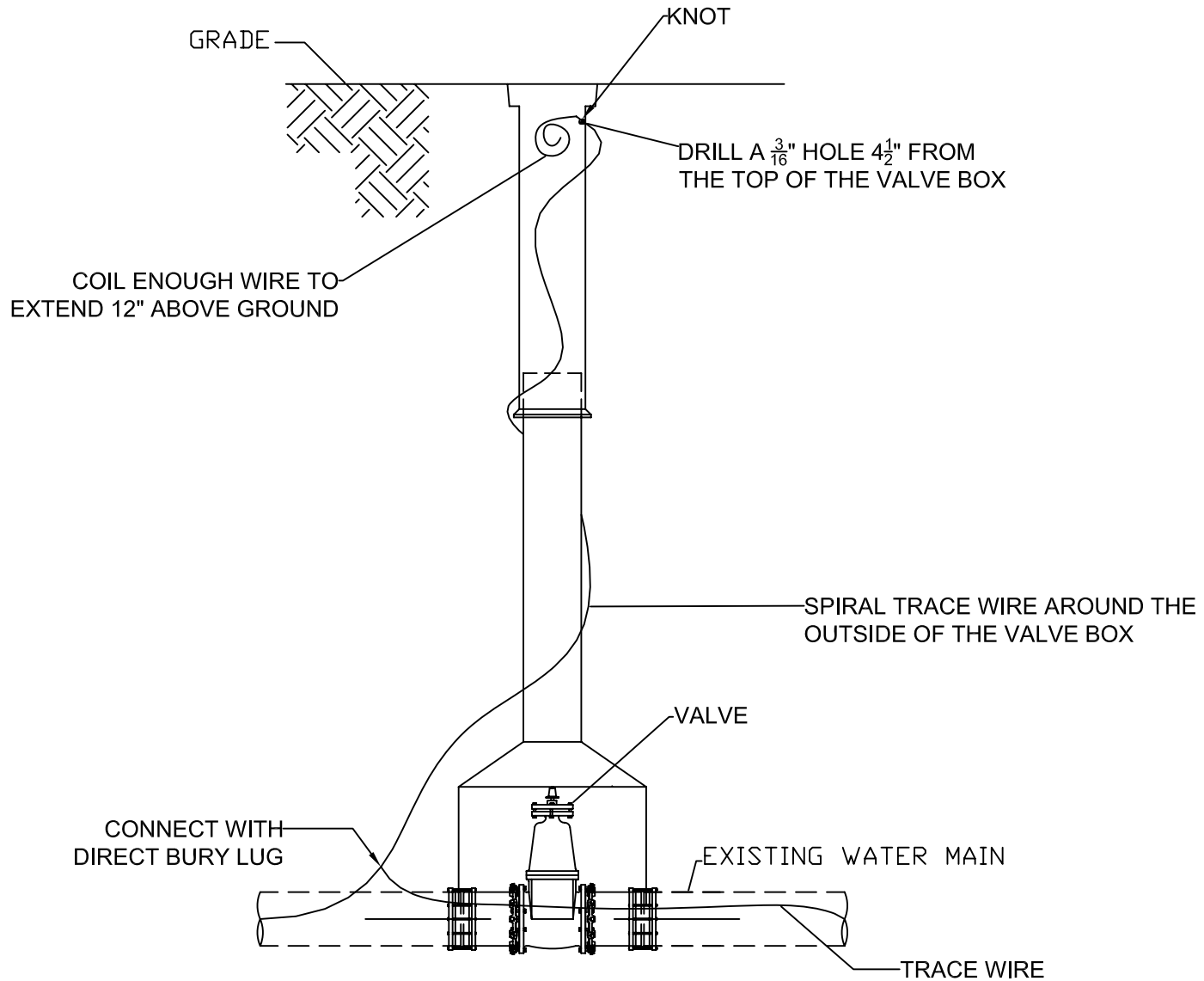
TRACER WIRE AT HYDRANT

- NOT TO SCALE -



TRACER WIRE AT HYDRANT TEE

- NOT TO SCALE -



TRACER WIRE AT LINE VALVE BOX

- NOT TO SCALE -