

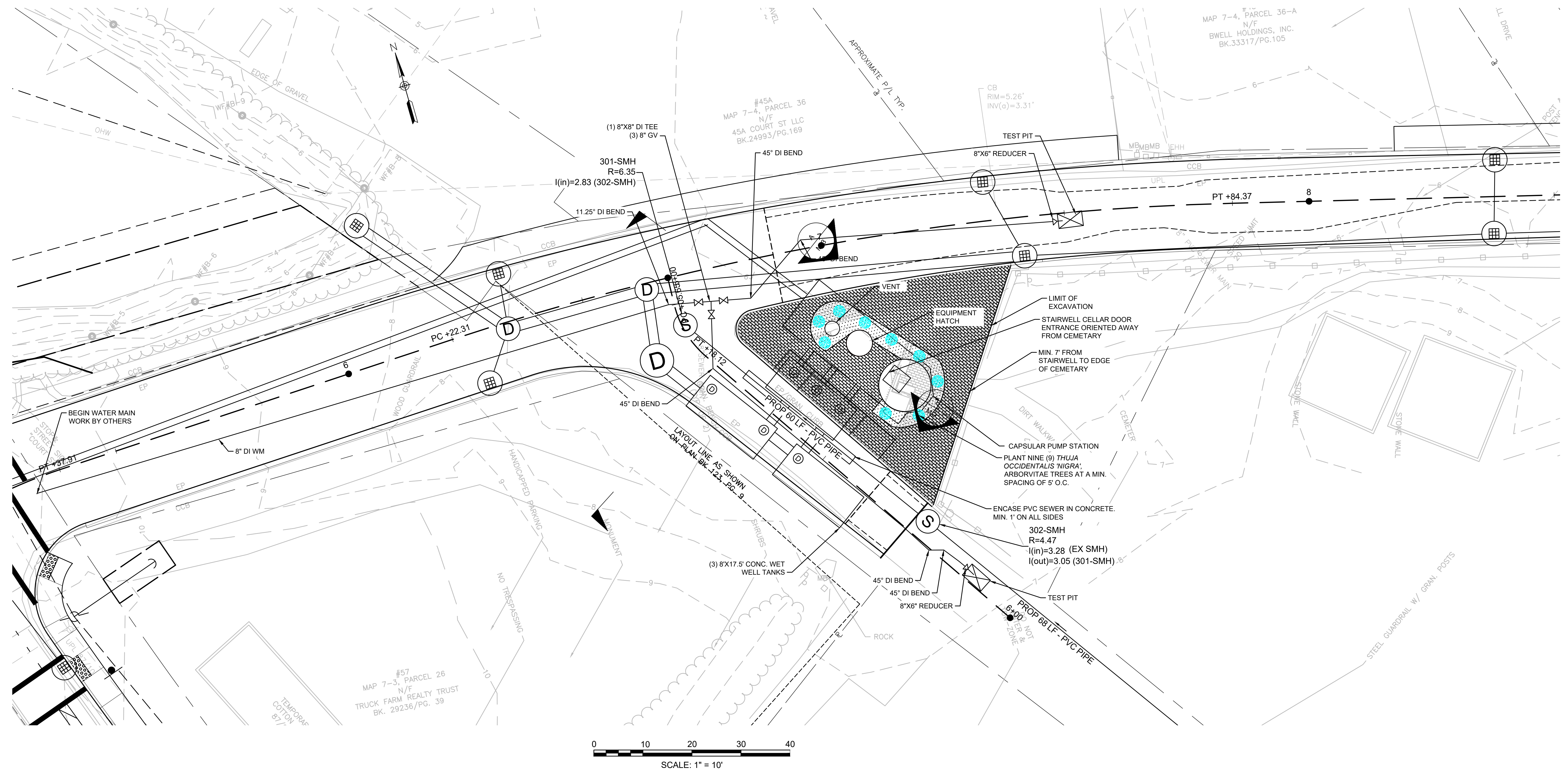
PROVINCETOWN  
SHANK PAINTER ROAD & ROUTE 6

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	172	293
PROJECT FILE NO.		608744	

PUMP STATION PLANS AND DETAILS - 01

NOTES:

1. ALL STATIONS AND OFFSETS ARE MEASURED AT THE CENTER OF STRUCTURES.
2. ALL RIM AND INVERT INFORMATION IS BASED OFF TOPOGRAPHIC SURVEY. CONTRACTOR TO FIELD VERIFY ALL INFORMATION AND REPORT ANY INCONSISTENCIES TO THE ENGINEER FOR RESOLUTION.
3. SANITARY STRUCTURES (SMH) BOLTED OR SEALED SHUT SHALL BE REPORTED TO THE TOWN PRIOR TO REMOVING THE COVERS AS NEEDED TO PERFORM ADJACENT ROADWAY WORK.
4. ALL DRAINAGE STRUCTURES AND PIPES PROPOSED TO BE RETAINED AND/OR UTILIZED WITHIN THE PROJECT LIMITS AND AS DIRECTED BY THE ENGINEER SHALL BE CLEANED OF ALL SEDIMENT AND DEBRIS TO THE SATISFACTION OF THE ENGINEER.





# PROCESS MECHANICAL NOTES

# PROCESS MECHANICAL LEGEND

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	173	293
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- ELECTRICAL DRAWINGS WILL BE INCLUDED IN THE 100% DESIGN SUBMISSION.
- THE REQUIREMENTS INCLUDED IN THESE NOTES ARE SUPPLEMENTARY TO THE CONTRACT, GENERAL CONDITIONS, TECHNICAL REQUIREMENTS, AND OTHER REQUIREMENTS SPECIFIED HEREIN.
- MOUNTING DETAILS PROVIDED ARE GENERIC FOR EQUIPMENT AND DEVICES OF VARIOUS MANUFACTURERS. THE CONTRACTOR MUST STRICTLY COMPLY WITH MANUFACTURER'S INSTRUCTION IN THE INSTALLATION OF THESE DEVICES. IF THERE ARE ANY ENGINEERING ISSUES THEY MUST BE REFERRED TO THE ENGINEER PRIOR TO INSTALLATION.
- ALL MECHANICAL LAYOUTS ARE GENERALLY DIAGRAMMATIC AS SHOWN ON THESE DRAWINGS. THE WORK OF THE VARIOUS TRADES SHALL BE COORDINATED TO AVOID INTERFERENCE AND TO SECURE MAXIMUM HEAD ROOM. PARTICULAR ATTENTION IS DRAWN TO CONGESTED SPACES INSIDE AND OUTSIDE OF THE STRUCTURES. IF, IN THE INTEREST OF COORDINATION AND EXPEDIENCY, IT BECOMES NECESSARY TO DEVELOP "INTERFERENCE DRAWINGS" (DEFINED AS DRAWINGS EMBODYING THE WORK OF TRADES INVOLVED, ILLUSTRATING DETAILS OR CONSTRUCTION PROPOSED BY THE CONTRACTOR AND ARRANGEMENT OF ACTUAL EQUIPMENT AND APPARATUS PURCHASED), SUCH DRAWINGS SHALL BE PREPARED BY THE CONTRACTOR AND SHALL BE COORDINATED WITH OTHER TRADES AT NO ADDITIONAL EXPENSE TO THE OWNER
- IT IS NOT THE INTENT OF THESE DRAWINGS TO PORTRAY EVERY DETAIL OF THE REQUIRED WORK. THE CONTRACTOR SHALL PROVIDE THE EQUIPMENT AND SYSTEMS COMPLETE SO THAT WHEN ASSEMBLED AND INSTALLED IN THE WORK, THEY SHALL OPERATE AND PERFORM AS DESCRIBED HEREIN.
- COORDINATE THE WORK REQUIRED BY THESE DRAWINGS ("M" SERIES) WITH THE WORK REQUIRED BY OTHER DRAWINGS, ALL TRADES, AND THE ENGINEER.
- ALL WALL AND FLOOR SLEEVES SHALL BE LARGE ENOUGH TO ACCOMMODATE FLANGES AS REQUIRED. FLOOR SLEEVES SHALL PROJECT AT LEAST 4-IN ABOVE FINISH FLOOR UNLESS OTHERWISE SHOWN. IF SLEEVES ARE TO BE SEALED, PROVIDE GROOVED COUPLING PIPING CONNECTION TO FACILITATE INSTALLATION AND REMOVAL OF PIPING.
- ALL PIPE PENETRATIONS THROUGH INTERIOR AND EXTERIOR WALLS AND FLOORS SHALL BE SEALED WATERTIGHT.
- SMALL PIPING (SAMPLE, SERVICE WATER, ETC.) IS SHOWN DIAGRAMMATICALLY; FIELD-ROUTING SUBJECT TO APPROVAL OF THE ENGINEER. SMALL PIPE ROUTING MUST NOT INTERFERE WITH ACCESS TO OR OPERATION OF ANY OTHER PIPE, VALVE OR EQUIPMENT.
- ALL PROCESS EQUIPMENT SHALL BE ISOLATED FROM PIPING LOADS AND DYNAMICS BY FLEXIBLE CONNECTORS IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS AND SPECIFICATIONS.
- ALL PIPING, VALVES, EQUIPMENT, ETC. SHALL BE LABELED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE LOCATION FOR ALL WALL PENETRATIONS WITH THE VARIOUS TRADES. WALL PIPES AND WALL SLEEVES SHALL BE REQUIRED FOR ALL PIPE PENETRATIONS THROUGH CONCRETE WALLS WHETHER SHOWN ON THE DRAWINGS OR NOT. ALL WALL AND FLOOR SLEEVES SHALL BE LARGE ENOUGH TO ACCOMMODATE FLANGES, IF REQUIRED.
- CONTRACTOR SHALL PROVIDE RESTRAINT OF ALL EXPANSION JOINTS/FLEX CONNECTORS WITH TIE-RODS.
- PROVIDE EXPANSION JOINTS WITH CONTROL RODS FOR ALL EXPOSED PIPING CROSSING STRUCTURAL EXPANSION JOINTS.
- ALL SLEEVE TYPE COUPLINGS ON PRESSURE PIPING SHALL BE HARNESSSED UNLESS OTHERWISE INDICATED. WHERE COUPLINGS ARE PROVIDED TO PROVIDE AXIAL FLEXIBILITY, PIPING MUST BE SECURELY RESTRAINED.
- MATERIALS AND WORKMANSHIP FURNISHED UNDER THIS CONTRACT SHALL BE A STANDARD, HIGH-GRADE QUALITY, AND OF THE BEST WORKMANSHIP AND DESIGN. ALL LIKE PARTS OF EQUIPMENT OF THE SAME SIZE OR CAPACITY SHALL BE INTERCHANGEABLE. SUITABLE PROVISION SHALL BE MADE FOR EASY ADJUSTMENT OR REPLACEMENT OF ALL PARTS REQUIRING ADJUSTMENT OR REPLACEMENT.
- THE INSTALLATION OF FACILITIES AND APPURTENANT WORK SHALL BE PROVIDED IN ACCORDANCE WITH THE REQUIREMENTS OF ALL FEDERAL, STATE, AND MUNICIPAL CODES AND REGULATIONS GOVERNING THE WORK. IN INSTANCES WHERE THE REQUIREMENT OF DRAWINGS AND SPECIFICATIONS ARE IN EXCESS OF THE REQUIREMENTS OF THE APPLICABLE CODES AND REGULATIONS, AND ARE PERMITTED THEREUNDER, THEN, IN SUCH INSTANCES, THE REQUIREMENTS OF THE CONTRACT DOCUMENTS SHALL GOVERN, UNLESS DIRECTED OTHERWISE IN WRITING BY THE ENGINEER.
- UNLESS OTHERWISE SPECIFIED, NEAT BRASS PLATE, OR OTHERWISE SUITABLE MATERIAL, HAVING THE SERIAL NUMBER, THE MAKE, HORSEPOWER, CAPACITY, SPEED, AND OTHER PERTINENT DATA, AND ANY IMPORTANT OPERATING OR MAINTENANCE INSTRUCTIONS, PERMANENTLY AND CLEARLY MARKED ON THE PLATE, SHALL BE MOUNTED ON EACH ITEM OF EQUIPMENT. ALL IMPORTANT PARTS OF EQUIPMENT, AS DIRECTED BY ENGINEER/OWNER SHALL BE STAMPED FOR IDENTIFICATION AND LOCATION.
- ALL NECESSARY ANCHOR BOLTS, NUTS, WASHERS, SETTING TEMPLATES, AND SUCH OTHER PARTS SHALL BE PROVIDED AS REQUIRED FOR THE PROPER INSTALLATION OF THE WORK, AND WHEREVER PRACTICABLE, THEY SHALL BE BUILT IN AS THE WORK PROGRESSES. THE PARTS SHALL BE OF THE MATERIALS SPECIFIED, AND WHERE NOT SPECIFIED OR INDICATED, THEY SHALL BE OF APPROVED TYPES AND MATERIALS FOR EACH APPLICATION. THE SETTING OF ANCHOR BOLTS BY DRILLING AND GROUTING WILL NOT BE PERMITTED.
- ALL EQUIPMENT SHALL BE INSTALLED IN STRICT CONFORMANCE WITH THE RECOMMENDATIONS OF THE MANUFACTURER, AS APPROVED, TRULY LEVEL AND PLUMB, AND SHALL BE PROVIDED COMPLETE WITH ALL NECESSARY PIPING, FITTINGS, VALVES, CONTROLS, WIRING, AND APPURTENANCES AND ACCESSORIES SO THE EQUIPMENT WILL BE LEFT COMPLETE AND IN SATISFACTORY WORKING CONDITION.
- ALL WEDGES, SHIMS, FILLING PIECES, KEYS, PACKING, GROUT, OR OTHER MATERIALS NECESSARY TO PROPERLY ALIGN, LEVEL, AND SECURE APPARATUS IN PLACE SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. ALL PARTS INTENDED TO BE PLUMB OR LEVEL MUST BE PROVEN EXACTLY SO. ANY GRINDING NECESSARY TO BRING PARTS TO PROPER BEARING AFTER ERECTION SHALL BE DONE AT THE EXPENSE OF THE CONTRACTOR.
- THE CONTRACTOR SHALL PROVIDE ALL OPENINGS, CHANNELS, CHASES, ETC. AS REQUIRED TO COMPLETE THE WORK UNDER THIS CONTRACT, TOGETHER WITH THOSE REQUIRED BY OTHER CONTRACTORS.
- CONTRACTOR SHALL SUBMIT PIPING OR DUCT LAYOUT DIAGRAMS TO THE ENGINEER FOR APPROVAL PRIOR TO ANY PIPING OR DUCT INSTALLATION. LAYOUT DIAGRAMS SHALL SHOW DIMENSIONS OF ALL VALVES, FITTINGS, PIPE RUNS, AND SUPPORTS.
- ALL PIPING SYSTEMS AND EQUIPMENT SHALL BE ADEQUATELY AND SAFELY SUPPORTED. CONTRACTOR SHALL DESIGN, PROVIDE, AND INSTALL ALL SUPPORTS AS REQUIRED BY THE PIPING AND EQUIPMENT PROVIDED. AT A MINIMUM, ALL PIPING SYSTEMS SHALL BE SUPPORTED PER THE REQUIREMENTS OF MANUFACTURER'S STANDARDIZATION SOCIETY (MSS) SP-58 AND MSS SP-69. SUPPORT DESIGN SHALL ACCOMMODATE ALL STATIC AND OPERATIONAL CONDITIONS TO WHICH THE PIPING AND EQUIPMENT MAY BE SUBJECTED. SUPPORTS SHALL BE IN ADDITION TO THOSE SHOWN ON THE CONTRACT DRAWINGS. PIPE SUPPORTS SHALL BE TIED INTO THE STRUCTURAL CONCRETE SLAB.
- ALL FIRE SEALANTS AND SEALING BY CONTRACTOR.
- CONTRACTOR SHALL PROVIDE REDUCERS AND EXPANDERS AS REQUIRED TO CONNECT TO PROCESS WATER LINE TO EQUIPMENT.
- STORMWATER PUMP STATION SHALL BE CAPSULAR PUMP STATION BY SMITH & LOVELESS, INC. OR APPROVED EQUAL.

## VALVES, COUPLING, & APPURTENANCES

	BURIED GATE VALVE		REDUCER/INCH
	BURIED PLUG VALVE		STRAINER
	BALL VALVE		UNION
	BUTTERFLY VALVE		FLEXIBLE HOSE
	ELECTRIC ACTUATED BUTTERFLY VALVE		METERING PUMP
	BALL CHECK VALVE		ROTAMETER
	SWING CHECK VALVE		DIAPHRAGM ISOLATOR (GAUGE GUARD)
	WAFER CHECK VALVE		VENT
	PLUG VALVE		DRAIN
	NEEDLE VALVE		FLOAT SWITCH
	SOLENOID VALVE		ULTRASONIC LEVEL SENSOR
	SLEEVE TYPE COUPLING		POSITIVE DISPLACEMENT BLOWER
	SPLIT SLEEVE ADAPTER		FILTER SILENCER
	FLANGED COUPLING ADAPTER		AIR FILTER/INSECT SCREEN
	EXPANSION JOINT (METAL)		CENTRIFUGAL PUMP
	FLEX CONNECTOR/EXPANSION JOINT (RUBBER)		CENTRIFUGAL FAN/BLOWER
	EXPANSION JOINT (REDUCING)		VOLUME DAMPER
	MAGMETER		ISOLATION DAMPER
	TURBINE FLOWMETER		
	PRESSURE REDUCING VALVE		
	BACK PRESSURE VALVE		
	VACUUM BREAKER		
	RELIEF VALVE		
	COMBINATION VALVE		
	PRESSURE INDICATOR (LIQUID SERVICE)		
	PRESSURE INDICATE TRANSMITTER (LIQUID SERVICE)		
	PRESSURE INDICATOR (AIR SERVICE)		
	FLOW SWITCH		
	PRESSURE SWITCH		
	TEMPERATURE INDICATOR		
	SAMPLE TAP		
	SLIDE GATE WITH OPERATOR NUT		
	SLIDE GATE		

## PIPE AND FITTINGS

DOUBLE LINE	SINGLE LINE	PIPE
		PIPE
		ELBOW (90)
		ELBOW (45)
		TEE
		WYE
		CROSS
		RED (CONC)
		RED (ECC)
		FLANGE
		PIPE END
		PIPE BREAK

PIPE AND FITTING SYMBOLOGY SHOWN ABOVE IS FOR FLANGED DUCTILE IRON PIPE. SYMBOLOGY FOR OTHER PIPING SYSTEMS IS SIMILAR. END CONNECTIONS DENOTE JOINING TECHNOLOGY.

	MECHANICAL JOINT
	FRP
	SOCKET WELD
	SINGLE LINE (JOINING TECHNOLOGY VARIES)

## PIPING AND TUBING MATERIALS

CI	CAST IRON PIPE
CPVC	CHLORINATED POLYVINYL CHLORIDE PIPE
CS	CARBON STEEL
CU	COPPER
DI	DUCTILE IRON PIPE
FRP	FIBERGLASS REINFORCED PLASTIC PIPE
GALV	GALVANIZED STEEL
HDPE	HIGH DENSITY POLYETHYLENE
HOSE	FLEXIBLE HOSE
PE	POLYETHYLENE
PVC	POLYVINYL CHLORIDE
RCP	REINFORCED CONCRETE PIPE
SS	STAINLESS STEEL PIPE OR TUBING
STL	STEEL
XP	EXPLOSION PROOF

## LINE DESIGNATIONS

	PROPOSED
	EXISTING, OTHER DISCIPLINE OR OUT OF FUNCTION
	UNDERGROUND OR BELOW ELEVATION IN VIEW

## PROCESS STREAM ABBREVIATIONS

SS	SANITARY SEWER
FM	FORCE MAIN
OC	ODOR CONTROL
V	VENT
NPT	NATIONAL PIPE THREAD

## VALVE TABLE

PROVINCETOWN SHANK PAINTER ROAD & ROUTE 6			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	174	293
PROJECT FILE NO.		608744	

PUMP STATION PLANS AND DETAILS - 03

TAG NO.	EQUIPMENT DESCRIPTION	LOCATION	TYPE	APPLICATION	SIZING		SERVICE	ACTUATOR	GATE/VALVE POSITION	REMARKS
					VALUE 1	UNIT 1				
PV-101	PUMP P-101 SUCTION PLUG VALVE	DRY WELL	PLUG VALVE	STORMWATER	14	INCHES	OPEN/CLOSE	MANUAL	NORMALLY OPEN	
PV-102	PUMP P-102 SUCTION PLUG VALVE	DRY WELL	PLUG VALVE	STORMWATER	14	INCHES	OPEN/CLOSE	MANUAL	NORMALLY OPEN	
CV-103	PUMP P-101 DISCHARGE CHECK VALVE	DRY WELL	CHECK VALVE	STORMWATER	8X12	INCHES	CHECK	MANUAL	NORMALLY OPEN	8" X 12" FULL BODY CHECK VALVE
CV-104	PUMP P-102 DISCHARGE CHECK VALVE	DRY WELL	CHECK VALVE	STORMWATER	8X12	INCHES	CHECK	MANUAL	NORMALLY OPEN	8" X 12" FULL BODY CHECK VALVE
PV-105	PUMP P-101 DISCHARGE PLUG VALVE	DRY WELL	PLUG VALVE	STORMWATER	12	INCHES	OPEN/CLOSE	MANUAL	NORMALLY OPEN	
PV-106	PUMP P-101 DISCHARGE PLUG VALVE	DRY WELL	PLUG VALVE	STORMWATER	12	INCHES	OPEN/CLOSE	MANUAL	NORMALLY OPEN	
CV-107	PUMP P-201 DISCHARGE CHECK VALVE	DRY WELL	CHECK VALVE	STORMWATER	2	INCHES	CHECK	MANUAL	NORMALLY OPEN	
CV-108	PUMP P-201 DISCHARGE BALL VALVE	DRY WELL	BALL VALVE	STORMWATER	2	INCHES	OPEN/CLOSE	MANUAL	NORMALLY OPEN	
CV-109	PUMP P-202 DISCHARGE CHECK VALVE	DRY WELL	CHECK VALVE	STORMWATER	2	INCHES	CHECK	MANUAL	NORMALLY OPEN	
CV-110	PUMP P-202 DISCHARGE BALL VALVE	DRY WELL	BALL VALVE	STORMWATER	2	INCHES	OPEN/CLOSE	MANUAL	NORMALLY OPEN	

## PUMP SCHEDULE

TAG NO.	EQUIPMENT DESCRIPTION	LOCATION	TYPE	FLOW		HEAD		DRIVER	MOTOR		VOLTAGE			REMARKS
				VALUE 1	UNIT 1	VALUE 2	UNIT 2		HP	RPM	VAC	Hz	PHASE	
P-101	STORMWATER PUMP	DRY WELL	FLOODED SUCTION	2000	GPM	50	TDH	CONSTANT	40	1170	460	60	3	PROVIDE STEEL BASE SET ON CONCRETE PEDESTAL
P-102	STORMWATER PUMP	DRY WELL	FLOODED SUCTION	2000	GPM	50	TDH	CONSTANT	40	1170	460	60	3	PROVIDE STEEL BASE SET ON CONCRETE PEDESTAL
P-201	SUMP PUMP	DRY WELL	SUMP PUMP	40	GPM	20	TDH	CONSTANT	3/10	1550	230	60	1	
P-202	SUMP PUMP	DRY WELL	SUMP PUMP	40	GPM	20	TDH	CONSTANT	3/10	1550	230	60	1	

## PRESSURE GAUGE SCHEDULE

TAG NO.	EQUIPMENT DESCRIPTION	LOCATION	TYPE	REMARKS
PI-101	PUMP P-101 DISCHARGE PRESSURE GAUGE	PUMP ROOM/DRY PIT	DIRECT MOUNTING, INDICATING DIAL	PROVIDE DIAPHRAGM SEALS
PI-102	PUMP P-102 DISCHARGE PRESSURE GAUGE	PUMP ROOM/DRY PIT	DIRECT MOUNTING, INDICATING DIAL	PROVIDE DIAPHRAGM SEALS
PI-103	PUMP P-101 SUCTION LINE PRESSURE GAUGE	PUMP ROOM/DRY PIT	DIRECT MOUNTING, INDICATING DIAL	PROVIDE DIAPHRAGM SEALS
PI-104	PUMP P-102 SUCTION LINE PRESSURE GAUGE	PUMP ROOM/DRY PIT	DIRECT MOUNTING, INDICATING DIAL	PROVIDE DIAPHRAGM SEALS
PIT-301	DISCHARGE LINE PRESSURE INDICATING TRANSMITTER	PUMP ROOM/DRY PIT	DIRECT MOUNTING, INDICATING DIAL	PROVIDE DIAPHRAGM SEALS

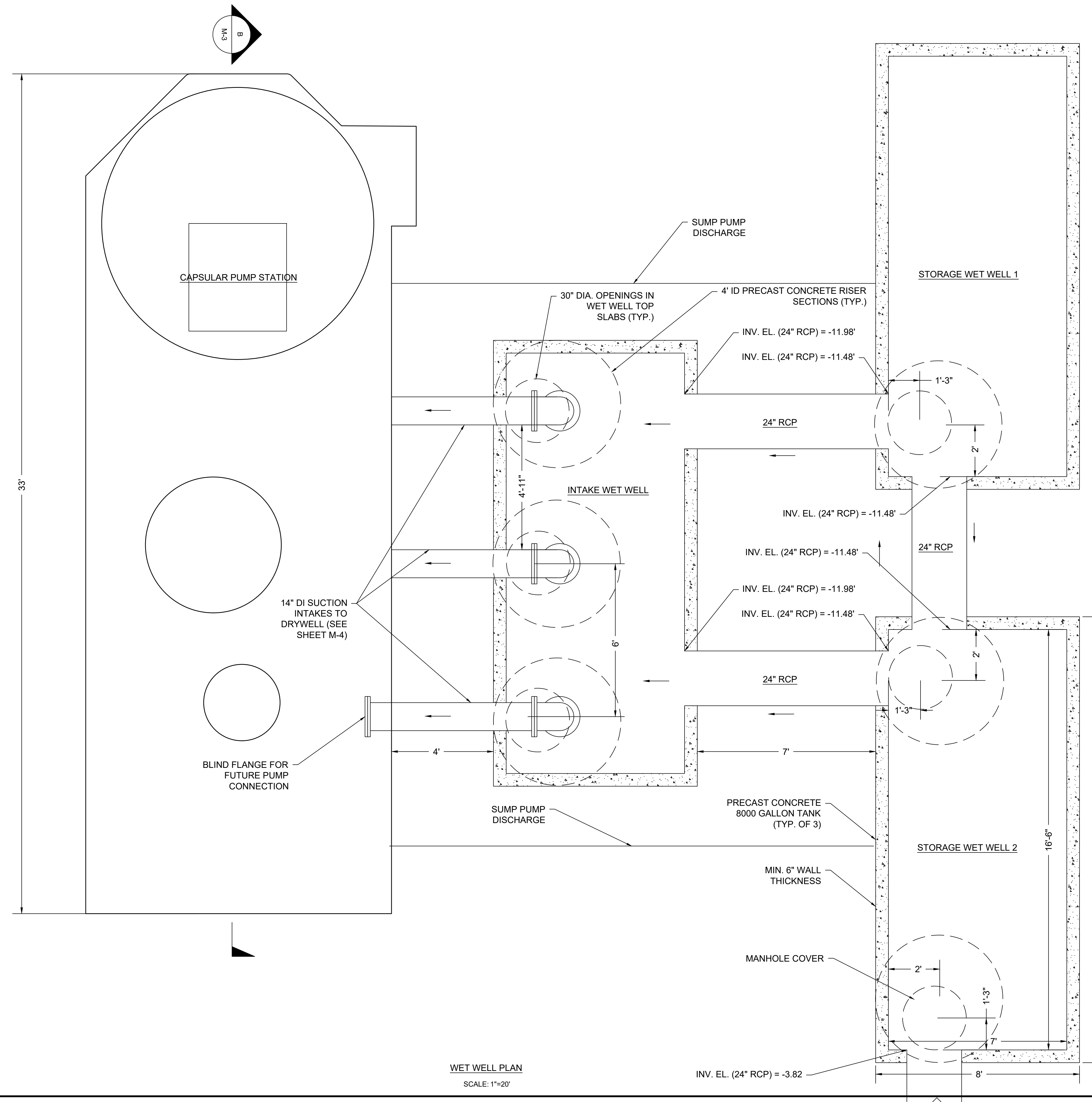
## VENTILATION SCHEDULE

TAG NO.	EQUIPMENT DESCRIPTION	LOCATION	TYPE	REMARKS
AB-101	AIR BLOWER 101 VENTILATION SYSTEM	ABOVE GRADE		

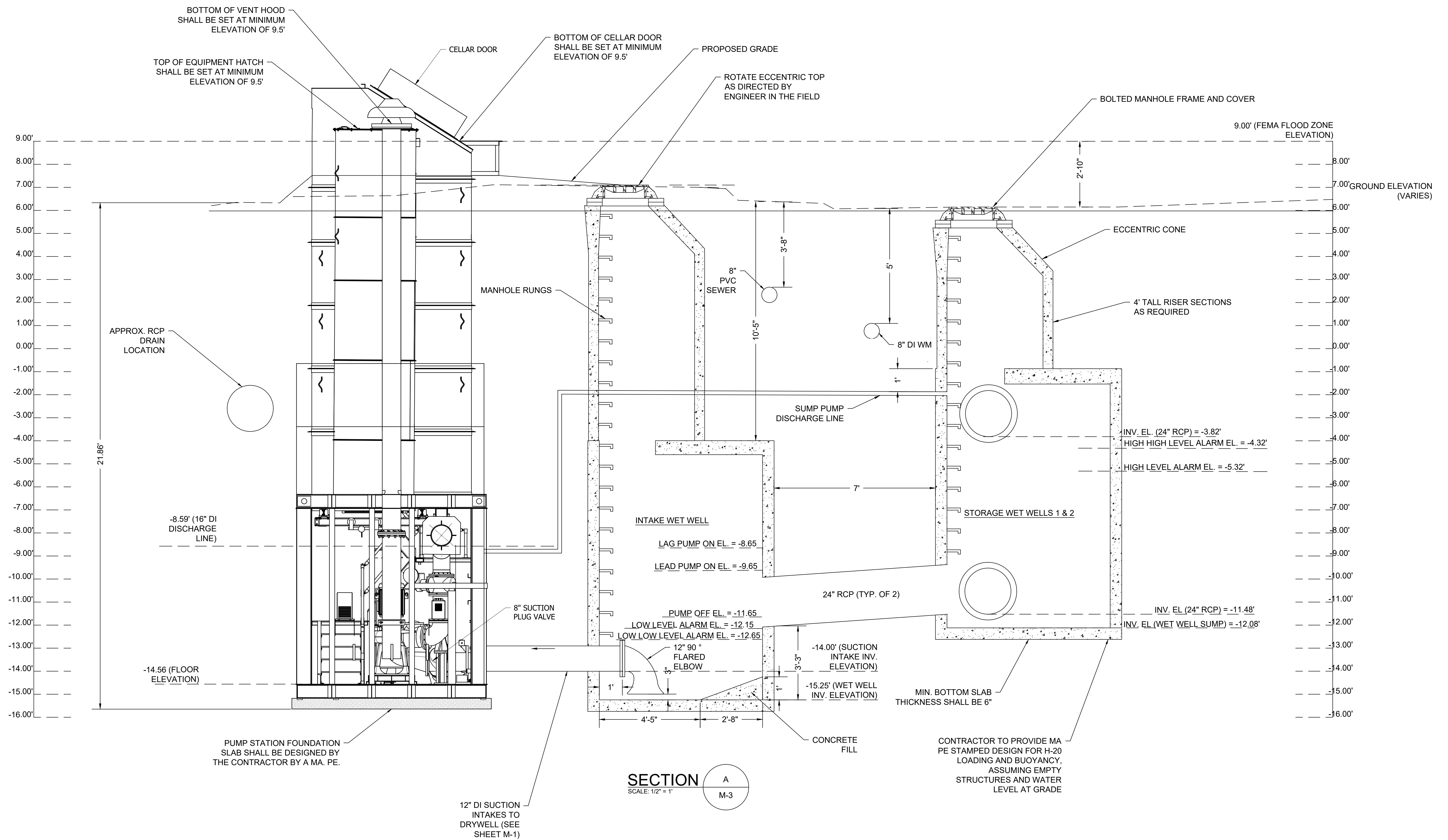
PROVINCETOWN  
SHANK PAINTER ROAD & ROUTE 6

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	175	293
PROJECT FILE NO.		608744	

PUMP STATION PLANS AND DETAILS - 04



WET WELL PLAN  
SCALE: 1"=20'



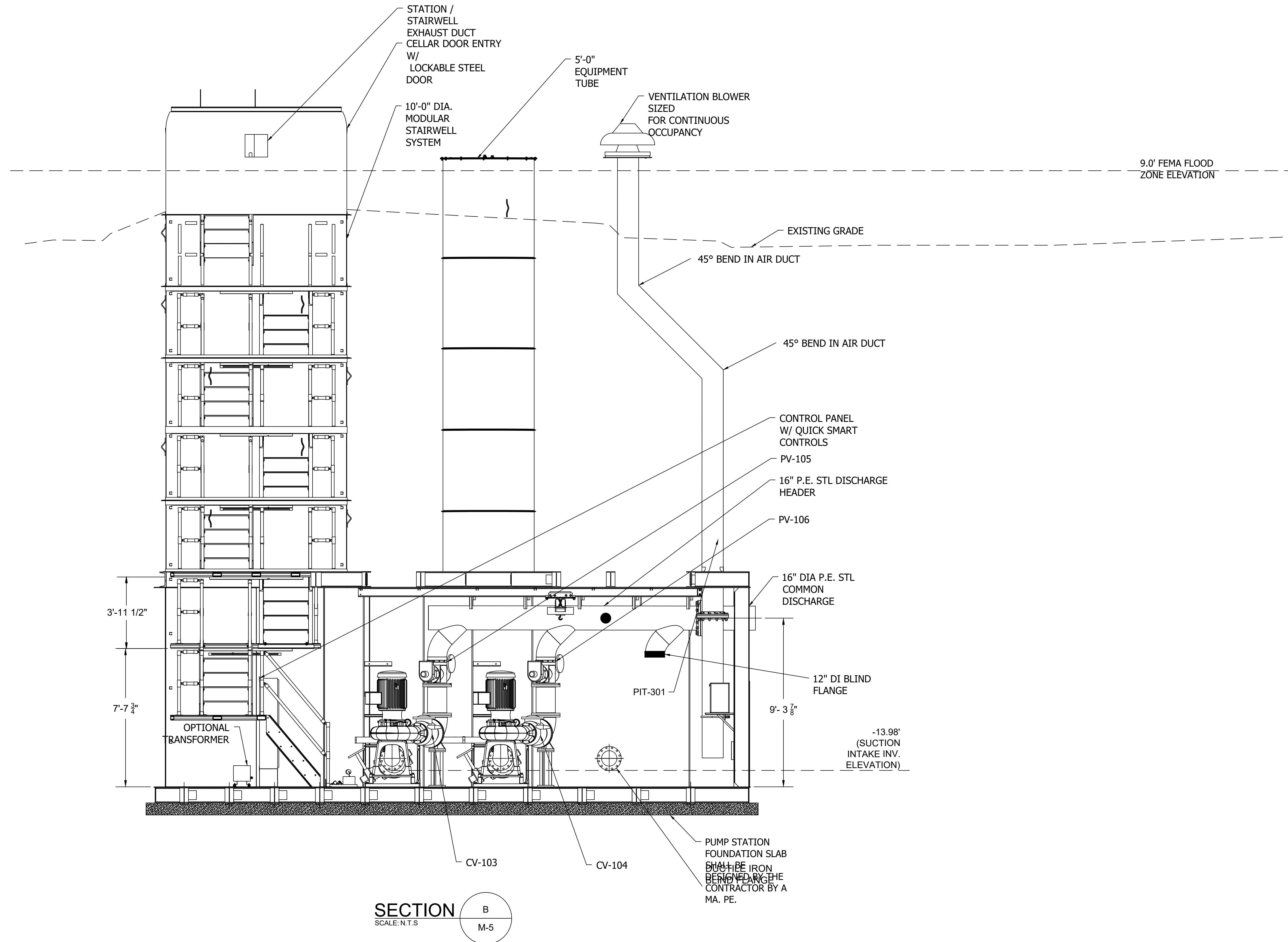
SECTION A  
SCALE: 1/2" = 1'

CONTRACTOR TO PROVIDE MA PE STAMPED DESIGN FOR H-20 LOADING AND BUOYANCY, ASSUMING EMPTY STRUCTURES AND WATER LEVEL AT GRADE

PROVINCETOWN  
SHANK PAINTER ROAD & ROUTE 6

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	177	293
PROJECT FILE NO.		608744	

PUMP STATION PLANS AND DETAILS - 06

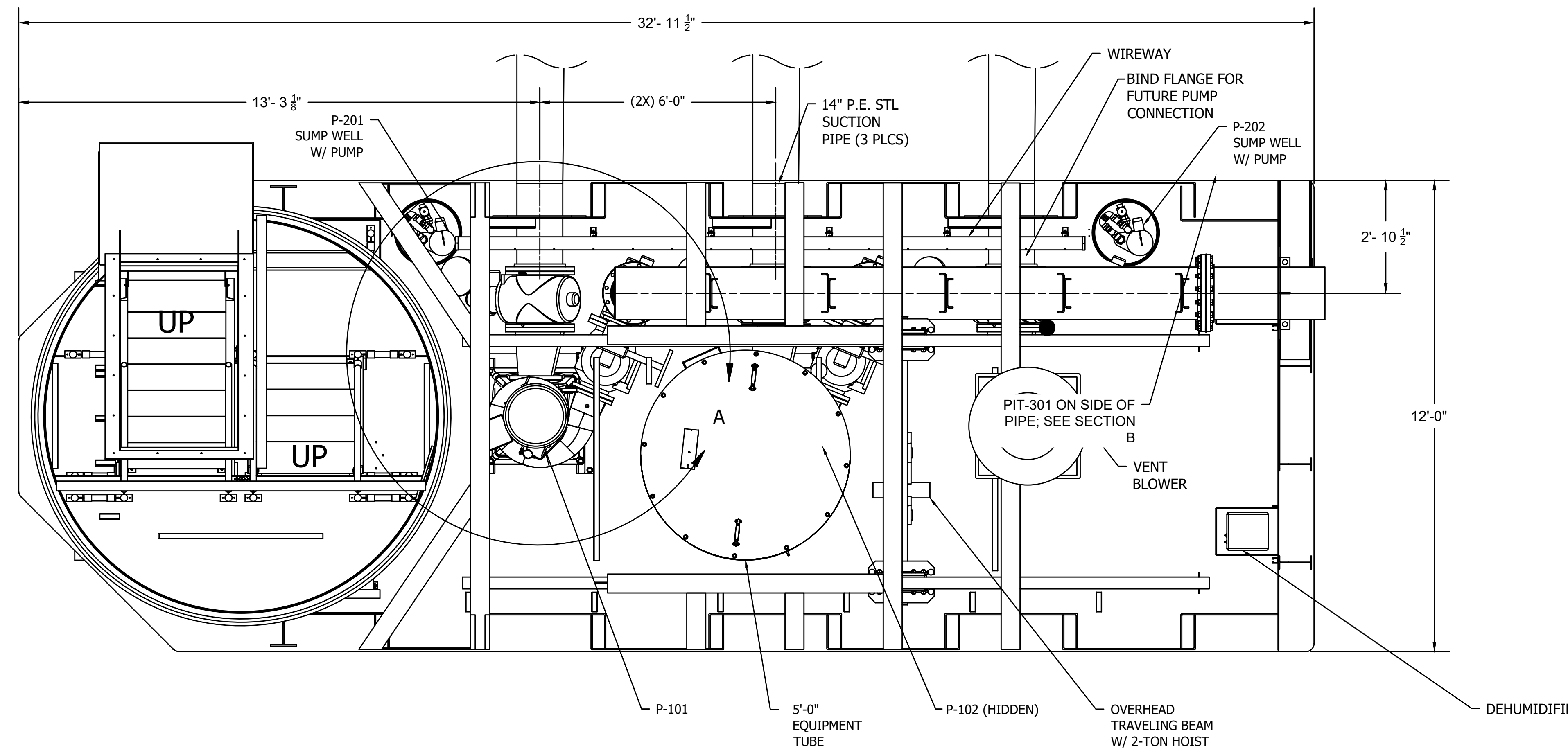




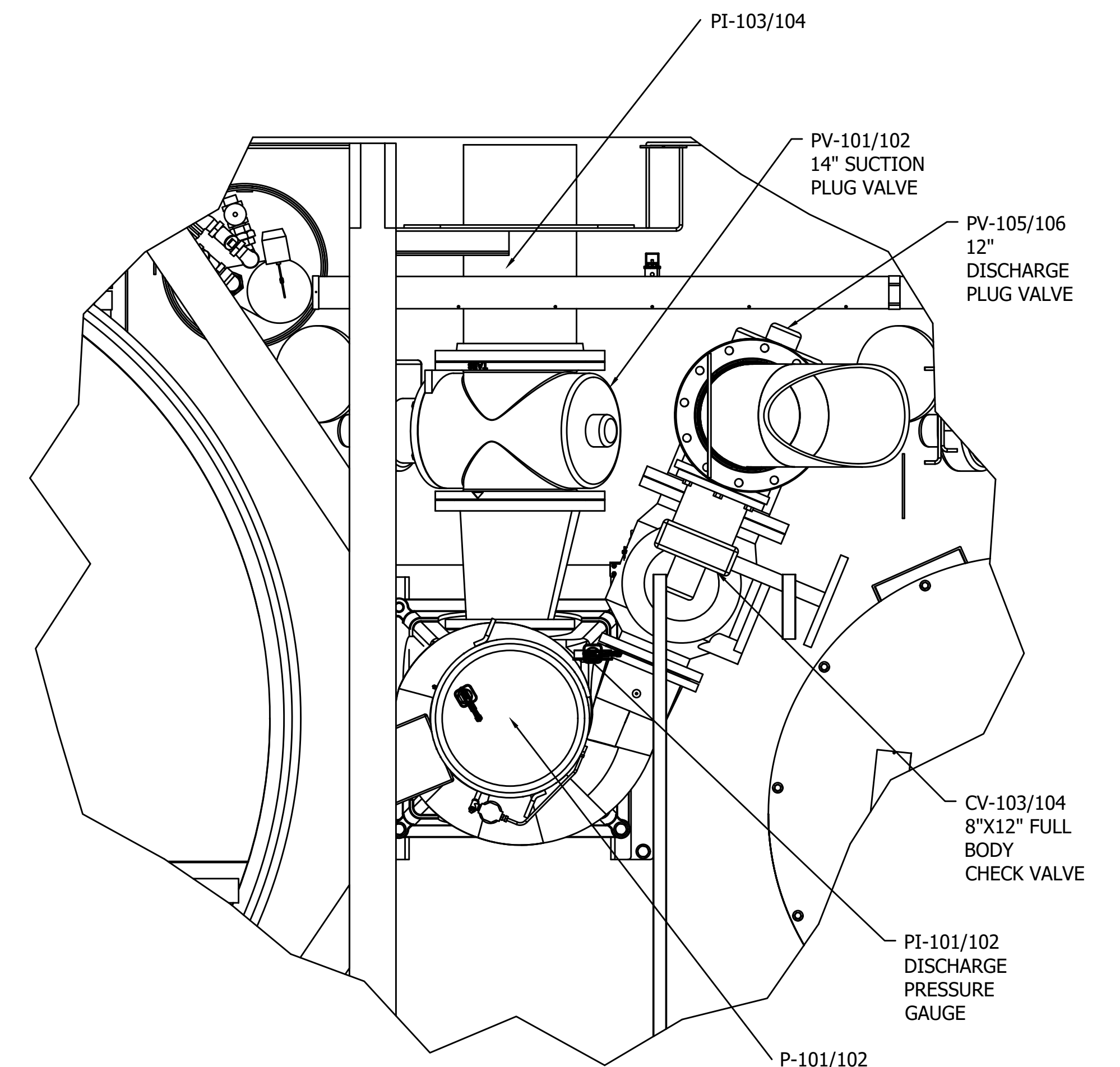
PROVINCETOWN  
SHANK PAINTER ROAD & ROUTE 6

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	178	293
PROJECT FILE NO.		608744	

PUMP STATION PLANS AND DETAILS - 07

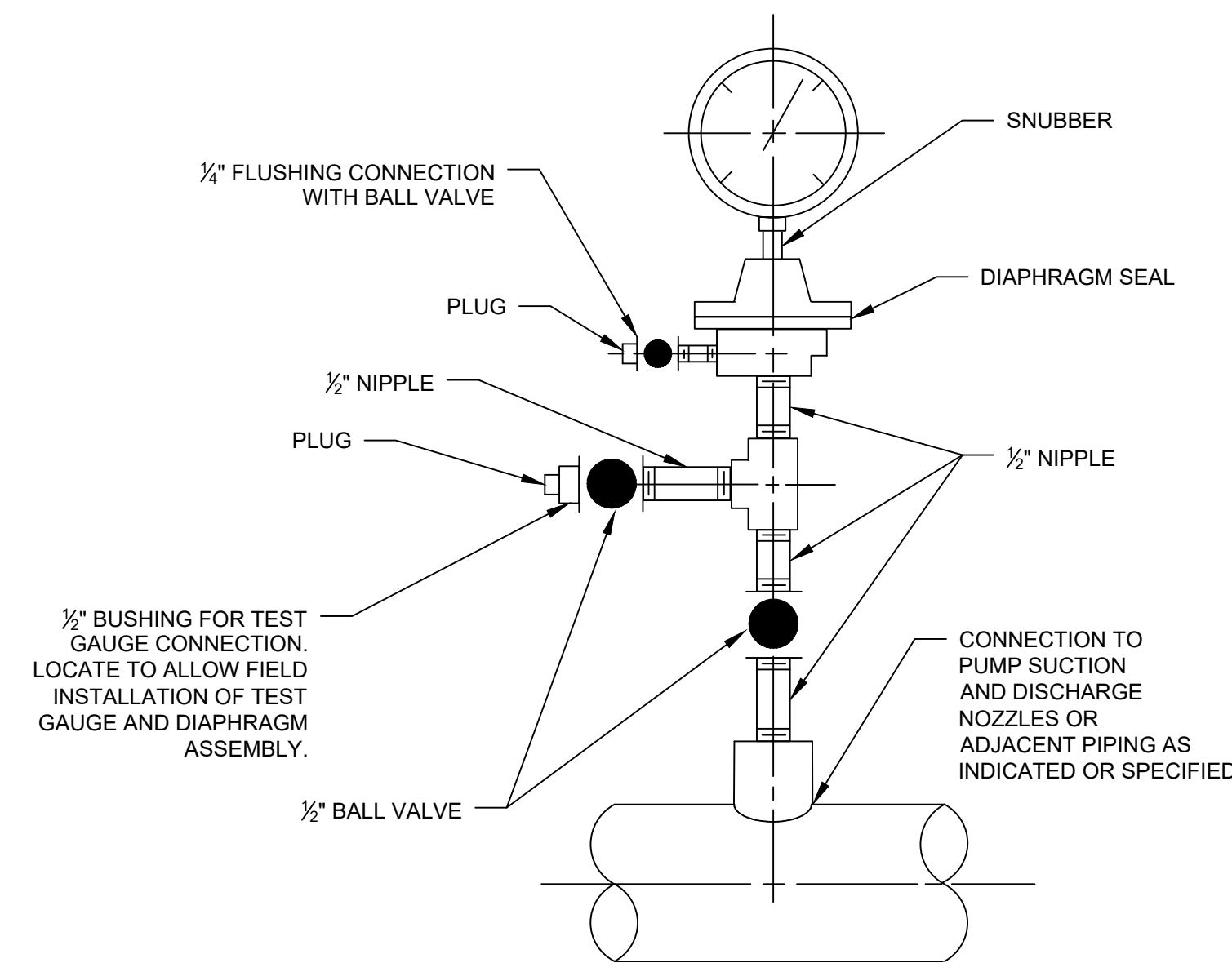


PLAN VIEW  
SCALE: NTS



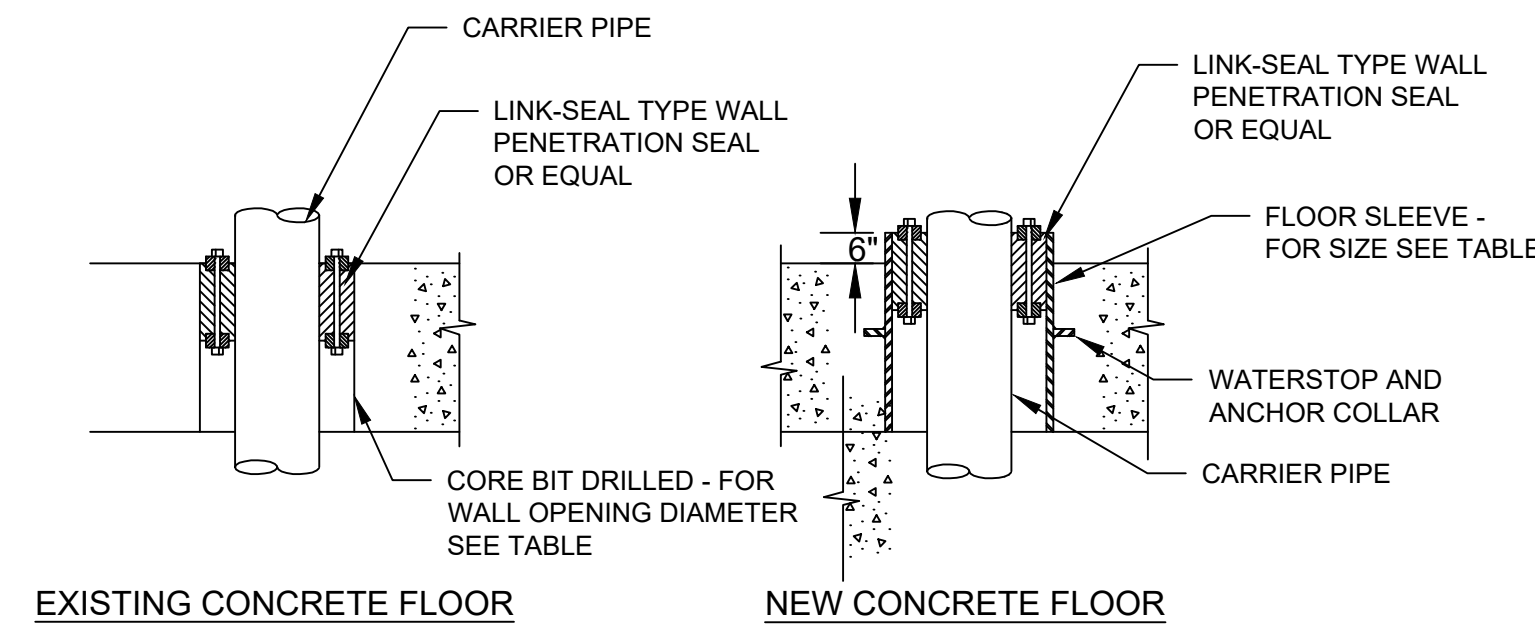
DETAIL A  
(TYP. PUMP LAYOUT)

NOTES:  
1. CAPSULAR PUMP STATION IS BASED AROUND SMITH AND LOVELESS, IN. DESIGN.



**PRESSURE GAUGE MOUNTING DETAIL  
FOR LIQUID PIPING**

SCALE: N.T.S.



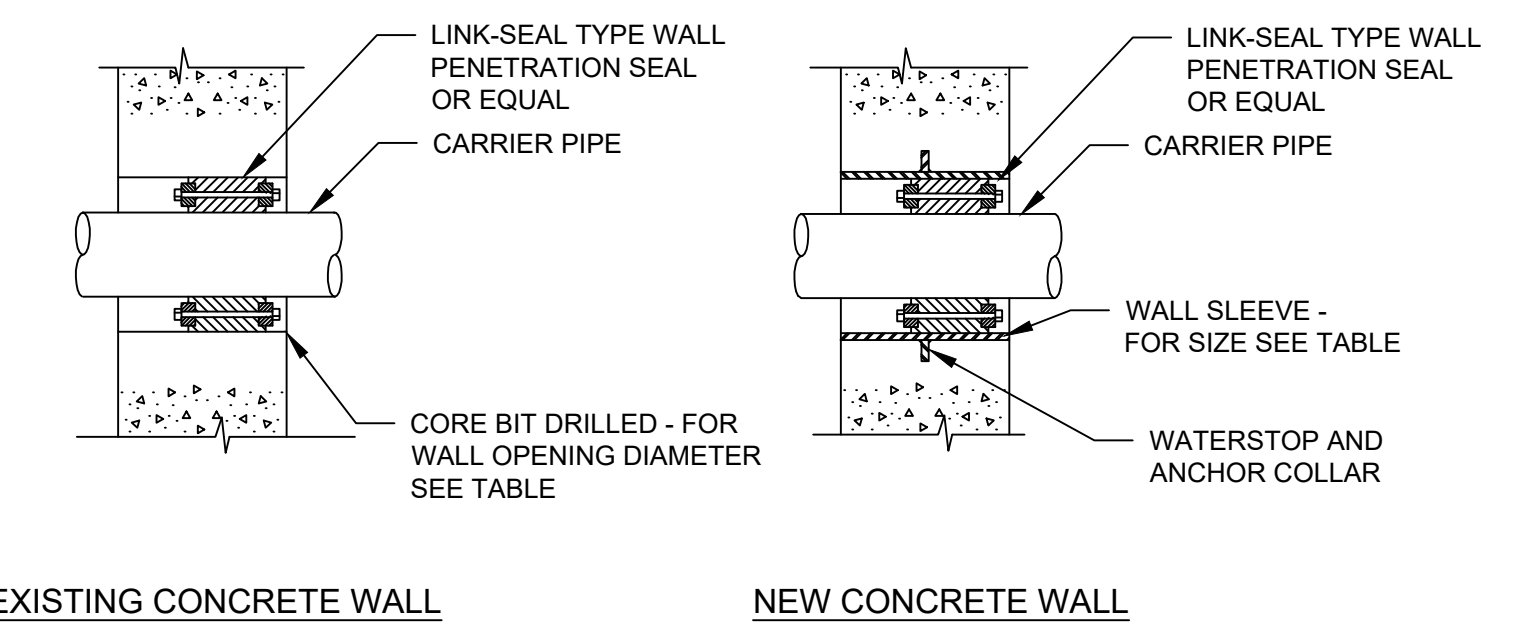
CARRIER PIPE NOMINAL SIZE	CARRIER PIPE O.D.	FLOOR SLEEVE SIZE	CORE DRILLED I.D.
1 1/2"	1.625"	3"	3"
2"	2.50"	4"	4"
4"	4.80"	8"	8"
6"	6.90"	10"	10"
8"	9.05"	12"	12"
16"	17.40"	20"	20"
18"	19.50"	24"	24"
24"	25.80"	30"	29"

**NOTES:**

- SIZES SHOWN ARE FOR DUCTILE IRON PIPE, FOR OTHER MATERIALS AND PIPE SIZES CONSULT MANUFACTURER'S SPECIFICATIONS.
- FOR WATER-TIGHT AND GAS-TIGHT APPLICATIONS, PROVIDE NON-SHRINK GROUT ON BOTH SIDES.

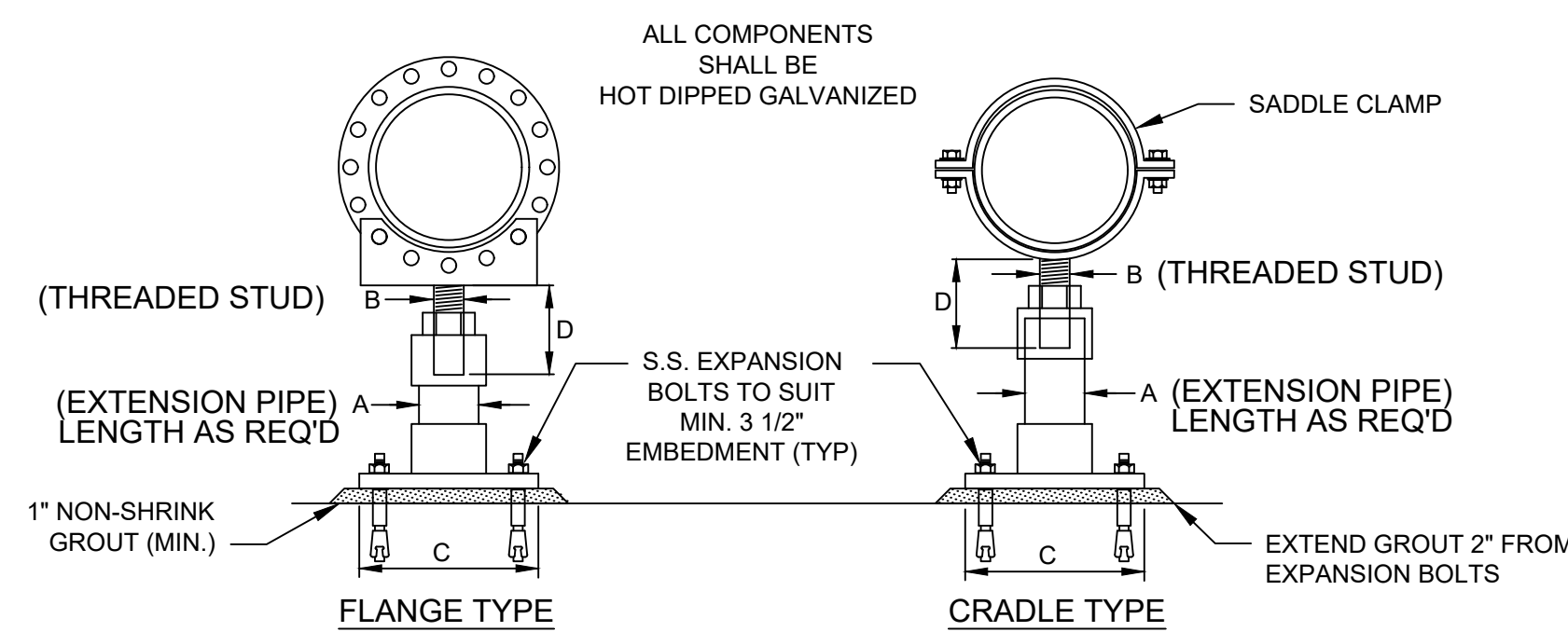
**TYPICAL PIPE SLAB PENETRATION DETAIL**

SCALE: N.T.S.



EXISTING CONCRETE WALL

NEW CONCRETE WALL



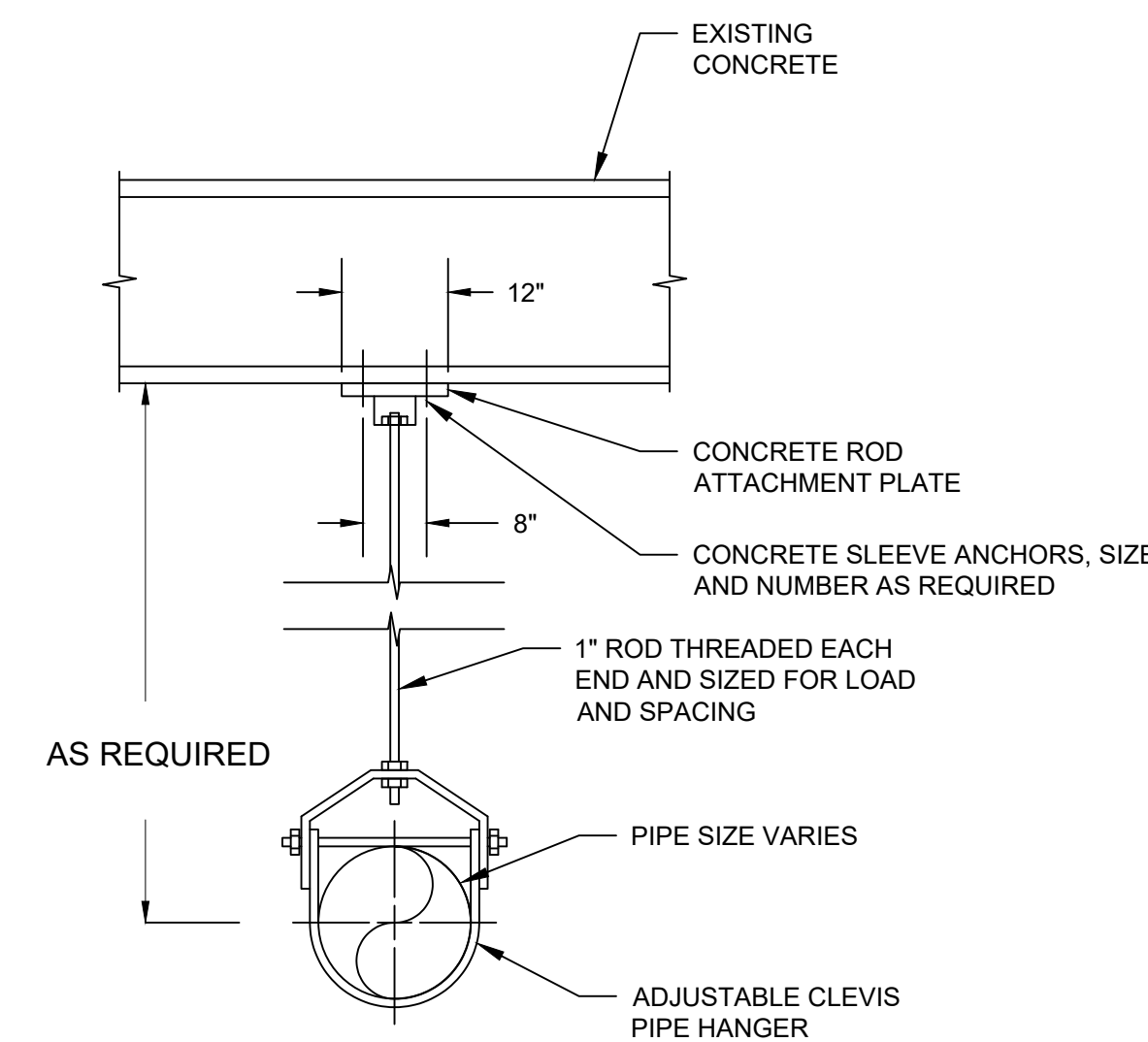
PIPE SIZE	APPROXIMATE DIMENSIONS			
	A	B	C	D (MIN)
6"	2"	1"	4"x6"	6"
8"	2"	1"	4"x6"	6"
10"	2"	1"	4"x6"	6"
12"	2"	1"	4"x6"	6"
14"	3"	1 1/2"	8"x8"	6"
16"	3"	1 1/2"	8"x8"	6"
20"	4"	2"	12"x12"	6"
24"	4"	2"	12"x12"	6"

**ADJUSTABLE PIPE SUPPORT DETAIL**

SCALE: N.T.S.

**NOTES:**

- SIZES SHOWN ARE FOR DUCTILE IRON PIPE, FOR OTHER MATERIAL AND PIPE SIZES CONSULT MANUFACTURER'S SPECIFICATIONS. REFER TO SECTION 11200 FOR ADDITIONAL REQUIREMENTS.
- PIPE SUPPORT CALCULATIONS SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 11200.
- ALL COMPONENTS OF PIPE SUPPORT SYSTEM (EXCEPT EXPANSION BOLTS) SHALL BE HOT-DIPPED GALVANIZED STEEL.



**PIPE HANGER DETAIL**

SCALE: N.T.S.

**NOTES:**

- FOR PIPE SIZES CONSULT MANUFACTURER'S SPECIFICATIONS. REFER TO SECTION 11200 FOR ADDITIONAL REQUIREMENTS.
- PIPE SUPPORT CALCULATIONS SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 11200.
- ALL COMPONENTS OF PIPE SUPPORT SYSTEM (EXCEPT EXPANSION BOLTS) SHALL BE HOT-DIPPED GALVANIZED STEEL.

CARRIER PIPE NOMINAL SIZE	CARRIER PIPE O.D.	WALL SLEEVE SIZE	CORE DRILLED I.D.
2"	2.50"	4"	4"
4"	4.80"	8"	8"
6"	6.90"	10"	10"
8"	9.05"	12"	12"
16"	17.40"	20"	20"
18"	19.50"	24"	24"
24"	25.80"	30"	29"

**NOTES:**

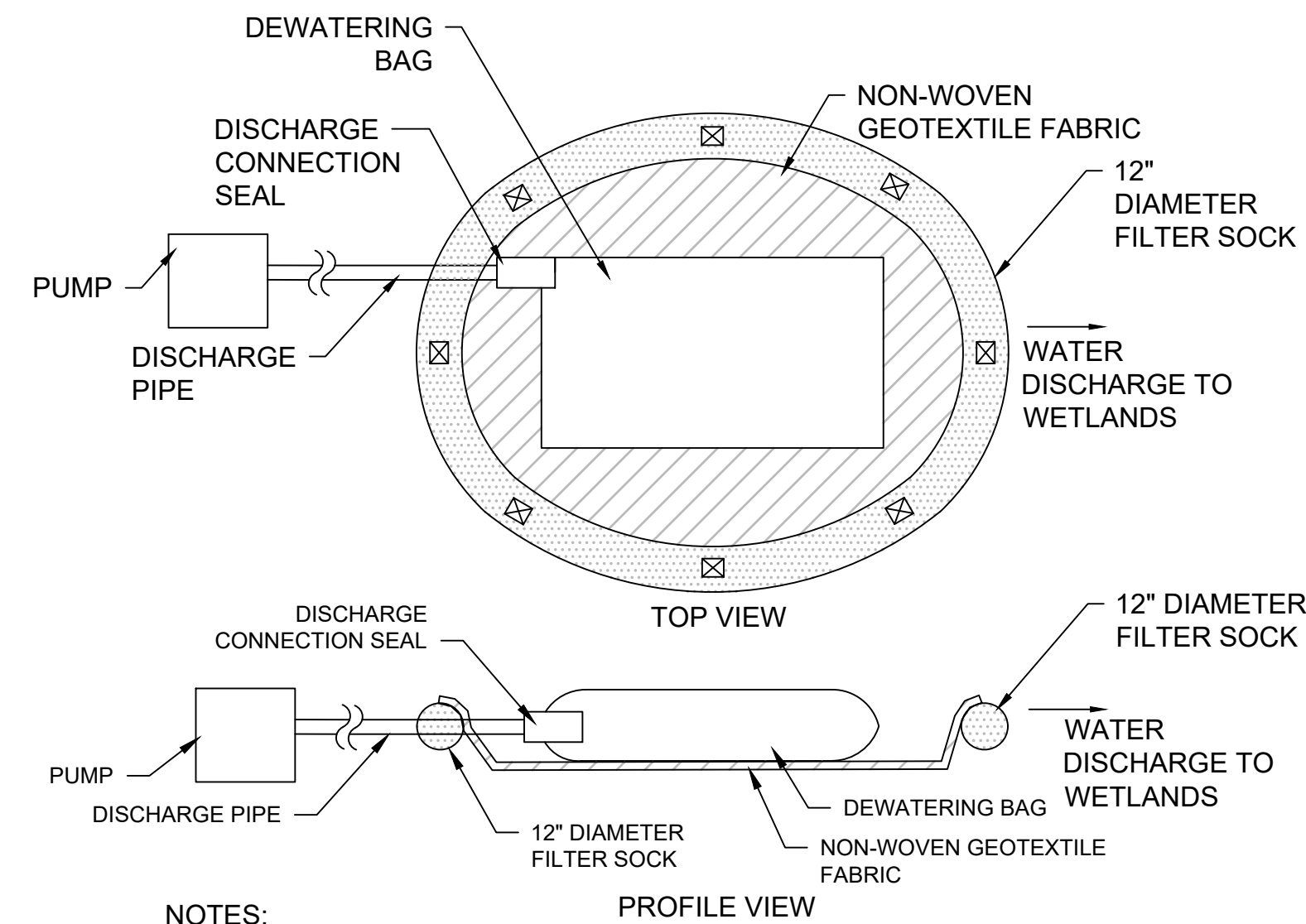
- SIZES SHOWN ARE FOR DUCTILE IRON PIPE, FOR OTHER MATERIALS AND PIPE SIZES CONSULT MANUFACTURER'S SPECIFICATIONS. SOME APPLICATIONS MAY REQUIRE STANDARD WALL CASTINGS.
- FOR WATER-TIGHT AND GAS-TIGHT APPLICATIONS, PROVIDE NON-SHRINK GROUT ON BOTH SIDES.

**TYPICAL WALL PENETRATION DETAIL**

SCALE: N.T.S.



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MA	-	180	293
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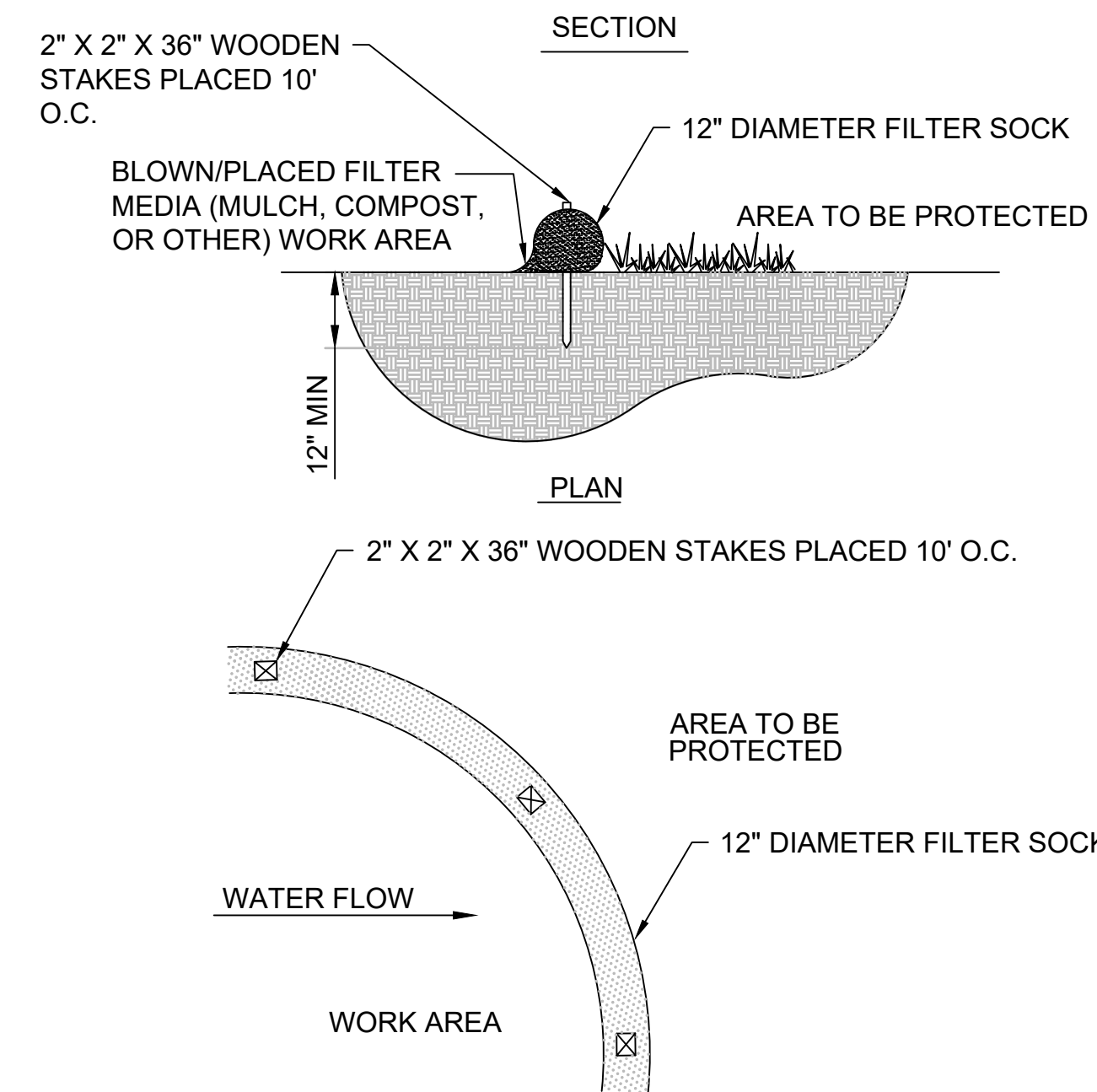


**NOTES:**

1. DEWATERING BAG SIZE AND QUANTITY SHALL BE AS NEEDED TO ADEQUATELY FILTER ALL PUMP EFFLUENT FROM DEWATERING ACTIVITIES. CONTRACTOR SHALL PROVIDE A REDUNDANT BAG ON SITE AT ALL TIMES.
2. EACH BAG SHALL HANDLE A 2", 3", OR 4" DISCHARGE HOSE.
3. DISCHARGE HOSES CAN BE PLACED ALONG ANY EDGE BY MAKING A SMALL INCISION INTO THE FABRIC, INSERTING THE HOSE, AND THEN CLAMPING THE FABRIC TO THE HOSE VIA WIRE, TIES, CLAMP, ROPE OR SIMILAR TO CREATE A GOOD SEAL.
4. CONTRACTOR SHALL AVOID DISCHARGING MULTIPLE PIPES INTO ONE BAG.
5. DISCHARGE FROM DEWATERING BAGS SHALL BE TO THE WETLANDS SOUTH OF THE PUMP STATION SITE.

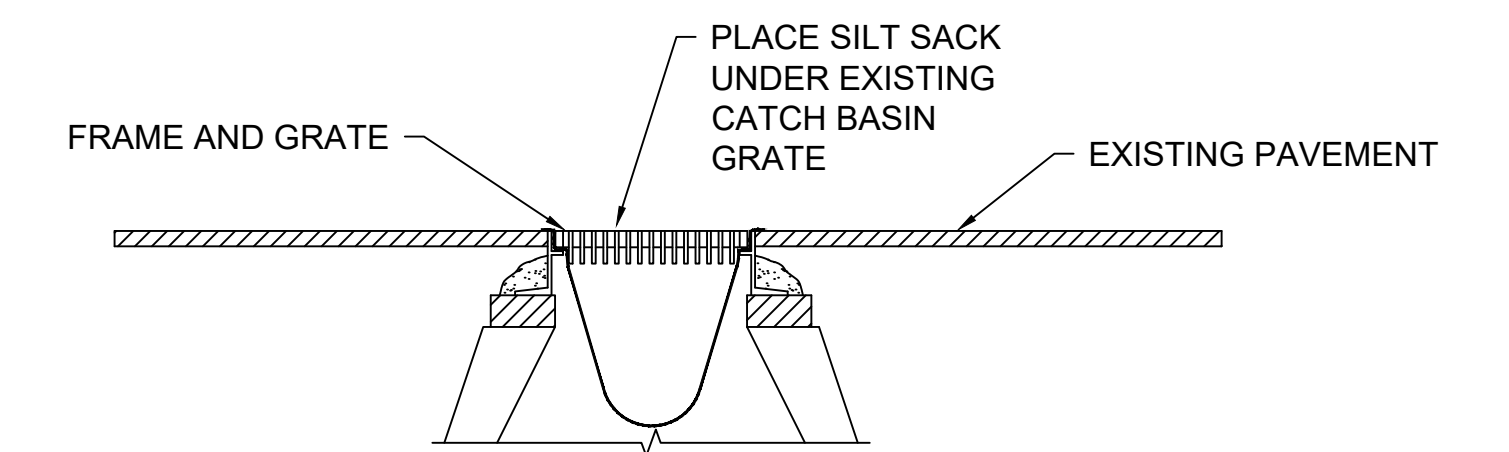
**DEWATERING BAGS**

SCALE: N.T.S.



**12" DIAMETER FILTER SOCK (AS REQUIRED)**

SCALE: N.T.S.

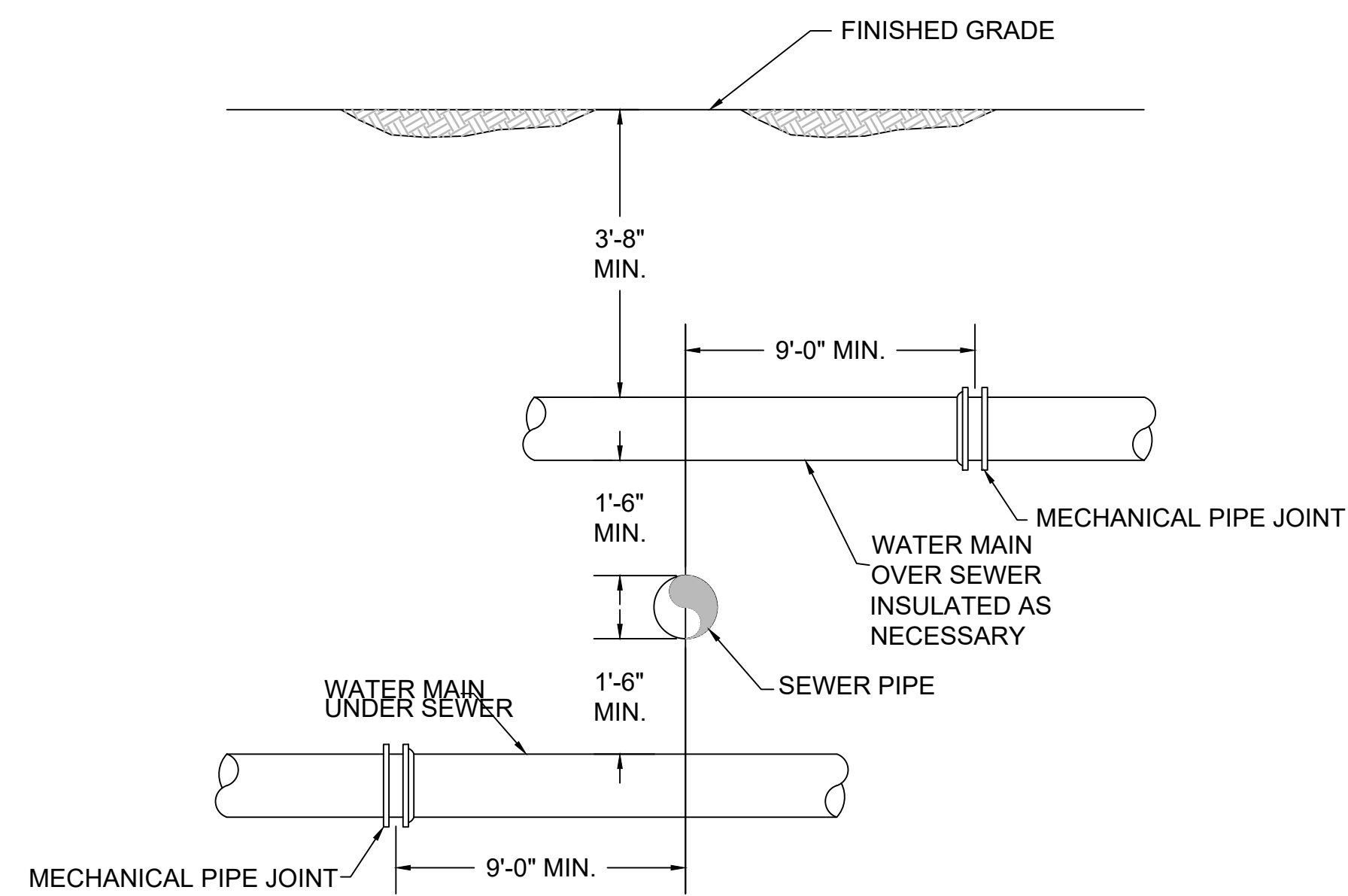


**NOTES:**

1. SILT SACKS SHALL BE INSPECTED WEEKLY AND ACCUMULATED SILT REMOVED TO ALLOW CATCH BASIN TO FUNCTION PROPERLY.
2. HIGH CAPACITY SILT SACK AS MANUFACTURED BY AC ENVIRONMENTAL OR APPROVED EQUAL.

**SEDIMENTATION CONTROL AT CATCH BASINS SILT SACKS**

SCALE: N.T.S.

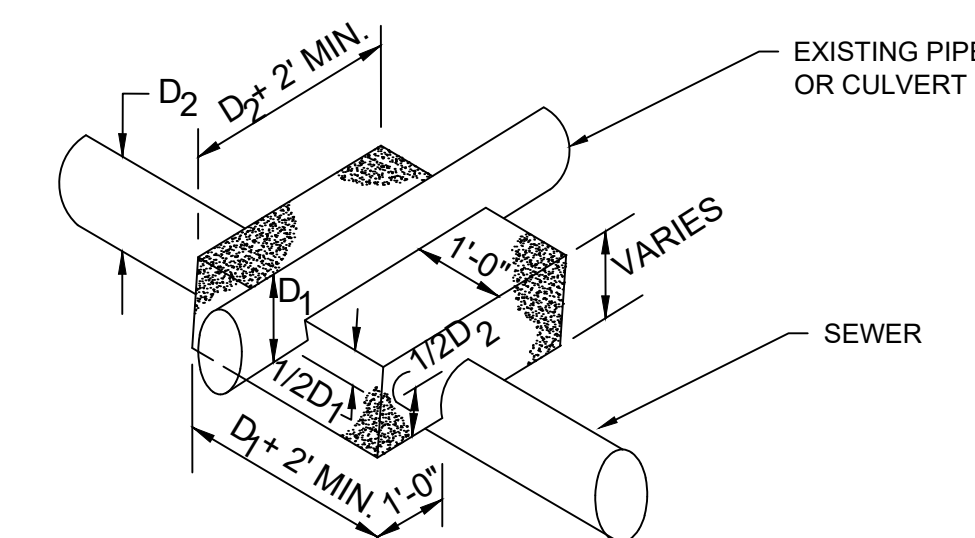


**NOTES:**

1. SEWERS SHALL BE KEPT REMOTE FROM WATER SUPPLY PIPING AND STRUCTURES. WHEREVER FEASIBLE, SEWERS SHOULD BE LAID AT A MINIMUM HORIZONTAL DISTANCE OF 10 FEET FROM WATER MAINS. IF LOCAL CONDITIONS PREVENT THIS, THE WATER MAIN SHOULD BE LAID IN A SEPARATE TRENCH, AND THE ELEVATIONS OF THE CROWN OF THE SEWER PLACED AT LEAST 18 INCHES BELOW THE INVERT OF THE WATER MAIN.
2. WHENEVER SEWERS MUST CROSS UNDER WATER MAINS, THE CROWN OF THE SEWER SHOULD BE PLACED A MINIMUM OF 18 INCHES BELOW THE INVERT OF THE WATER MAIN. IN ADDITION, THE WATER MAIN MUST BE CONSTRUCTED WITH ONE FULL LENGTH OF PIPE CENTERED ABOVE THE CROSSING. THE WATER PIPE SHALL HAVE MECHANICAL JOINTS FOR A MINIMUM DISTANCE OF 10 FEET ON EACH SIDE OF THE CROSSING.
3. WHEN IT IS IMPOSSIBLE TO OBTAIN HORIZONTAL OR VERTICAL SEPARATION AS STIPULATED ABOVE, BOTH THE WATER AND THE SEWER PIPING SHALL BE CONSTRUCTED SUCH THAT THE PIPE JOINTS ARE PLACED AS FAR AWAY FROM THE CROSSING AS POSSIBLE AND THE PIPE CROSSING SHALL BE ENCASED IN CONTROL DENSITY FILL FOR A DISTANCE OF 10 FEET ON ALL SIDES OF THE CROSSING.

**SEWER CROSSING**

SCALE: N.T.S.

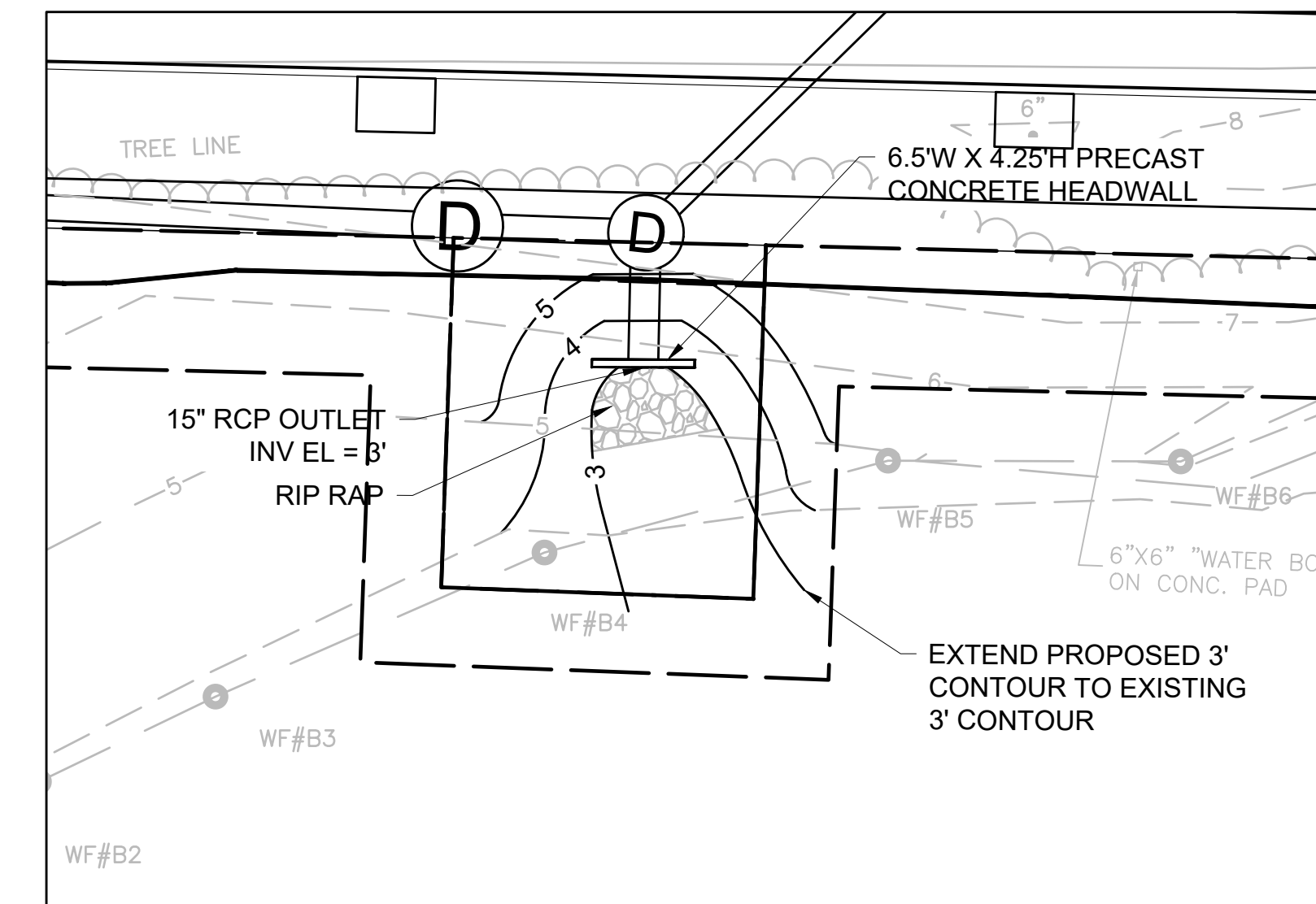
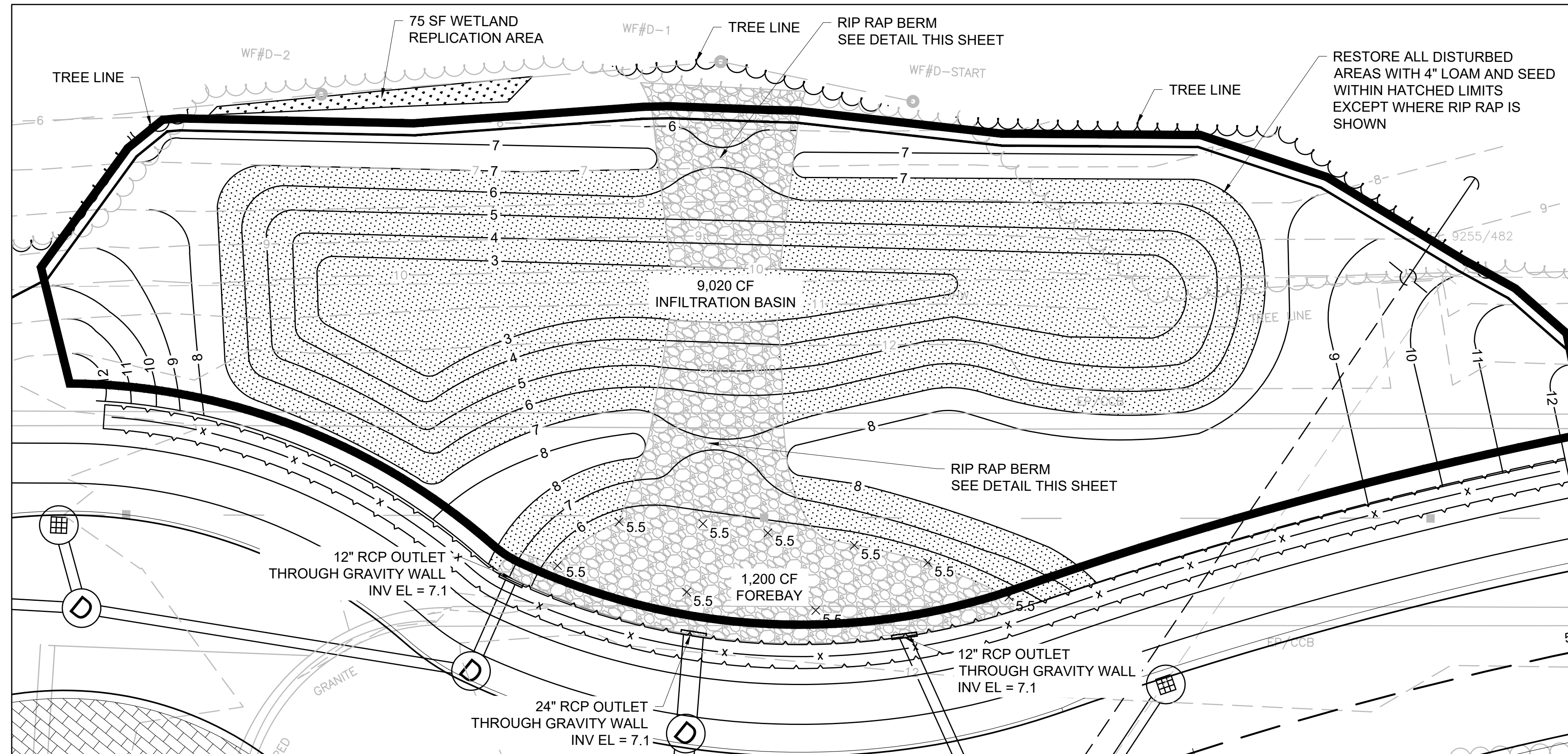


**NOTES:**

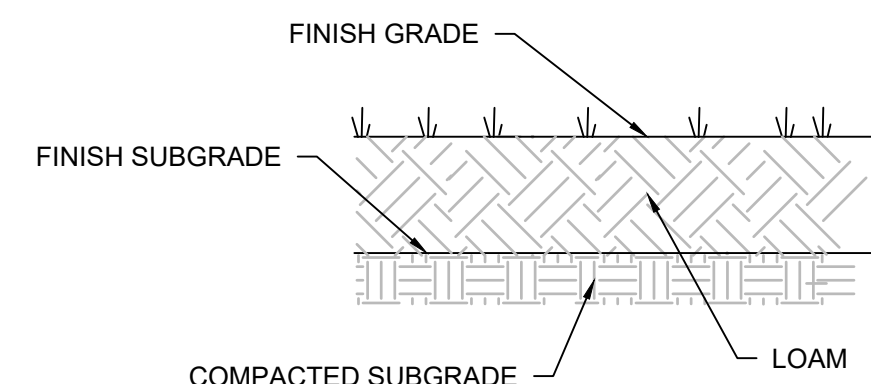
1. CONCRETE ENCASEMENT OF SEWER WHEN CROSSING A UTILITY WILL BE REQUIRED WHENEVER ADEQUATE COMPACTION CANNOT BE ACHIEVED BETWEEN THE UTILITY AND THE SEWER. CONCRETE TO BE PLACED BETWEEN SEWER AND UTILITY, AT THE DIRECTION OF THE ENGINEER.
2. REFER TO THE DETAIL ENTITLED "SEWER CROSSING" FOR WATER PIPE CROSSING SEWER.

**CONCRETE ENCASEMENT**

SCALE: N.T.S.



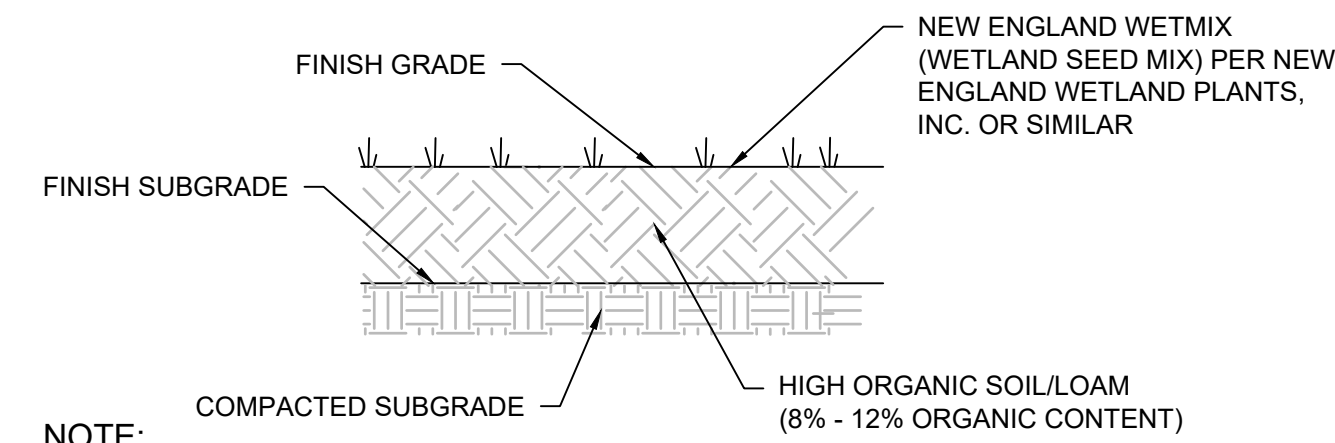
416-OF GRADING PLAN  
SCALE: 1"=10'



NOTE:

- SEED MIXTURE COMPOSITION SHALL BE CAPE COD LANDSCAPE UTILITY SEED MIX, FREE OF FERTILIZERS.
- LOAM SHALL BE NATIVE TO CAPE COD AND OF LOW NITROGEN CONTENT.
- INSTALL CURLEX CL EROSION CONTROL BLANKET AS MANUFACTURED BY AMERICAN EXCELSIOR COMPANY (OR APPROVED EQUAL) ON ALL LOAM AND SEEDED SLOPES 3:1 OR STEEPER.

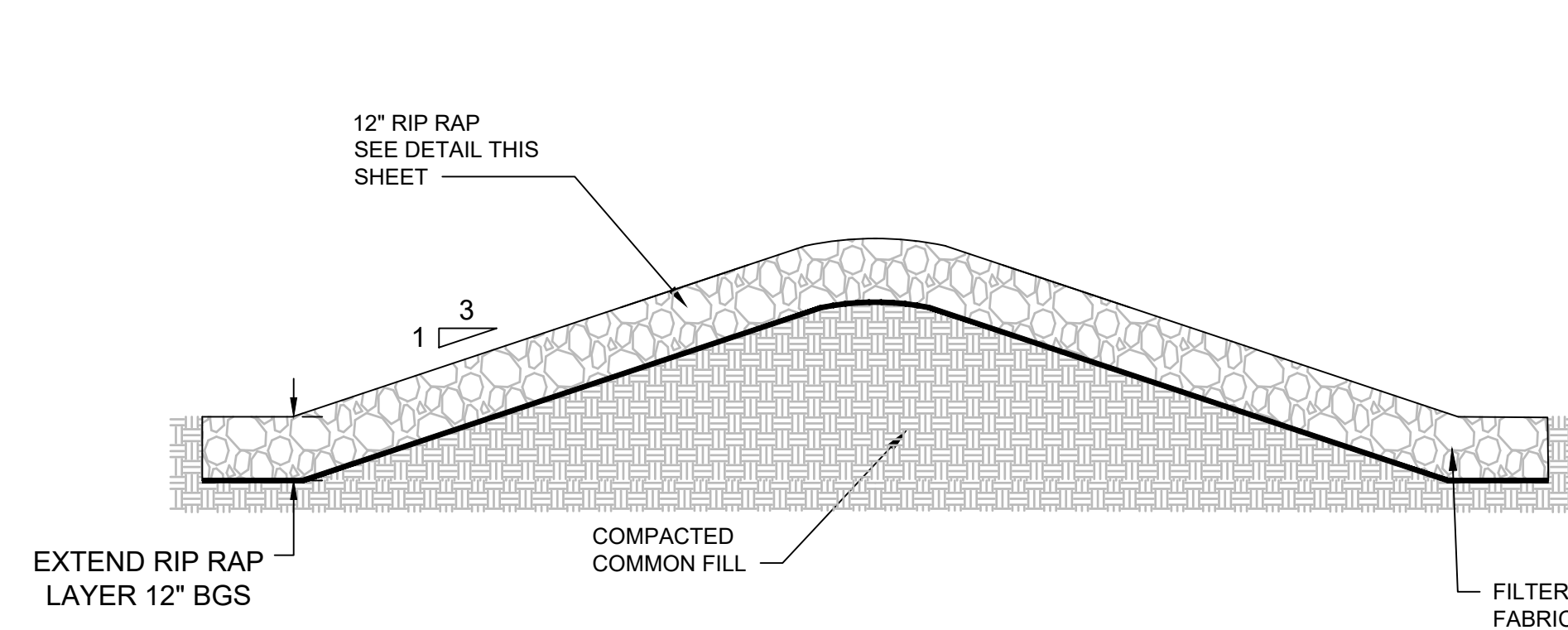
LOAM AND SEED (DISTURBED AREAS)  
SCALE: N.T.S.



NOTE:

- SEED MIXTURE COMPOSITION SHALL BE NEW ENGLAND WETMIX (WETLAND SEED MIX) PER NEW ENGLAND WETLAND PLANTS, INC. OR SIMILAR.
- THE REPLICATION AREA SHALL BE EXCAVATED TO THE ELEVATION OF THE EXISTING WETLAND.

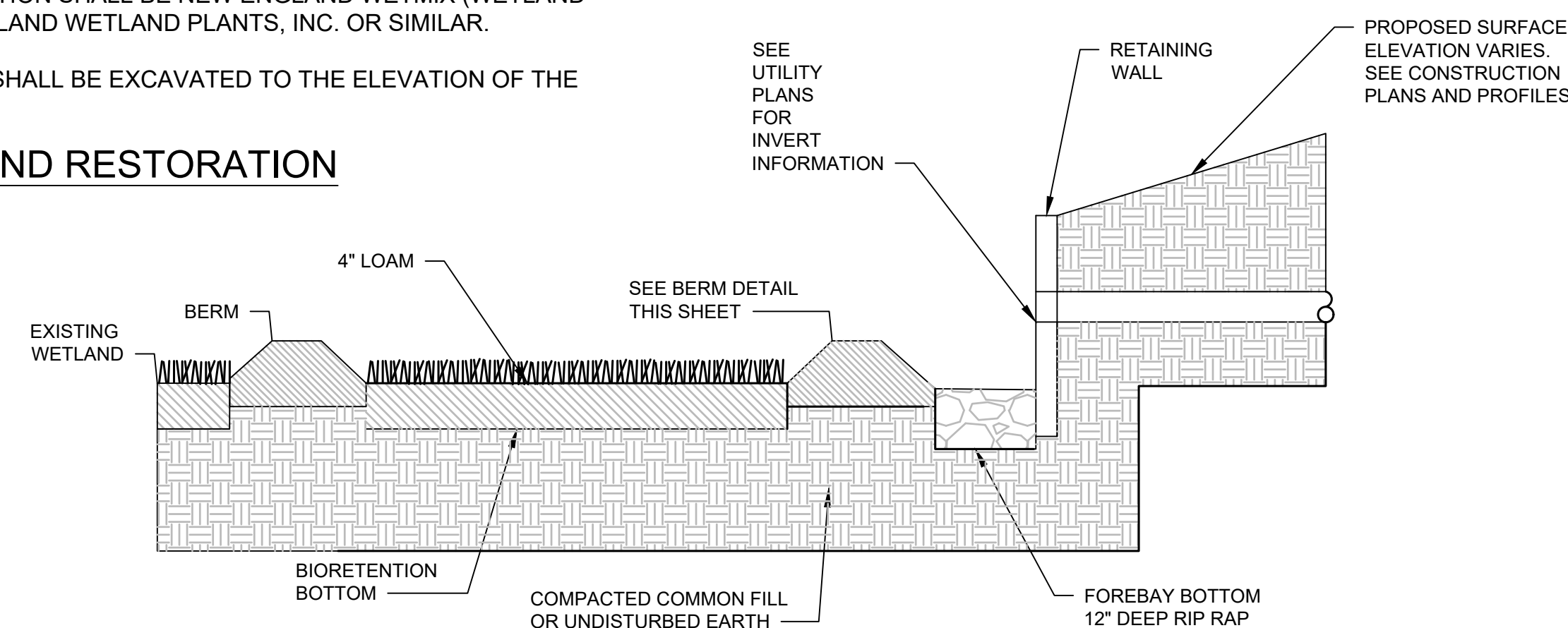
WETLAND RESTORATION  
SCALE: N.T.S.



NOTES:

- SEE PLAN FOR GRADING.

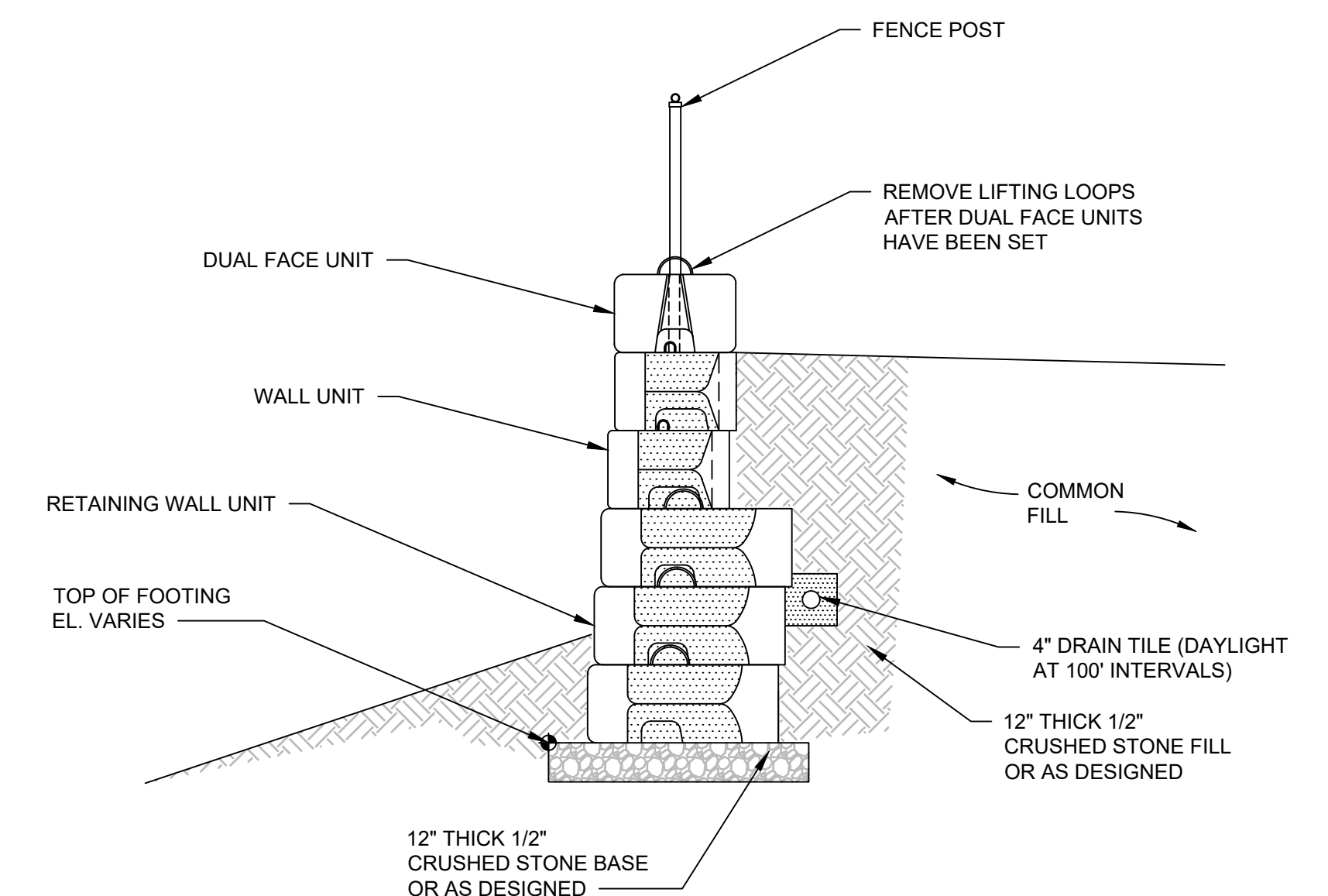
BERM DETAIL  
SCALE: N.T.S.



NOTES:

- ALL AGGREGATE WITHIN THE STONE STORAGE BED SHALL BE CLEAN-WASHED, DEFINED AS HAVING LESS THAN 0.5% WASH LOSS, BY MASS, WHEN TESTED PER THE AASHTO T-11 WASH LOST TEST.
- BOTTOM OF STORAGE SHOULD MAINTAIN A TWO-FOOT SEPARATION FROM SEASONAL HIGH GROUNDWATER.
- SEE PLAN VIEW THIS SHEET FOR ELEVATION INFORMATION.

INFILTRATION BASIN  
SCALE: N.T.S.

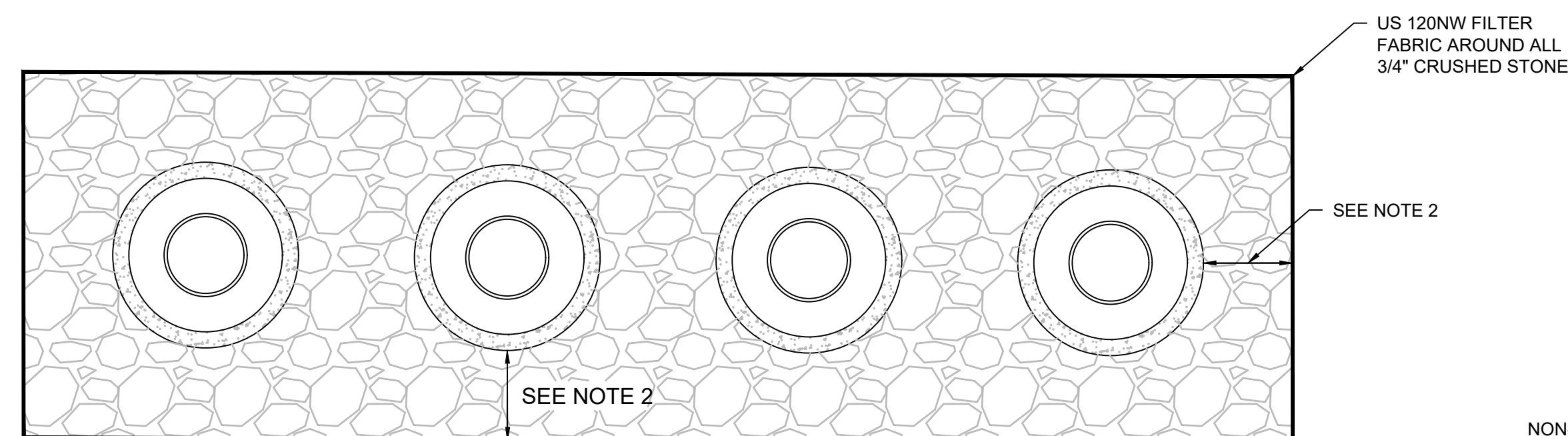


NOTES:

- THE CONTRACTOR SHALL SUBMIT BLOCK WALL SHOP DRAWINGS DESIGNED AND STAMPED BY A LICENSED MA GEOTECHNICAL ENGINEER.

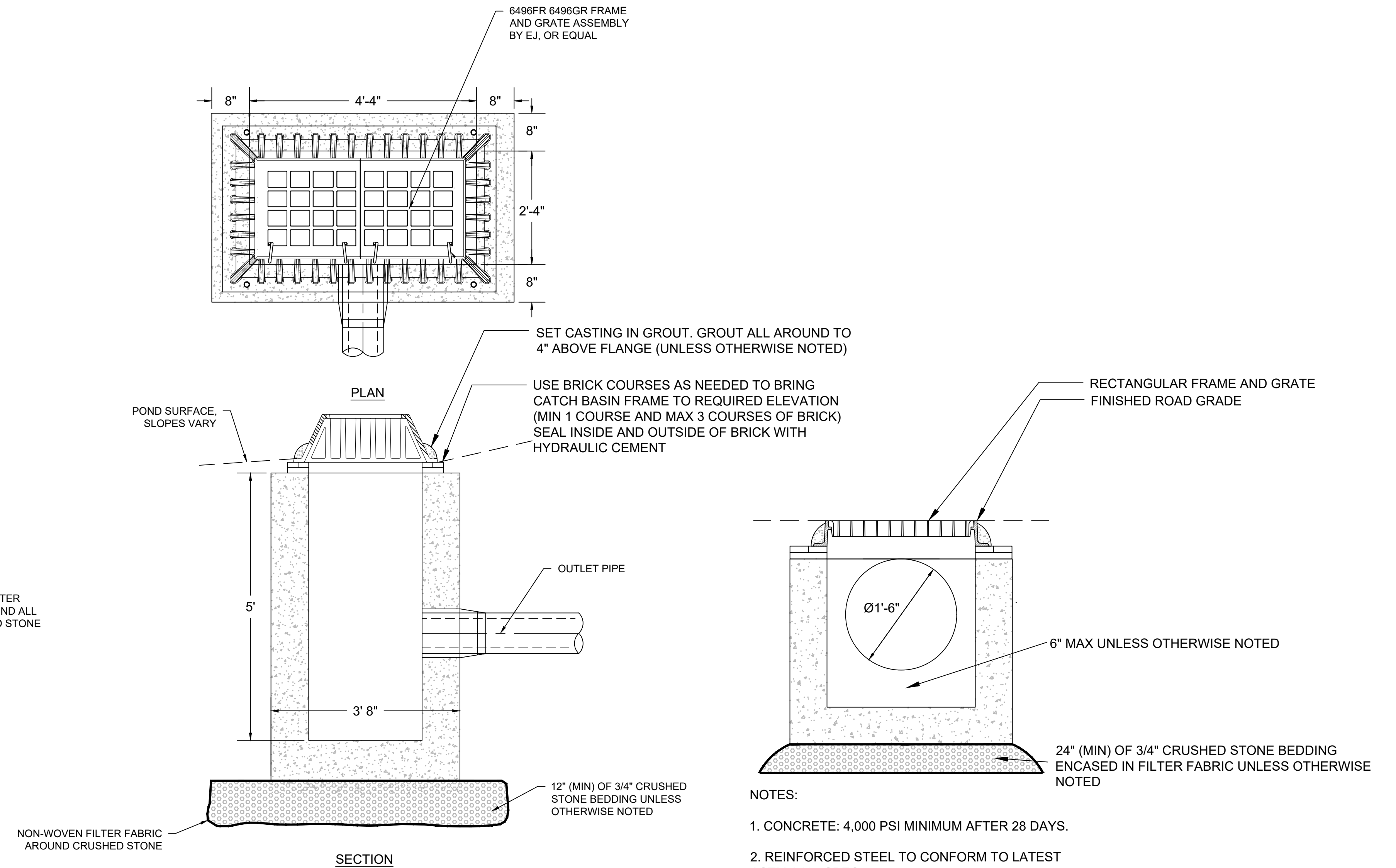
BLOCK WALL CROSS SECTION  
SCALE: N.T.S.

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	182	293
PROJECT FILE NO.		608744	



- NOTES:
- LEACHING BASIN SHALL BE ACCORDING TO MASS DOT STANDARD DETAIL 205.2.0 WITH THE FOLLOWING CHANGES: 6' INNER DIAMETER STRUCTURE, AND USING A FRAME AND COVER INSTEAD OF FRAME AND GRATE.
  - 3/4" CRUSHED STONE SHALL EXTEND 1' BEYOND THE EDGE OF THE STRUCTURES IN ALL DIRECTIONS

**LEACHING PITS**  
SCALE: N.T.S.



- NOTES:
- H-20 LOADING PER AASHTO HS-20-44; ASTM C478 SPEC. FOR "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS".

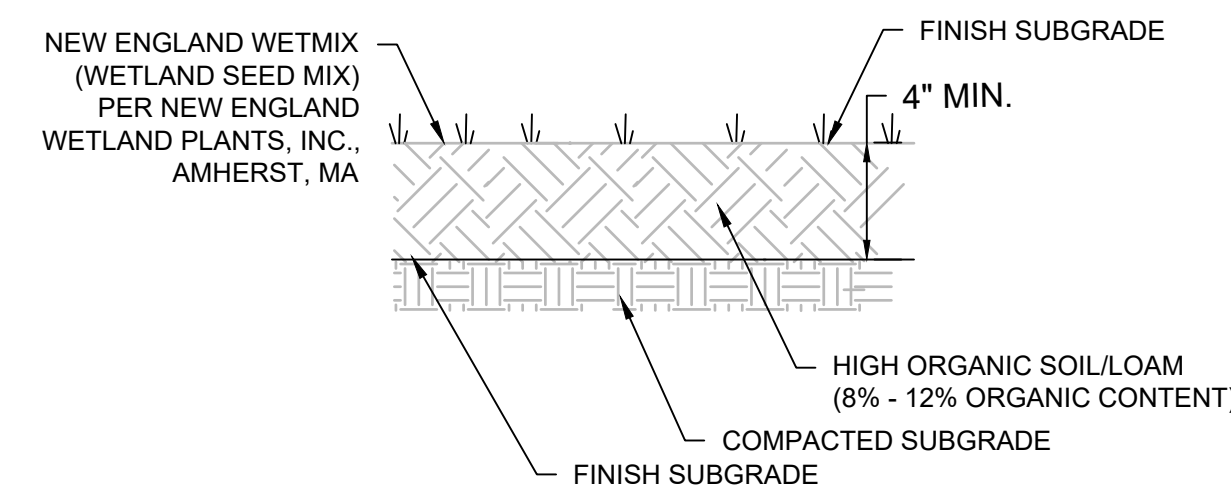
**COURT STREET POND OUTLET STRUCTURE**  
SCALE: N.T.S.

- NOTES:
- CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
  - REINFORCED STEEL TO CONFORM TO LATEST ASTM A185 SPEC.
  - H-20 LOADING PER AASHTO HS-20-44; ASTM C478 SPEC. FOR "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS".
  - FRAME SHALL BE 4 FLANGE.
  - GRATE SHALL BE SQUARE HOLE GRATE UNLESS OTHERWISE REQUIRED.

**GUTTER INLET STRUCTURE**  
SCALE: N.T.S.



STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	183	293
PROJECT FILE NO.		608744	

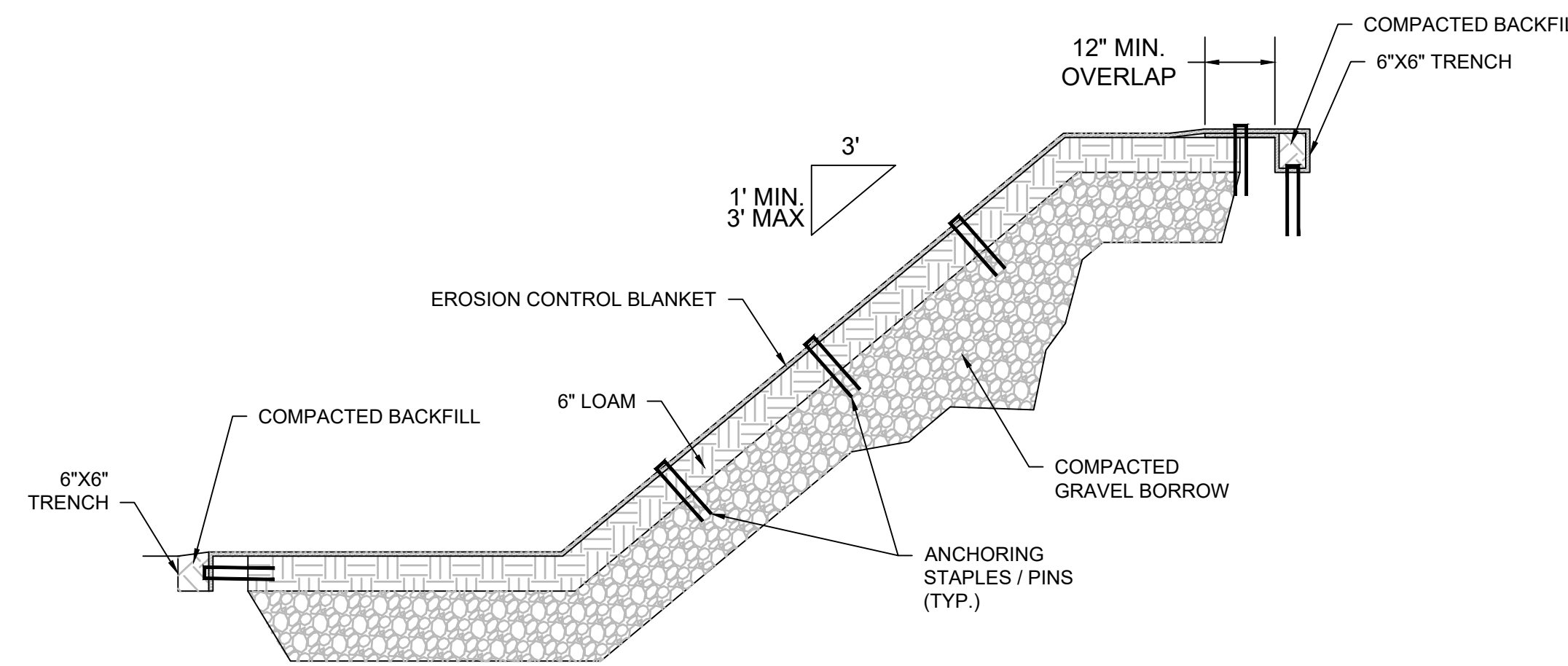


**WETLAND PLANTING PLAN NOTES:**

1. THE REPLICATION AREA SHALL BE EXCAVATED TO THE ELEVATION OF THE EXISTING WETLAND.
2. FOR ALL SLOPES GREATER THAN 3H:1V, ADD THE EROSION CONTROL BLANKET AS SHOWN IN THE DETAIL ON THIS SHEET.

**WETLAND PLANTS MONITORING PLAN NOTES:**

1. MONITORING AND REPORTING ASSOCIATED WITH THE COMPLETED WETLAND REPLICATION AREA SHOULD FOLLOW AND BE IN COMPLIANCE WITH THE ORDER OF CONDITIONS ISSUED BY THE WESTWOOD CONSERVATION COMMISSION AND ANY OTHER RELEVANT PERMIT THAT APPLIES.
2. ANNUAL REPORTING AND ANY DELIVERABLES WILL BE SUBMITTED TO THE APPLICABLE PERMITTING AUTHORITIES.
3. POST PLANTING, THE AREA WILL BE MONITORED AS REQUIRED IN THE MASSACHUSETTS INLAND WETLAND REPLICATION GUIDELINES AND THE ORDER OF CONDITIONS FOR A PERIOD OF TWO YEARS, TO CONDUCT VISUAL ASSESSMENT TO DETERMINE IF FURTHER ACTION IS NECESSARY TO REMOVE AND REPLACE DEAD PLANTS, REMOVE ACCUMULATED DEBRIS, AND TO REMOVE ANY UNWANTED AND COMPETING INVASIVE PLANTS.
4. SHOULD THE AREA EXPERIENCE AN UNUSUAL FLOOD EVENT, AN ADDED SITE VISIT WILL BE CONDUCTED TO ASSESS ANY DAMAGE AND TO TAKE RADIATION ACTION.
5. THE INTENT IS TO HAVE THE PLANTED WETLAND AREA ACHIEVE 75% GROWTH IN COVER AND MATURITY AT THE END OF THE TWO (2) YEAR MONITORING PERIOD.
6. EVERY OPPORTUNITY WILL BE TAKEN TO REMOVE INVASIVE PLANTS SO THEY ARE WEAKENED ALLOWING THE INDIGENOUS PLANTINGS TO TAKE OVER AND THRIVE.
7. IF THE PLANTS GET DISTRESSED DURING THE MONITORING PERIOD, AN EXAMINATION OF THE SOIL SHALL DETERMINE IF THE SOIL PH BALANCE NEEDS ADJUSTMENT OR PLANT FERTILIZATION IS NEEDED.

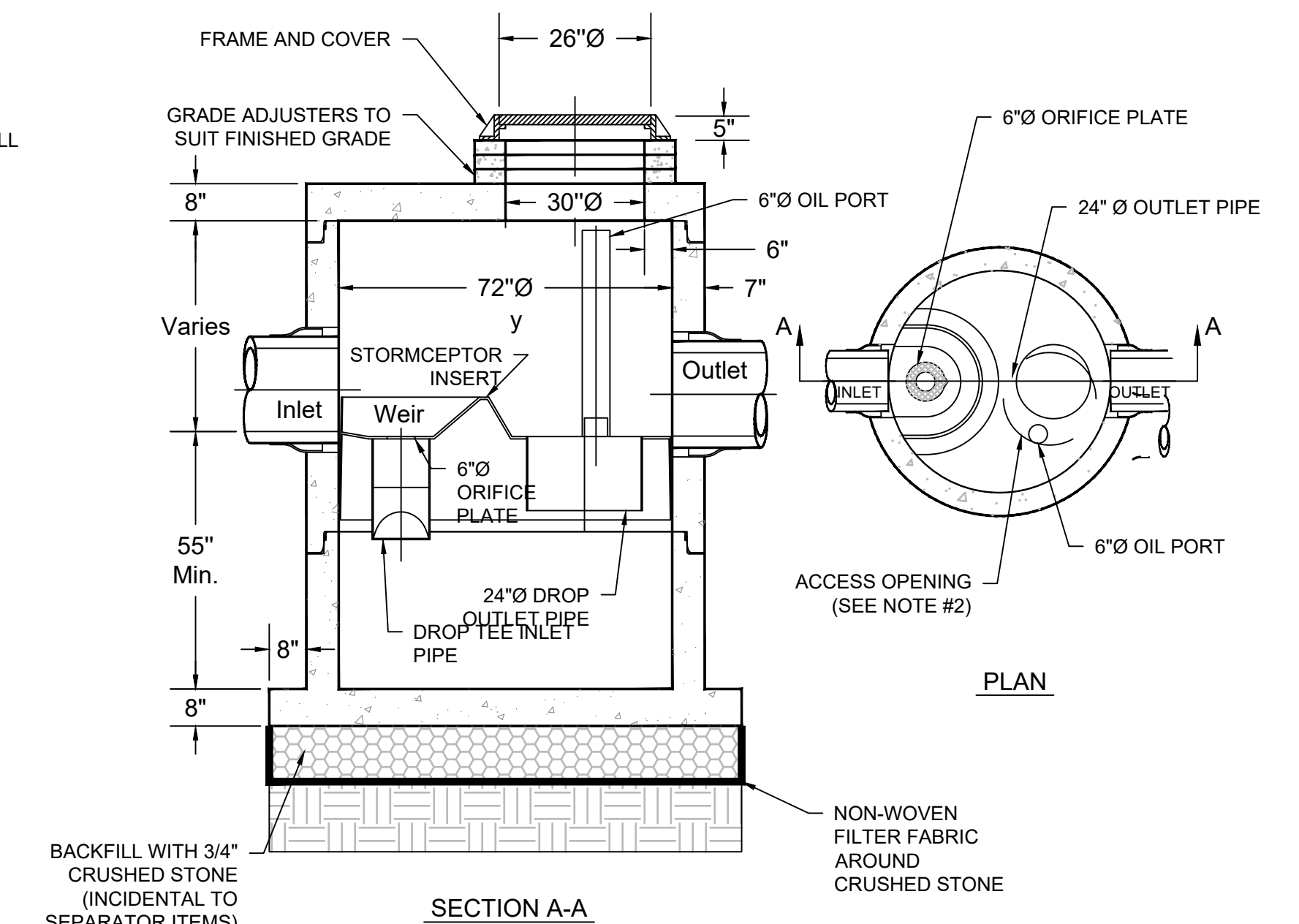


**NOTES:**

1. EROSION CONTROL BLANKET SHALL BE ECSC-2B BY EAST COAST EROSION CONTROL, OR EQUAL.
2. REFER TO THE MANUFACTURER'S GUIDELINES FOR STAPLE ANCHORING SPACING.

**EROSION CONTROL BLANKET**

SCALE: N.T.S.



**NOTES:**

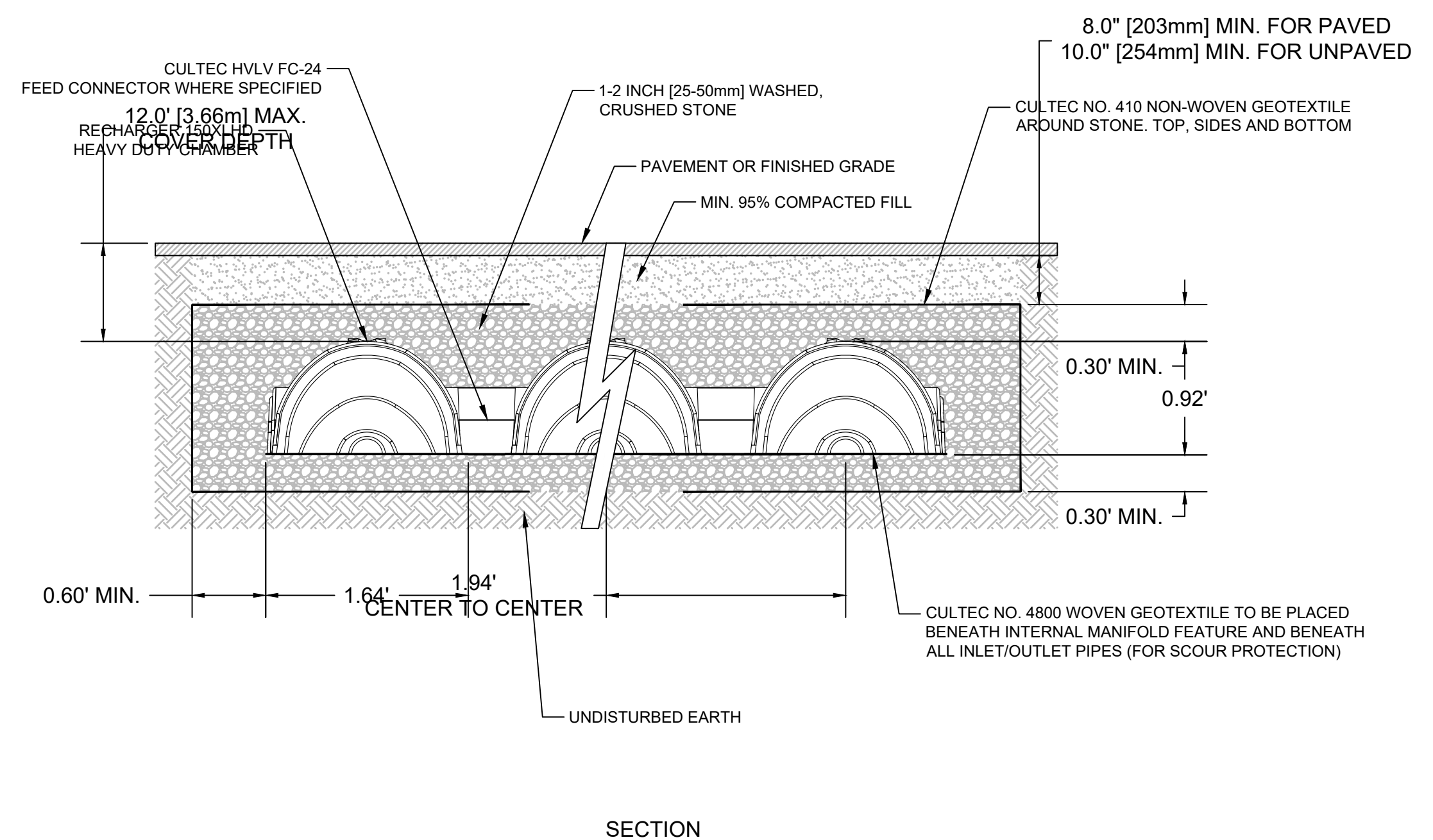
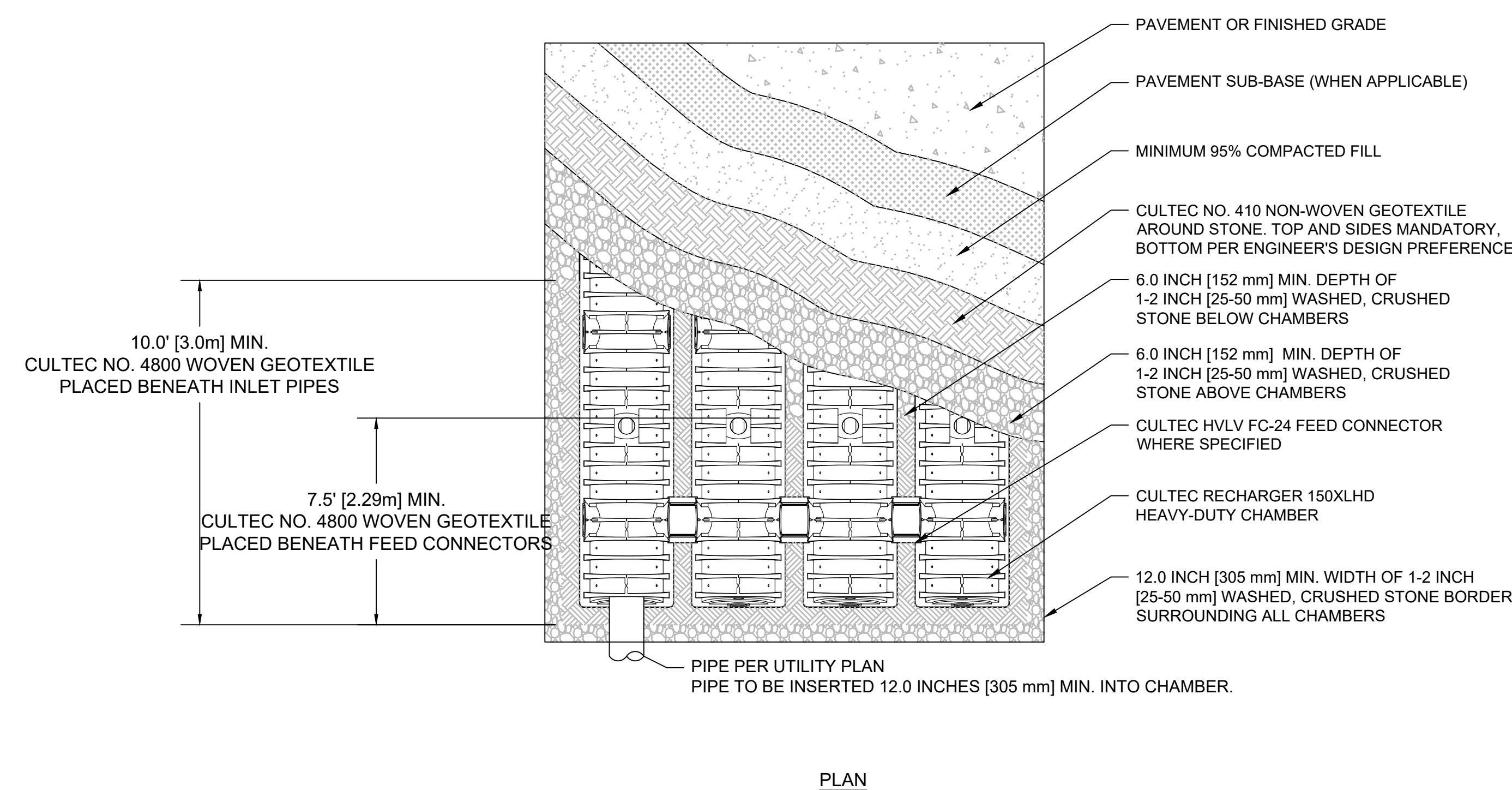
1. THE USE OF FLEXIBLE CONNECTIONS ARE RECOMMENDED AT THE INLET AND OUTLET WHERE APPLICABLE.
2. THE COVER SHALL BE POSITIONED OVER THE OUTLET DROP PIPE AND THE OIL PORT.
3. THE HYDRODYNAMIC SEPARATOR SHALL BE AS STATED IN THE STRUCTURES TABLE, OR EQUAL.

**HYDRODYNAMIC SEPARATOR**

SCALE: N.T.S.

**WETLAND PLANTING PLAN**

SCALE: N.T.S.



**SECTION**

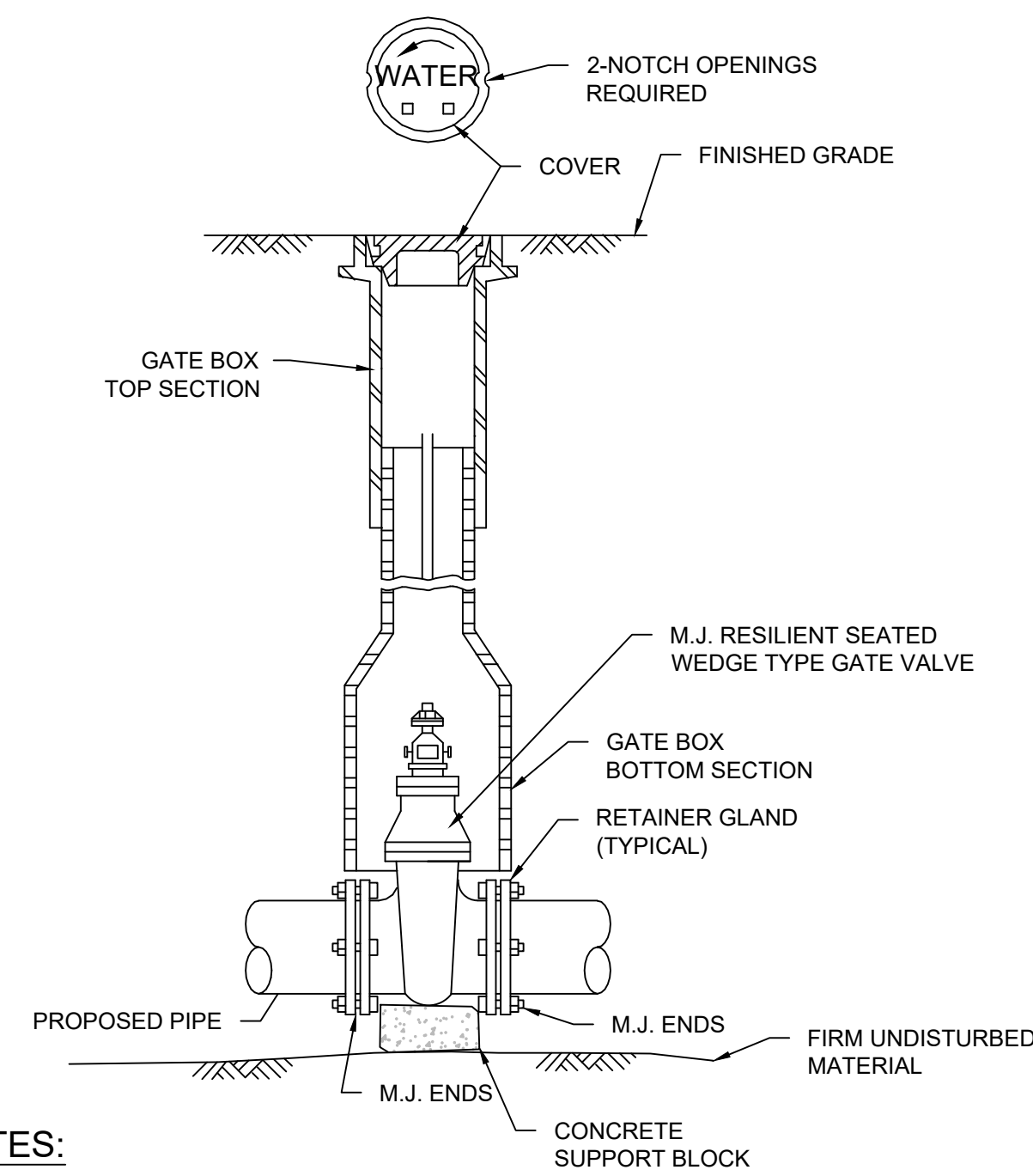
**NOTES:**

1. INFILTRATION CHAMBER IS DESIGNED AROUND CULTEC 150 XLHD. CHAMBER LAYOUT SHALL BE 10 ROWS OF 7 CHAMBERS PER ROW.

**SOUTH SHANK PAINTER INFILTRATION CHAMBERS**

SCALE: N.T.S.

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	184	293
PROJECT FILE NO.		608744	

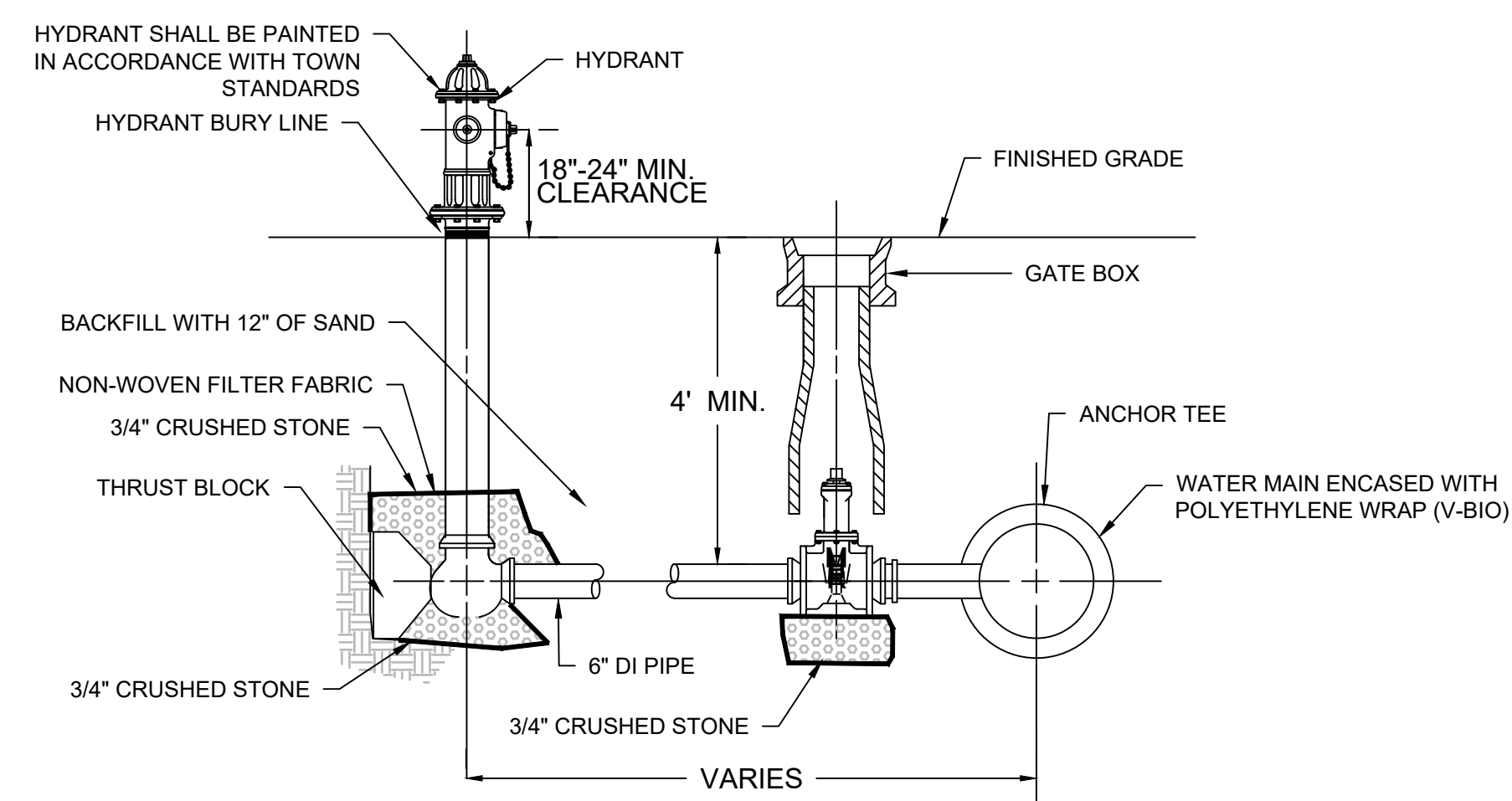


**NOTES:**

1. ALL EXCAVATION, BACKFILLING AND PAVING SHALL BE IN ACCORDANCE WITH THE TOWN OF PROVINCETOWN REQUIREMENTS.
2. WATER GATE COVER SHALL HAVE A MINIMUM HEIGHT OF 3.5 INCHES AND A MINIMUM WEIGHT OF 13 POUNDS, BRAND NAME BIBBY-STE-CROIX OR EQUAL.
3. VALVES SHALL HAVE A 2-INCH SQUARE OPERATING NUT, AND BE OPEN LEFT (COUNTER-CLOCKWISE TO OPEN)

**GATE VALVE AND VALVE BOX DETAIL**

SCALE: N.T.S.

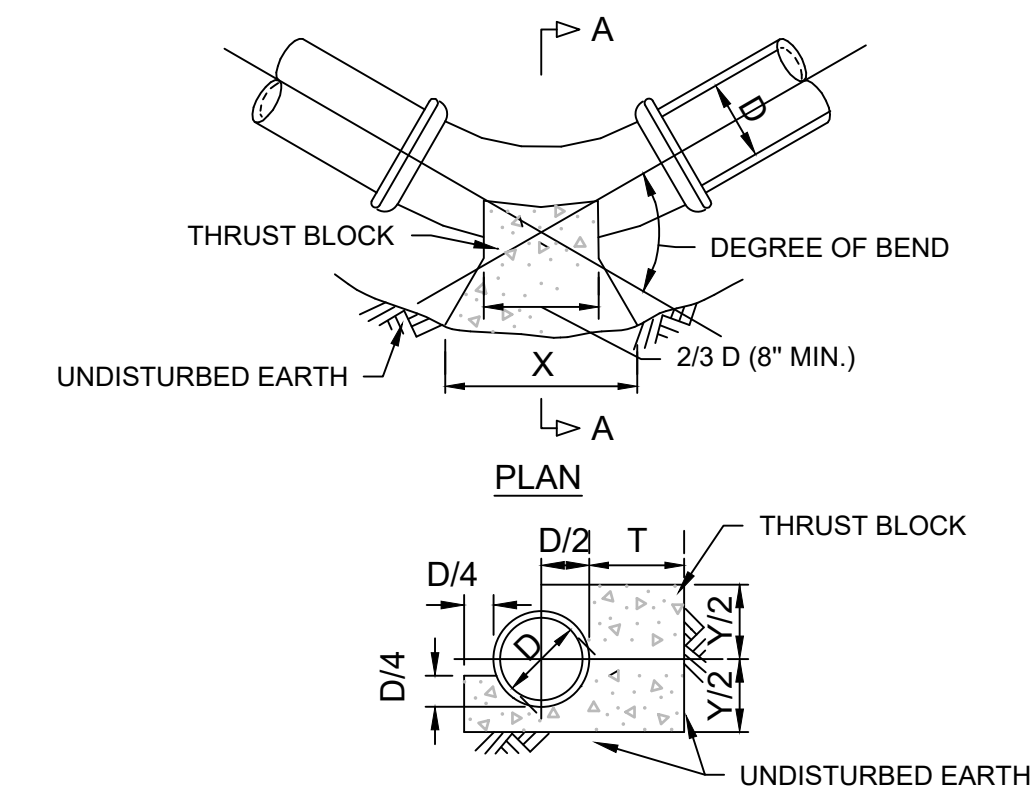


**NOTES:**

1. PRIOR TO INSTALLATION, CONFIRM FINAL HEIGHT OF HYDRANT WITH ENGINEER AND OWNER. FINAL HEIGHT SHALL MATCH PROPOSED GRADES FOR FUTURE ROADWAY IMPROVEMENTS PROJECT.
2. CONFIRM HYDRANT LOCATION WITH OWNER, ENGINEER AND FIRE DEPARTMENT PRIOR TO EXCAVATION.
3. ALL HYDRANT, VALVE, AND TEE JOINTS SHALL HAVE RESTRAINED MECHANICAL JOINTS.
4. DEPTH OF HYDRANT BURY SHALL SUIT INSTALLED DEPTH OF COVER OVER WATER MAIN. INSTALL RISERS AS NECESSARY AT NO ADDITIONAL COST TO THE OWNER.

**HYDRANT ASSEMBLY DETAIL**

SCALE: N.T.S.



**NOTES:**

**SECTION A-A**

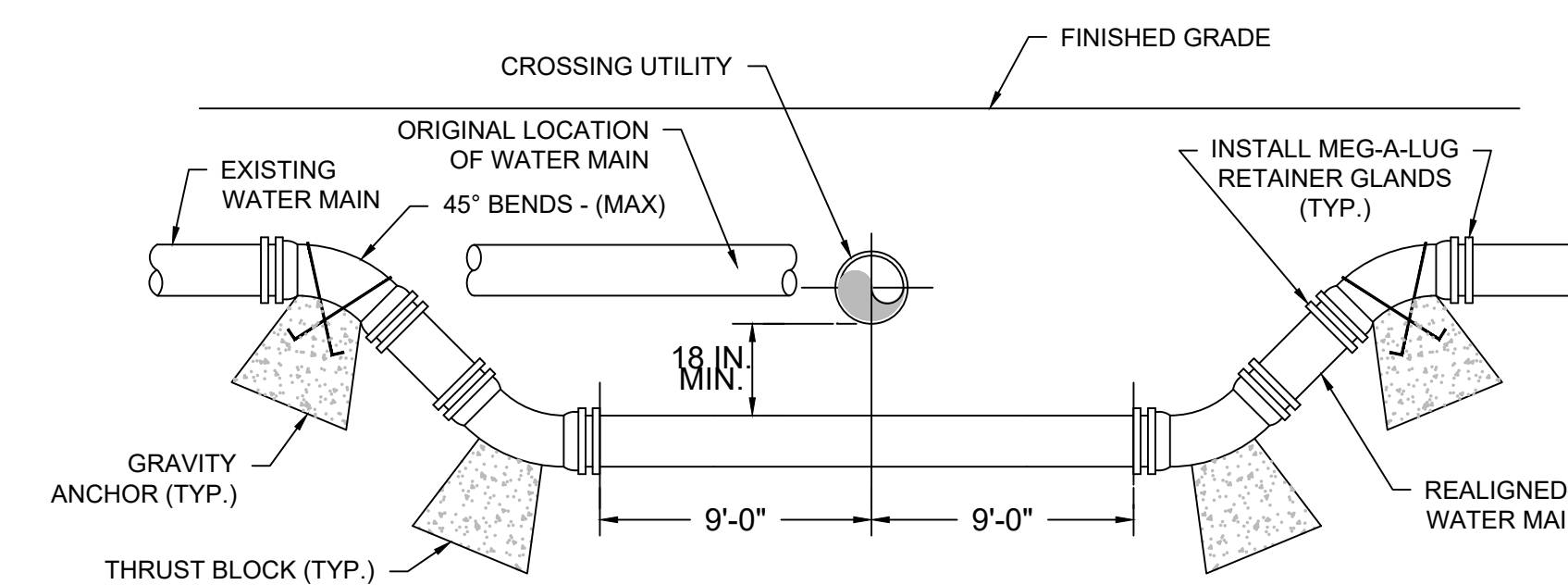
1. ALL CONCRETE SHALL BE 3000 P.S.I. @ 28 DAYS (CLASS "A" CONCRETE)
2. DIMENSIONS SHOWN ARE MINIMUM AND ARE BASED UPON SOIL PRESSURE OF 1500 P.S.F. AND TOTAL PRESSURE OF 250 P.S.I. TOTAL PRESSURE IS WORKING PRESSURE PLUS SURGE PRESSURE.
3. THRUST BLOCKS SHALL BEAR AGAINST UNDISTURBED EARTH.

**TABLE OF DIMENSIONS**

DIMENSION	90° BEND				45° BEND				22 1/2° BEND				11 1/4° BEND					
D (in.)	4	6	8	10	12	14	4	6	8	10	12	14	4	6	8	10	12	14
X (in.)	35	35	50	56	72	80	24	24	35	45	51	60	28	28	30	32	37	42
Y (in.)	20	20	24	32	35	40	16	16	19	21	27	33	13	13	13	16	19	22
T (in.)	11	11	14	16	19	22	11	11	14	16	19	22	11	11	13	16	19	22

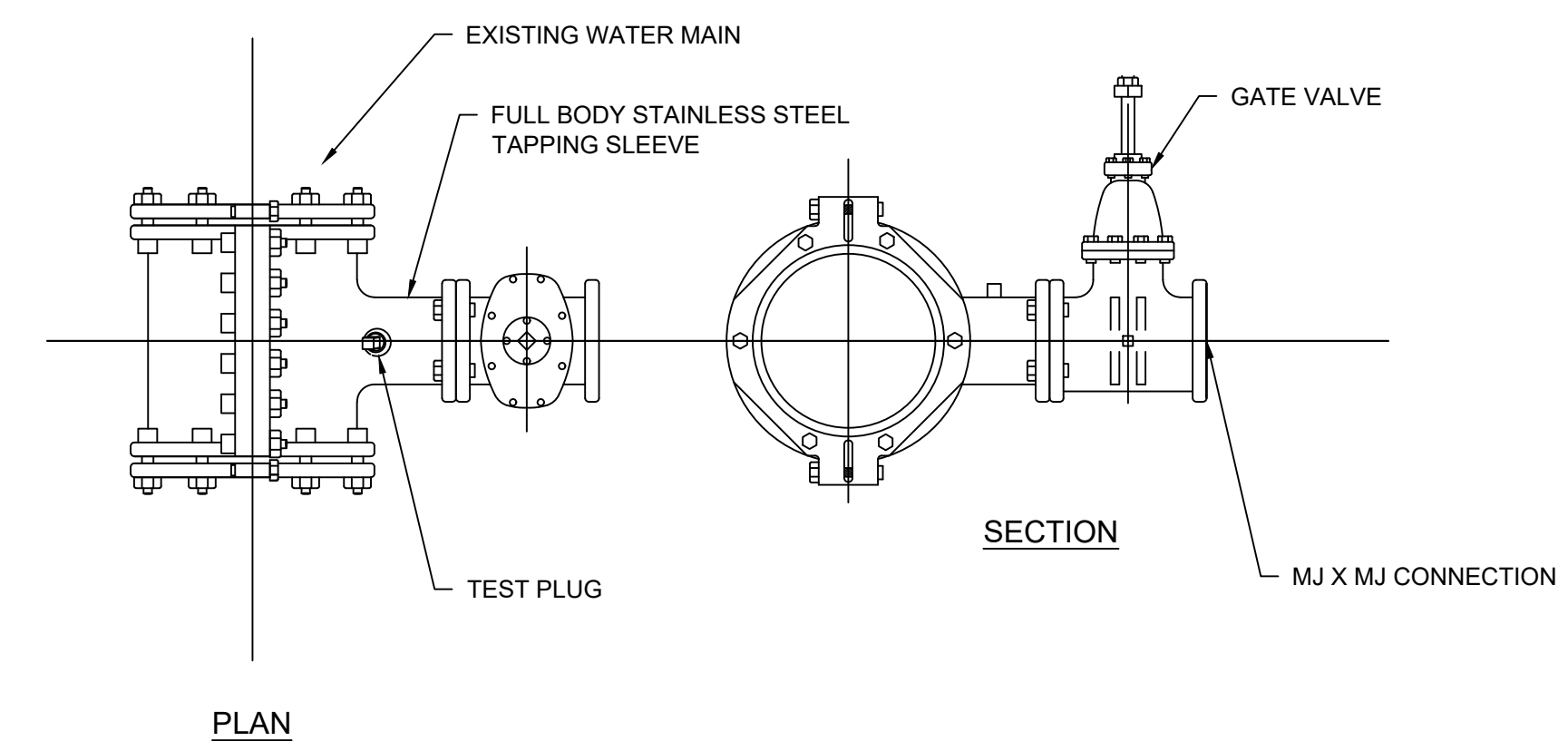
**CONCRETE THRUST BLOCK DETAIL AT BEND**

SCALE: N.T.S.



**WATER MAIN LOWERING DETAIL**

SCALE: N.T.S.



**PLAN**

**SECTION**

**TAPPING SLEEVE AND GATE VALVE**

SCALE: N.T.S.

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	185	293
PROJECT FILE NO.		608744	

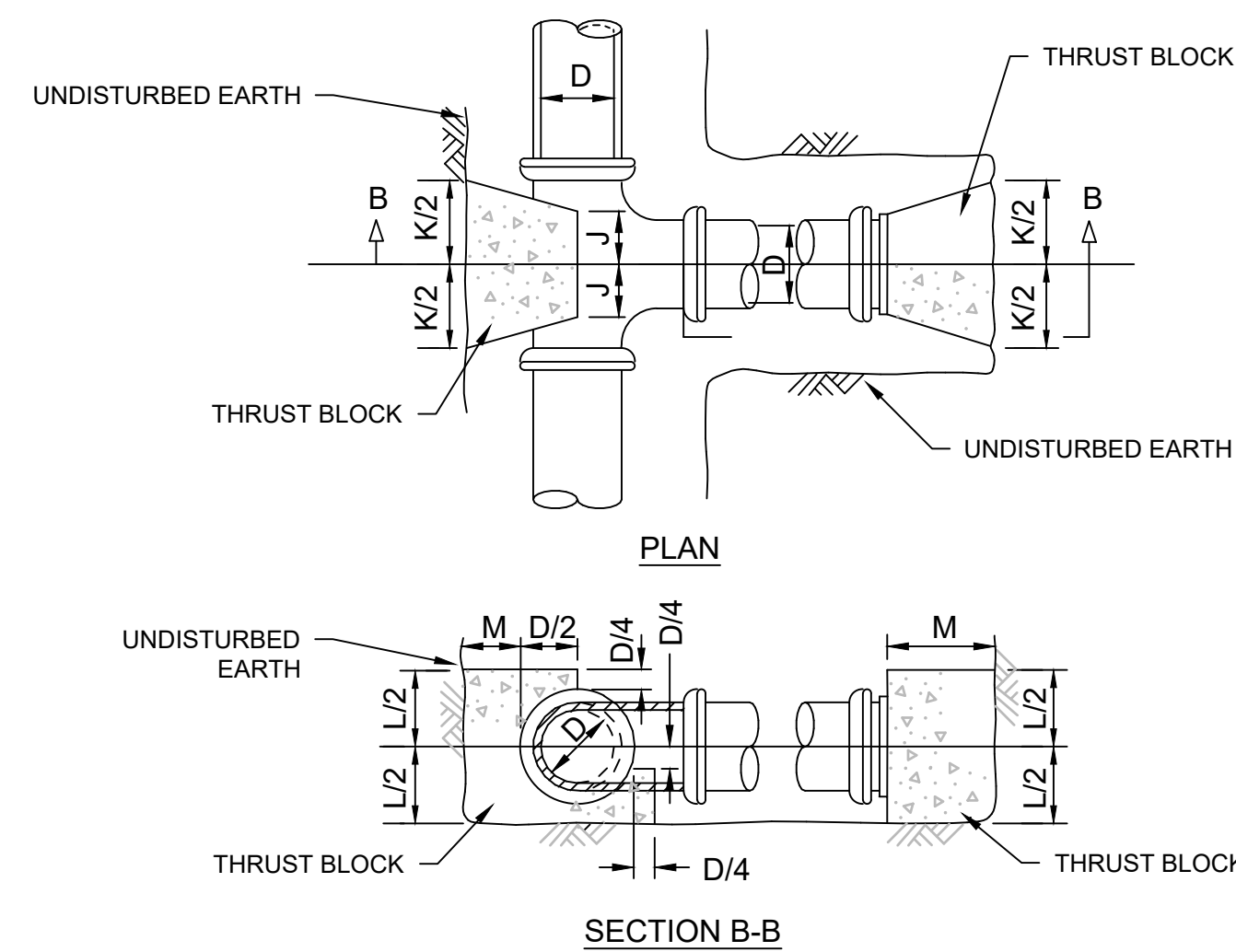
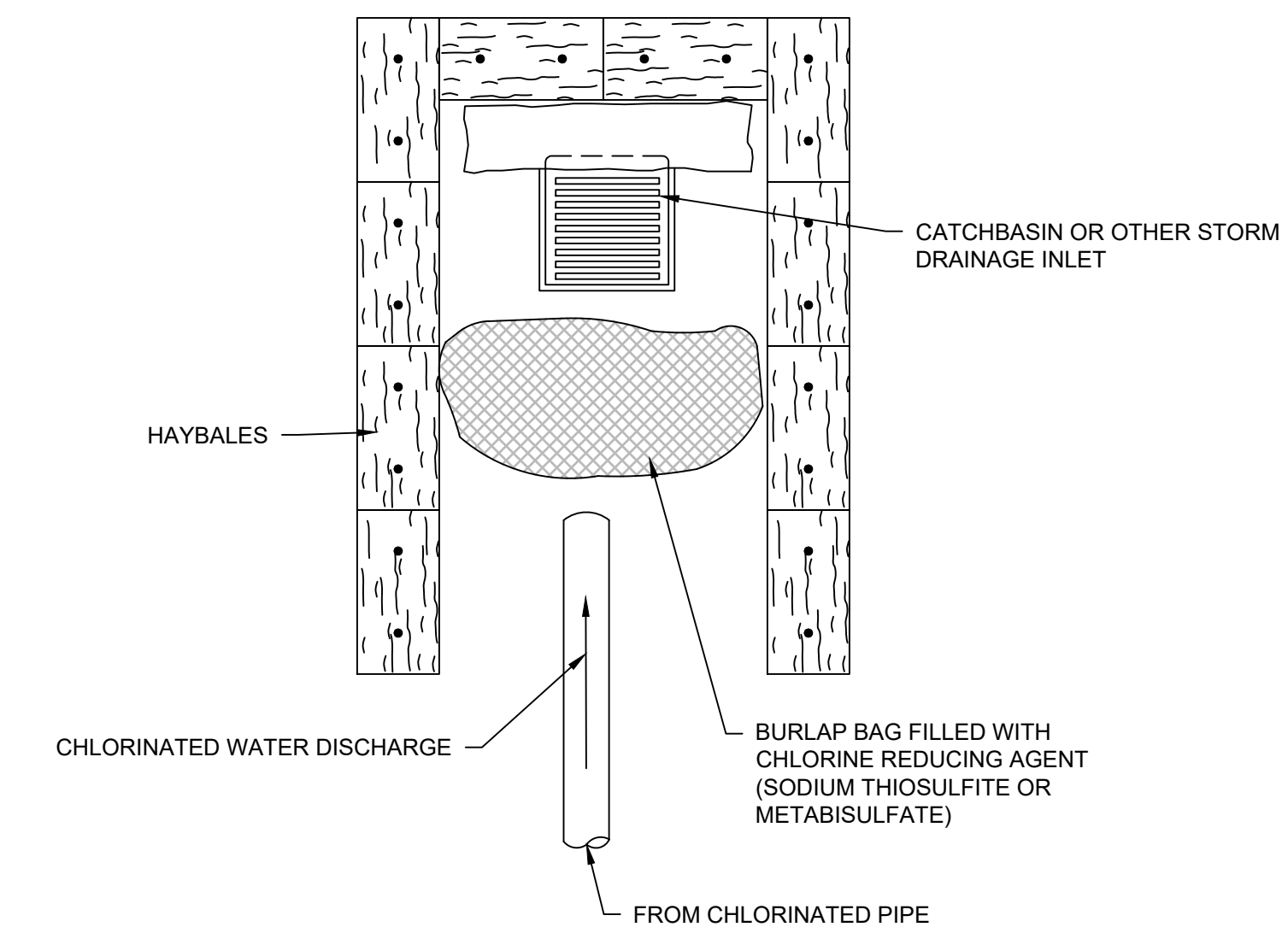
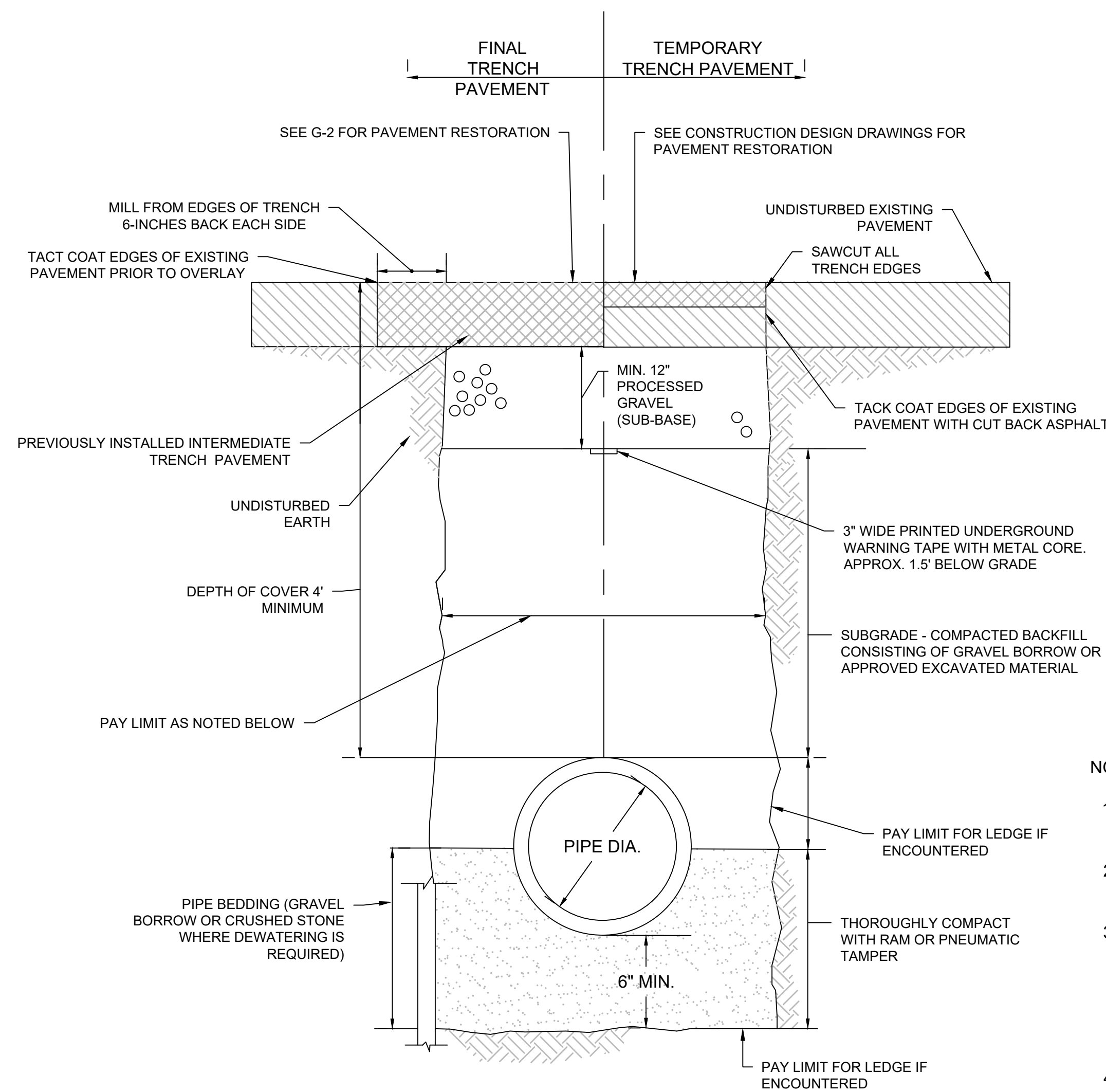


TABLE OF DIMENSIONS						
D (in)	4	6	8	10	12	14
J (in)	6	6	7	9	10	12
K (in)	16	16	20	26	32	36
L (in)	16	16	21	24	29	34
M (in)	11	11	14	16	19	22

**CONCRETE THRUST BLOCK  
DETAIL AT TEE / PLUG/CAP**  
SCALE: N.T.S.



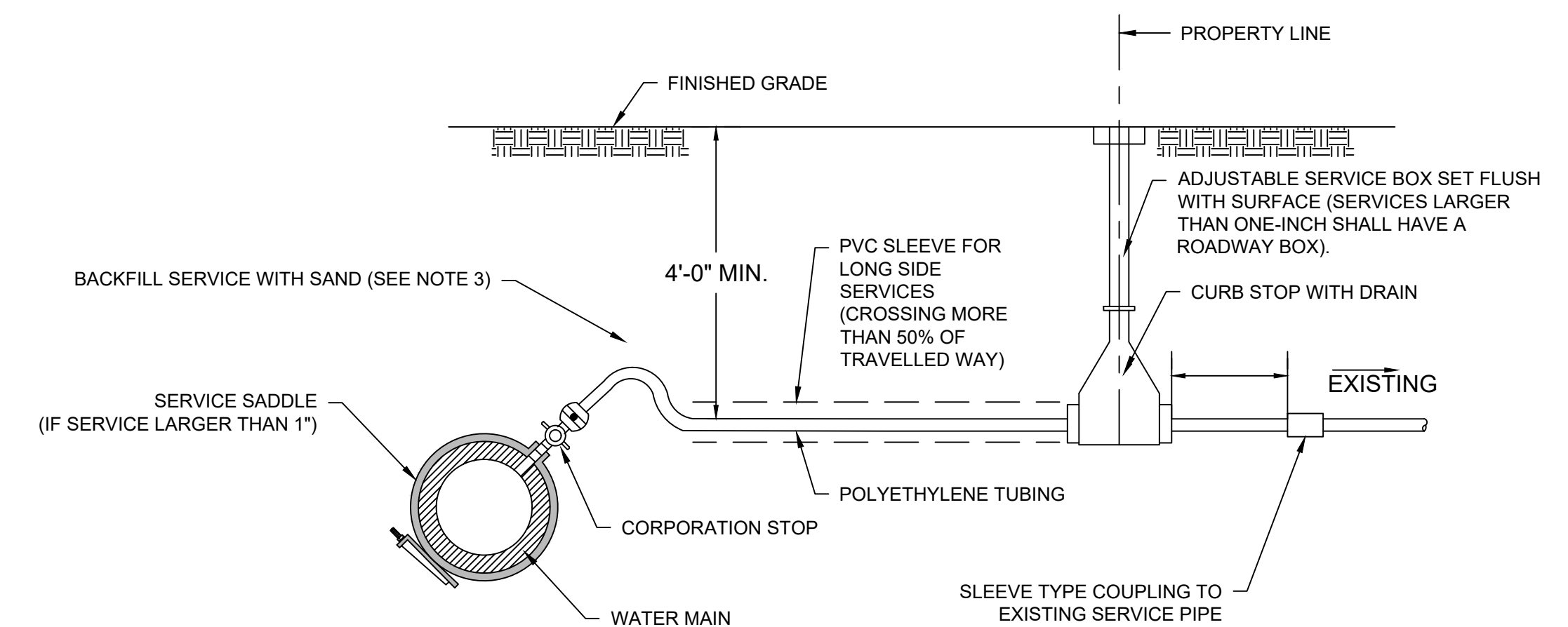
**DECHLORINATION DETAIL**  
SCALE: N.T.S.



**WATER MAIN TRENCH DETAIL**  
SCALE: N.T.S.

NOTES:

1. INSTALL RECESSED STEEL PLATES DAILY ON PAVED ROAD SURFACES.
2. INSTALL TEMPORARY TRENCH PAVEMENT WEEKLY.
3. REMOVE TEMPORARY TRENCH PAVEMENT AND INSTALL INTERMEDIATE TRENCH PAVEMENT AFTER ALL CLEANING AND LINING IS COMPLETED, TESTED, AND ACCEPTED BY THE ENGINEER.
4. FOR WATER MAIN TRENCH, THE PAY LIMIT FOR TRENCH WIDTH IS 4'.
5. PAVEMENT INSTALLED BEYOND PAYMENT LINE MUST BE PRE-APPROVED BY THE ENGINEER AND AT THE CONTRACTOR'S EXPENSE.



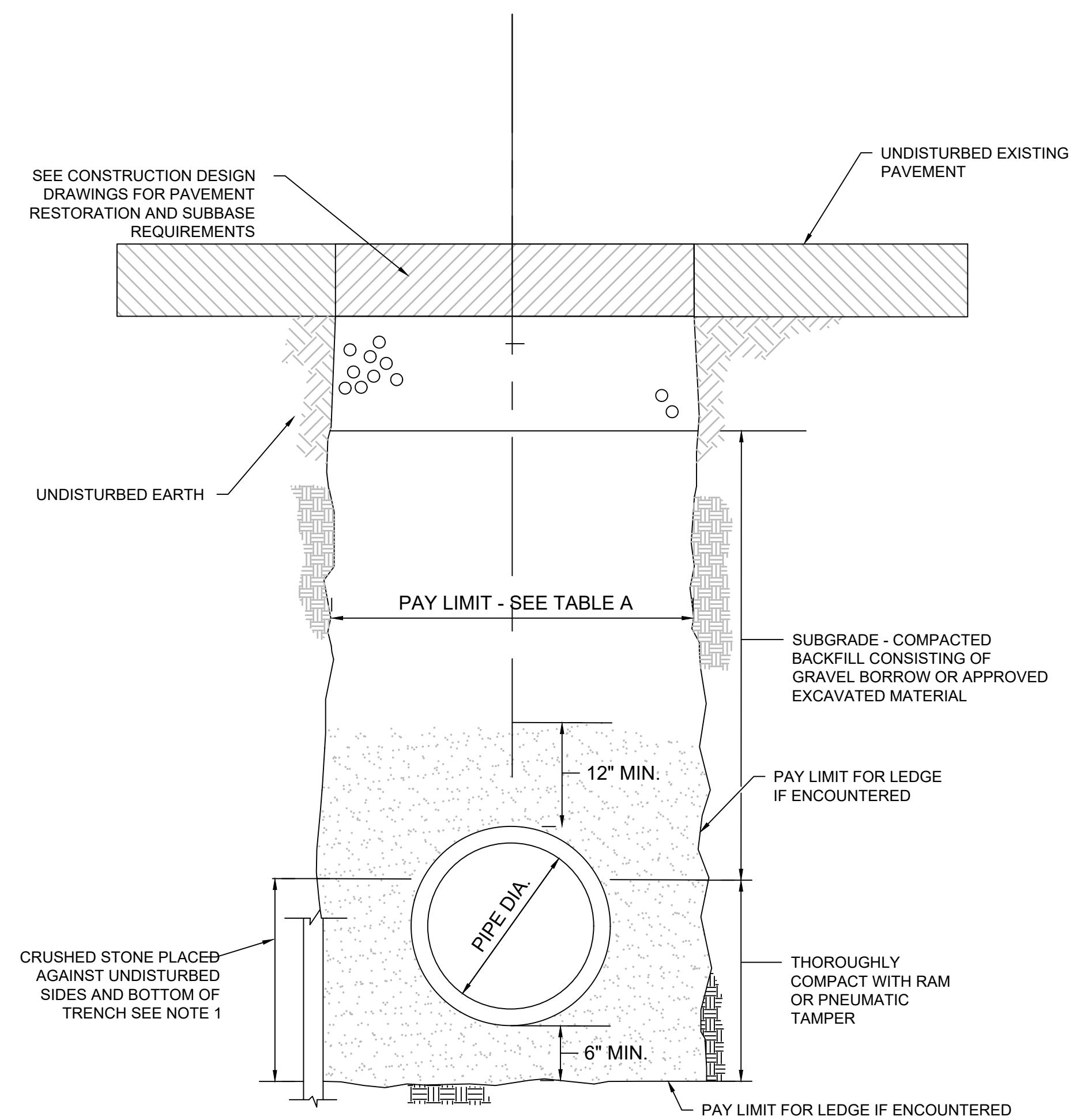
NOTES:

1. ALL EXISTING SERVICES SHALL BE CLOSED AT THE CORPORATION AND EXISTING SERVICE TUBING SHALL BE ABANDONED IN PLACE.
2. ALL JOINTS SHALL BE COMPRESSION TYPE.
3. PE SERVICE LINE SHALL BE BACKFILLED WITH SAND BY HAND TO 12" ABOVE TUBING AND SHALL HAVE A SAND BEDDING OF 6".
4. CORPORATION STOPS LARGER THAN ONE INCH SHALL HAVE A SADDLE.
5. WATER SERVICES SHALL BE INSULATED IN AREAS WHERE CONNECTION TO EXISTING WATER SERVICE IS LESS THAN 4 FEET.
6. ALL WATER SERVICE PLUMBING MATERIALS SHALL BE "LEAD FREE" IN ACCORDANCE WITH SECTION 1417 OF THE SAFE DRINKING WATER ACT AND SECTION 9 OF NSF STANDARD 61.
7. SERVICE BOX SHALL BE MANUFACTURED IN NORTH AMERICA.

**TYPICAL SERVICE TRANSFER  
DUCTILE IRON WATER MAINS**  
SCALE: N.T.S.



STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	186	293
PROJECT FILE NO.		608744	



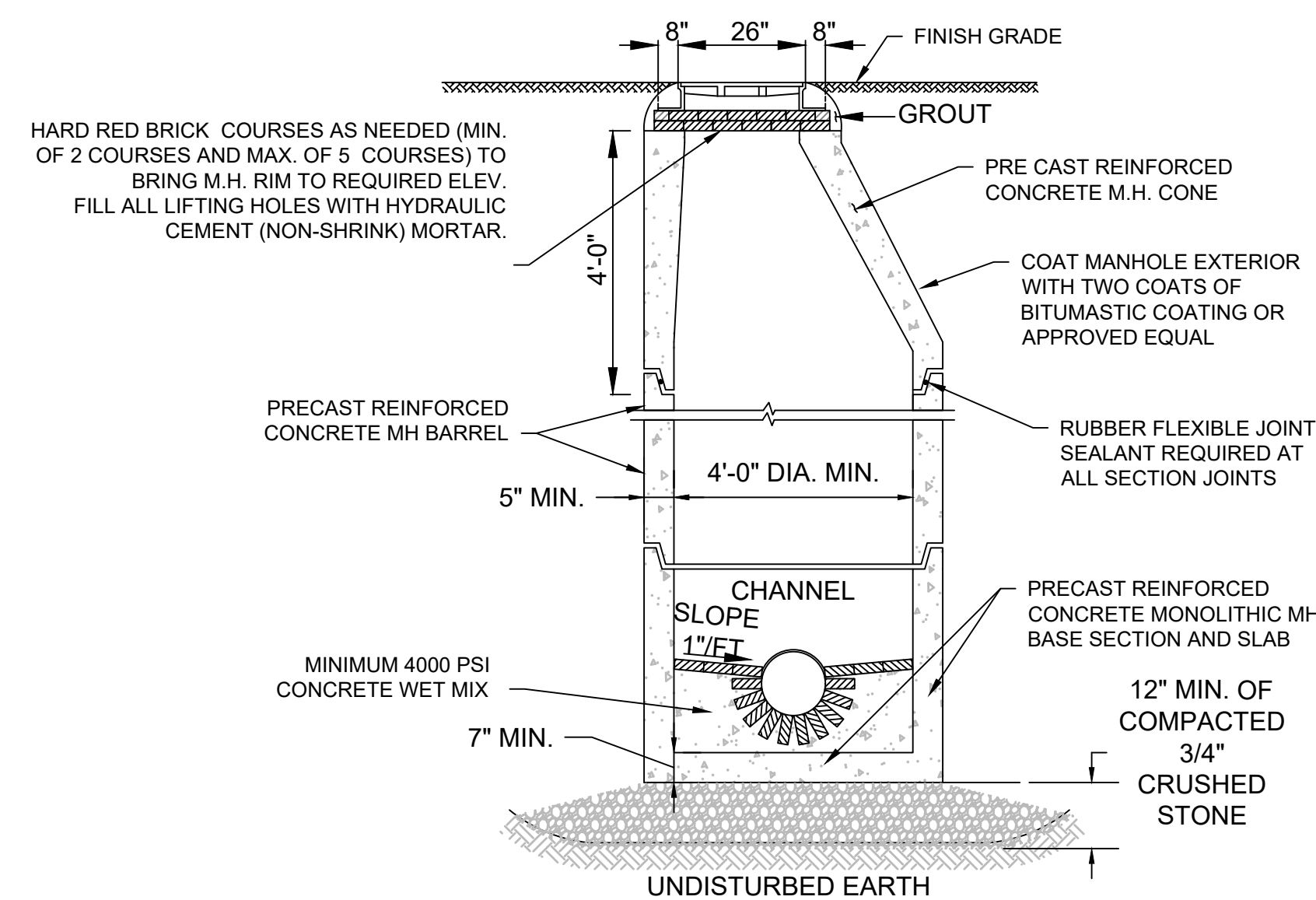
**NOTES:**

- FOR PIPES OTHER THAN P.V.C., SELECTED COMMON FILL MAY BE USED FROM MID-DIAMETER OF PIPE TO 12" ABOVE TOP OF PIPE.
- TRENCHES LOCATED ON THE ROAD SHOULDER SHALL BE TREATED THE SAME AS STREET EXCEPT FOR PAVING.
- PROVIDE AT LEAST ONE IMPERVIOUS DAM IN BEDDING BETWEEN EACH MANHOLE OR EVERY 300 FT., WHICHEVER IS LESS.

DEPTH TO INVERT	DIAMETER OF PIPE (DP)	MAXIMUM TRENCH WIDTH PAY LIMIT (SHEETED OR UNSHEETED) (W)	MINIMUM CLEARANCE (S)	TRENCH PAVEMENT WIDTH PAY LIMIT (TP)
0 - 12"	TO 18"	5'-0"	0'-6"	6'-6"
0 - 12"	21 - 24"	5'-0"	0'-7 1/2"	6'-6"
OVER 12"	TO 18"	7'-0"	0'-6"	9'-6"
OVER 12"	21" - 24"	7'-0"	0'-7 1/2"	9'-6"

**TYPICAL TRENCH DETAIL FOR SEWER PIPE**

SCALE: N.T.S.

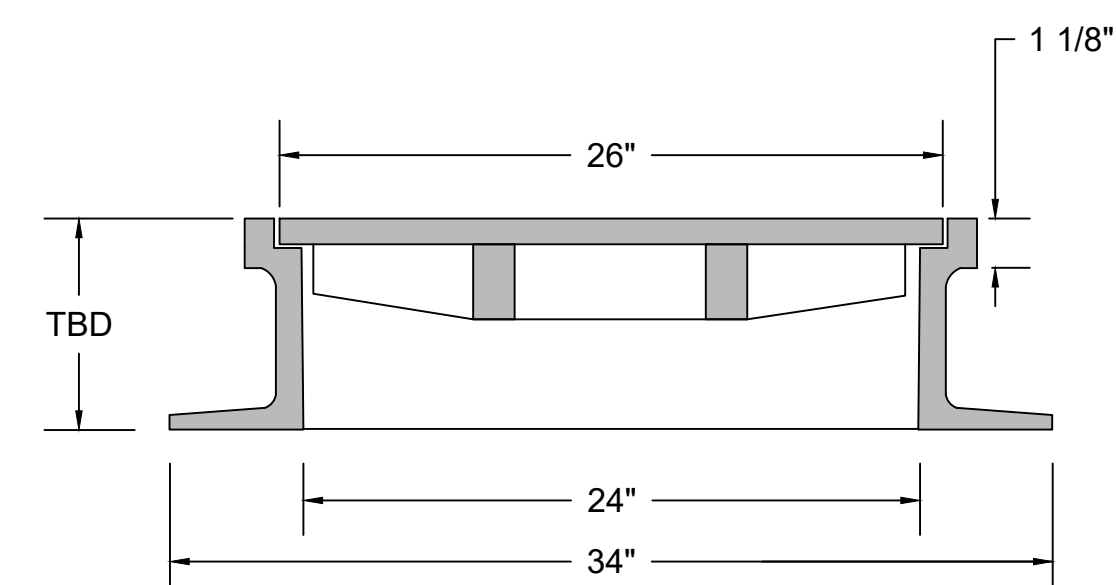


**NOTES:**

- TYPICAL SANITARY MANHOLE TO BE 4 FEET IN DIAMETER.
- 5'-0" DIAMETER FOR ALL MANHOLE DEPTHS GREATER THAN 12 FEET OR WHEN ORDERED BY THE ENGINEER.
- 6" MIN. WALL THICKNESS AND 7" MIN. BASE THICKNESS WITH 5'-0" DIAMETER MANHOLES.
- INNER EDGE OF BRICK TABLE TO BE AT ELEVATION OF CROWN OF TOP OF PIPE.
- DESIGN LOAD - HS20.
- ALL INVERTS SHALL BE 4,000 PSI CEMENT CONCRETE IN VOID AREAS AND RED SEWER BRICK CONSTRUCTION.
- INVERTS SHALL NOT BE BUILT ABOVE GRADE. ALL INVERTS SHALL BE BUILT IN PLACE AFTER ALL PIPES HAVE BEEN INSTALLED.

**TYPICAL SEWER MANHOLE**

SCALE: N.T.S.

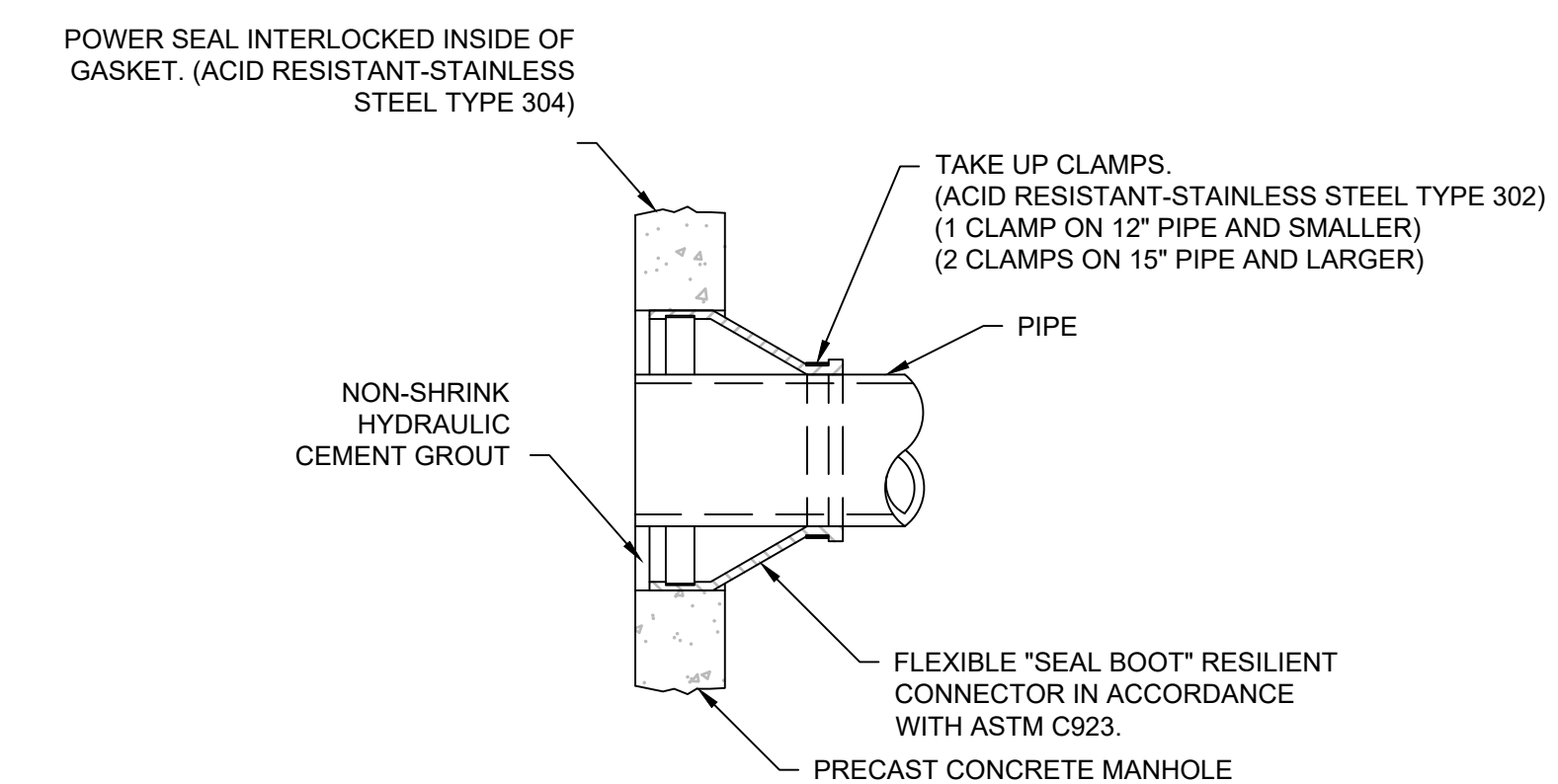


**NOTES:**

- FRAME AND COVER SHALL BE HEAVY DUTY, 24 INCH DIAMETER, MARBLEHEAD PATTERN AS MANUFACTURED BY ej OR APPROVED EQUAL.
- EACH COVER SHALL READ SEWER IN 3" LETTERING.
- FRAME AND COVER SHALL BE SET IN FULL BED OF MORTAR.
- FRAME HEIGHT TO BE DETERMINED BY CONTRACTOR.

**STANDARD SEWER MANHOLE FRAME AND COVER**

SCALE: N.T.S.



**TYPICAL SEWER MANHOLE SEAL**

SCALE: N.T.S.