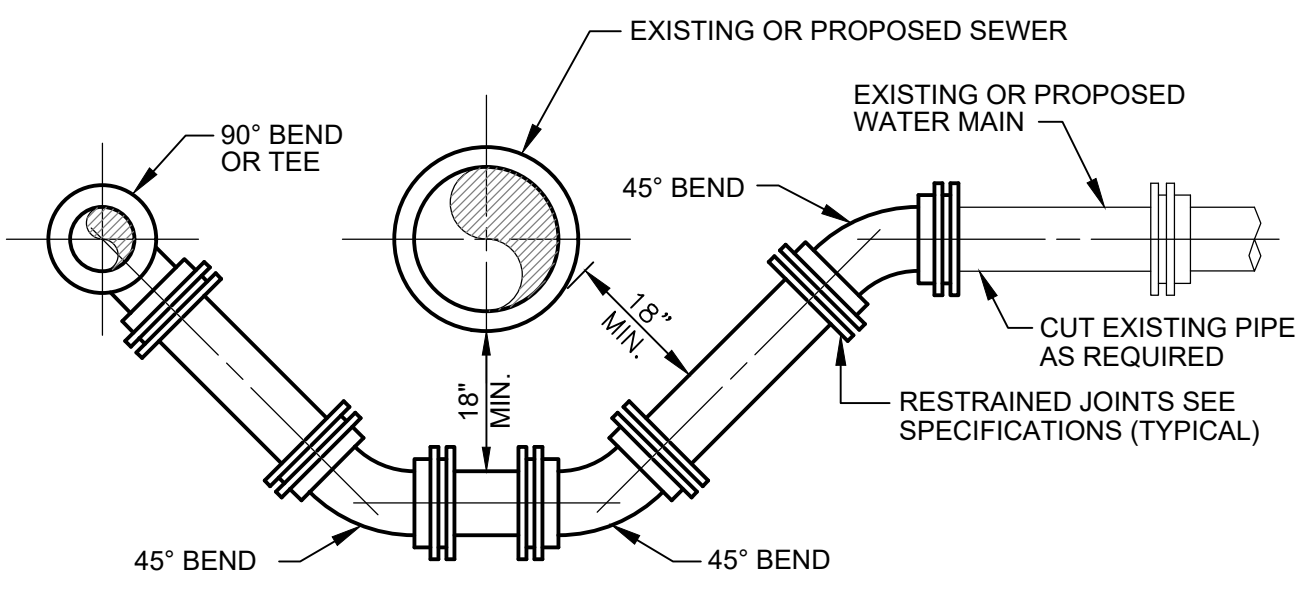


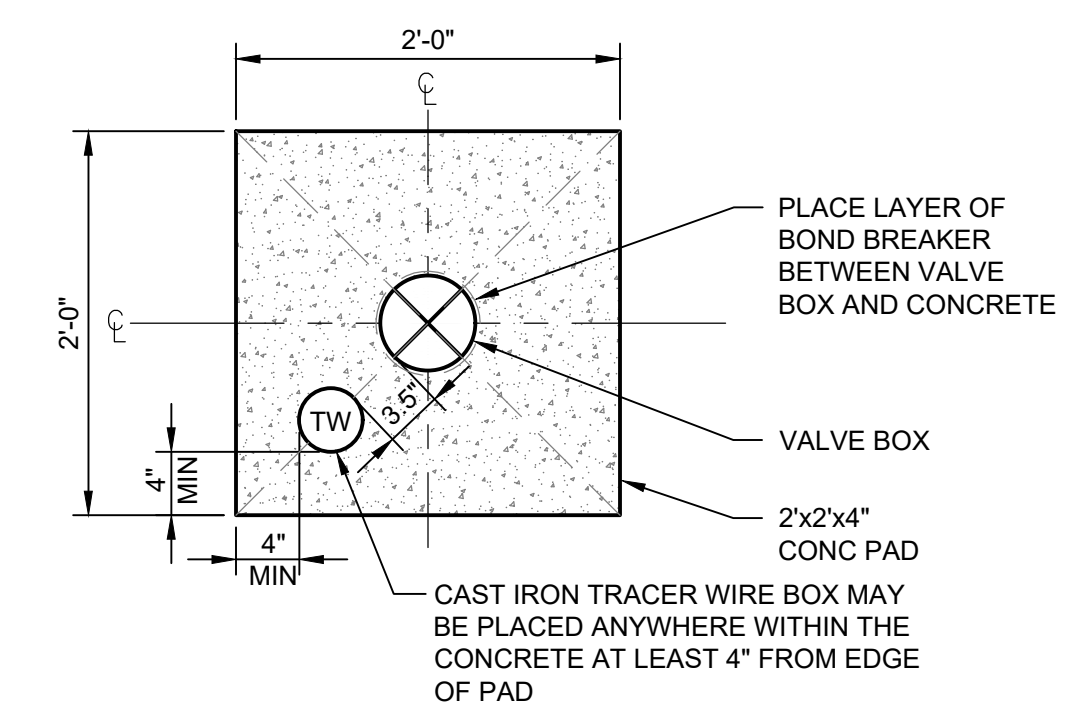
| PIPE RESTRAINT SCHEDULE | | | | | | | |
|--|-----------------|-----------|---------------|---------------|-----------|--------------------------------|--------------------------------|
| GROUND BURIED PRESSURE PIPE - POLYETHYLENE ENCASED DUCTILE IRON PIPE | | | | | | | |
| PIPE DIAMETER | TEES, 90° BENDS | 45° BENDS | 22-1/2° BENDS | 11-1/4° BENDS | DEAD ENDS | REDUCERS (ONE SIZE REDUCTION)* | REDUCERS (TWO SIZE REDUCTION)* |
| 4 | 13 | 5 | 3 | 1 | 40 | -- | -- |
| 6 | 19 | 8 | 4 | 2 | 58 | 31 | -- |
| 8 | 24 | 10 | 5 | 2 | 75 | 30 | 70 |
| 12 | 34 | 14 | 7 | 3 | 107 | 57 | 116 |
| 16 | 43 | 18 | 9 | 4 | 139 | 59 | 137 |
| 20 | 52 | 22 | 10 | 5 | 169 | 59 | 134 |
| 24 | 61 | 25 | 12 | 6 | 199 | 60 | 132 |
| 30 | 73 | 30 | 15 | 7 | 242 | 85 | 168 |
| 36 | 84 | 35 | 17 | 8 | 281 | 84 | 168 |

- LENGTHS OF PIPE RESTRAINT ARE GIVEN IN FEET.
- IF REQUIRED PIPE DIAMETER IS NOT LISTED IN THIS TABLE, THE NEXT LARGEST PIPE DIAMETER SHALL BE USED.
- THIS TABLE IS BASED ON A TEST PRESSURE OF 180 PSI (OPERATING PRESSURE PLUS WATER HAMMER. FOR OTHER TEST PRESSURES, ALL VALUES TO BE INCREASED OR DECREASED PROPORTIONALLY.
- THE VALUES PROVIDED OF RESTRAINT LENGTH ARE IN EACH DIRECTION FROM THE POINT OF DEFLECTION OR TERMINATION EXCEPT FOR TEES, AT WHICH ONLY THE BRANCH IN THE DIRECTION OF THE STEM.
- IF TIE RODS ARE USED, USE FOUR RODS MINIMUM AND ADD 1/8-INCH TO BAR DIAMETER AS CORROSION ALLOWANCE.
- SIZE REDUCTION IS BASED UPON THE PIPE DIAMETER SHOWN IN THIS TABLE.

BASED UPON:
 INTERNAL PRESSURE: 180
 PIPE DEPTH: 5
 BEDDING CLASS: TYPE 4
 SOIL TYPE: GOOD SAND
 SAFETY FACTOR: 2

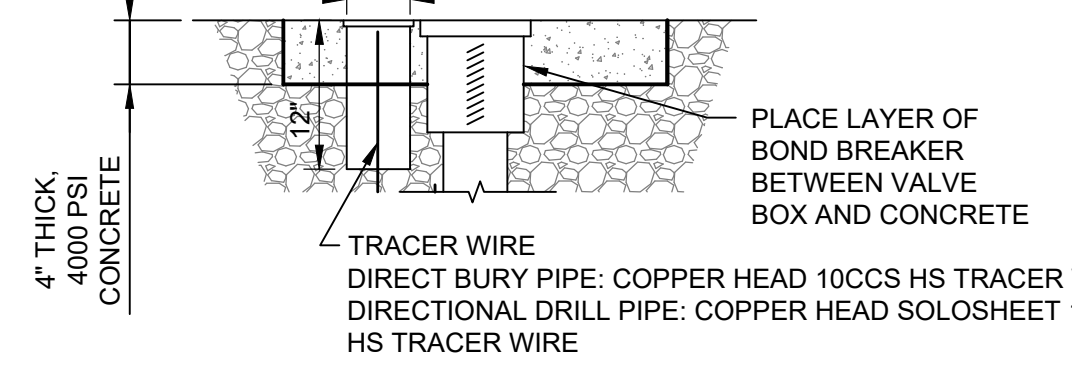


WATER MAIN UTILITY OFFSET



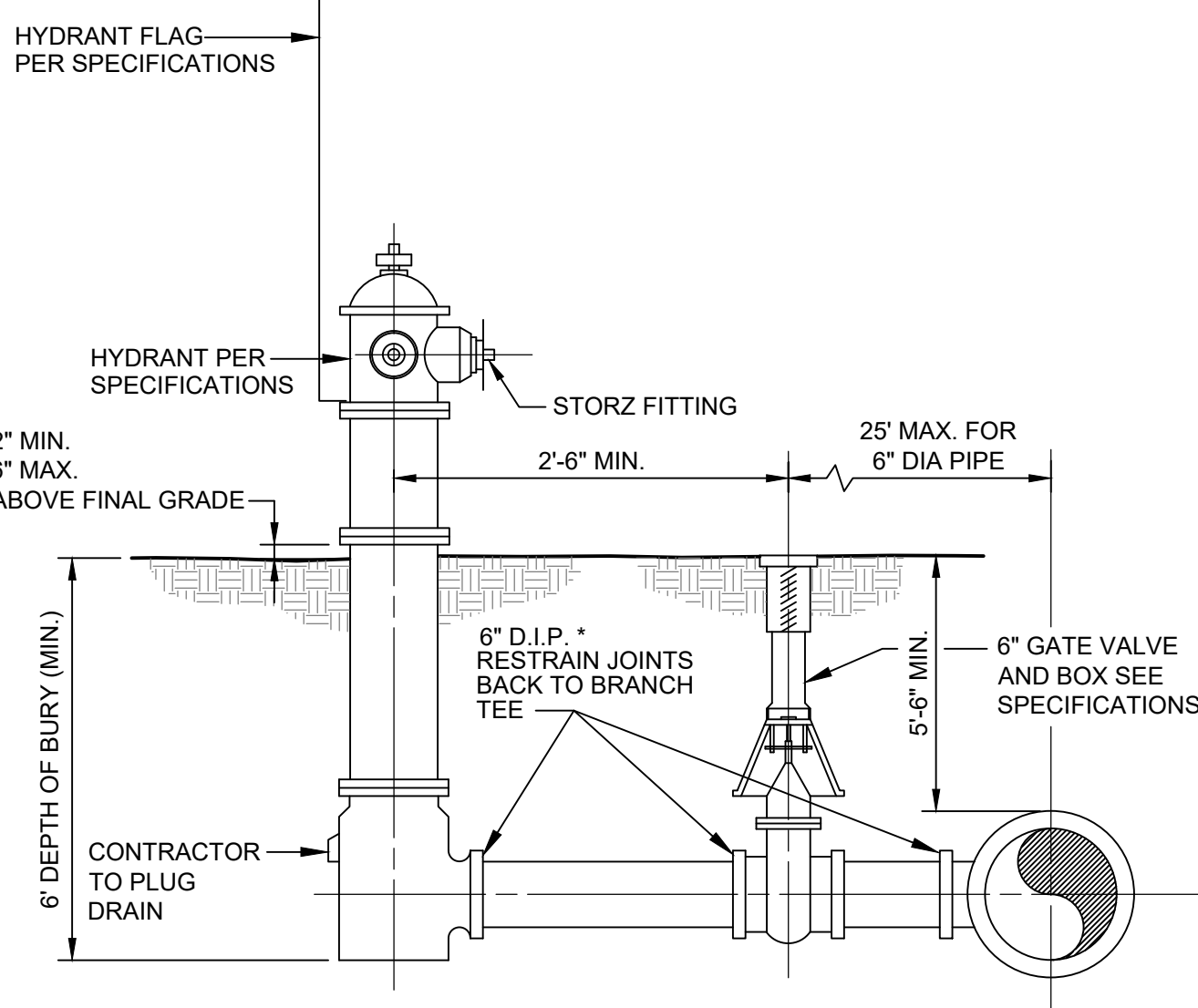
NOTE: ALL BOXES & ADJOINING TW BOXES SHALL BE ENCASED IN A CONC. PAD UNLESS OTHERWISE DETERMINED BY MHOG.

PLAN
VALVE/TRACER WIRE BOX IN CONCRETE DETAIL
 NO SCALE



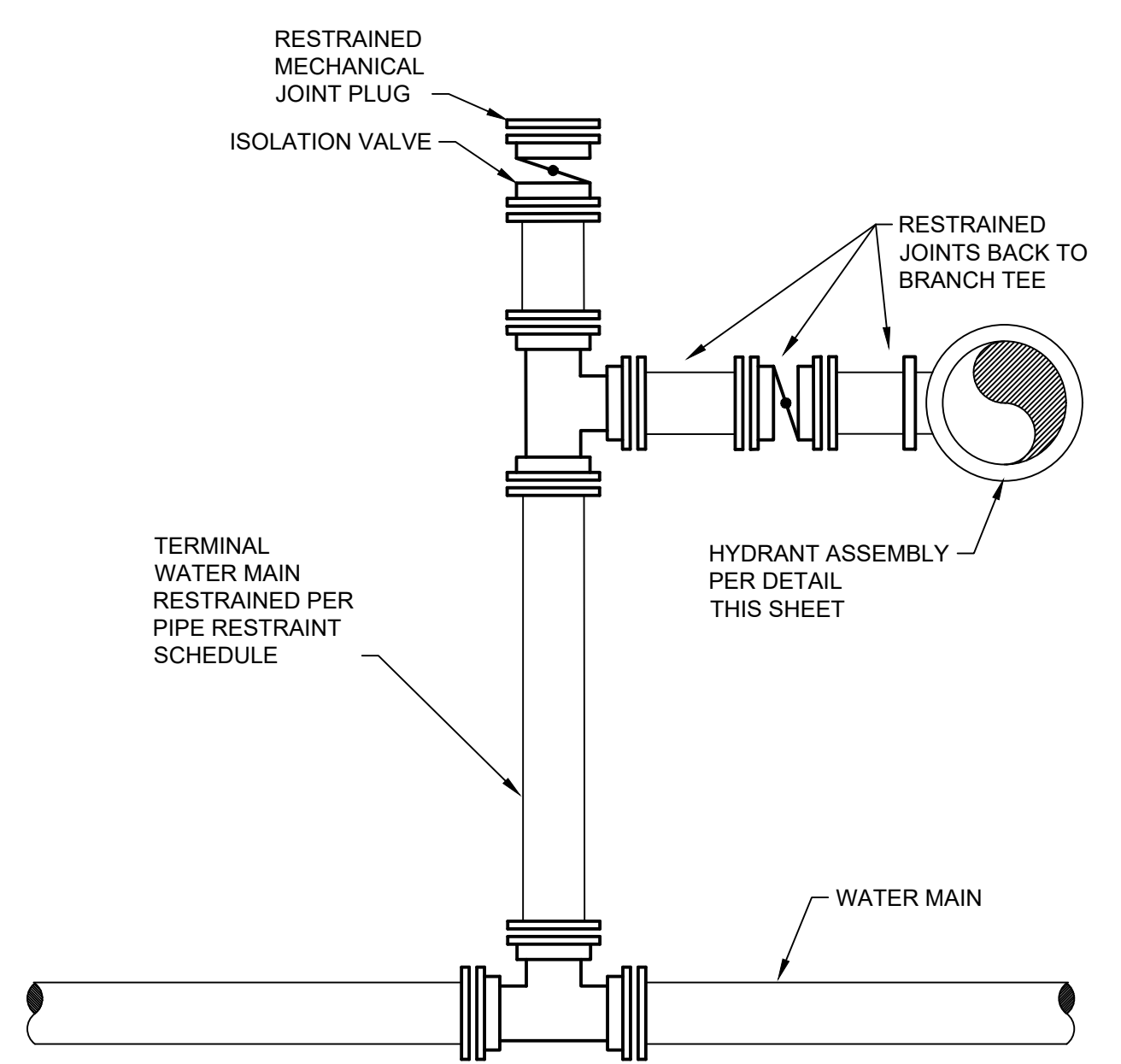
- NOTE:
- TRACER WIRE BOXES LOCATED WITHOUT A VALVE BOX ONLY REQUIRE AN 18" X 18" CONCRETE PAD.
 - TRACER WIRE BOX SHALL HAVE A LOCKING LID W/STANDARD AWWA PENTAGON KEY.
 - TRACER WIRE BOX SHALL BE COPPERHEAD RB14"TP IN ASPHALT INSTALLATIONS AND CD14"TP FOR ALL OTHER INSTALLATIONS.

SECTION

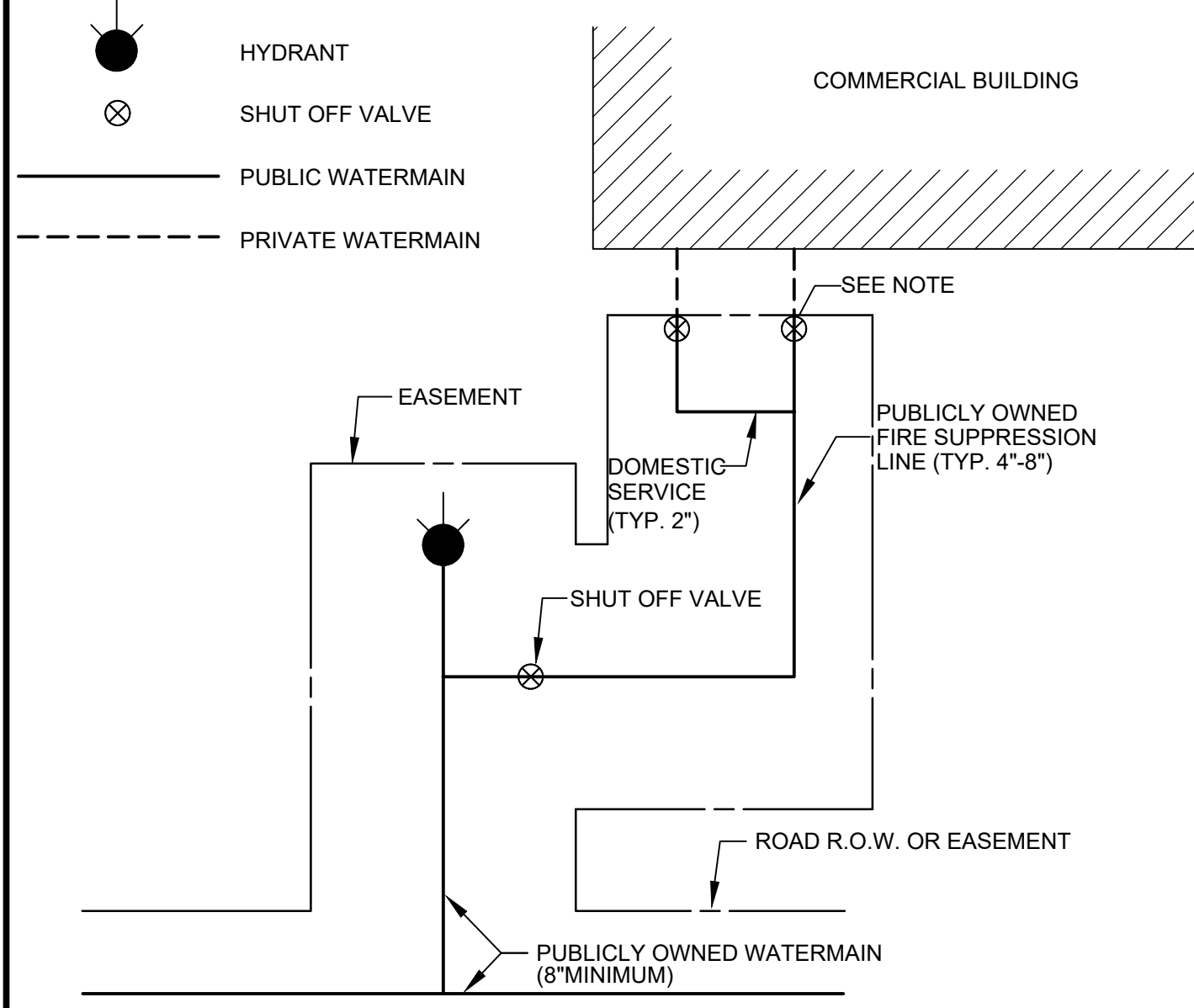


* THE LENGTH OF 6" PIPE FROM THE MAIN TO THE HYDRANT ASSEMBLY CANNOT EXCEED 25'. ANY PIPE OVER 25 FEET SHALL BE 8" DIAMETER MINIMUM AND DESIGNED PER MHOG SPECIFICATIONS.

FIRE HYDRANT ASSEMBLY

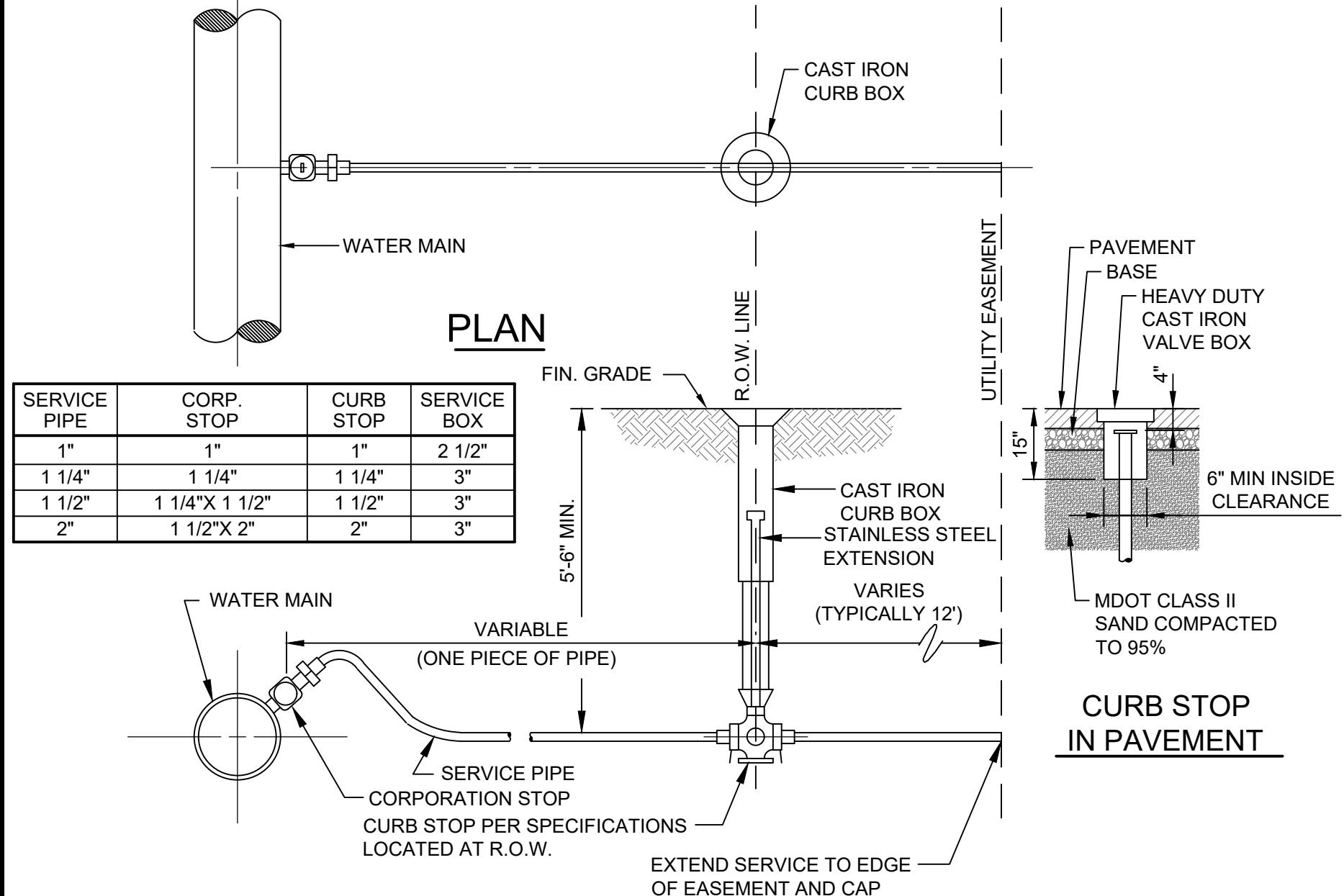


TERMINAL HYDRANT DETAIL

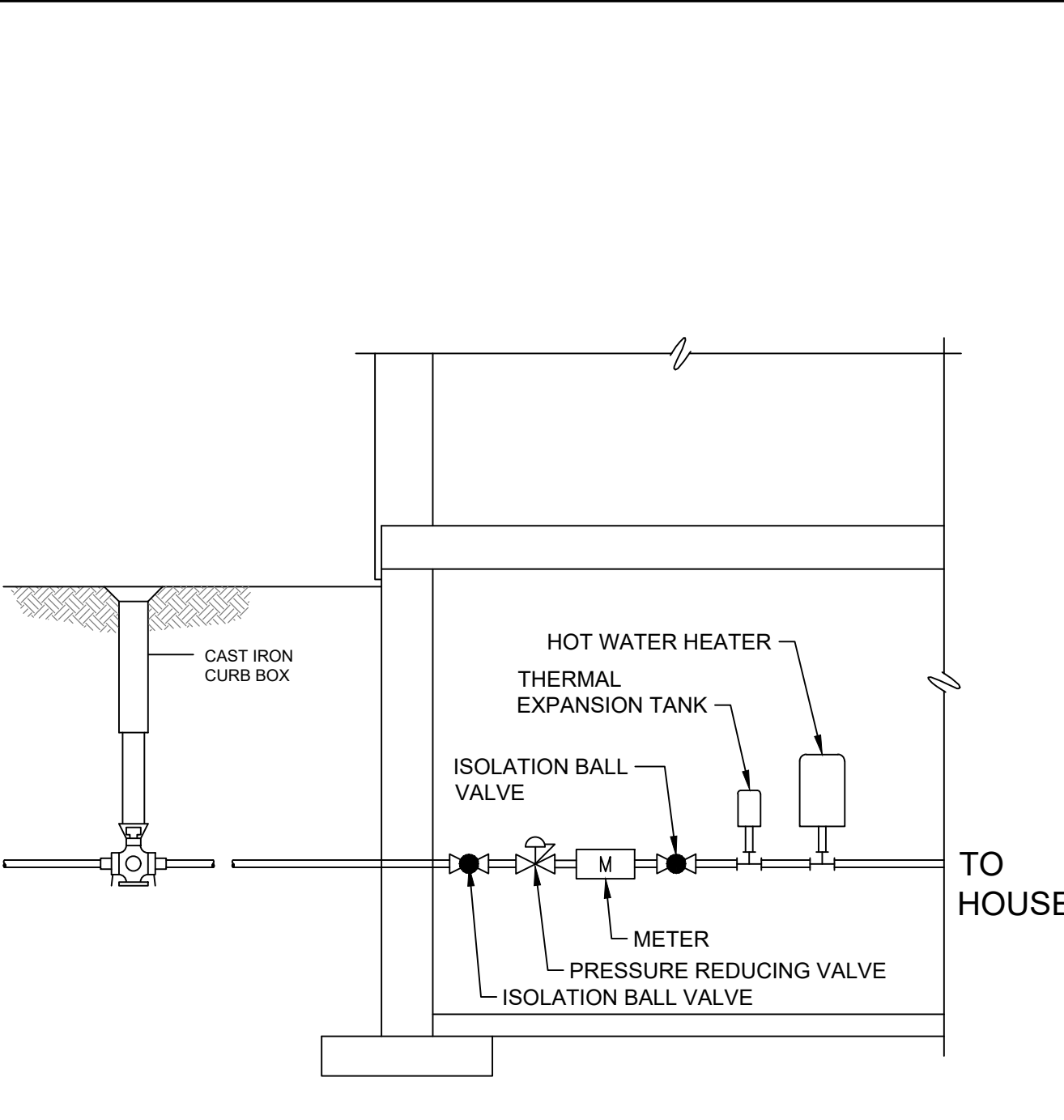


NOTE: FIRE SUPPRESSION LINE AND DOMESTIC SERVICE TO BE LOCATED WITHIN EASEMENT UP TO SHUTOFF VALVES OUTSIDE OF BUILDING.

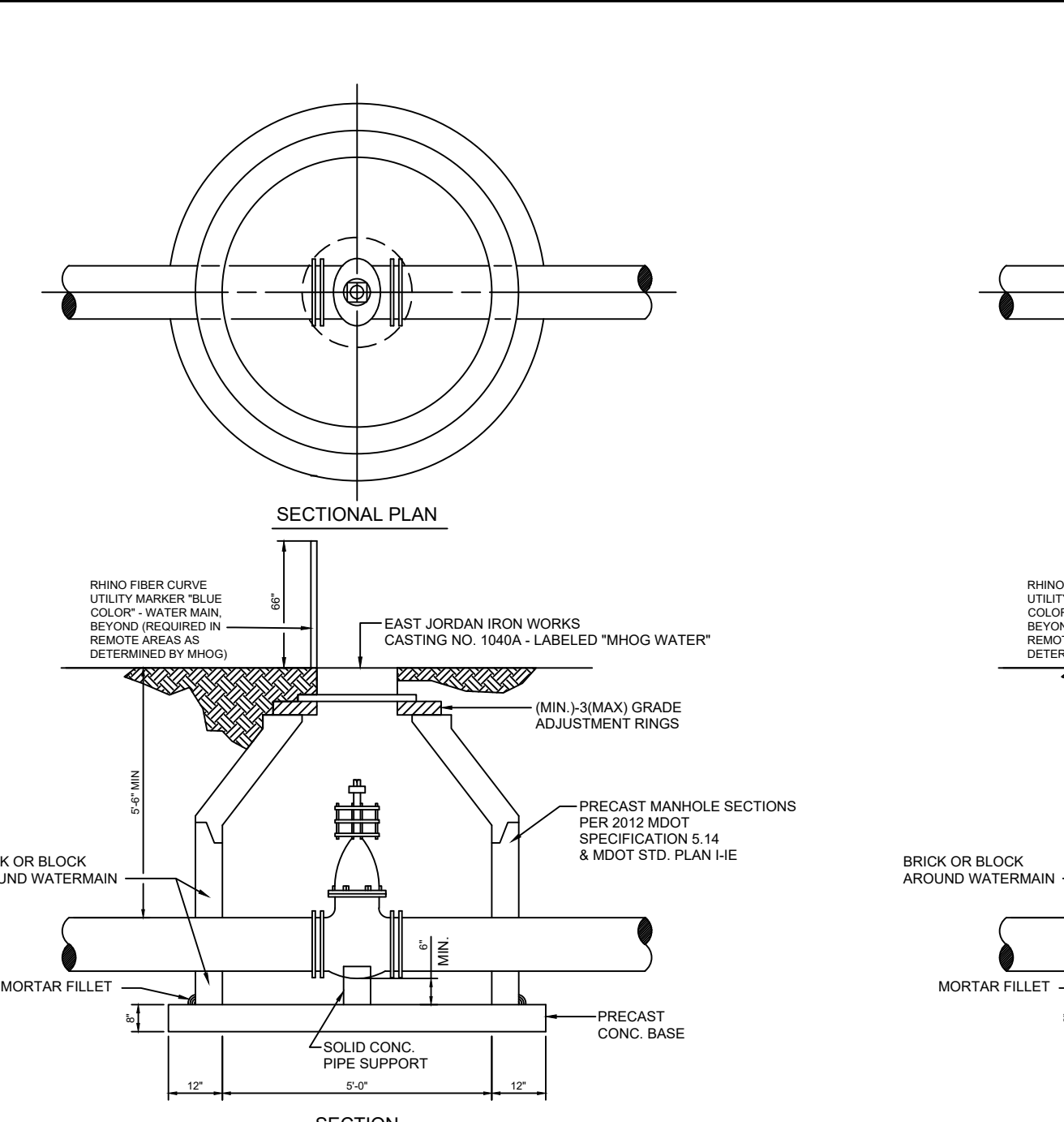
COMMERCIAL BUILDING WATER SERVICE LAYOUT



SECTION
WATER SERVICE LATERAL

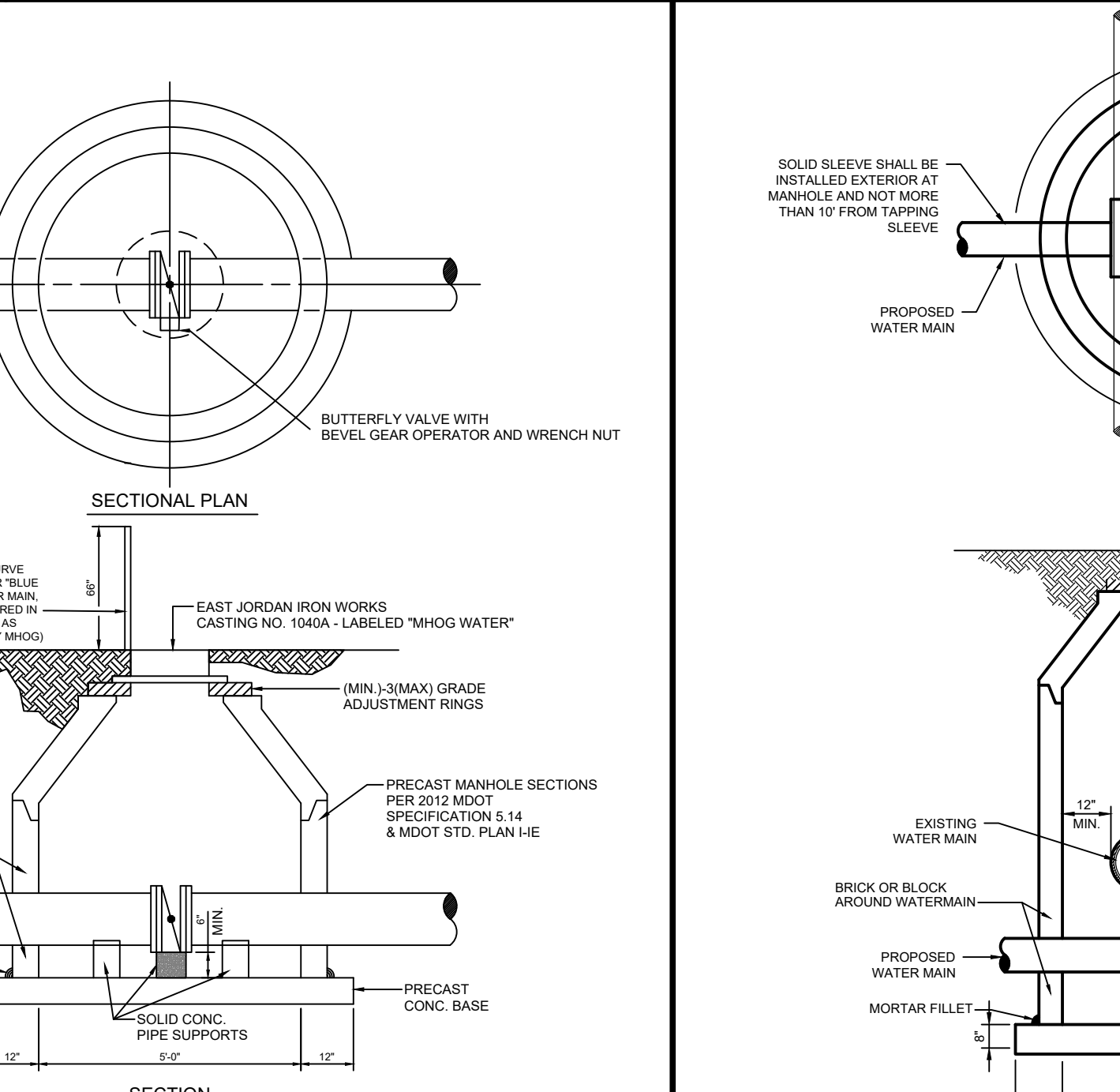


PRIVATE RESIDENCE
PRESSURE REDUCING VALVE (PRV)



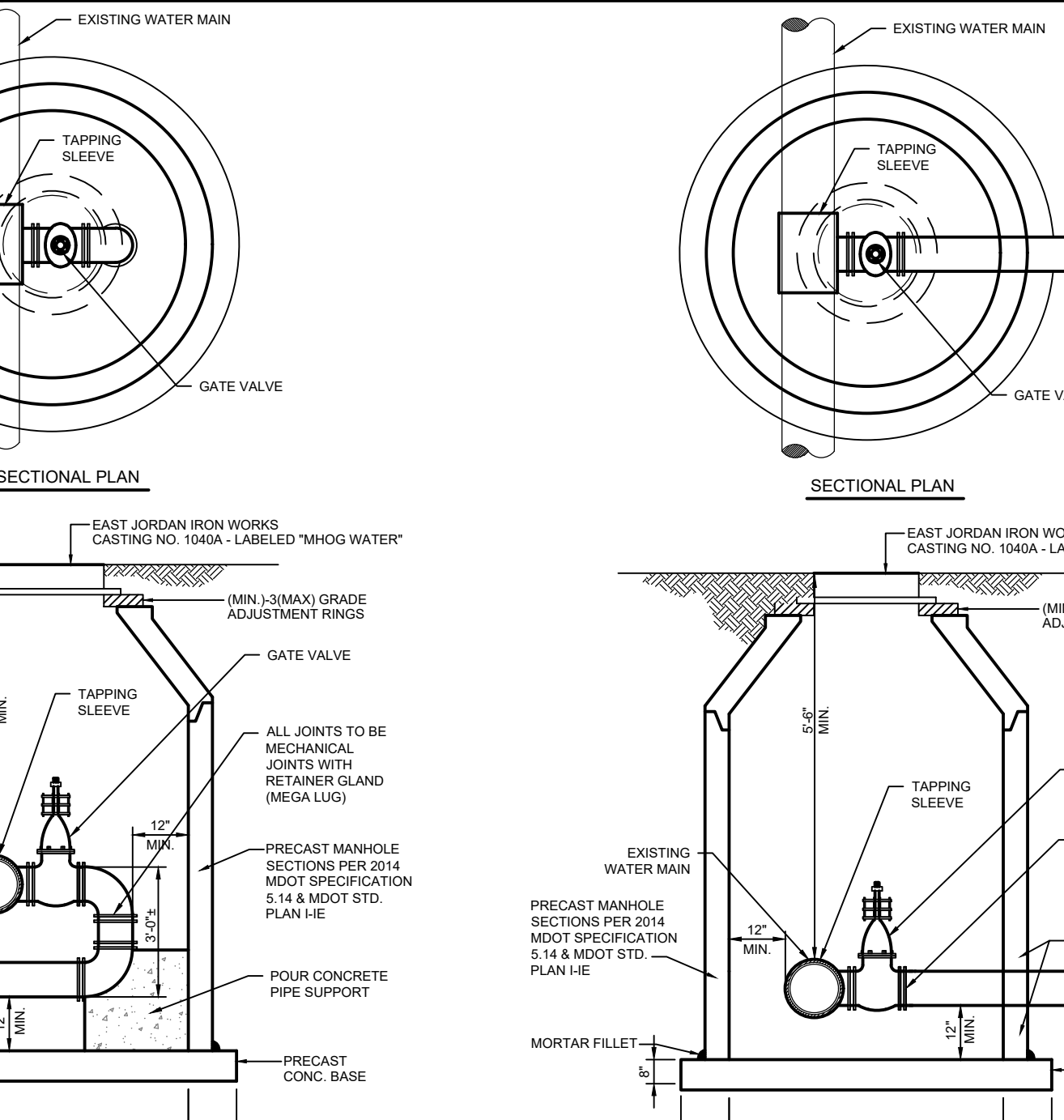
NOTES:
 1. ALL LIFT HOLES AND JOINTS SHALL BE MORTARED BOTH INSIDE AND OUTSIDE.
 2. BLOCK MANHOLES TO BE USED ONLY WITH ENGINEERS PERMISSION.
 3. NO STEPS PERMITTED.

VALVE AND GATE WELL



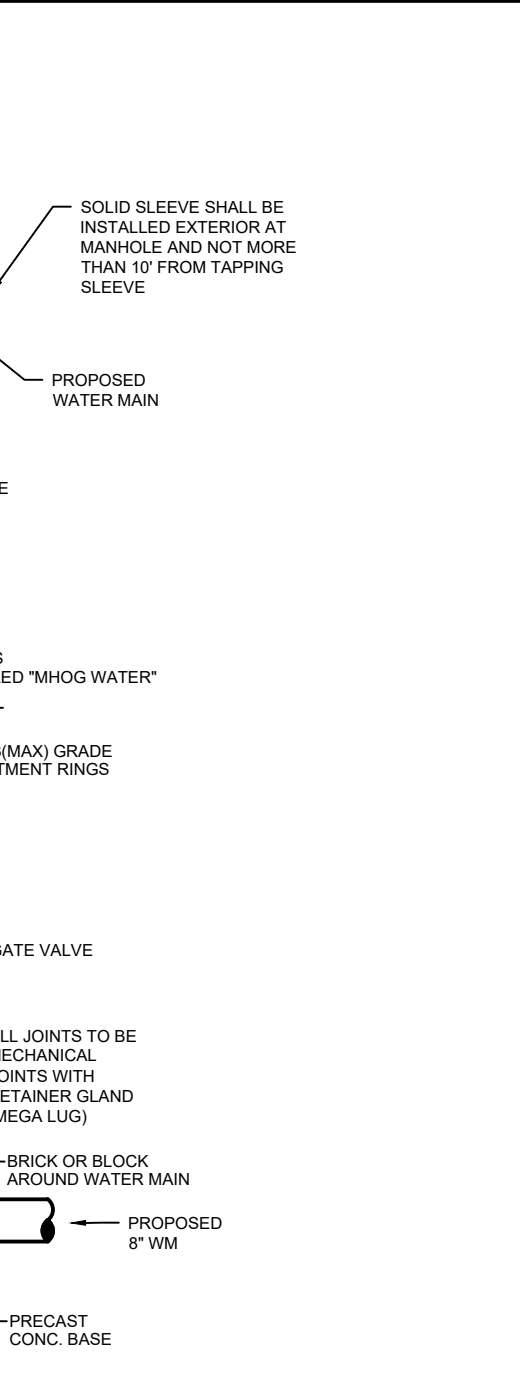
NOTES:
 1. ALL LIFT HOLES AND JOINTS SHALL BE MORTARED BOTH INSIDE AND OUTSIDE.
 2. BLOCK MANHOLES TO BE USED ONLY WITH ENGINEERS PERMISSION.
 3. NO STEPS PERMITTED.

BUTTERFLY VALVE AND WELL



NOTES:
 1. ALL LIFT HOLES AND JOINTS SHALL BE MORTARED BOTH INSIDE AND OUTSIDE.
 2. BLOCK MANHOLES TO BE USED ONLY WITH ENGINEERS PERMISSION.
 3. TAPPING SLEEVES ONLY PERMITTED FOR CONNECTIONS SMALLER THAN MAIN LINE.
 4. NO STEPS PERMITTED.

REVERSE TAP GATE WELL



NOTES:
 1. ALL LIFT HOLES AND JOINTS SHALL BE MORTARED BOTH INSIDE AND OUTSIDE.
 2. BLOCK MANHOLES TO BE USED ONLY WITH ENGINEERS PERMISSION.
 3. TAPPING SLEEVES ONLY PERMITTED FOR CONNECTIONS SMALLER THAN MAIN LINE.
 4. NO STEPS PERMITTED.

REGULAR TAP GATE WELL



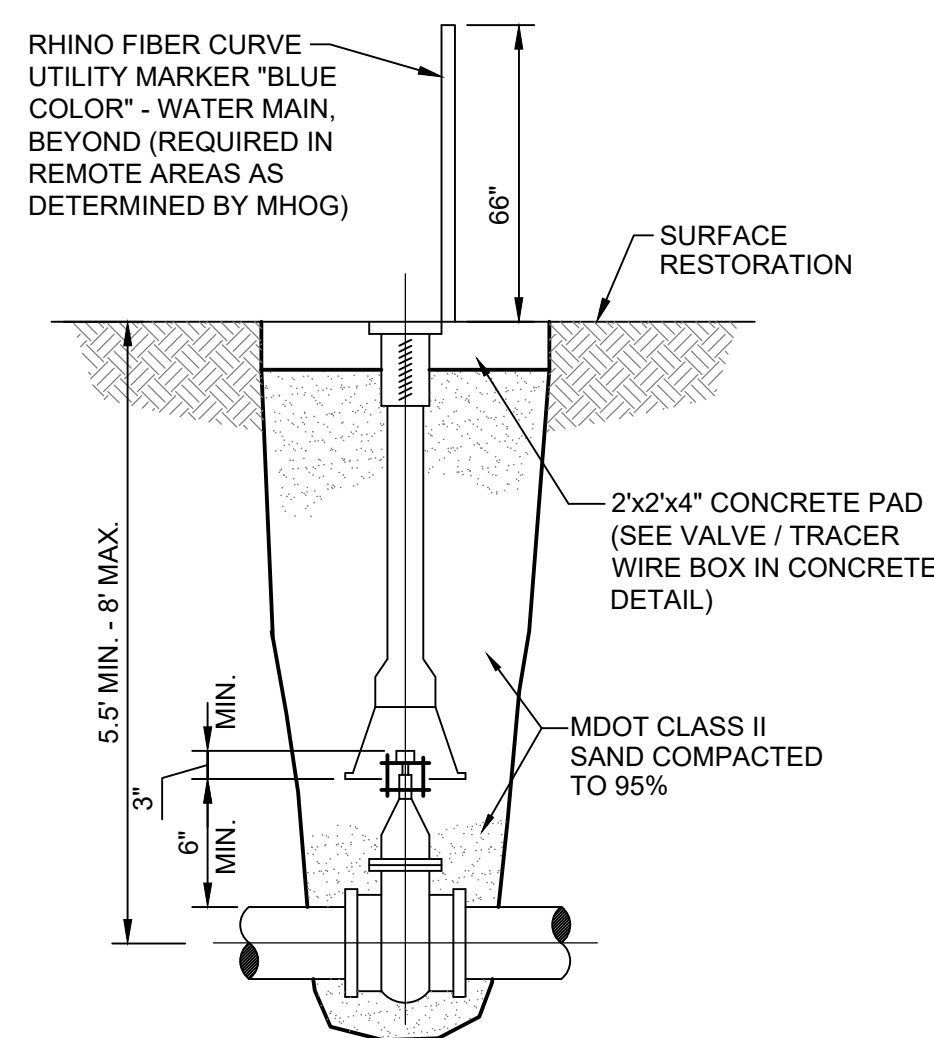
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Scale: NONE
 Issued Date: JANUARY - 2014
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 UPDATED: FEBRUARY 2016
 UPDATED: APRIL 2016
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 UPDATED: FEBRUARY 2019
 UPDATED: NOVEMBER 2022

STANDARD DETAILS

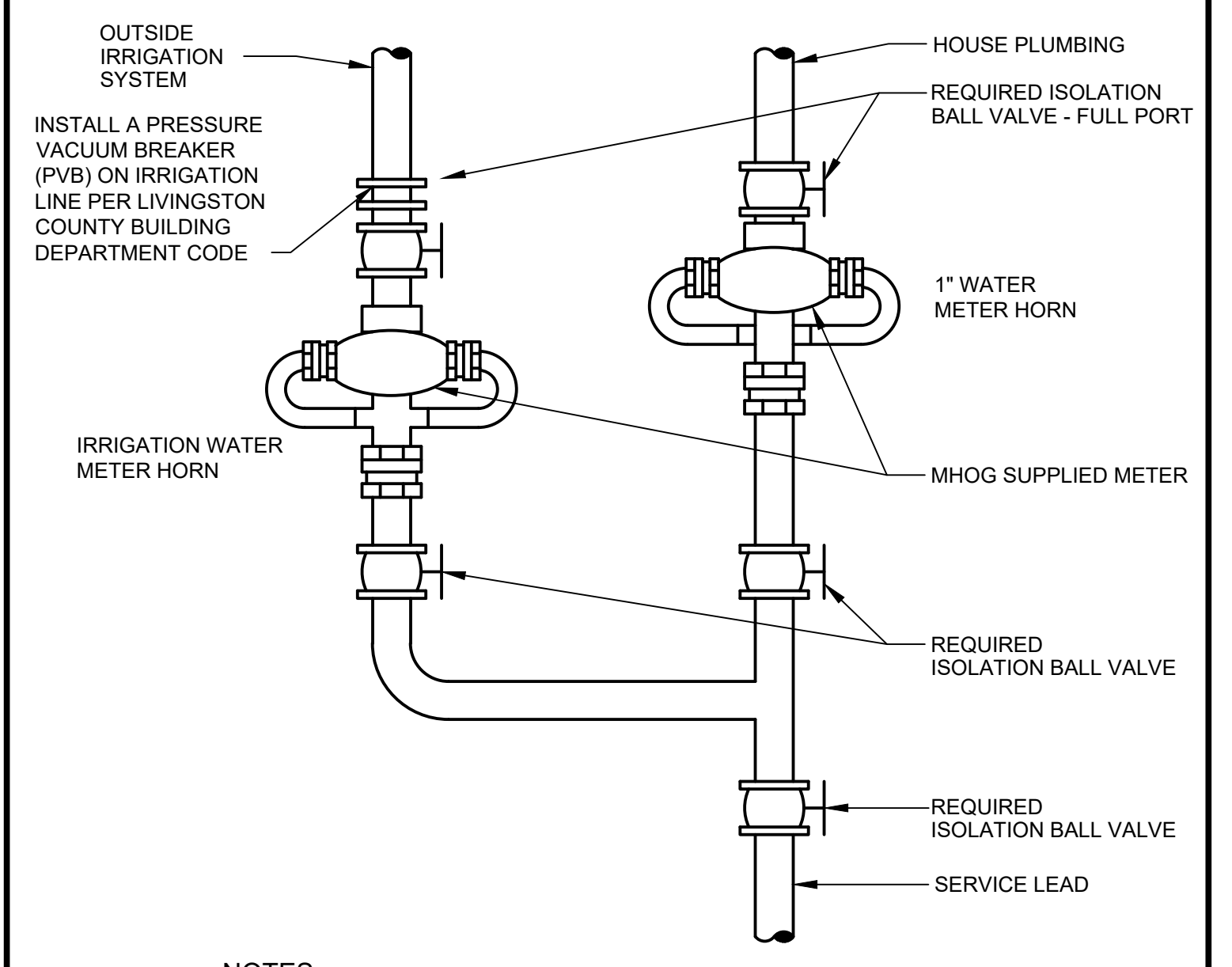
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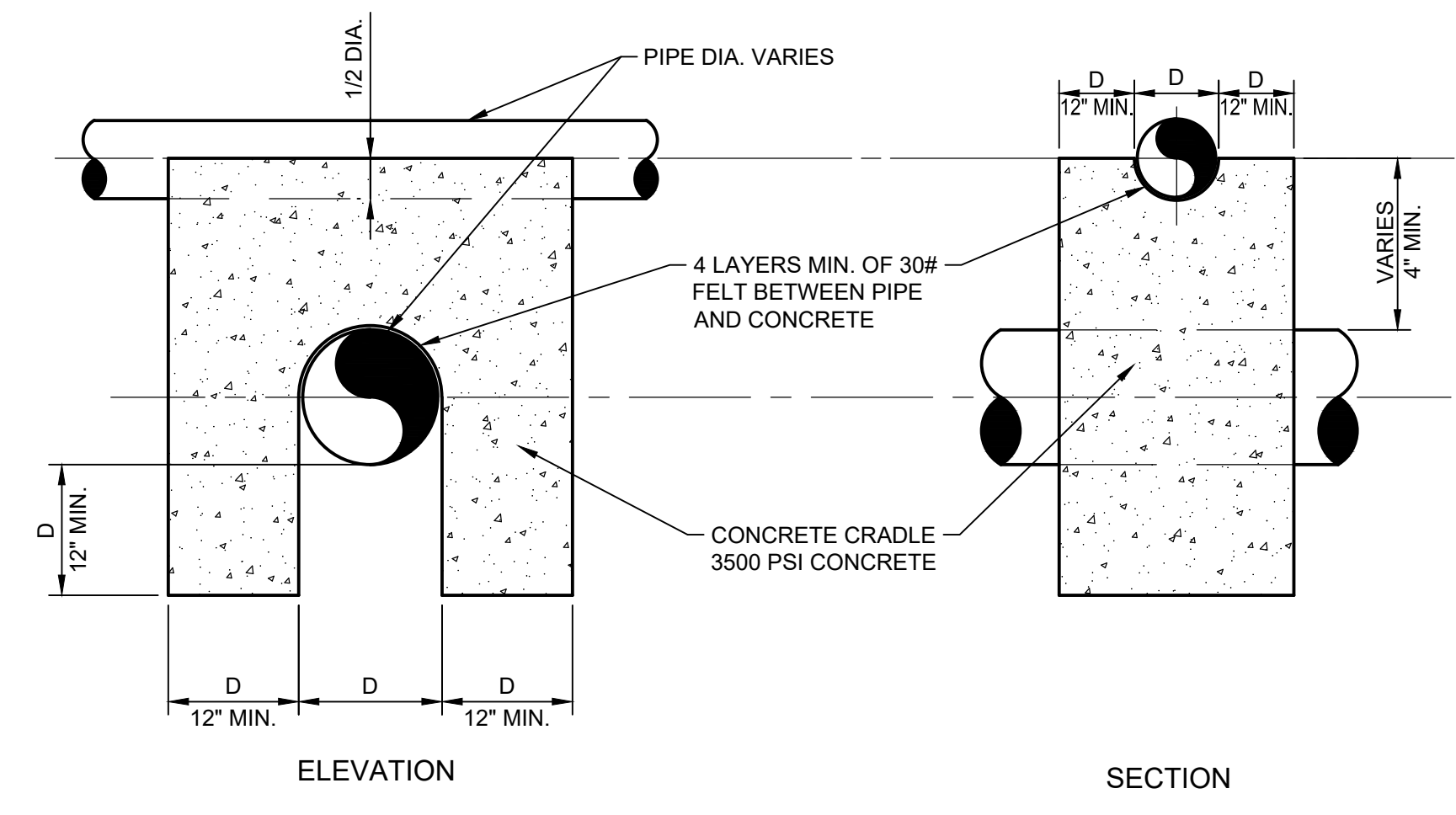
- NOTES:
1. VALVE BOX SHALL NOT REST ON VALVE OR MAIN LINE PIPE.
 2. A VALVE STEM EXTENSION WITH CENTERING RING IS REQUIRED FOR VALVES BURIED DEEPER THAN 6'.

GATE VALVE AND BOX



- NOTES:
1. ALL METERS ARE TO BE INSTALLED HORIZONTALLY IN A DRY, CLEAN, SANITARY LOCATION THAT IS READILY ACCESSIBLE. THIS DRAWING IS NOT TO SCALE & IS ONLY A REPRESENTATION OF HOW THE VALVES AND METERS SHOULD BE INSTALLED. THE SECOND METER IS OPTIONAL FOR IRRIGATION USAGE. METERS SHOULD NOT BE INSTALLED IN LINE (ONE RIGHT AFTER THE OTHER).
 2. PROPERTIES DESIGNATED "HIGH HAZARD" PER THE MHOG CROSS CONNECTION RULES MANUAL WILL REQUIRE THE INSTALLATION OF A REDUCED PRESSURE ZONE (RPZ) BACK FLOW PREVENTION DEVICE.

TYPICAL METER HORN INSTALLATION



CONCRETE CRADLE DETAIL
SCALE: NONE



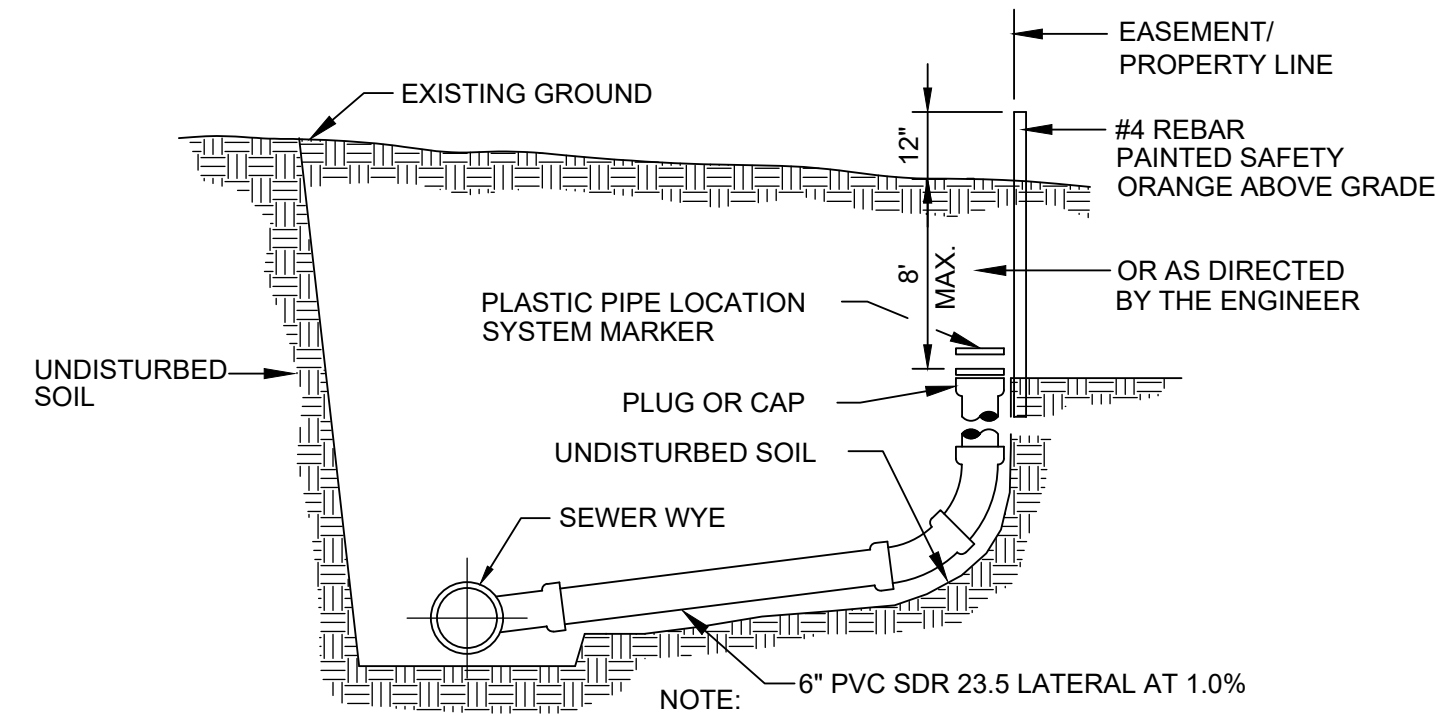
MHOG CASTING DETAIL
NO SCALE



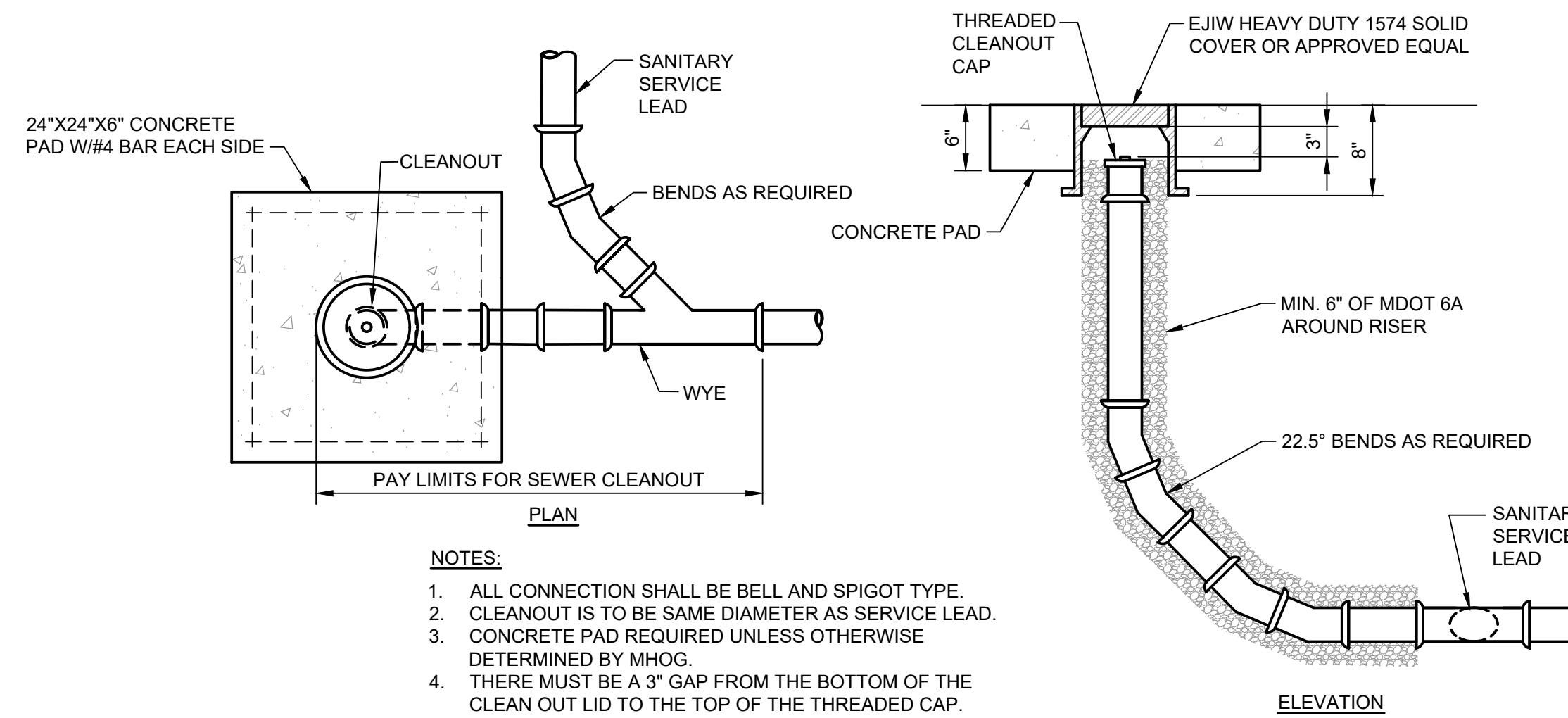
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STANDARD DETAILS

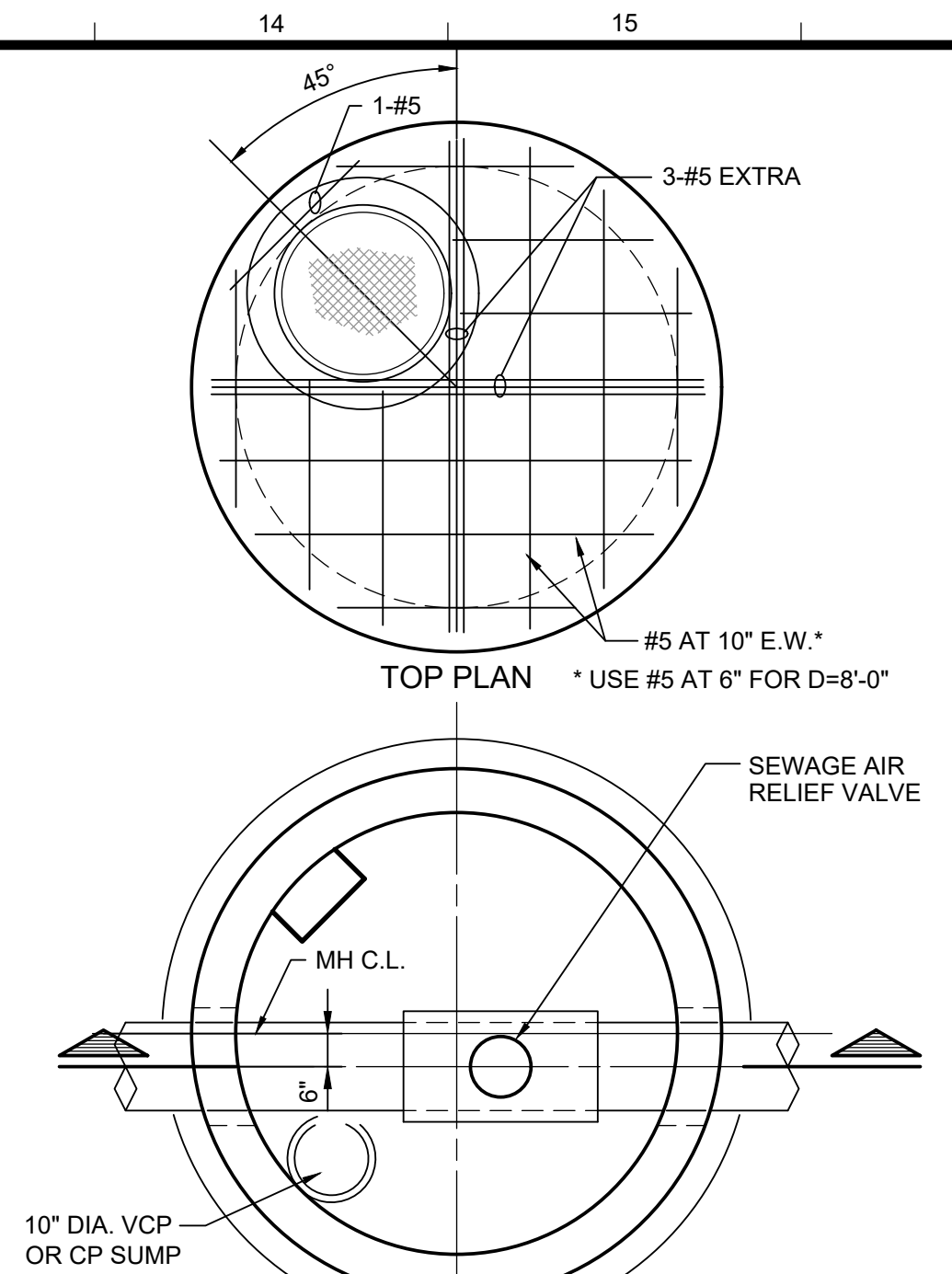
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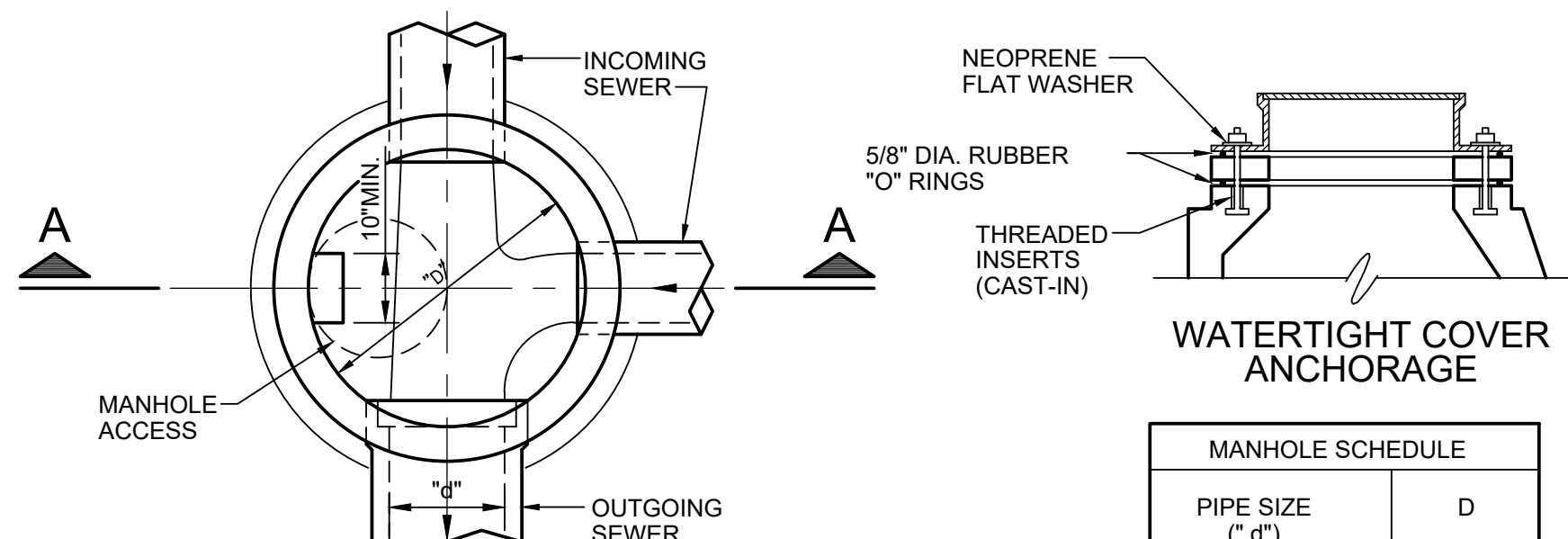
SANITARY SEWER LATERAL



SEWER CLEANOUT DETAIL

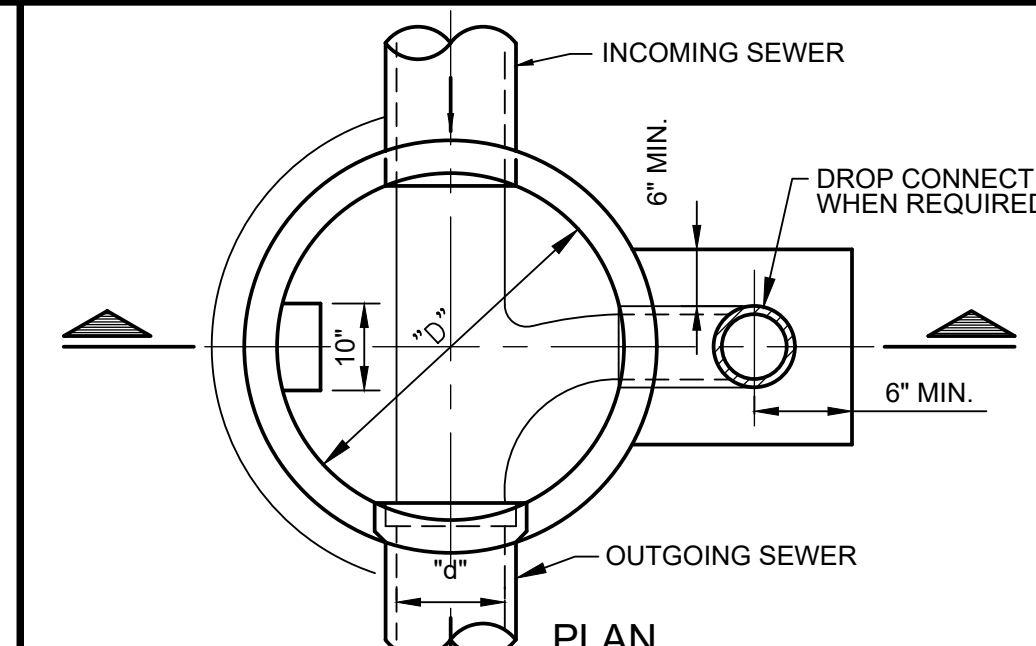


AIR RELIEF STRUCTURE

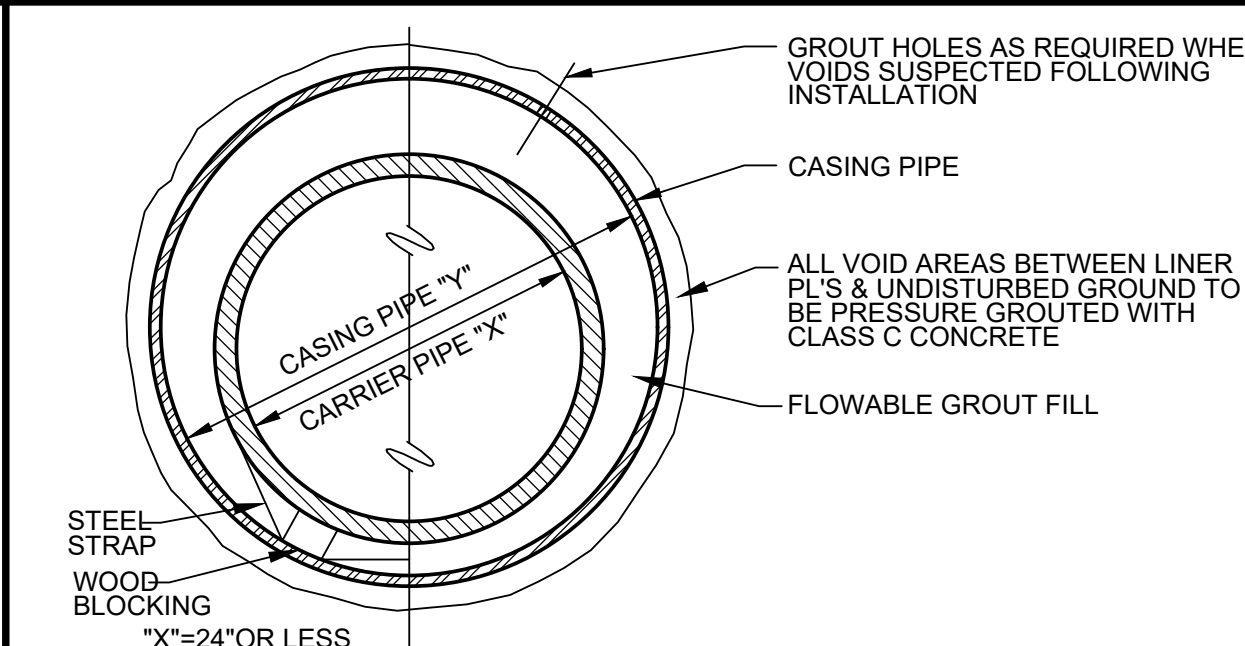


WATERTIGHT COVER ANCHORAGE

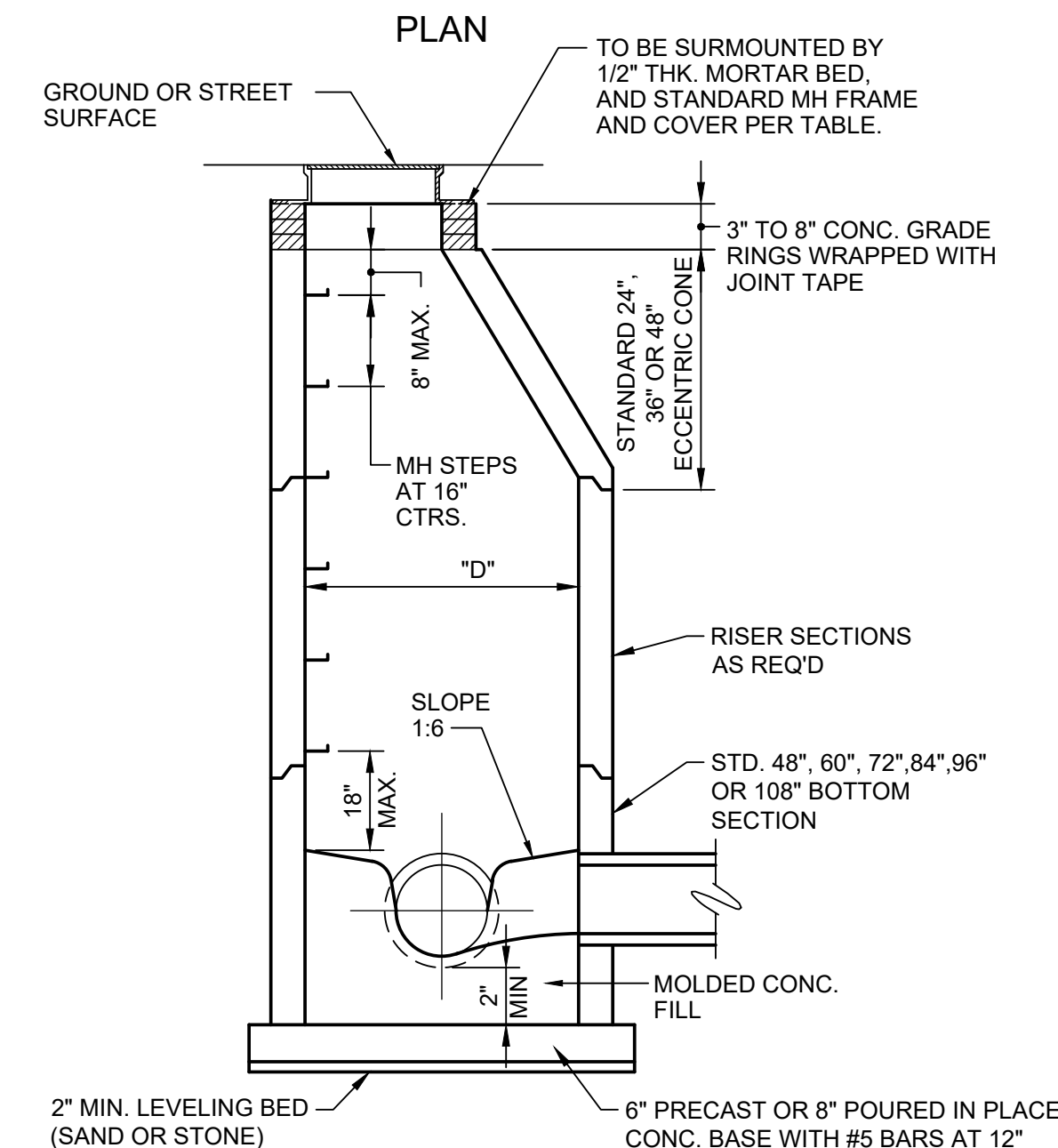
| MANHOLE SCHEDULE | |
|------------------|-----|
| PIPE SIZE ("d") | D |
| 8"-24" | 48" |
| 27"-36" | 60" |
| 42"-48" | 72" |
| 54" | 84" |



DROP CONNECTION



CASING PIPE



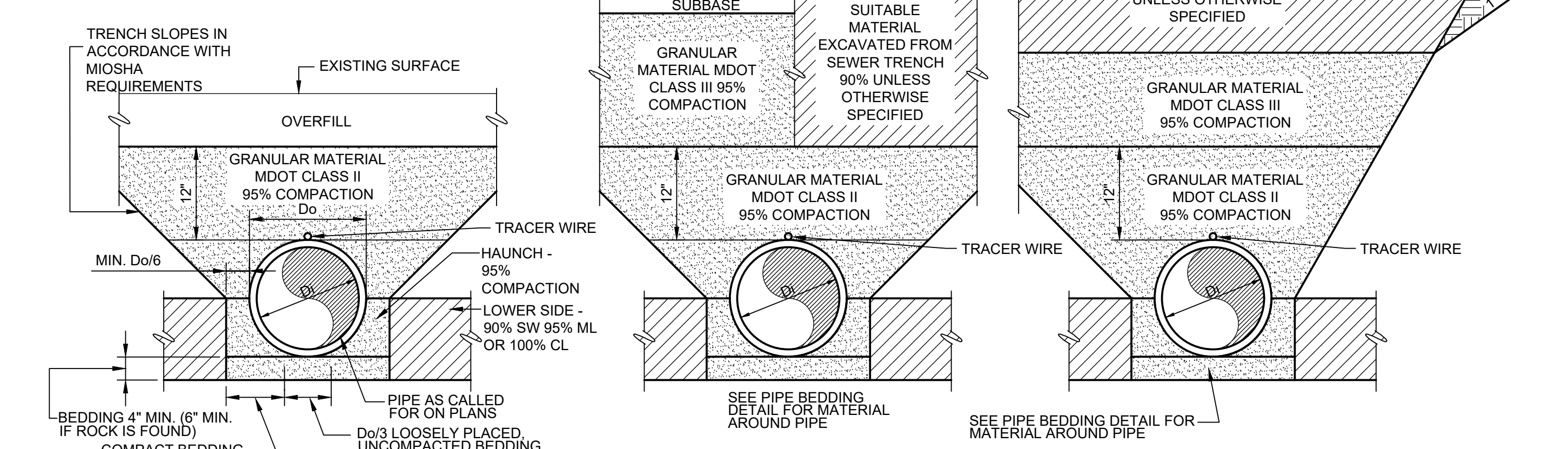
SECTION A-A

- NOTES:
- ALL SANITARY MANHOLES TO BE PRECAST REINFORCED CONCRETE WITH PREMIUM JOINTS. SEE SPECIFICATIONS FOR BASE SLAB AND PIPE OPENINGS AND CONNECTIONS.
 - MANHOLE CONES SHALL BE THE ECCENTRIC TYPE.
 - PROVIDE 6" OF COMPACTED GRANULAR MATERIAL UNDER ALL PRECAST CONCRETE BASE SLVC.
 - FORCE MAINS CONNECT DIRECTLY TO A MANHOLE SHALL BE INSTALLED SO THAT THE ELEVATION OF THE PIPE CROWNS MATCH. THE FORCE MAIN SHALL BE DIRECTED DOWNWARD INTO THE FLOW CHANNEL.
 - FOR SANITARY SEWERS ALL PIPES SHALL ENTER MANHOLE THROUGH RUBBER BOOTED CONNECTION.

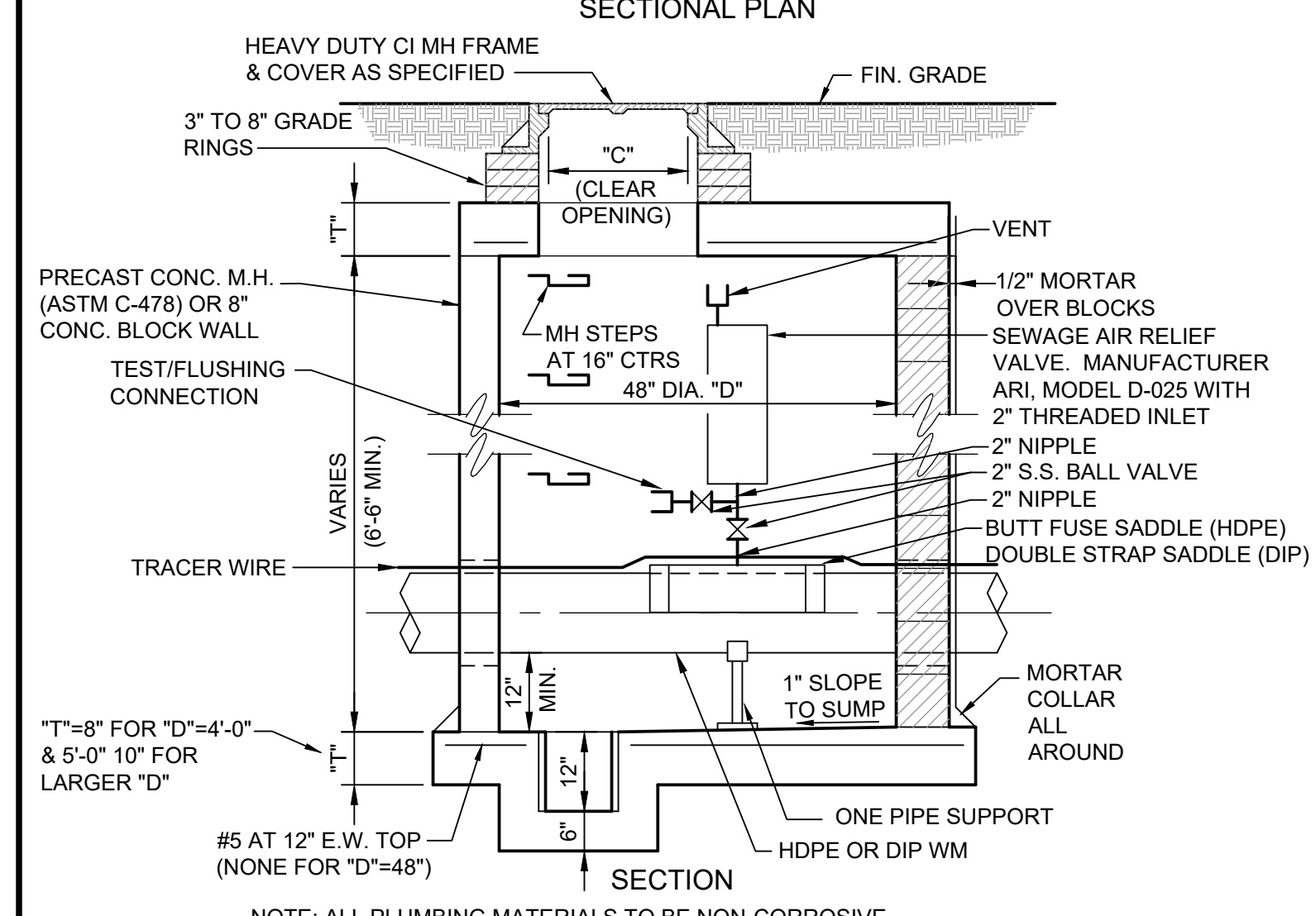
| FRAME & COVER FOR SANITARY SEWER MANHOLES | | | | |
|---|-------------------------------|-----------------------|----------|--|
| TYPE | TYPE OF COVER | MANUFACTURER OR EQUAL | | |
| | | EAST JORDAN | NEENAH | |
| MH | SANITARY - SOLID SELF-SEALING | 1040.0000 | R-1642 | |
| MH | SANITARY - SOLID WATERTIGHT | 1040-APT | R-1916-F | |
| CO | SOLID | 1574A | R-1973-A | |

STANDARD MANHOLE

- NOTES:
- COMPACTION PRESENTED AS MINIMUM STANDARD PROCTOR VALUES.
 - MATERIALS AROUND THERMOPLASTIC PIPE WITH DIAMETER < 6 INCHES SHALL PASS 0.5 INCH SIEVE, MATERIALS AROUND OTHER PIPES SHALL PASS 1.5 INCH SIEVE.
 - MATERIALS AROUND HDPE PIPE TO BE MDOT 6A OR 21AA.
 - DRIVEN SURFACE IS DRIVEWAY, PARKING AREA, ROAD BED OR SHOULDER.
 - UTILITY TRENCHES LOCATED WITHIN A MDOT ROW SHALL CONFORM TO MDOT STANDARD DETAIL R-83.
 - TRACER WIRE IS REQUIRED ON FORCE MAIN ONLY AND SHALL BE BROUGHT TO GRADE AT A MINIMUM EVERY 1000 FEET IN A APPROVED CAST IRON TRACER WIRE BOX ENCASED IN CONCRETE OR WITH AN APPROVED GREEN MARKER POST.



PIPE BEDDING TRENCH EXCAVATION & PIPE BEDDING



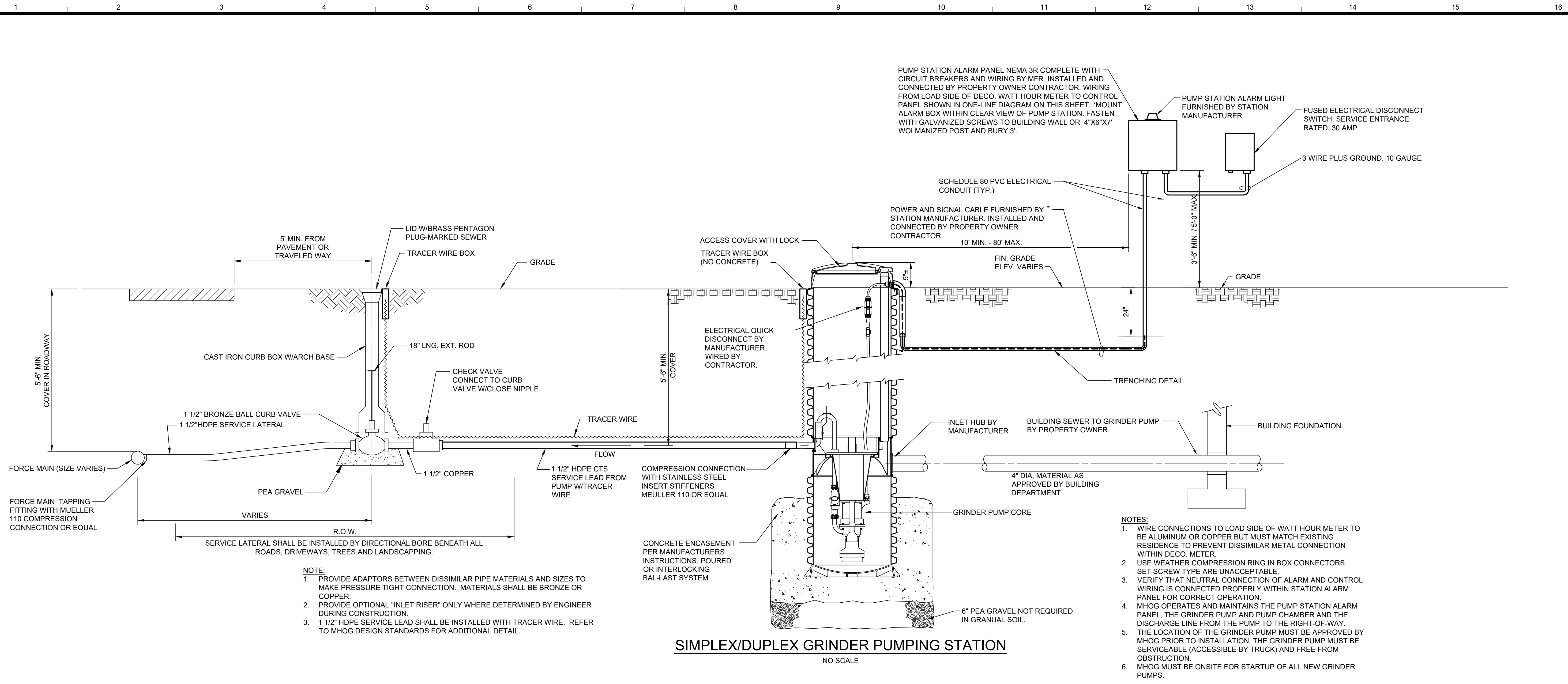
INTERIOR SEWER LATERAL DROP CONNECTION



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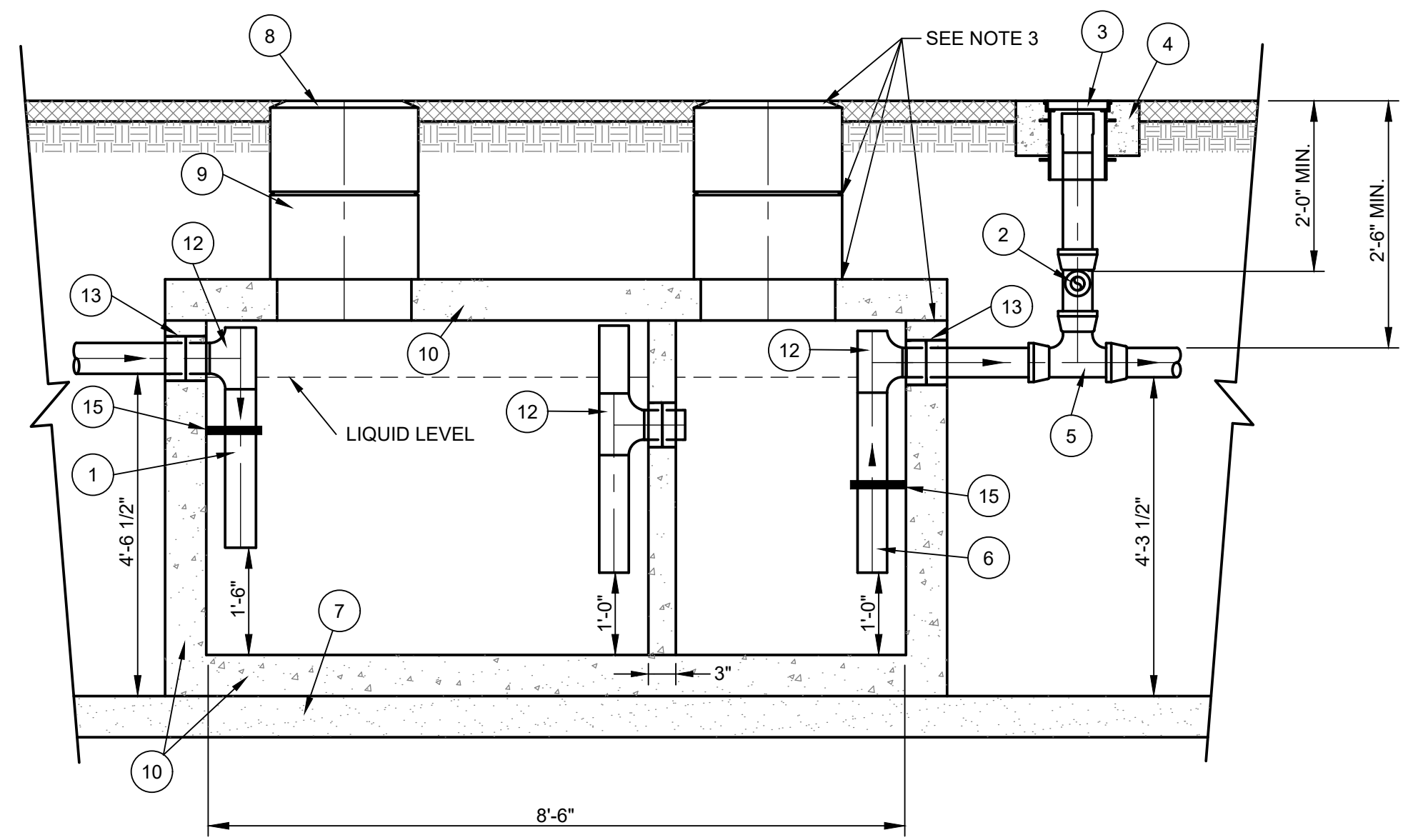
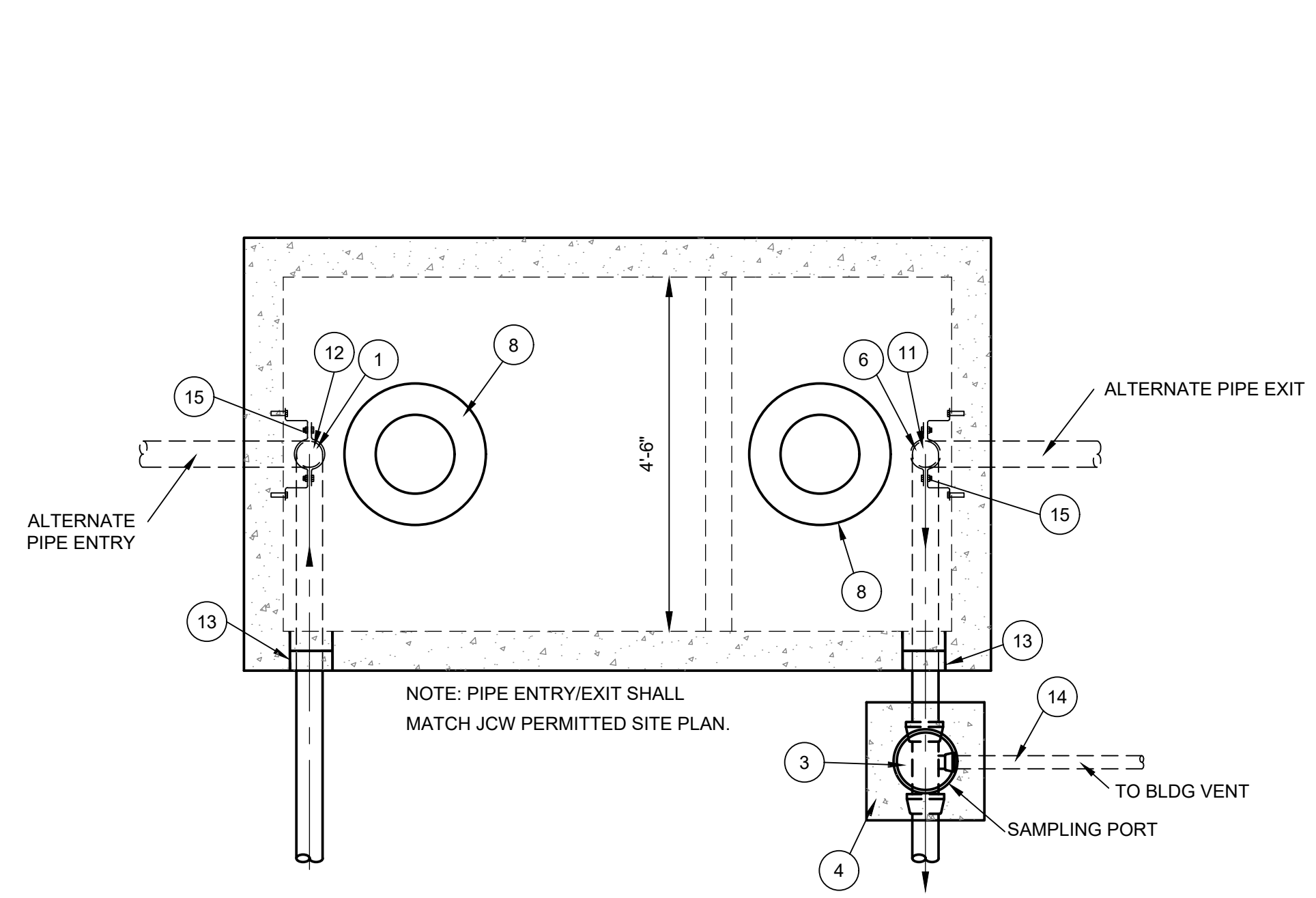
Scale: NONE
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 UPDATED: FEBRUARY 2019

STANDARD DETAILS



SIMPLEX/DUPLEX GRINDER PUMPING STATION

NO SCALE



GREASE INTERCEPTOR 1000 GALLON

NO SCALE

| ITEM | DESCRIPTION |
|------|--|
| 1 | 4" PVC INLET PIPE* |
| 2 | 4"x4"x2" TEE WITH 2" PIPE TO BUILDING VENT* |
| 3 | THREADED C/O CAP JOSAM 58860 OR APP EQUAL** |
| 4 | CONCRETE PAD |
| 5 | 4"x4"x4" TWO-WAY CLEANOUT TEE* |
| 6 | 4" PVC OUTLET* |
| 7 | 4" - 6" GRAVEL BEDDING |
| 8 | HEAVY-DUTY CAST IRON FRAME AND COVER *** |
| 9 | CONCRETE ADJUSTMENT RINGS |
| 10 | REINFORCE AS REQUIRED FOR SERVICE CONDITIONS |
| 11 | 4" PVC 90° ELBOW* |
| 12 | 4" PVC TEE* |
| 13 | A-LOK OR PRESS SEAL PSX PIPE/WALL CONNECTOR |
| 14 | 2" VENT PIPE (IDENTIFY PIPE TYPE, CLASS & JOINT AS REQUIRED FOR PROJECT) |
| 15 | STAINLESS STEEL PIPE SUPPORT CLAMP **** |

* 6" PIPE MAY BE SUBSTITUTED TO MATCH UPSTREAM PIPE DIAMETER.
 ** REFER TO CLEAN OUT DETAIL(S) ON STANDARD DETAIL SHEET
 *** CLAY & BAILEY 2008 BV OR EQUAL (FROST PROOF COVERS OPTIONAL)
 **** FM STAINLESS FASTENERS #63 OR EQUAL. 1/2"x2-1/2" SS BRACKET W/ 1/2"x1-1/2" FULLY THREADED SS HEX BOLT WITH 1/2" SS WASHER AND 1/2"x1-3/4" SS ANCHORS. CLAMP TO BE FACTORY INSTALLED.

- NOTES:**
1. THREE COVERS AND RISERS SHOWN. TWO COVERS AND RISERS CENTERED OVER UPPER TWO BAFFLES ARE OPTIONAL.
 2. INTERCEPTOR SIZE - 1000 GAL MINIMUM (REVISE THE SIZE DIMENSIONS, AS NEEDED, FOR LARGER CAPACITY INTERCEPTORS)
 3. ALL JOINTS AT THE FRAME & COVER, CONCRETE ADJUSTMENT RINGS AND THE LID OF THE INTERCEPTOR SHALL BE SEALED WITH A MINIMUM OF TWO (2) ROWS OF 3/4 TO 1 INCH PREFORMED BUTYL JOINT SEALER AND A 6" BUTYL JOINT WRAP AROUND SLEEVE (EZ WRAP). THE ENDS OF THE 6" EZ WRAP SHALL OVERLAP BY 12".
 4. PIPING ON THE INTERIOR OF THE INTERCEPTOR SHALL BE PVC WITH SOLVENT-CEMENTED JOINTS.
 5. GREASE INTERCEPTOR INCLUDING ADJUSTMENT RINGS AND CASTINGS SHALL BE WATER TESTED FOR WATER TIGHTNESS AFTER THE BACKFILL OPERATIONS HAVE BEEN COMPLETED. WATER TESTING SHALL CONSIST OF THE FOLLOWING: 1. SEAL THE TANK, 2. FILL WITH WATER, 3. LET STAND FOR 24 HOURS, 4. REFILL TANK, 5. TANK IS APPROVED IS WATER LEVEL IS HELD FOR 1 HOUR.
 6. ONLY KITCHEN WASTE SHALL BE DIVERTED TO THE GREASE TRAP.



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Sewer and Water Authority

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