

APPENDIX D

SEWER CONSTRUCTION DETAILS

SANITARY SEWER

DESCRIPTION

DETAIL NUMBER

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**DEDHAM DPW
DESIGN & CONSTRUCTION STANDARDS**

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SANITARY SEWER

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SANITARY SEWER CONTINUED

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DEDHAM DPW DESIGN & CONSTRUCTION STANDARDS

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SANITARY SEWER

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GENERAL NOTES FOR PIPE TRENCHES

1. PIPE TRENCHES MAY BE EXCAVATED WIDER THAN TRENCH WIDTH W_s (SHEETED) OR W_u (UNSHEETED) ABOVE THE TOP OF PIPE ZONE.
2. TRENCHES SHALL NOT BE EXCAVATED BEYOND THE TRENCH WIDTH W_u BELOW THE TOP OF PIPE ZONE.
3. SHEETING MUST BE USED IF EXCAVATION AND BACKFILL, BELOW NORMAL DEPTH, IS REQUIRED. SHEETING SHALL BE LEFT IN PLACE AS SPECIFIED.
4. ALL ROCK WITHIN 3'-0" HORIZONTALLY OF THE ENDS OF BUILDING CONNECTIONS, BRANCHES OR STUBS AND DOWN TO A HORIZONTAL PLANE 6" BELOW THE BOTTOMS OF SUCH CONNECTIONS, BRANCHES OR STUBS, SHALL BE EXCAVATED.
5. WHERE INDICATED ON THE DRAWINGS, GEOTEXTILE FILTER FABRIC SHALL BE PROVIDED FOR SEWER AND BUILDING CONNECTION FOUNDATIONS. OVERLAP FABRIC ABOVE THE PIPE CROWN AND PROVIDE A MINIMUM OF 12" FABRIC OVERLAP.

TRENCH WIDTH W_s OR W_u		
NOMINAL PIPE DIAMETER D	DEPTH OF PIPE INVERT BELOW GROUND SURFACE	
	0 TO 12'	12' TO 20'
24" AND SMALLER	5'-0"	7'-0"
OVER 24"	$D + 3'-0"$	$D + 5'-0"$



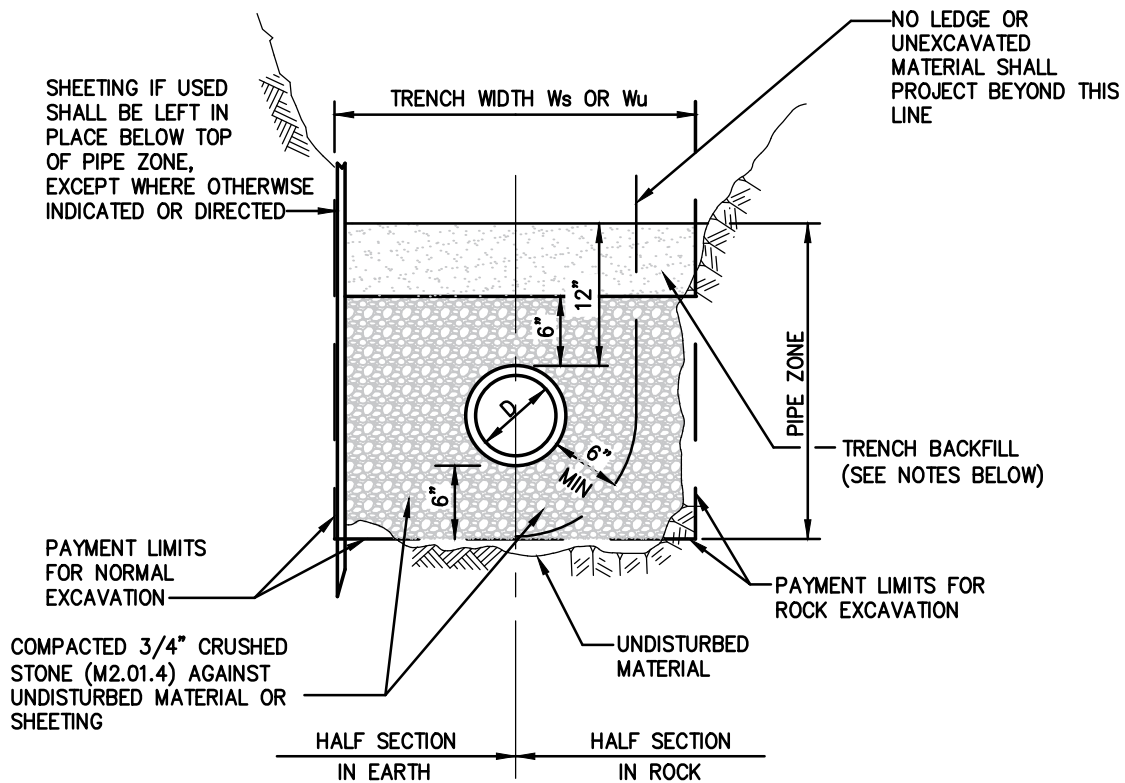
DEDHAM DPW DESIGN & CONSTRUCTION STANDARDS

GENERAL NOTES FOR PIPE TRENCHES

SCALE: NTS	DATE OF ISSUE: AUGUST 2015
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DETAIL NUMBER: SS.01



NOTES:

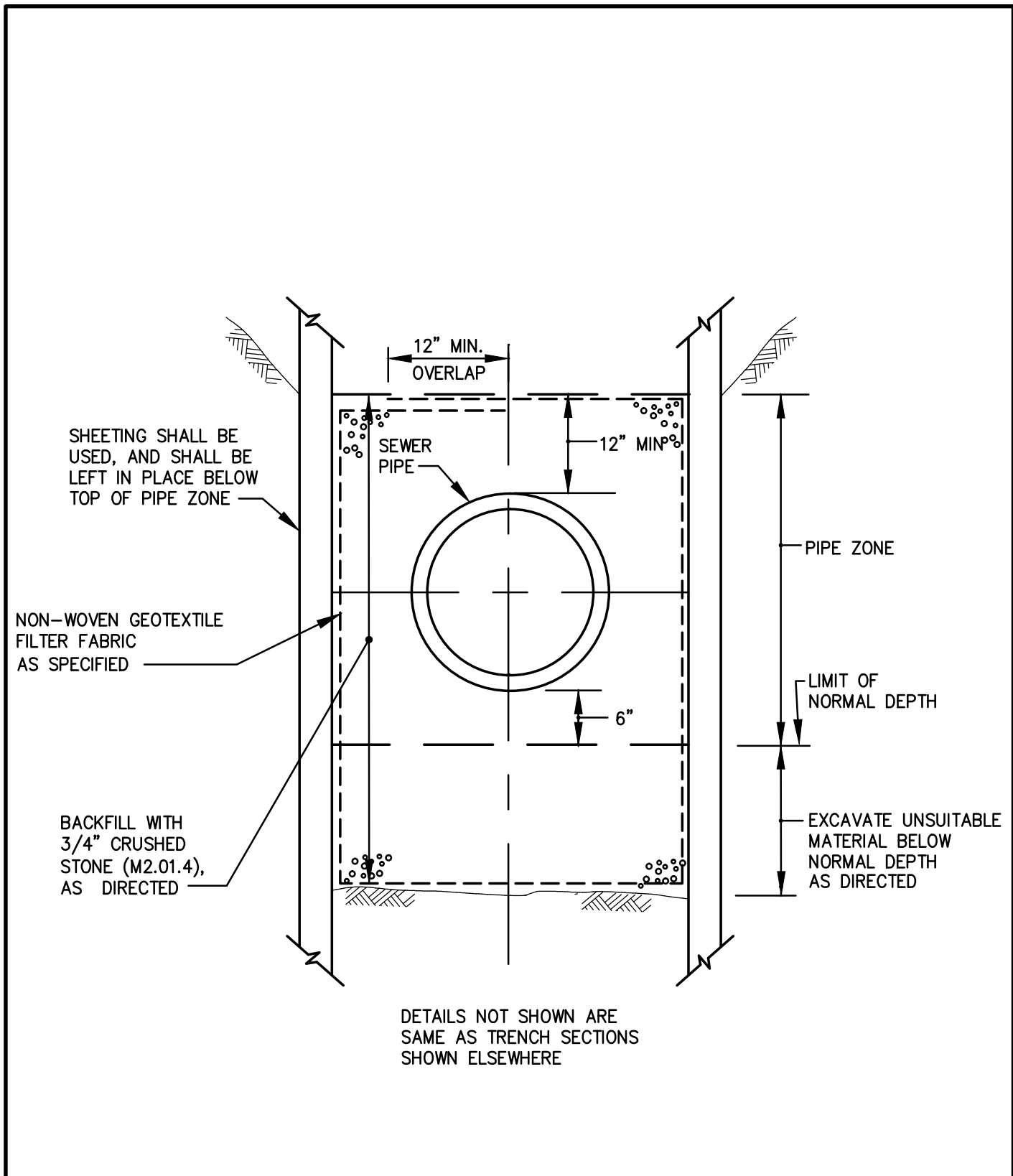
1. TRENCH BACKFILL TO BE USED WITHIN THE RIGHT-OF-WAY SHALL CONSIST OF EITHER GRAVEL BORROW MEETING MassDOT SPECIFICATION M1.03.0, TYPE "B" OR PROCESSED GRAVEL BORROW FOR SUBBASE MEETING MassDOT SPECIFICATION M1.03.1.
2. WHERE THE REMOVAL OF 100 SQUARE FEET OR LESS OF ASPHALT IS REQUIRED WITHIN THE RIGHT-OF-WAY, THEN THE TRENCH BACKFILL MATERIAL SHALL CONSIST OF CONTROLLED DENSITY FILL MEETING MassDOT SPECIFICATION M4.08.0, TYPE "1E" OR "2E".
3. TRENCH BACKFILL MATERIAL TO BE USED OUTSIDE OF THE RIGHT-OF-WAY MAY CONSIST OF MATERIAL GENERATED DURING EXCAVATIONS PROVIDED ALL STONES GREATER THAN 4" ARE REMOVED PRIOR TO PLACEMENT AND COMPACTION.
4. GRANULAR TRENCH BACKFILL MATERIAL USED WITHIN THE RIGHT-OF-WAY SHALL BE PLACED IN MAXIMUM 6" LIFTS AND MECHANICALLY COMPACTIONED TO A MINIMUM OF 95% OF THE MATERIAL'S MAXIMUM DRY DENSITY AND TO 90% ELSEWHERE AS DETERMINED BY ASTM D 1557.
5. REFER TO DETAILS RS.33-RS.35 FOR ASPHALT REPAIR REQUIREMENTS.



**DEDHAM DPW
DESIGN & CONSTRUCTION STANDARDS**

TRENCH SECTION FOR SEWER PIPE
18-INCH DIAMETER AND SMALLER

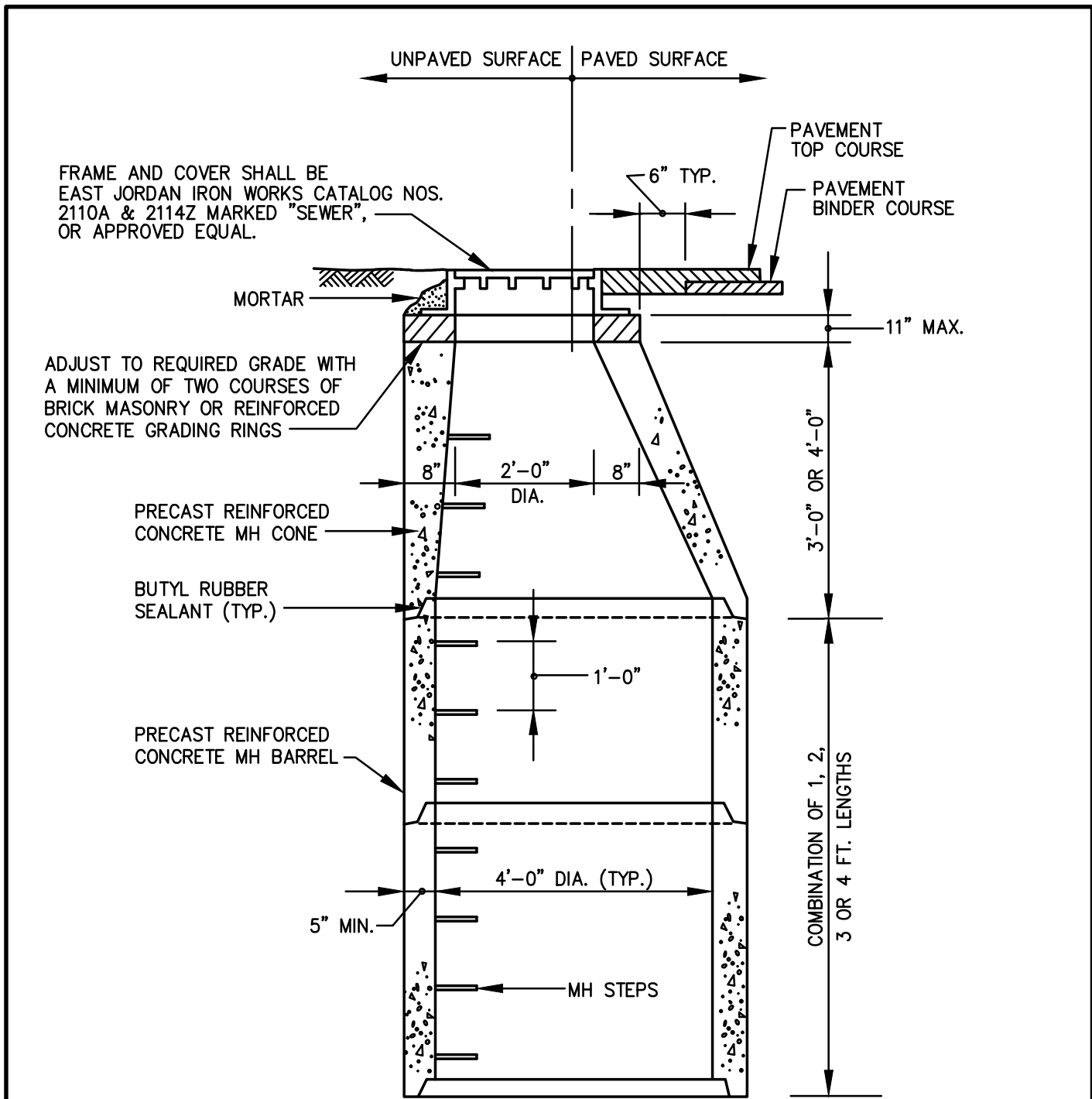
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DETAIL NUMBER: SS.02	



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TRENCH SECTION IN UNSUITABLE MATERIAL

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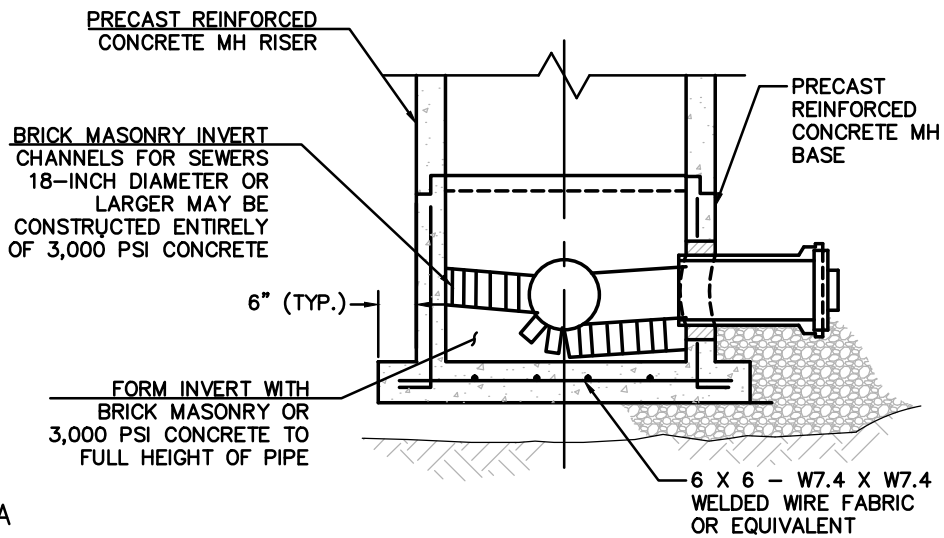
NOTE:
 ALL EXTERIOR SURFACES OF MANHOLE GRADE ADJUSTMENT COURSES SHALL BE COVERED WITH 1/4" TO 3/8" MASONRY CEMENT PLASTER.



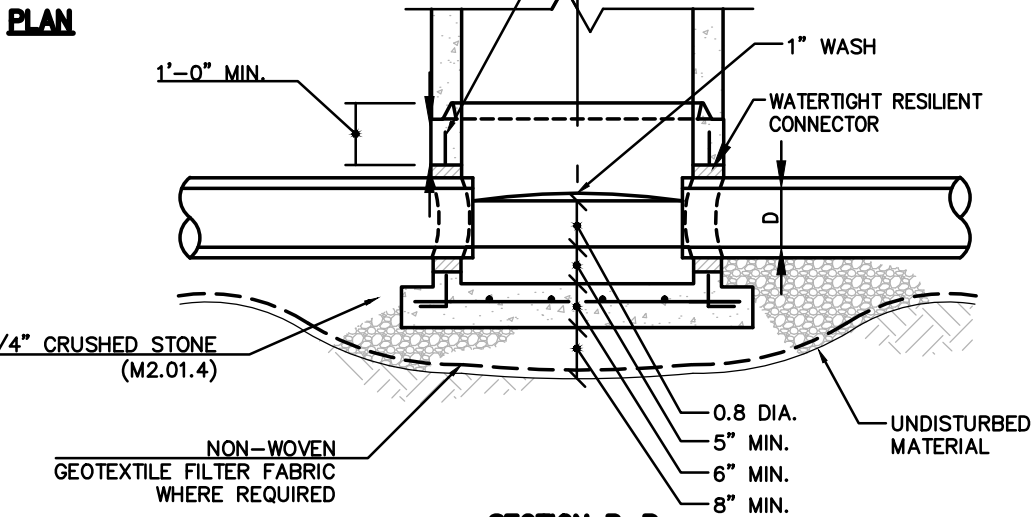
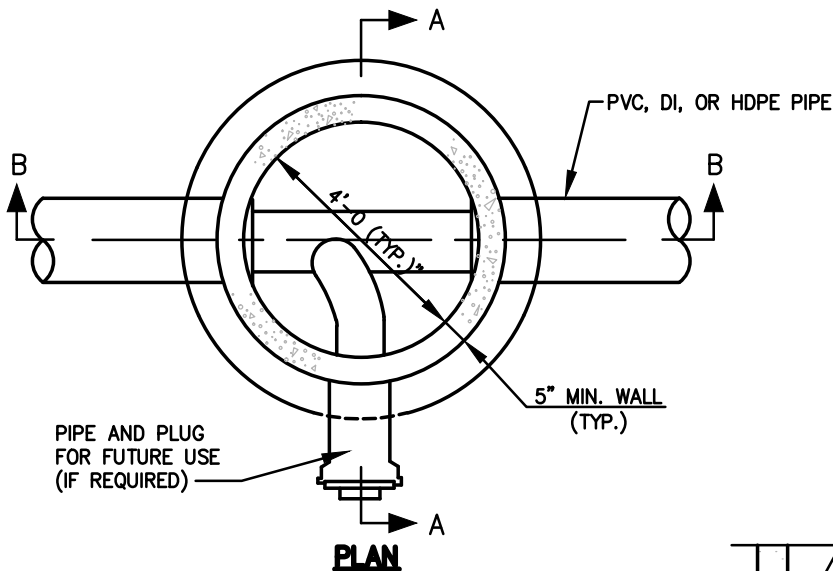
**DEDHAM DPW
 DESIGN & CONSTRUCTION STANDARDS**

MANHOLE RISER WITH ECCENTRIC CONE TOP

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SECTION A-A



SECTION B-B



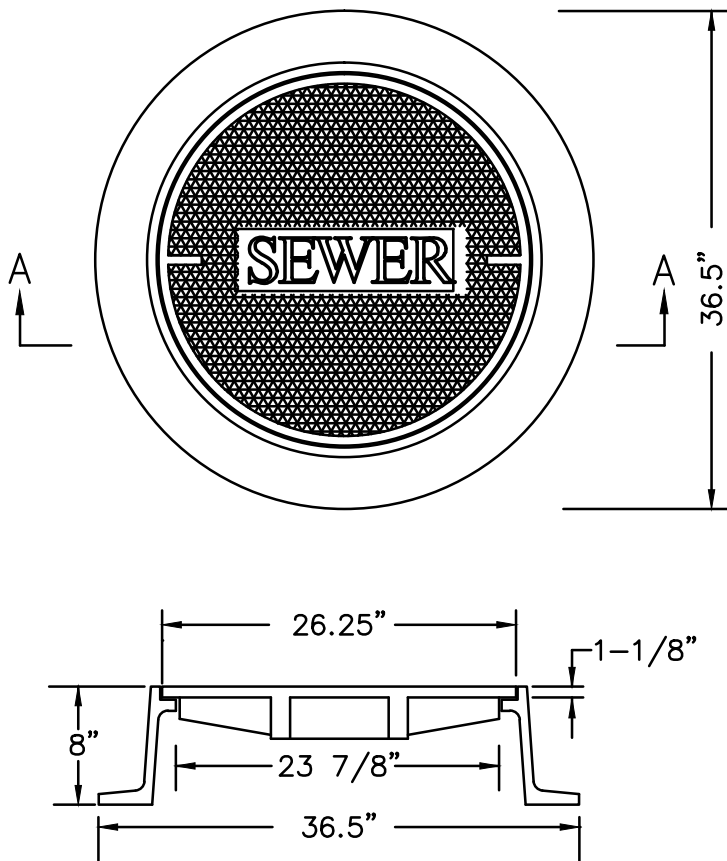
**DEDHAM DPW
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PRECAST REINFORCED CONCRETE
MANHOLE BASE FOR SEWERS

SCALE: DATE OF ISSUE:
NTS AUGUST 2015

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DETAIL NUMBER:
SS.05



SECTION A-A

NOTE:

FRAME AND COVER SHALL BE EAST JORDAN IRON WORKS CATALOG NOS. 2110A & 2114Z MARKED "SEWER", OR APPROVED EQUAL.



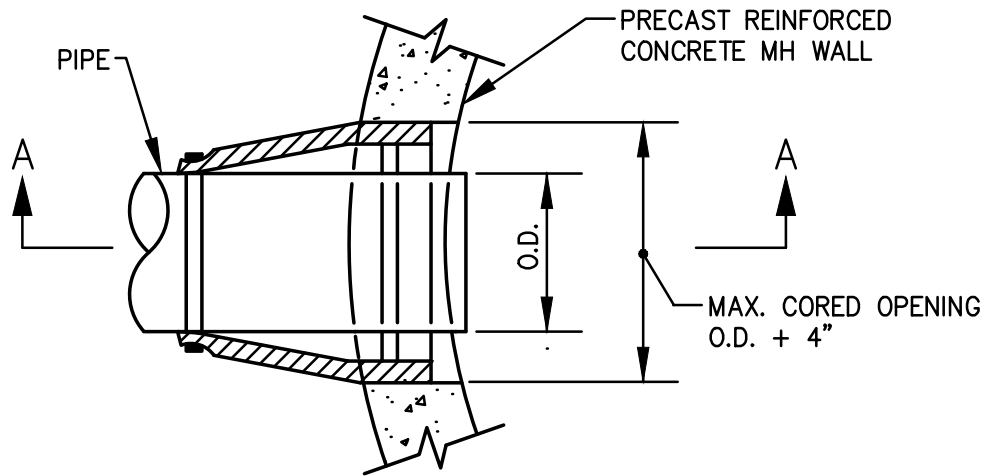
**DEDHAM DPW
DESIGN & CONSTRUCTION STANDARDS**

MANHOLE FRAME & COVER
MARKED "SEWER"

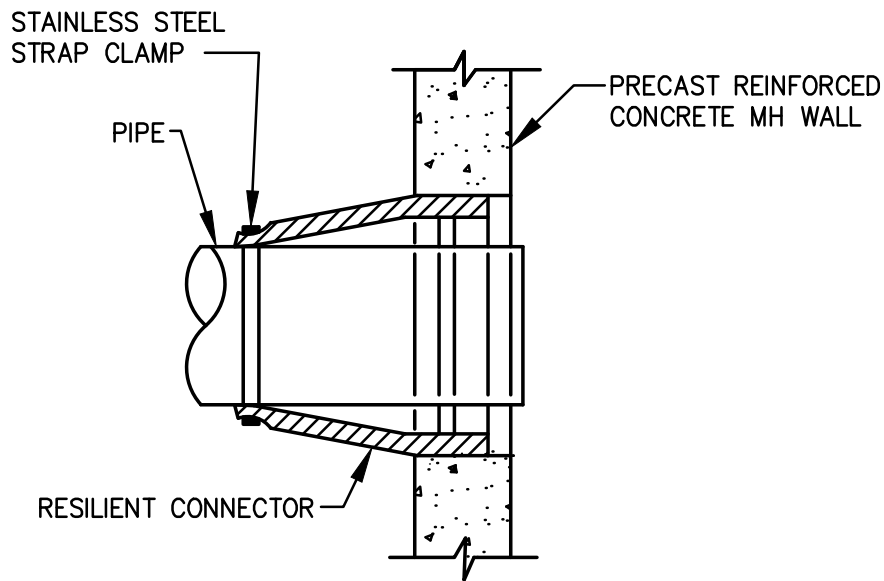
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PLAN



SECTION A-A



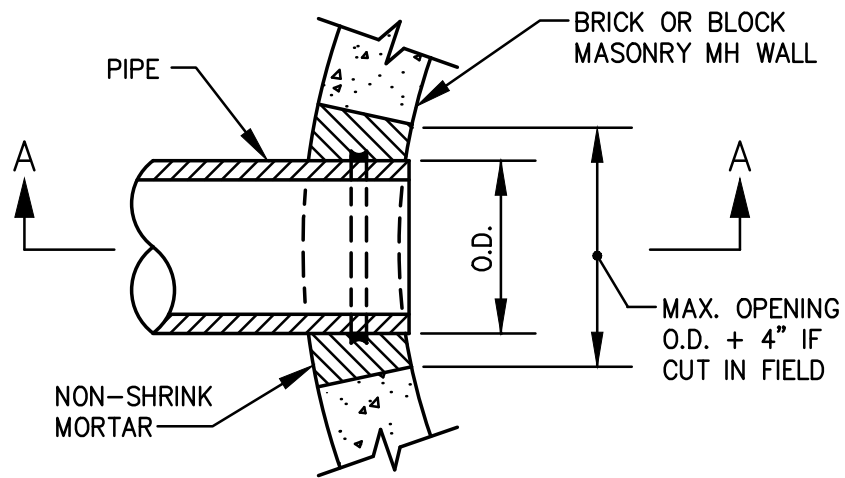
**DEDHAM DPW
DESIGN & CONSTRUCTION STANDARDS**

**WATERTIGHT RESILIENT CONNECTOR FOR CONNECTING
PIPES TO PRECAST CONCRETE MANHOLES**

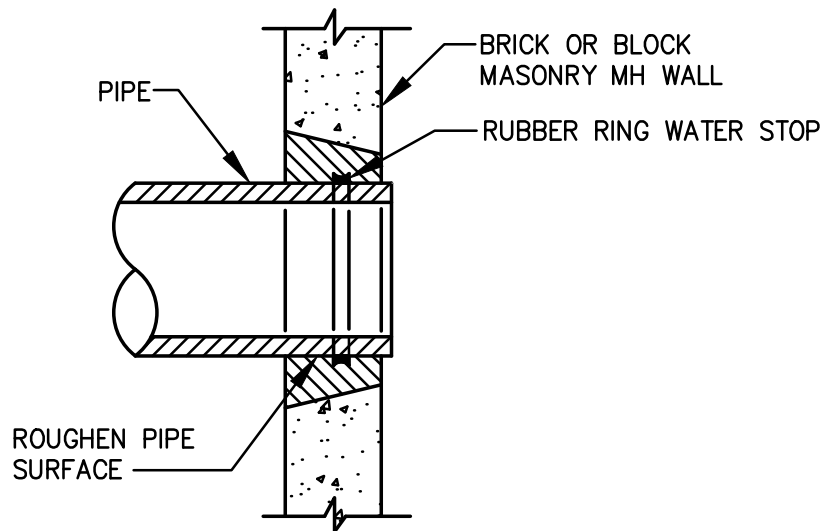
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DETAIL NUMBER: SS.07



PLAN



SECTION A-A

NOTES:

1. THIS METHOD ONLY TO BE USED UNDER SPECIAL CIRCUMSTANCES AND WITH PRIOR APPROVAL FROM THE DIRECTOR OF ENGINEERING. THE WATERTIGHT RESILIENT CONNECTOR IS THE PREFERRED CONNECTION METHOD.



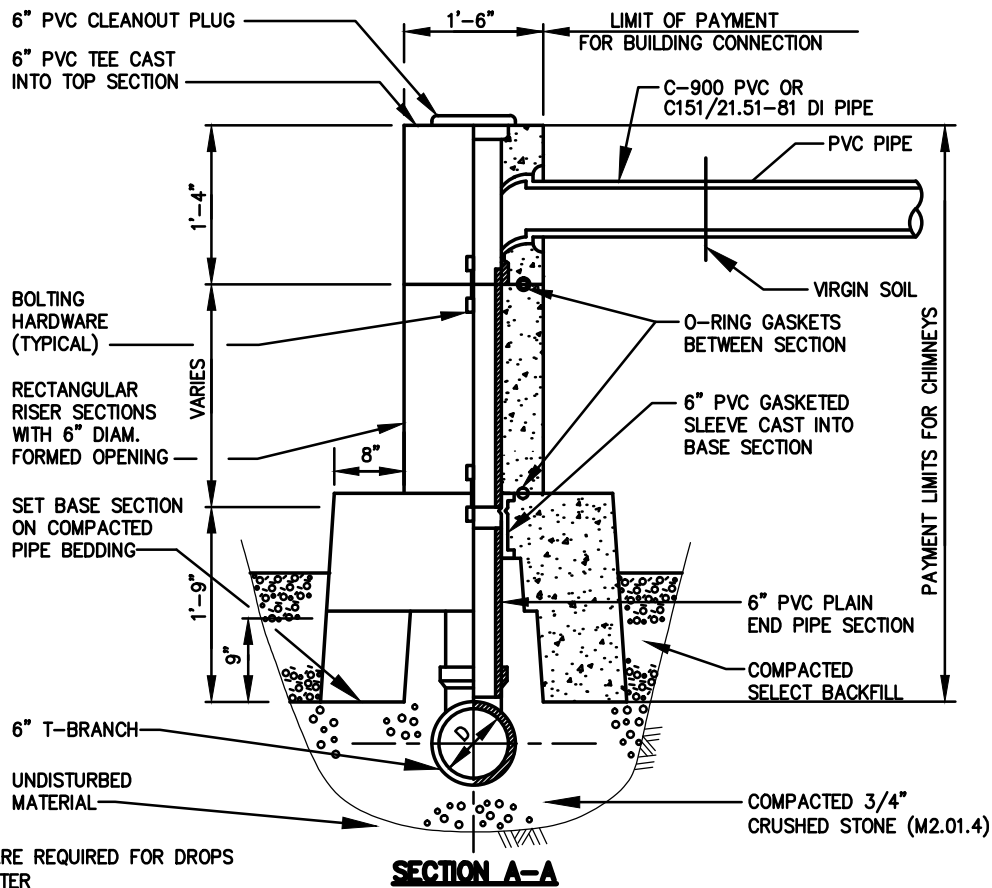
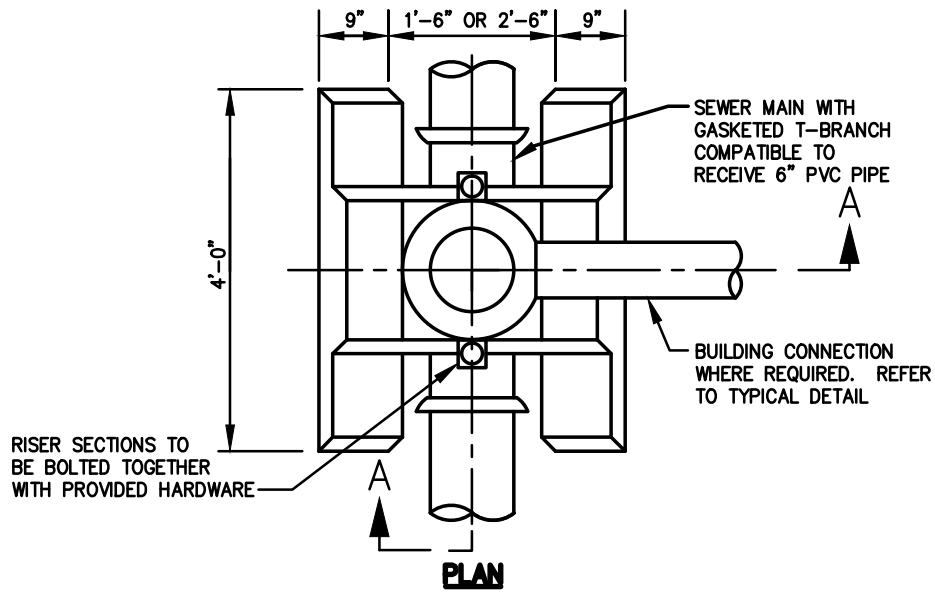
**DEDHAM DPW
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NON-SHRINK MORTAR JOINTS FOR CONNECTING
PIPES TO BRICK OR BLOCK MASONRY MANHOLES

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REVISED:

DETAIL NUMBER: SS.08



* CHIMNEYS ARE REQUIRED FOR DROPS 3' OR GREATER



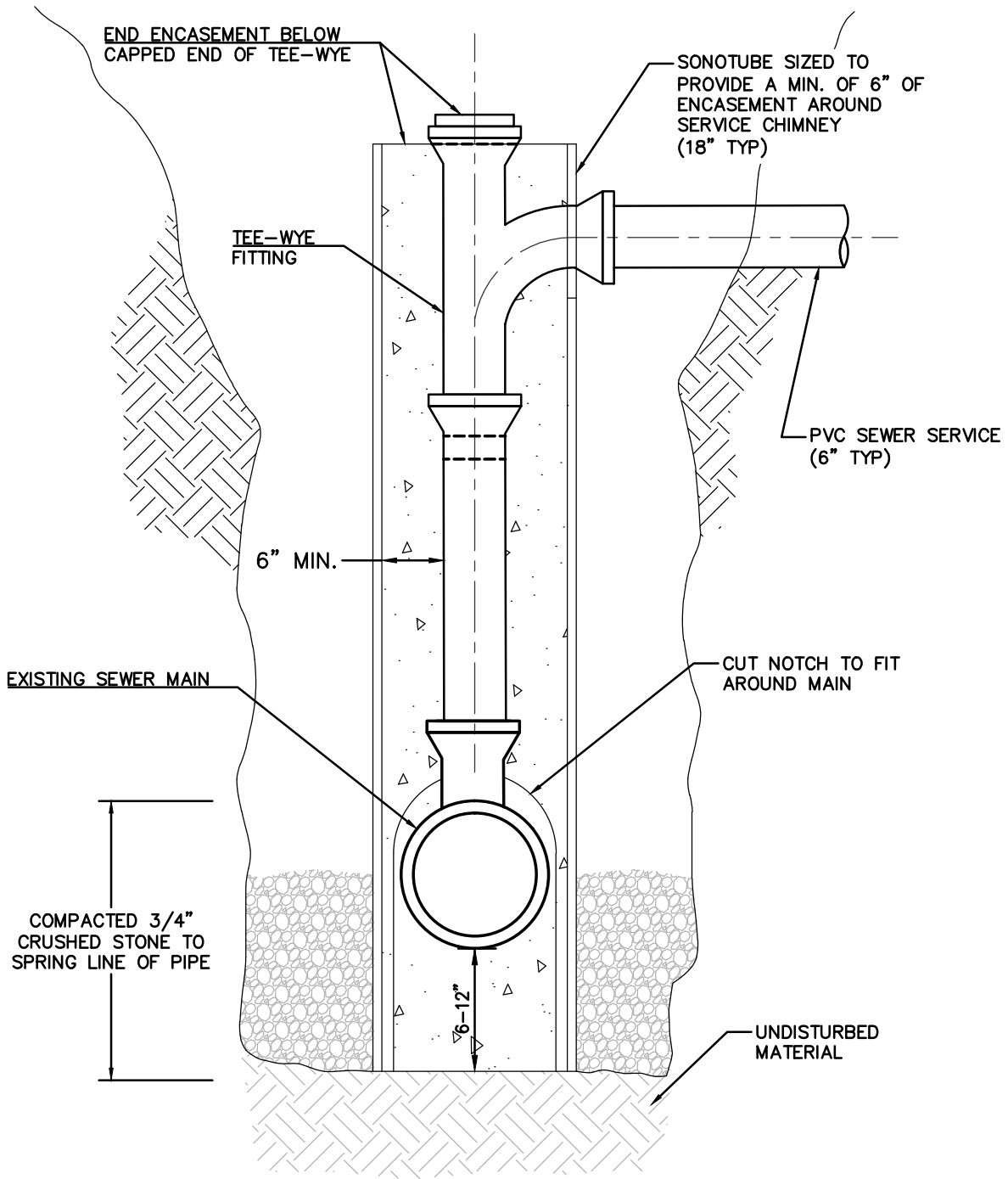
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PRECAST REINFORCED CONCRETE SEWER CHIMNEY

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DETAIL NUMBER: SS.09



* CHIMNEYS ARE REQUIRED FOR DROPS 3' OR GREATER



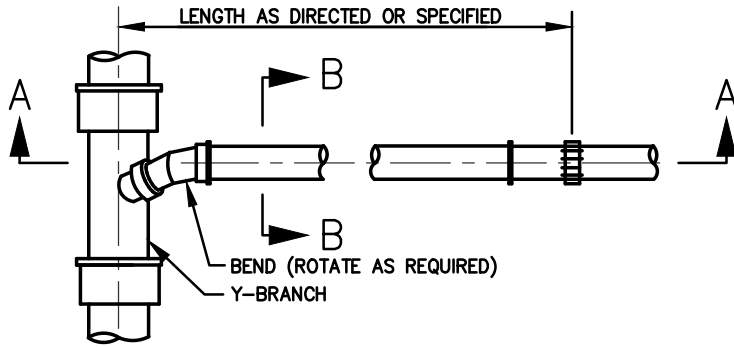
**DEDHAM DPW
DESIGN & CONSTRUCTION STANDARDS**

TYPICAL SONOTUBE
CAST-IN-PLACE SEWER CHIMNEY

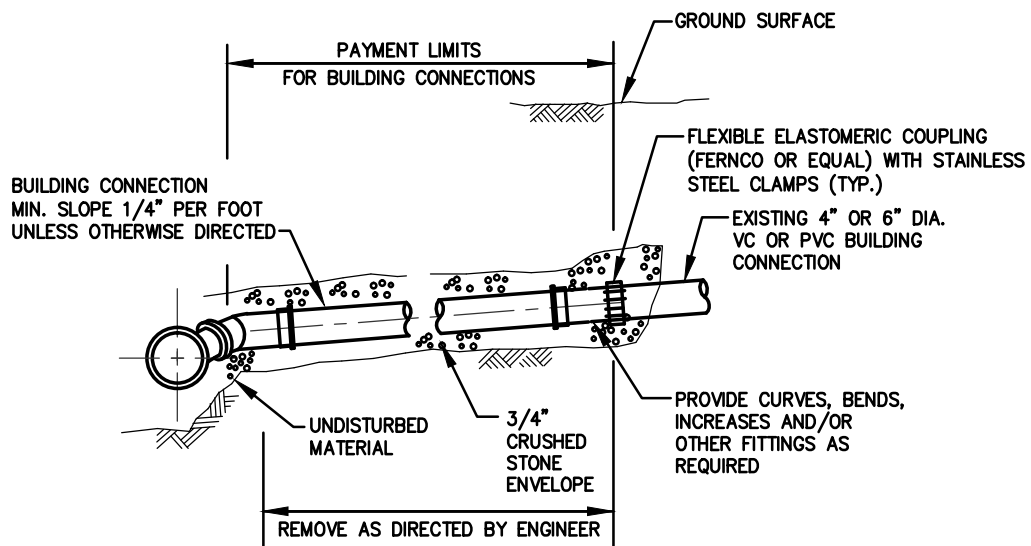
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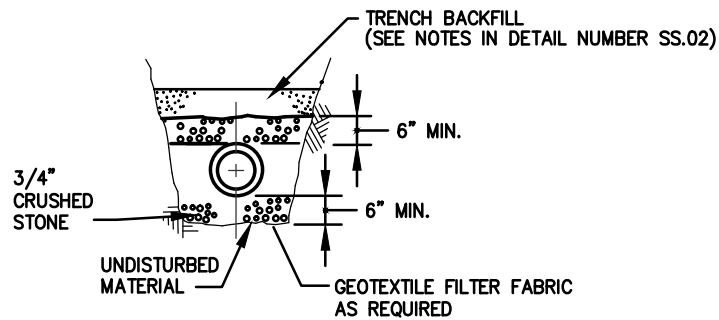
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PLAN



SECTION A-A



SECTION B-B



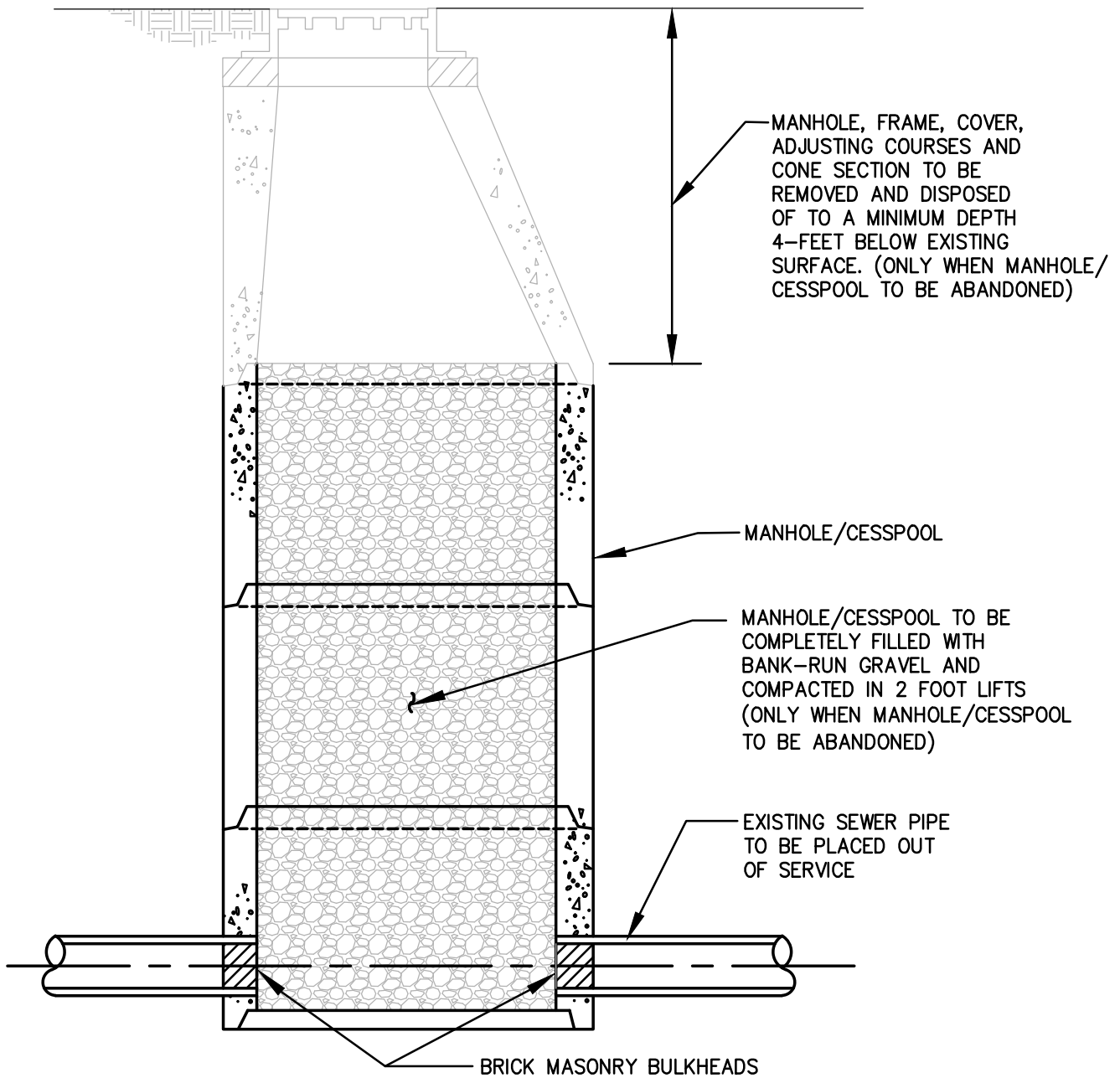
**DEDHAM DPW
DESIGN & CONSTRUCTION STANDARDS**

RECONSTRUCTED BUILDING CONNECTION

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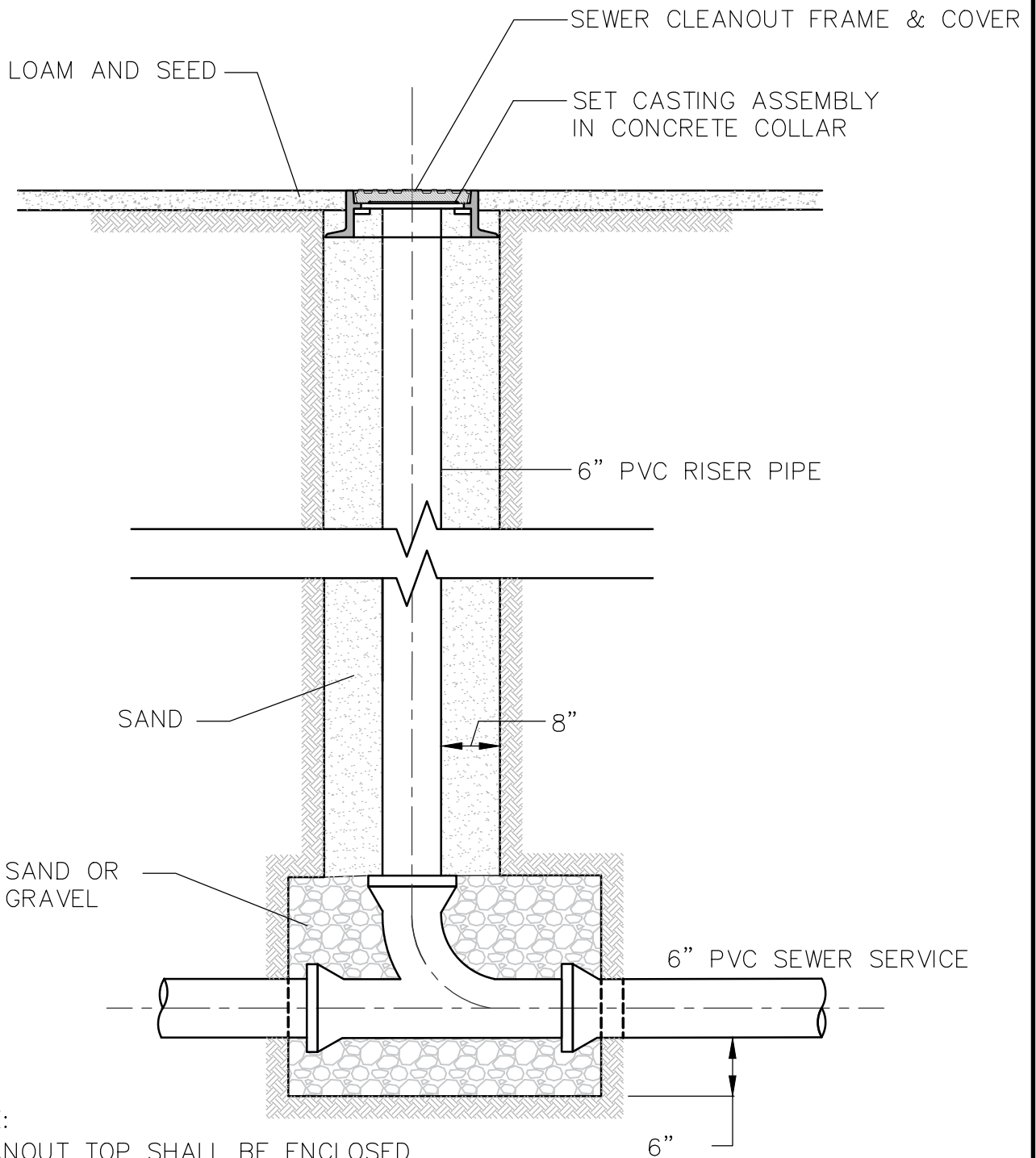
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ABANDON EXISTING MANHOLES/CESSPOOLS

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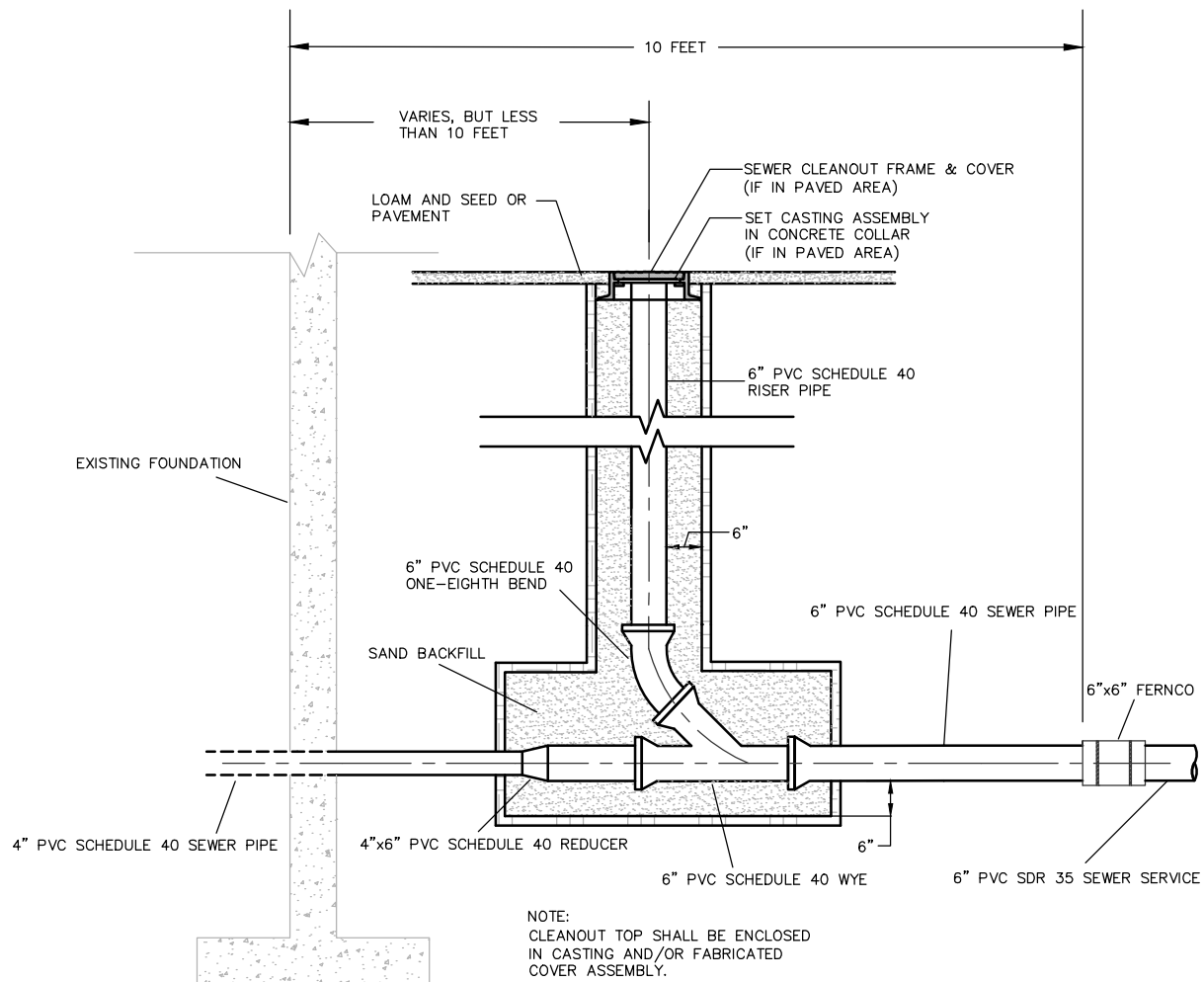
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DESIGN & CONSTRUCTION STANDARDS**

TYPICAL SEWER CLEANOUT DETAIL

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SS.13



NOTES:

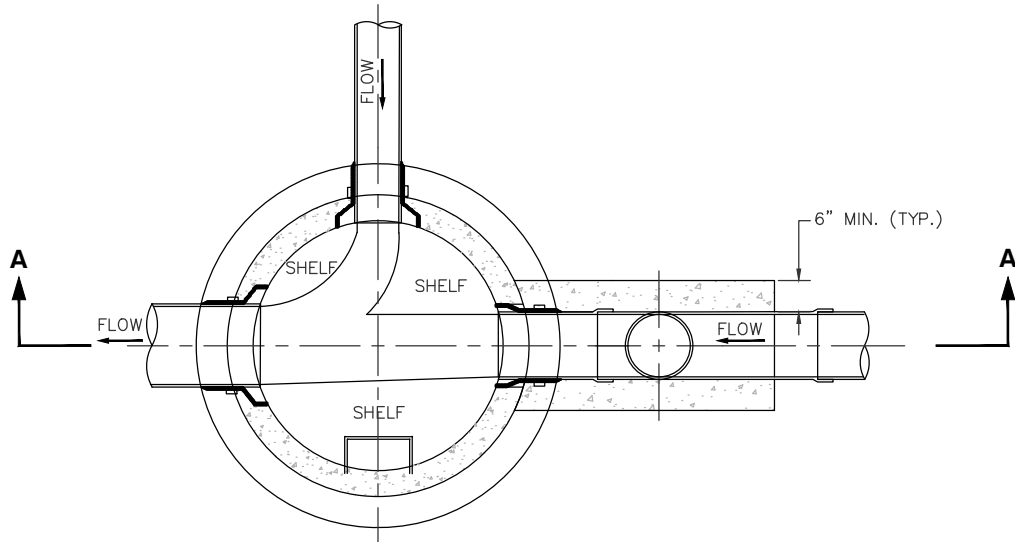
- SEWER CLEANOUTS SHALL TYPICALLY BE LOCATED A MINIMUM OF 10' FROM THE FOUNDATION. HOWEVER, IN SPECIAL CIRCUMSTANCES THE CLEANOUT MAY BE LOCATED WITHIN 10' OF THE FOUNDATION WITH PERMISSION FROM THE ENGINEERING DEPARTMENT. THE 10' ZONE SHALL BE CONSIDERED THE DISTANCE FROM THE INSIDE FACE OF THE FOUNDATION TO A DISTANCE OF 10' OUTSIDE OF THE FOUNDATION, PERPENDICULAR TO THE INSIDE FACE OF THE FOUNDATION.
- ALL WORK TO BE CONDUCTED WITHIN THE 10' ZONE SHALL BE PERFORMED BY A PLUMBER LICENSED IN THE STATE OF MASSACHUSETTS AND SHALL CONFORM TO 248 CMR 2.00 AND 248 CMR 10.00.



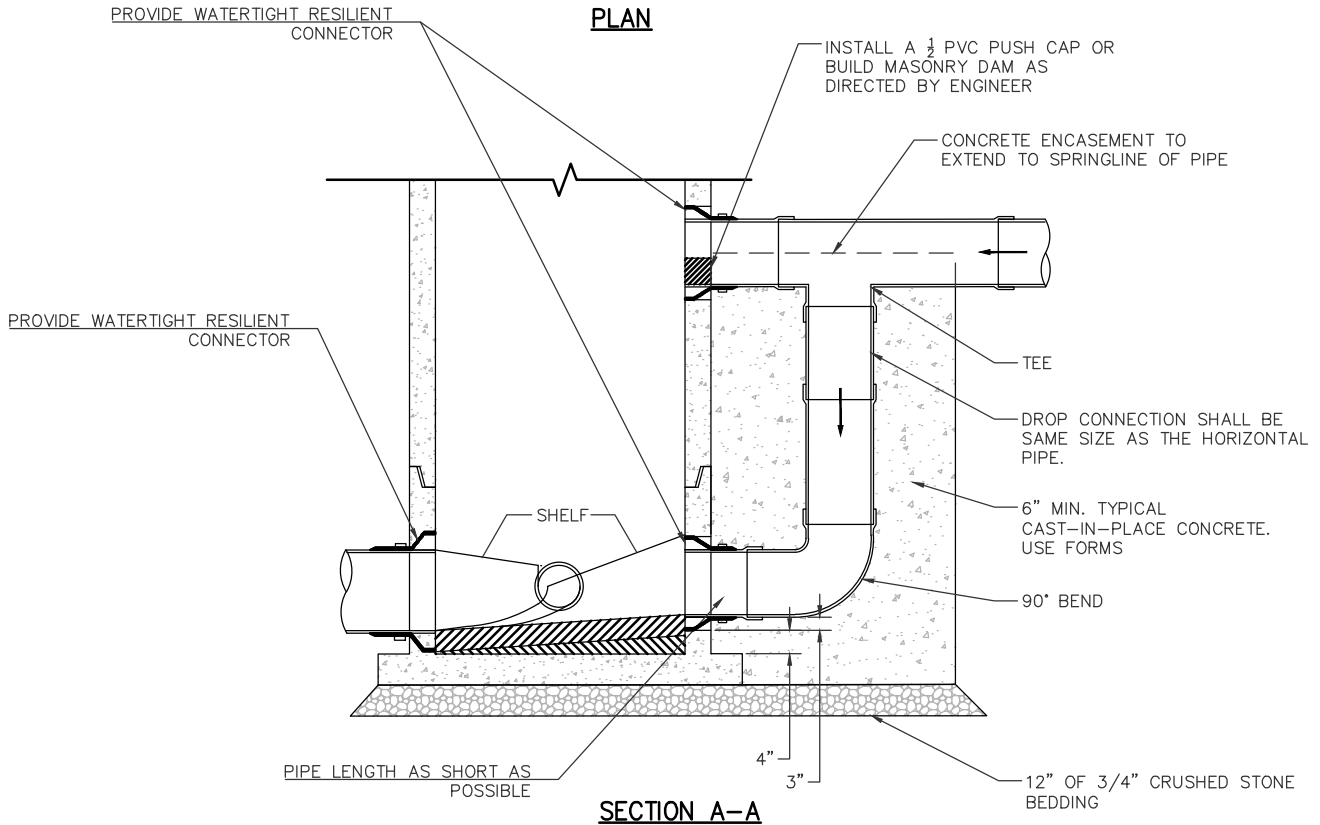
**DEDHAM DPW
DESIGN & CONSTRUCTION STANDARDS**

**SEWER CLEANOUT DETAIL WITHIN
10' OF BUILDING FOUNDATION**

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DETAIL NUMBER: SS.14	



PLAN



SECTION A-A

NOTES:

1. DROP MANHOLES ARE REQUIRED WHEN THE VERTICAL DROP IS 24" OR GREATER.
2. DROP PIPE AND FITTINGS SHALL BE THE SAME DIAMETER AS THE INCOMING SEWER PIPE.



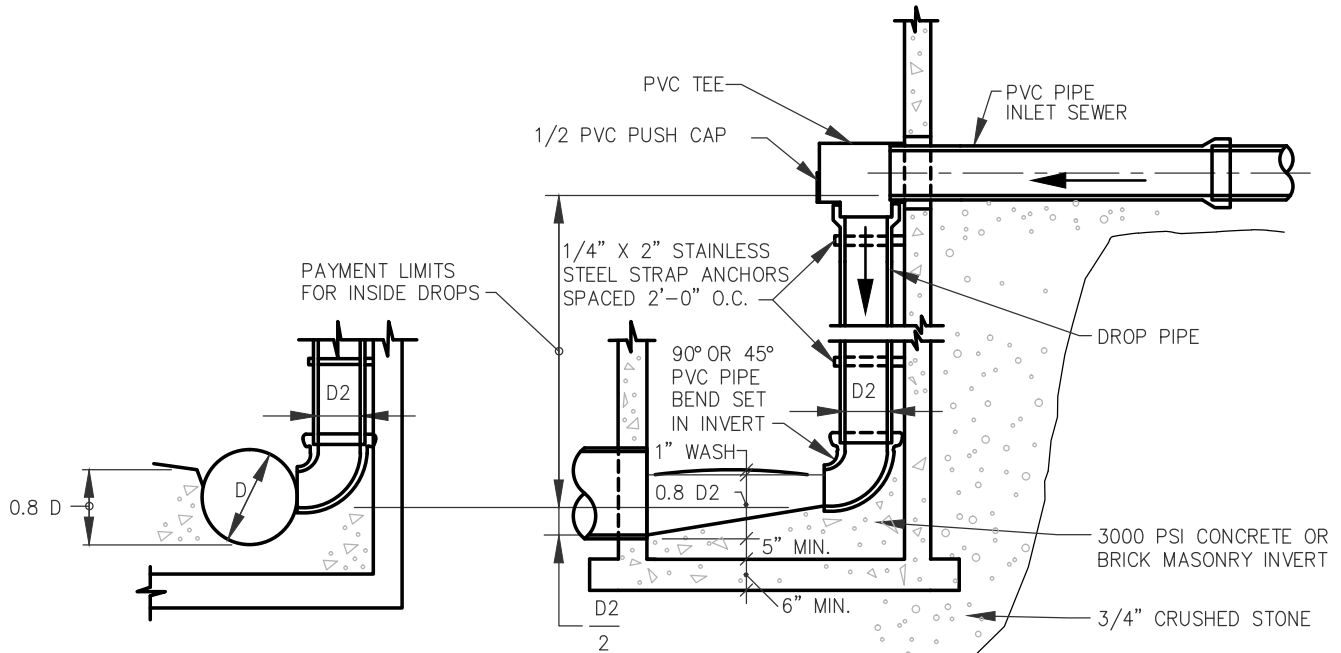
**DEDHAM DPW
DESIGN & CONSTRUCTION STANDARDS**

TYPICAL OUTSIDE DROP MANHOLE DETAIL

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REVISED:

DETAIL NUMBER: SS.15



INVERT DETAIL
AT SIDE DROPS

INVERT DETAIL
AT MAIN RUN DROPS

NOTES:

1. INSIDE DROPS ARE ONLY ALLOWED WHEN OUTSIDE DROPS ARE IMPRACTICAL AND ONLY WITH THE PRIOR APPROVAL OF THE DIRECTOR OF ENGINEERING.
2. DROP MANHOLES ARE REQUIRED WHEN THE VERTICAL DROP IS 24" OR GREATER.
3. DROP PIPE AND FITTINGS SHALL BE THE SAME DIAMETER AS THE INCOMING SEWER PIPE.
4. MANHOLE SHALL HAVE SUFFICIENT DIAMETER FOR ENTRY WITH DROP PIPE INSTALLED (5' TYPICAL).



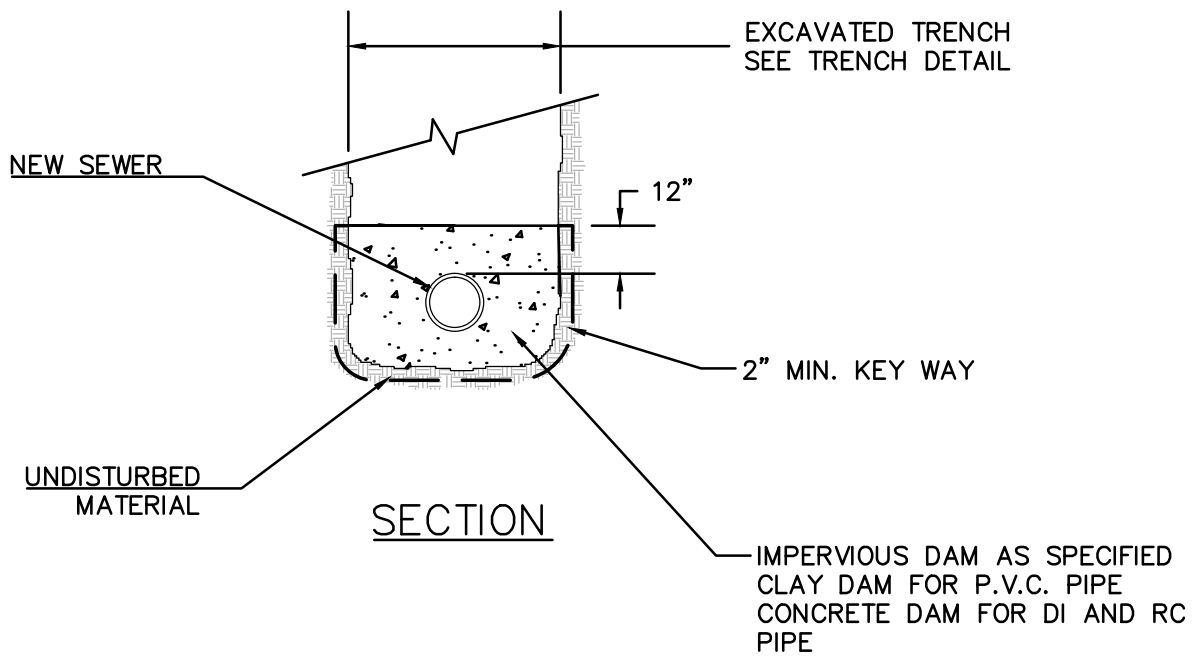
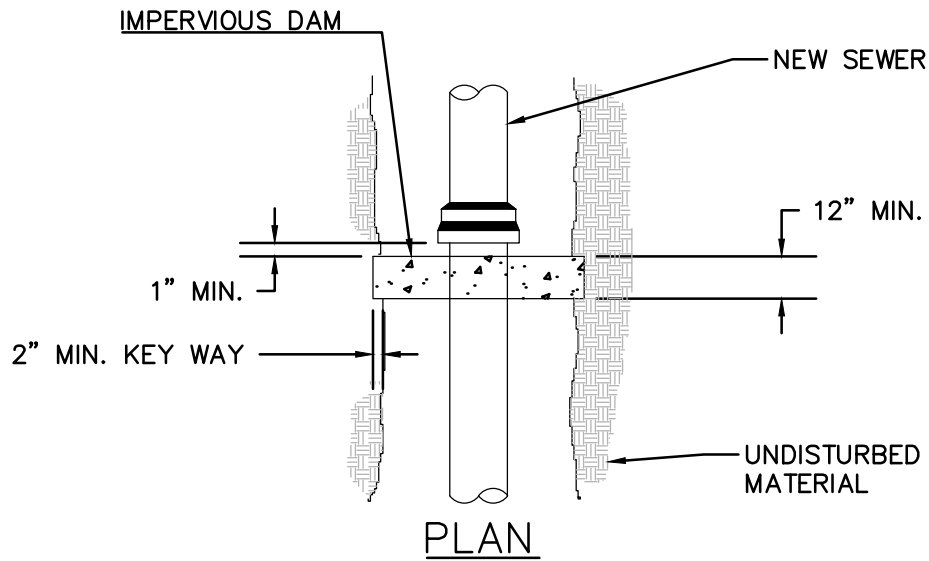
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DESIGN & CONSTRUCTION STANDARDS**

INSIDE DROPS FOR PVC SEWERS
12-INCH DIAMETER AND SMALLER

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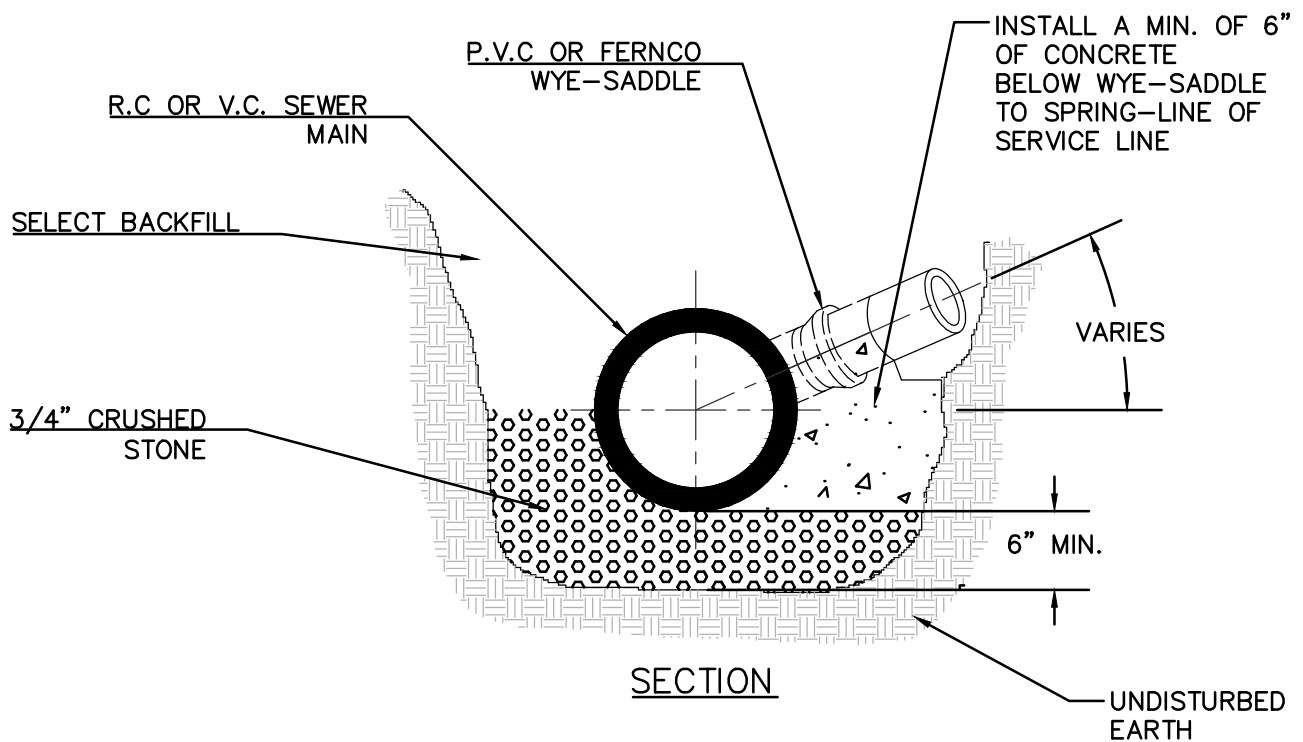
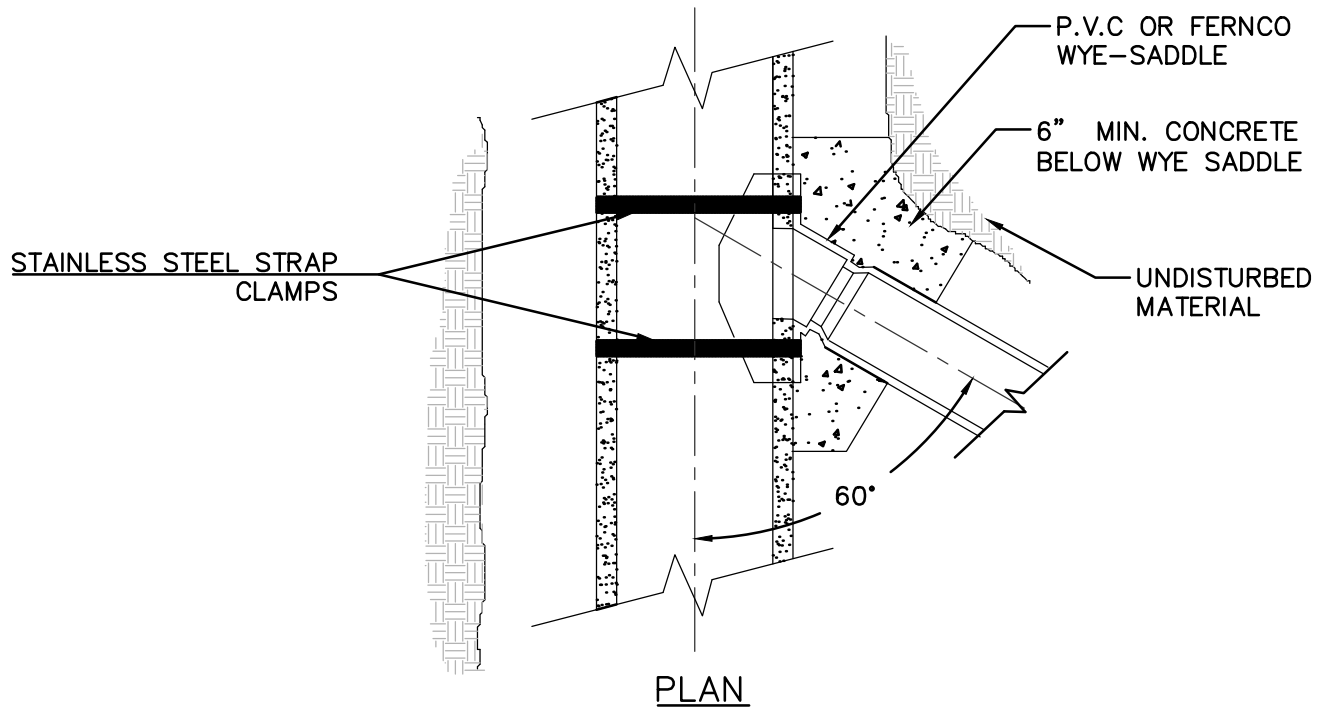
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DESIGN & CONSTRUCTION STANDARDS**

PIPE TRENCH DAM DETAIL

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SS.17



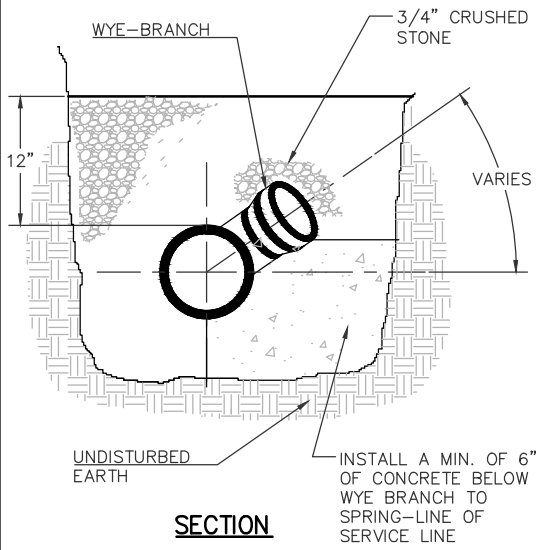
**DEDHAM DPW
DESIGN & CONSTRUCTION STANDARDS**

**WYE-SADDLE DETAIL FOR SERVICE CONNECTION
ON R.C. OR V.C. MAIN**

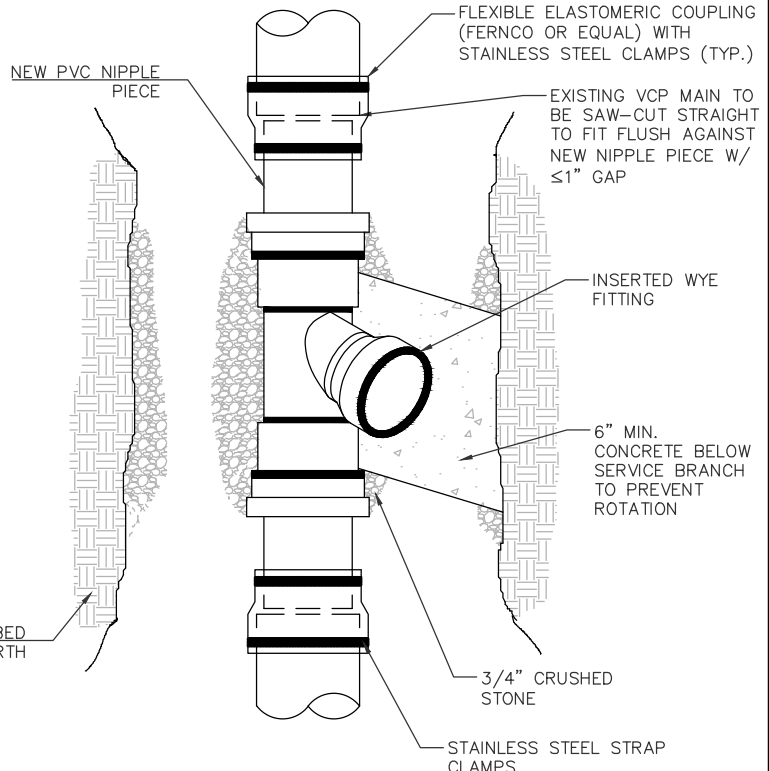
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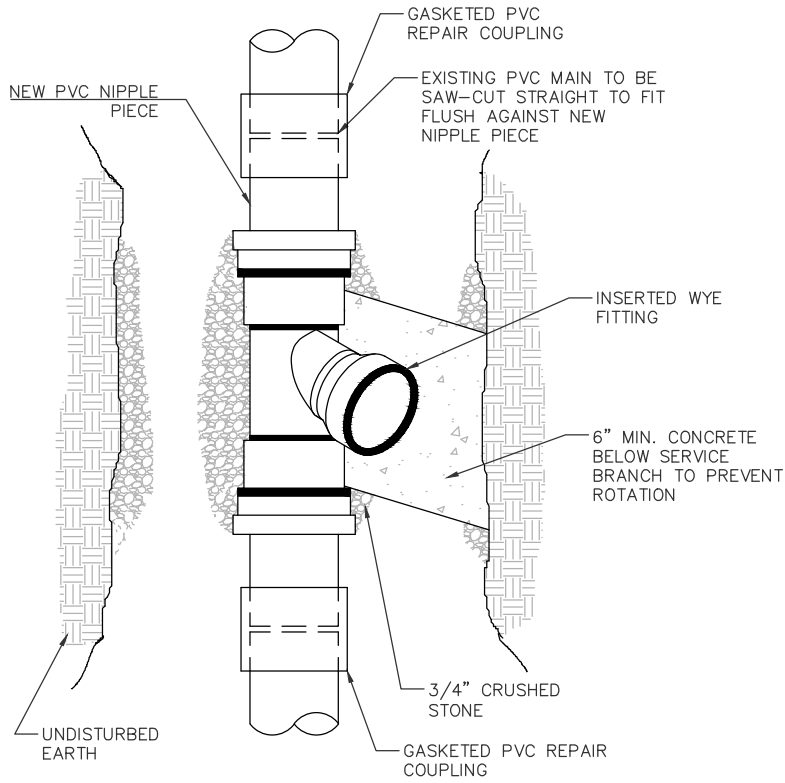
DETAIL NUMBER:
SS.18



SECTION



PLAN - VCP MAIN



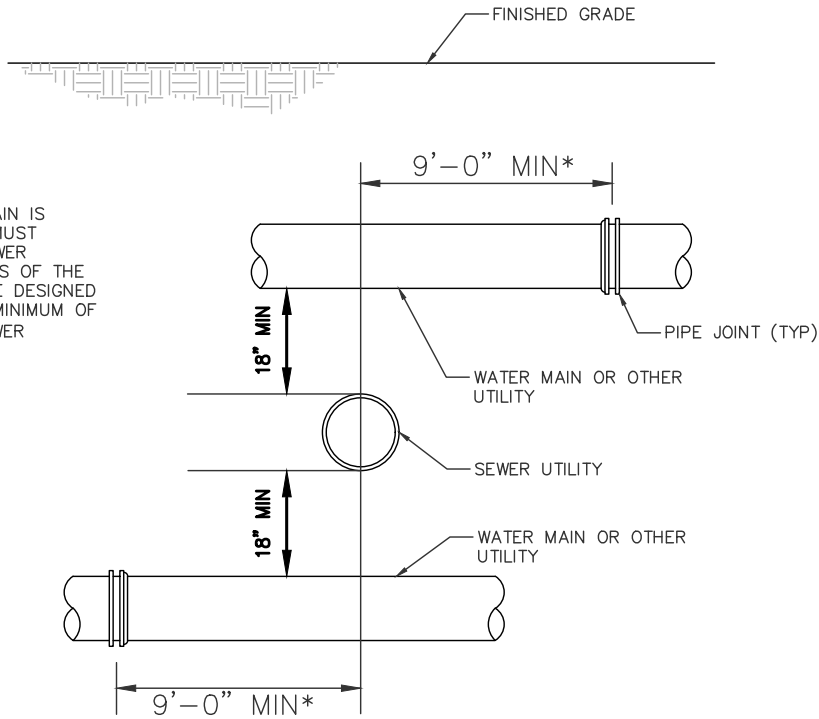
PLAN - PVC MAIN



**DEDHAM DPW
DESIGN & CONSTRUCTION STANDARDS**

P.V.C. WYE INSERTED ON EXISTING MAIN

SCALE: NTS	DATE OF ISSUE: AUGUST 2015
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DETAIL NUMBER: SS.19	



* WHEN A NEW WATER MAIN IS BEING INSTALLED AND MUST CROSS AN EXISTING SEWER UTILITY, THE PIPE JOINTS OF THE WATER MAIN SHOULD BE DESIGNED SO THAT THEY ARE A MINIMUM OF 9' AWAY FROM THE SEWER UTILITY.

NOTES:

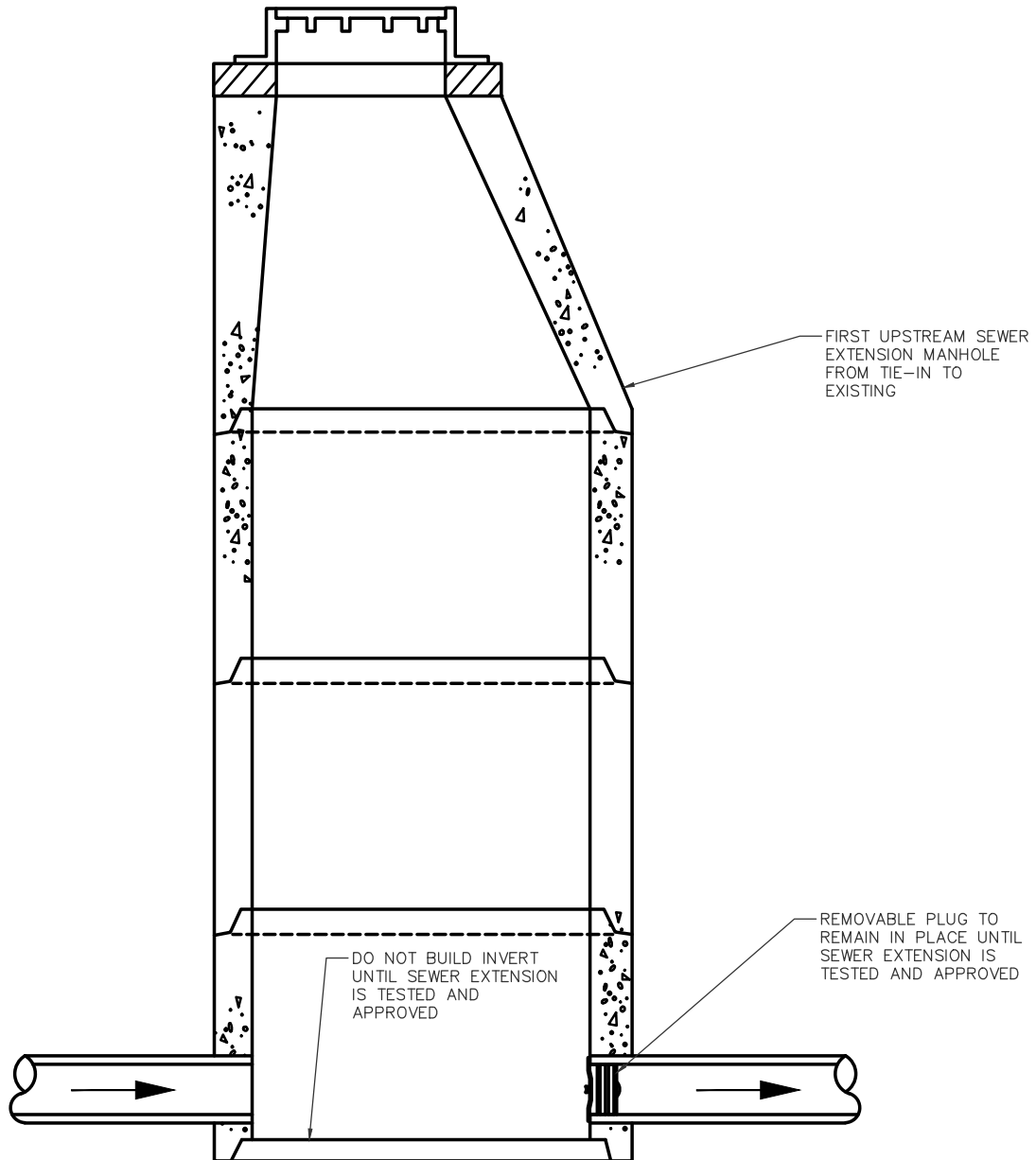
1. ANY WATER MAIN OR OTHER UTILITY SHALL NOT BE INSTALLED WITHIN 6" ABOVE OR BELOW AN EXISTING SEWER MAIN OR LATERAL. ALL EFFORTS SHALL BE MADE TO DESIGN UTILITIES WITH THE MINIMUM 18" OF SEPARATION FROM EXISTING SEWER MAINS OR LATERALS.
2. ALL BACKFILLING OPERATIONS FOR SEWER MAINS AND LATERALS SHALL FOLLOW DETAIL NO. SS.02 UNLESS OTHERWISE STATED BELOW.
3. WHERE A WATER MAIN / UTILITY IS TO BE INSTALLED BELOW AN EXISTING VC SEWER MAIN, REGARDLESS OF SEPARATION DISTANCE, THE SEWER MAIN SHALL BE ADEQUATELY SUPPORTED. IF IN THE OPINION OF THE ENGINEER THAT THE SEWER MAIN CANNOT BE ADEQUATELY SUPPORTED, IT SHALL BE EITHER LINED USING APPROVED CIPP METHODS PRIOR TO EXCAVATION BELOW THE SEWER MAIN OR SHALL BE REPLACED WITH PVC C900. IF PVC C900 IS USED, MECHANICAL JOINTS OR AN APPROVED EQUAL THAT ARE WATERTIGHT SHALL BE USED TO FASTEN THE C900 TO THE EXISTING VC SEWER MAIN.
4. WHENEVER A WATER MAIN IS TO BE INSTALLED WITHIN 18" ABOVE AN EXISTING VC SEWER MAIN, IF THE WATER MAIN IS GREATER THAN 12" IN DIAMETER, THE SEWER MAIN SHALL BE LINED USING APPROVED CIPP METHODS PRIOR TO THE INSTALLATION OF THE WATER UTILITY.
5. WHERE A WATER MAIN IS TO BE INSTALLED BELOW AN EXISTING VC SEWER LATERAL, REGARDLESS OF SEPARATION DISTANCE, THE SEWER LATERAL SHALL BE EITHER ENCASED IN A MINIMUM OF 6" OF CONCRETE FOR A MINIMUM OF 10' ON EACH SIDE OF THE CROSSING, OR THE SEWER LATERAL SHALL BE REMOVED AND REPLACED WITH PVC SDR 35 PIPE FOR THE FULL WIDTH OF THE TRENCH. FERNCO COUPLINGS, OR APPROVED EQUALS THAT ARE WATERTIGHT SHALL BE USED TO CONNECT THE PVC PIPE TO THE EXISTING VC SEWER LATERAL.
6. WHENEVER A WATER MAIN / UTILITY IS TO BE INSTALLED WITHIN 18" ABOVE AN EXISTING VC SEWER LATERAL, IF THE WATER MAIN / UTILITY IS GREATER THAN 12" DIAMETER, THE SEWER LATERAL SHALL BE EITHER REMOVED AND REPLACED WITH PVC C900 OR DI PIPE FOR THE FULL WIDTH OF THE TRENCH OR THE SEWER LATERAL SHALL BE LINED USING APPROVED CIPP METHODS FOR A MINIMUM DISTANCE OF 10' ON EACH SIDE OF THE CROSSING.
7. WHERE A WATER MAIN / UTILITY IS INSTALLED BELOW AN EXISTING SEWER LATERAL, IF THE LATERAL IS COMPRISED OF CI, DI OR PVC MATERIAL, THE LATERAL CAN REMAIN IN PLACE PROVIDED IT IS ADEQUATELY SUPPORTED DURING EARTHWORK ACTIVITIES.



**DEDHAM DPW
DESIGN & CONSTRUCTION STANDARDS**

TYPICAL UTILITY CROSSINGS

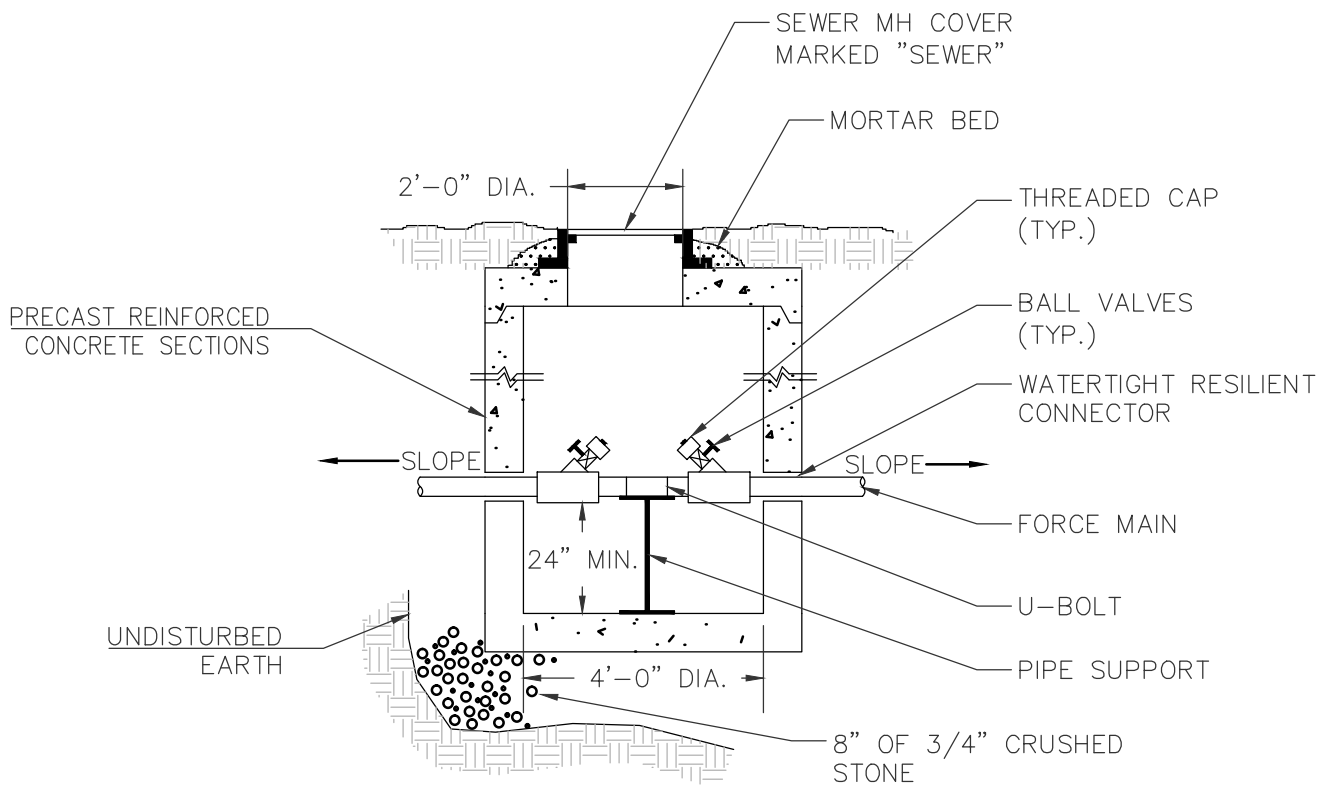
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REVISED: 7/26/2018	
DETAIL NUMBER: SS.20	



**DEDHAM DPW
DESIGN & CONSTRUCTION STANDARDS**

SANITARY SEWER PROTECTION DURING
SEWER EXTENSION CONSTRUCTION

SCALE: NTS	DATE OF ISSUE: AUGUST 2015
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DETAIL NUMBER: SS.21	



SECTION

NOTES:

1. PROVIDE MANHOLE STEPS 1'-0" O.C.
2. CONTRACTOR SHALL CONFIRM ELEVATION AND ALIGNMENT OF PROPOSED FORCE MAIN AND GROUND SURFACE AT EACH MANHOLE PRIOR TO ORDERING SECTION.
3. ADJUST FRAME TO GRADE WITH A MINIMUM OF TWO COURSES OF BRICK MASONRY OR REINFORCED CONCRETE GRADE RINGS (NOT SHOWN).
4. ALL EXTERIOR SURFACES OF GRADE ADJUSTMENT COURSES SHALL BE COVERED WITH 1/4" TO 3/8" MASONRY CEMENT PLASTER.



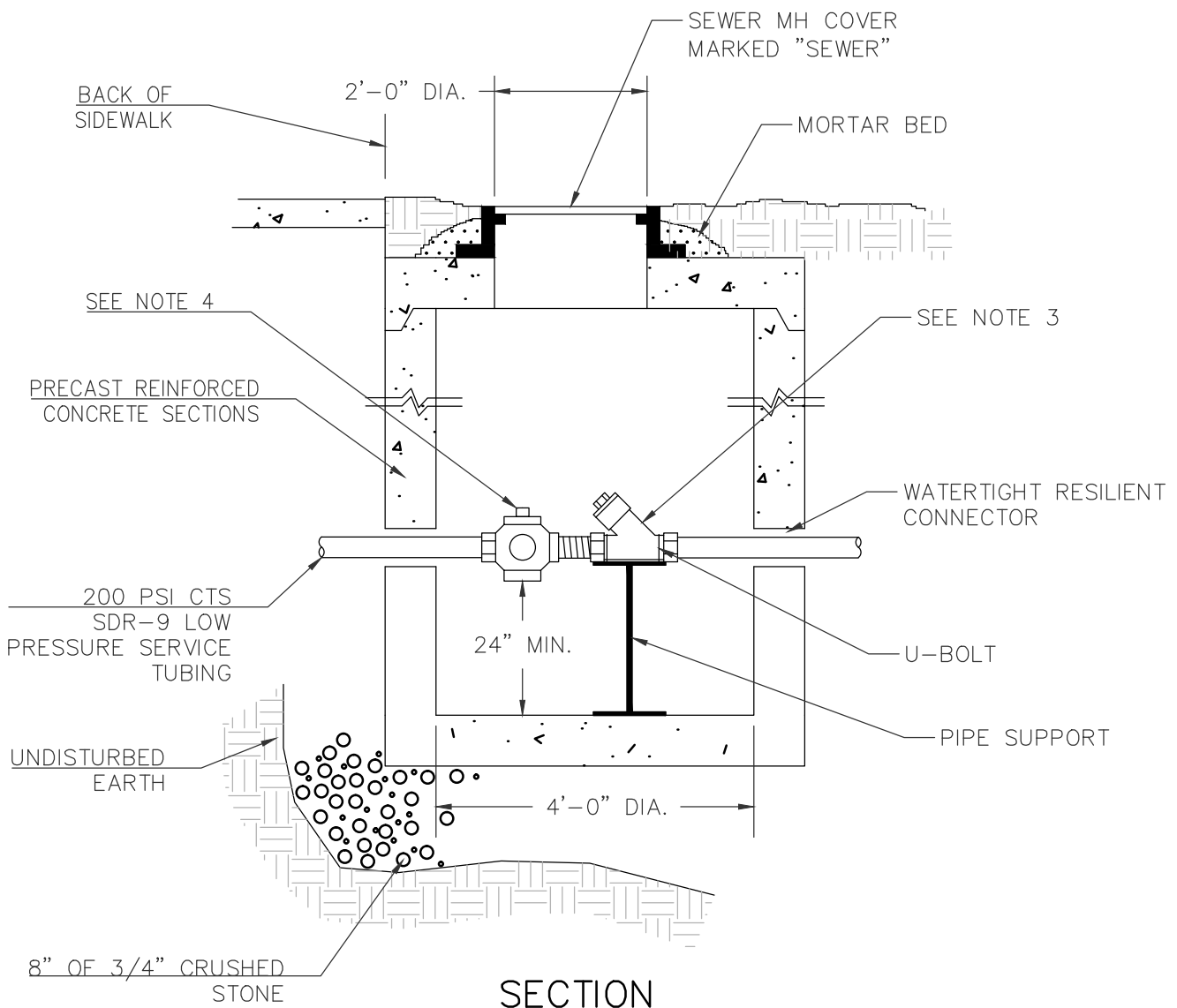
**DEDHAM DPW
DESIGN & CONSTRUCTION STANDARDS**

FORCE MAIN CLEANOUT MANHOLE DETAIL

SCALE: NTS	DATE OF ISSUE: AUGUST 2015
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REVISED:

DETAIL NUMBER: SS.22



SECTION

NOTES:

1. PROVIDE MANHOLE STEPS 1'-0" O.C.
2. CONTRACTOR SHALL CONFIRM ELEVATION AND ALIGNMENT OF PROPOSED LOW PRESSURE SERVICE(S) AND GROUND SURFACE AT EACH MANHOLE PRIOR TO ORDERING SECTION.
3. SINKING BALL CHECK VALVE - FEMALE IPS X IPS (FLOMATIC MODEL 208, PART NO. 2142, OR EQUAL) W/ MUELLER 110 (OR EQUAL) COMPRESSION CONNECTION.
4. SHUT-OFF VALVE - IPT MUELLER 300 BALL CURB VALVE B-25122, OR EQUAL W/ MUELLER 110 (OR EQUAL) COMPRESSION CONNECTION.
5. ADJUST FRAME TO GRADE WITH A MINIMUM OF TWO COURSES OF BRICK MASONRY OR REINFORCED CONCRETE GRADE RINGS (NOT SHOWN).
6. ALL EXTERIOR SURFACES OF GRADE ADJUSTMENT COURSES SHALL BE COVERED WITH 1/4" TO 3/8" MASONRY CEMENT PLASTER.



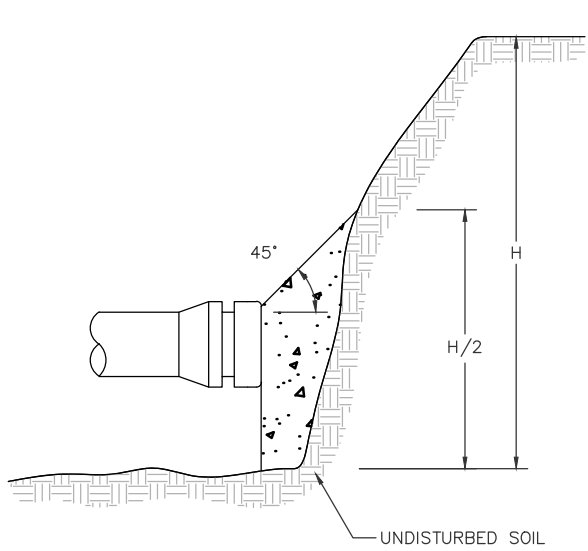
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**LOW PRESSURE SEWER SERVICE
VALVE BOX**

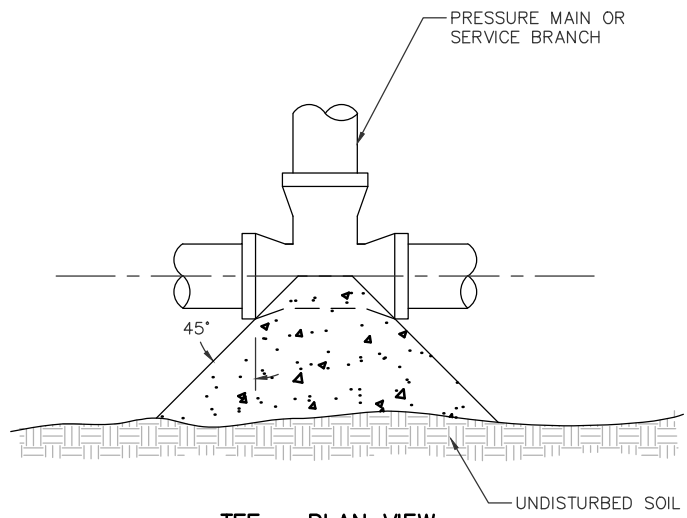
SCALE: NTS	DATE OF ISSUE: AUGUST 2015
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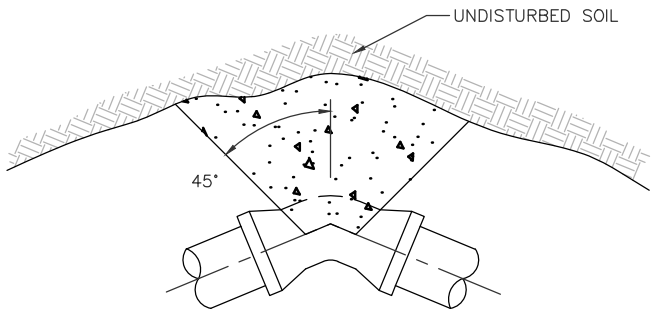
DETAIL NUMBER:
SS.23



PLUG / DEAD END - ELEVATION



TEE - PLAN VIEW



ELBOW - PLAN VIEW

NOTES:

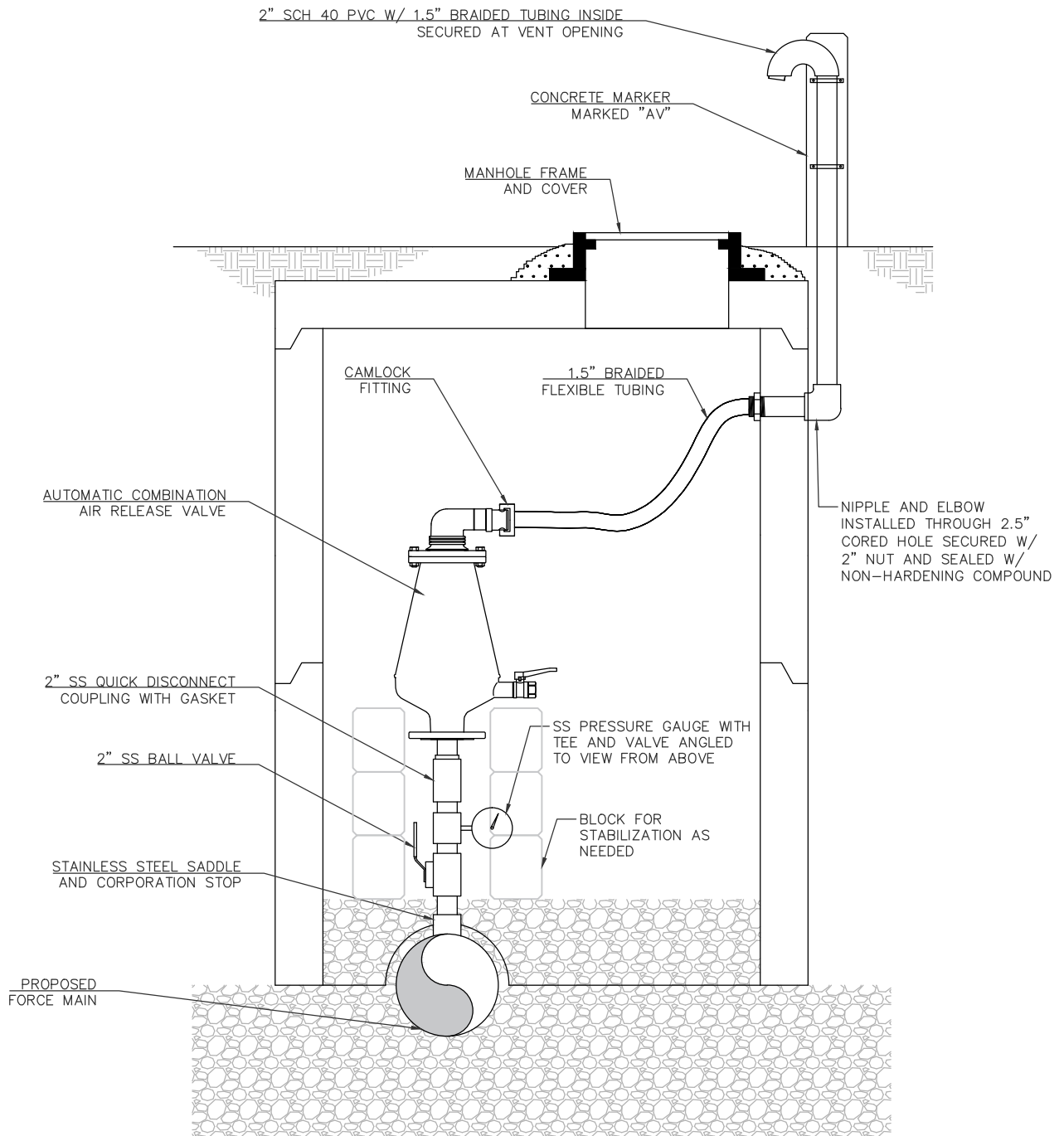
1. THRUST BLOCKS SHALL BE Poured AGAINST UNDISTURBED SOILS USING FORMS AND 3,000 PSI CONCRETE.
2. CONCRETE SHALL NOT OBSTRUCT ANY BOLTS OR FLANGES.
3. THRUST AND BEARING AREA CALCULATIONS PERFORMED BY A PROFESSION ENGINEER LICENSED IN THE STATE OF MASSACHUSETTS MAY BE REQUIRED AT THE DISCRETION OF THE DIRECTOR OF ENGINEERING.



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THRUST BLOCKS

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NOTES:

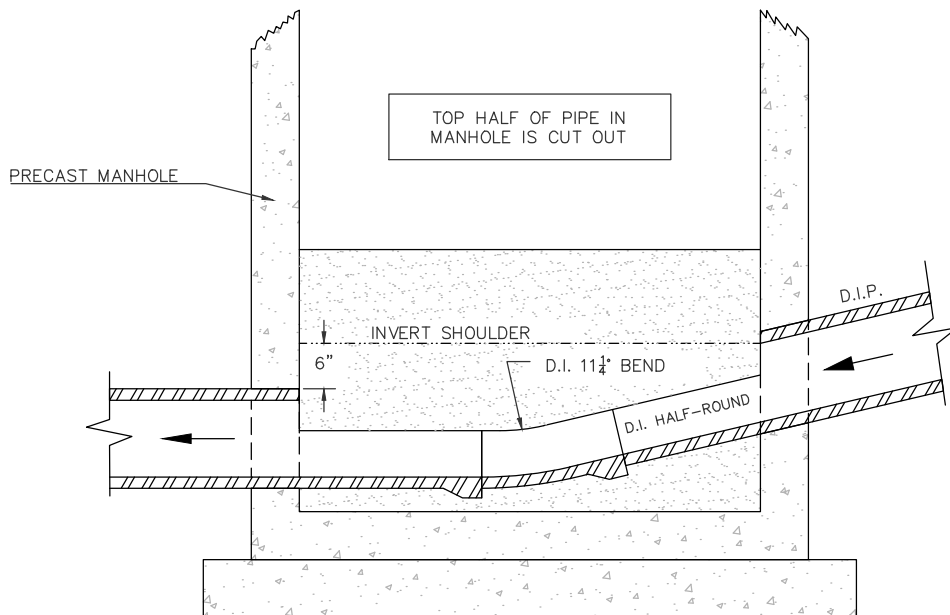
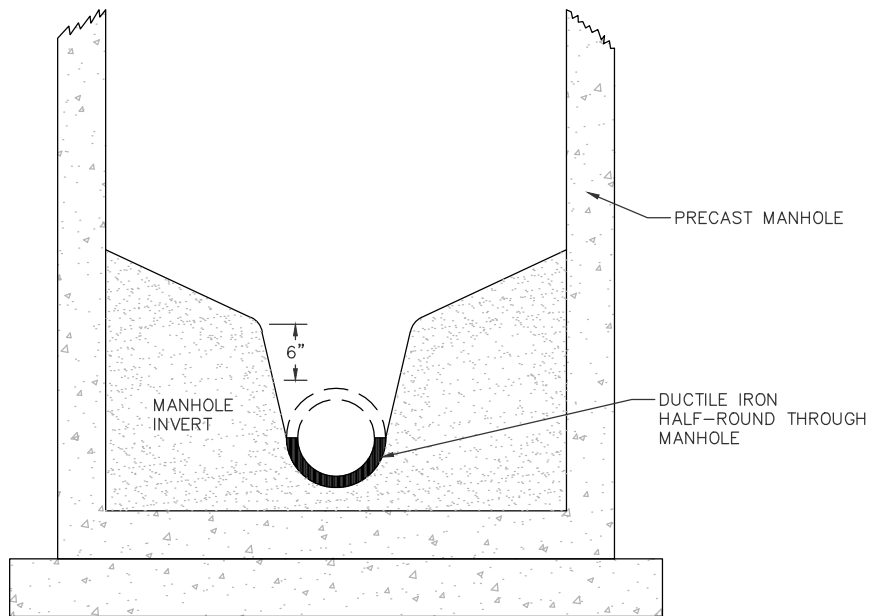
1. FORCE MAIN PROFILE AND ARV LOCATION TO BE ADJUSTED SUCH THAT ARV IS AT HIGH POINT WITH SUFFICIENT DEPTH FOR INSTALLATION AND TO PREVENT FREEZING.
3. ADJUST FRAME TO GRADE WITH A MINIMUM OF TWO COURSES OF BRICK MASONRY OR REINFORCED CONCRETE GRADE RINGS (NOT SHOWN).
4. ALL EXTERIOR SURFACES OF GRADE ADJUSTMENT COURSES SHALL BE COVERED WITH 1/4" TO 3/8" MASONRY CEMENT PLASTER.



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COMBINATION AIR RELEASE VALVE

SCALE: NTS	DATE OF ISSUE: AUGUST 2015
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DETAIL NUMBER: SS.25	



NOTES:

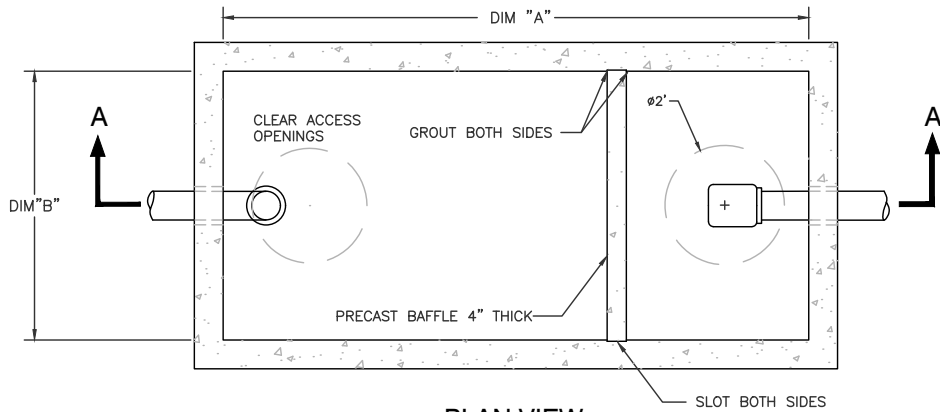
1. NO HORIZONTAL ALIGNMENT CHANGE CAN BE MADE WITHIN THIS MANHOLE TYPE. USE ON GRADES OF 10% OR GREATER.
2. EACH JOINT OF PIPE BETWEEN HIGH VELOCITY MANHOLE & MANHOLE UPGRADE SHALL HAVE A TRENCH DAM (SS.17).



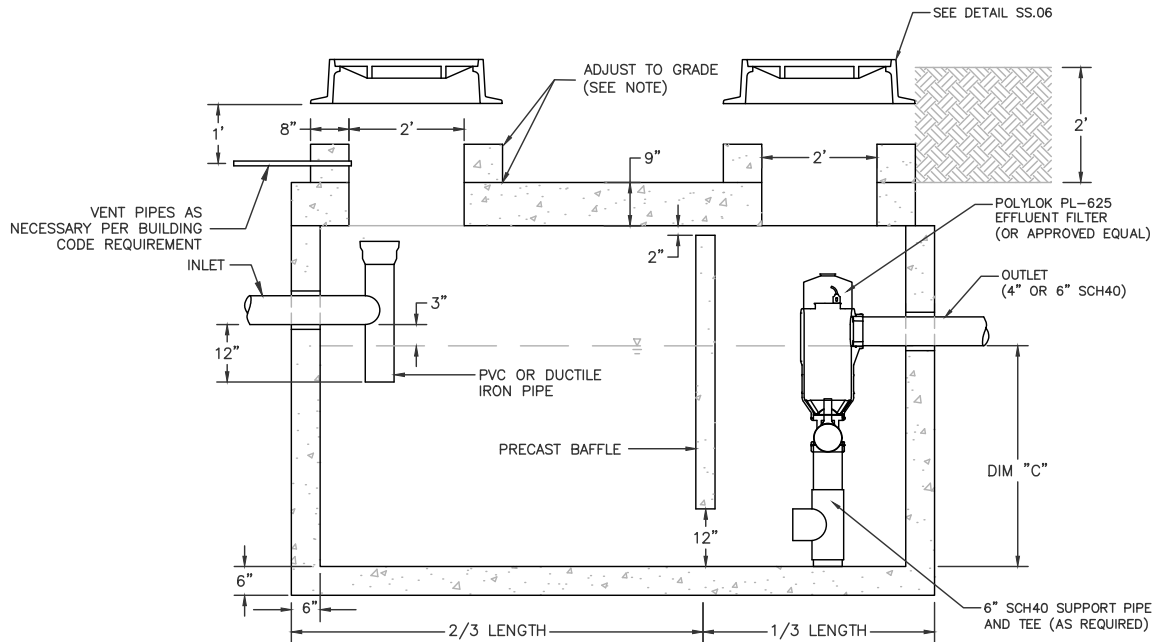
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HIGH VELOCITY MANHOLE INVERT

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DETAIL NUMBER: SS.26	



PLAN VIEW



SECTION A-A

SIZING CHART			
GALLON CAPACITY	DIM "A"	DIM "B"	DIM "C"
1500 (MIN.)	120"	60"	48"
1750	120"	60"	58"
2000	144"	68"	48"
2500	144"	72"	56"
2750	144"	72"	62"
3000	168"	84"	50"
4000	168"	84"	66"
5000	216"	96"	56"
6000	216"	96"	68"

NOTES:

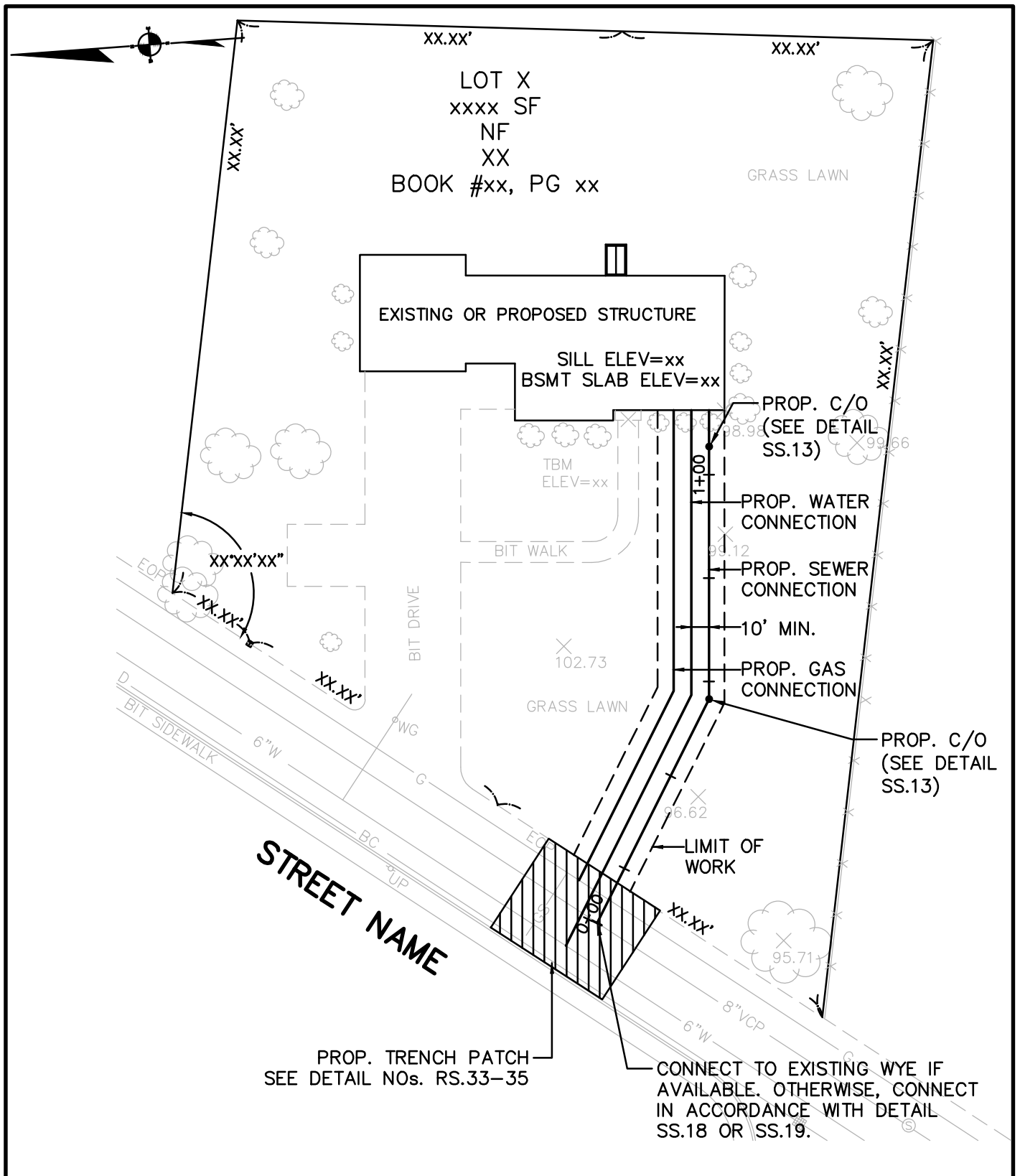
1. CONCRETE: 28 DAY F'c= 4500 psi
2. REBAR: ASTM A615 GRADE 60
3. MESH: ASTM A-185 GRADE 65
4. DESIGN: AC1318-83 BUILDING CODE
ASTM C-857 MINIMUM STRUCTURAL DESIGN
LOADING FOR UNDERGROUND PRECAST
CONCRETE UTILITY STRUCTURES
5. LOADS: H-20 LOADING
6. FILL w/ CLEAN WATER PRIOR TO START UP OF SYSTEM
7. CONTRACTOR TO SUPPLY AND INSTALL ALL PIPING AND
SANITARY TEES
8. GRAY WATER ONLY, BLACK WATER SHALL BE CARRIED BY
SEPARATE SEWER
9. TRAP SIZE WILL BE BASED ON 15 GPD PER SEAT
10. LARGER SIZES MAY BE REQUIRED AS PER REVIEW OF FACILITY
11. WHERE COVER OVER GREASE TRAP EXCEEDS 2', 4' DIAMETER
PRECAST CONE SECTIONS SHALL BE USED.
12. TOP, WALL, AND BASE THICKNESS MAY BE ADJUSTED AS
NEEDED BY PRECASTER TO MEET H-20 LOADING.



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STANDARD GREASE TRAP

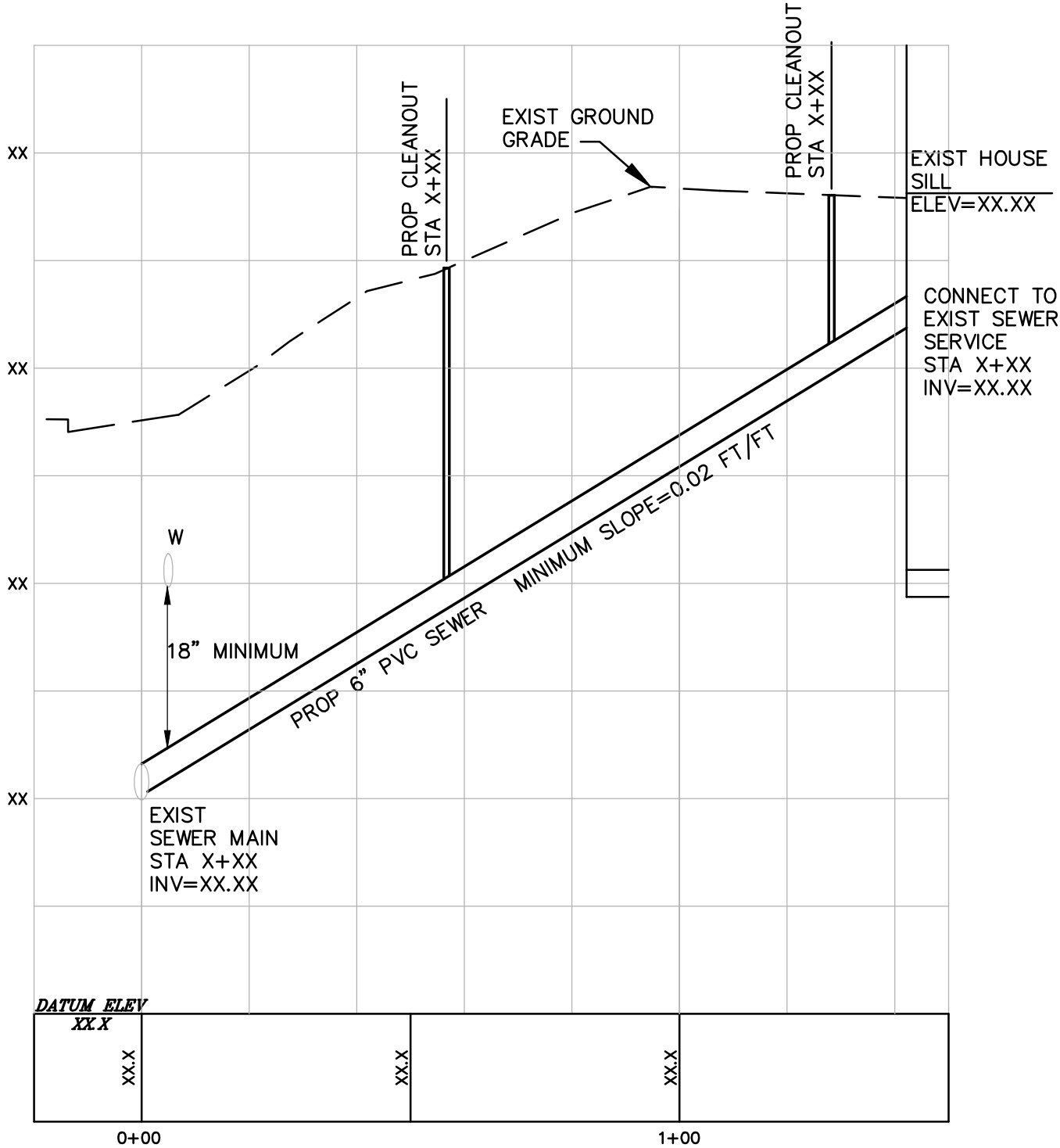
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TYPICAL SEWER PLAN

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TYPICAL SEWER PROFILE

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DETAIL NUMBER: SS.29	