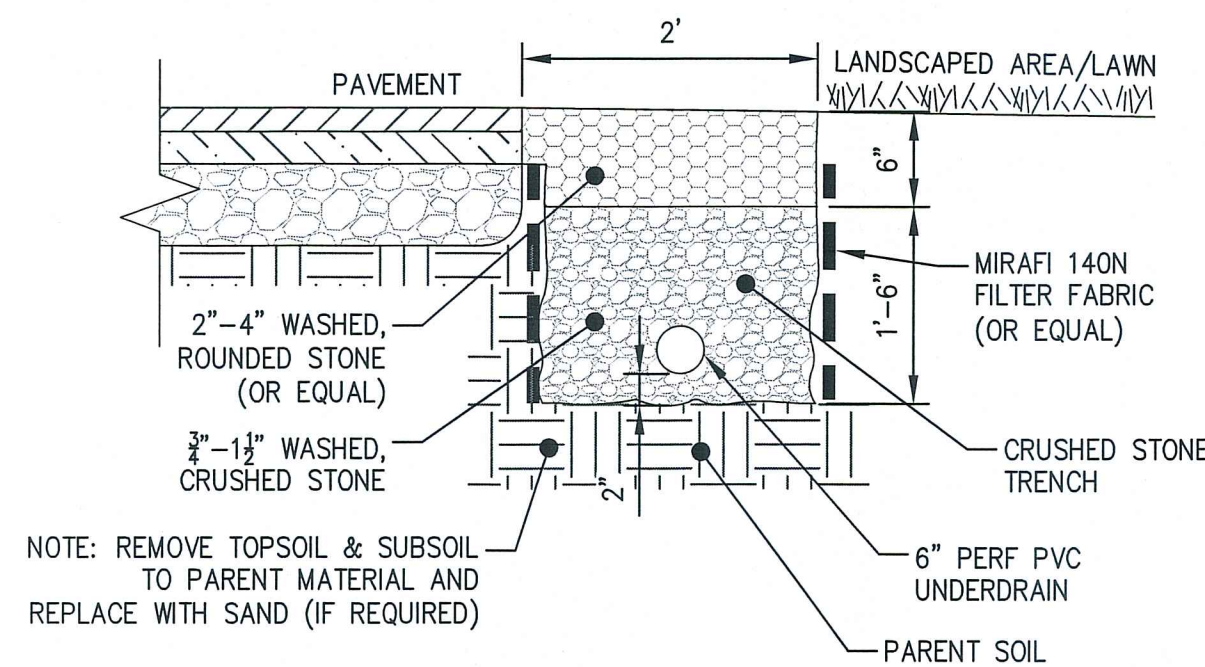
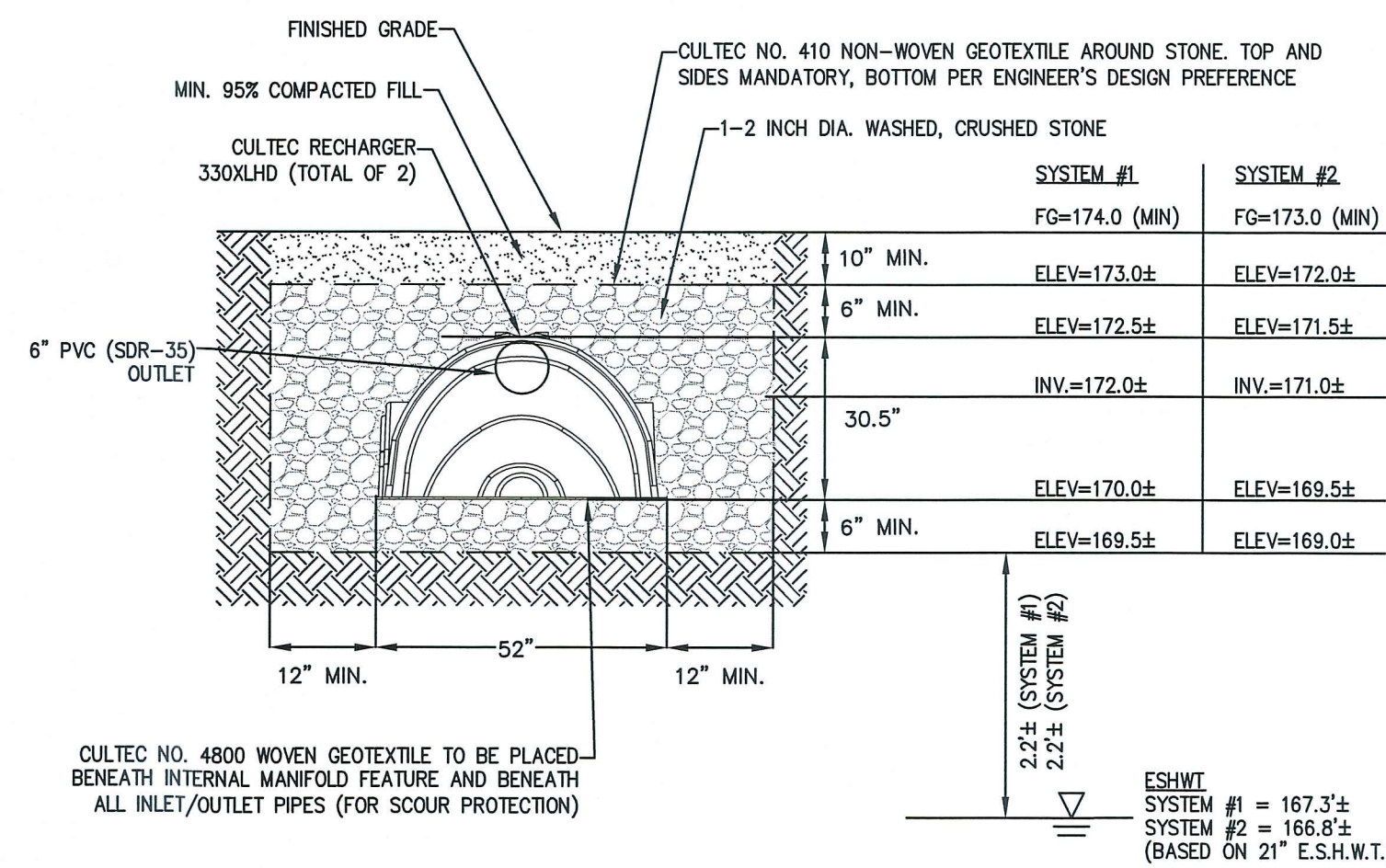


- NOTES:**
1. ALL FORCE MAIN BENDS SHALL BE RESTRAINED WITH THRUST BLOCKS.
 2. ALL THRUST BLOCKS & COLLARS SHALL BE INSTALLED SO THAT THEY BEAR AGAINST UNDISTURBED EARTH.
 3. MINIMUM COMPRESSIVE STRENGTH OF THRUST BLOCK CONCRETE SHALL BE 3,000 P.S.I.

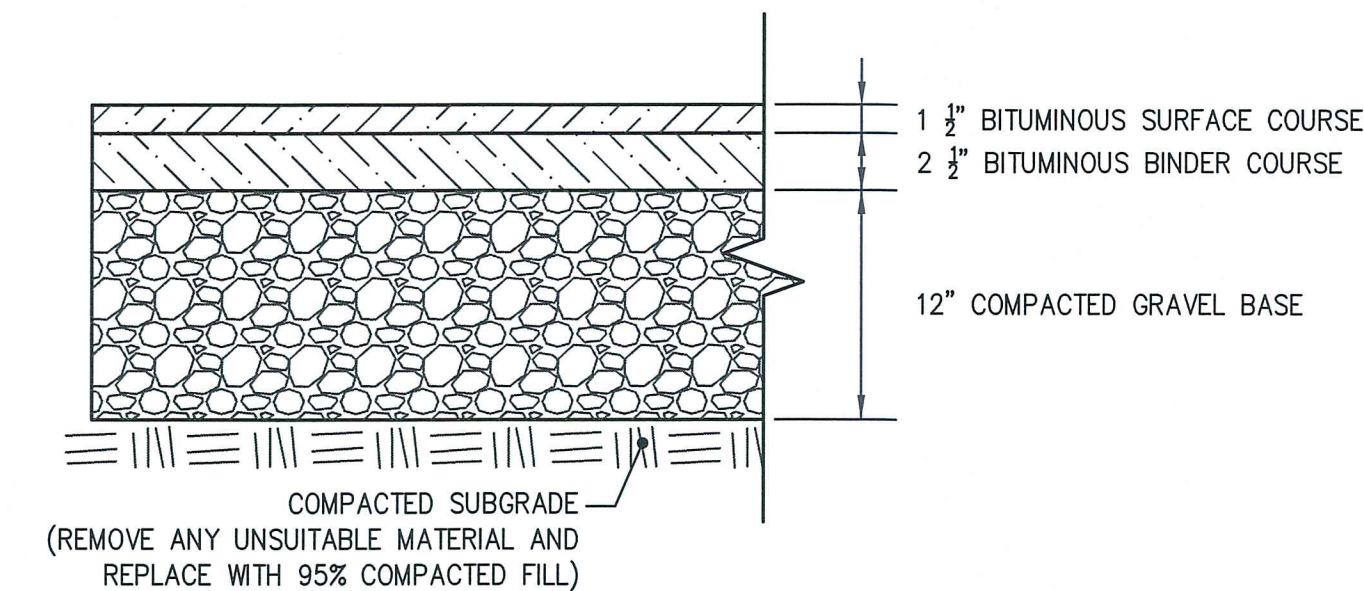
THRUST BLOCK DETAIL
(NOT TO SCALE)



CRUSHED STONE TRENCH DETAIL
(NOT TO SCALE)

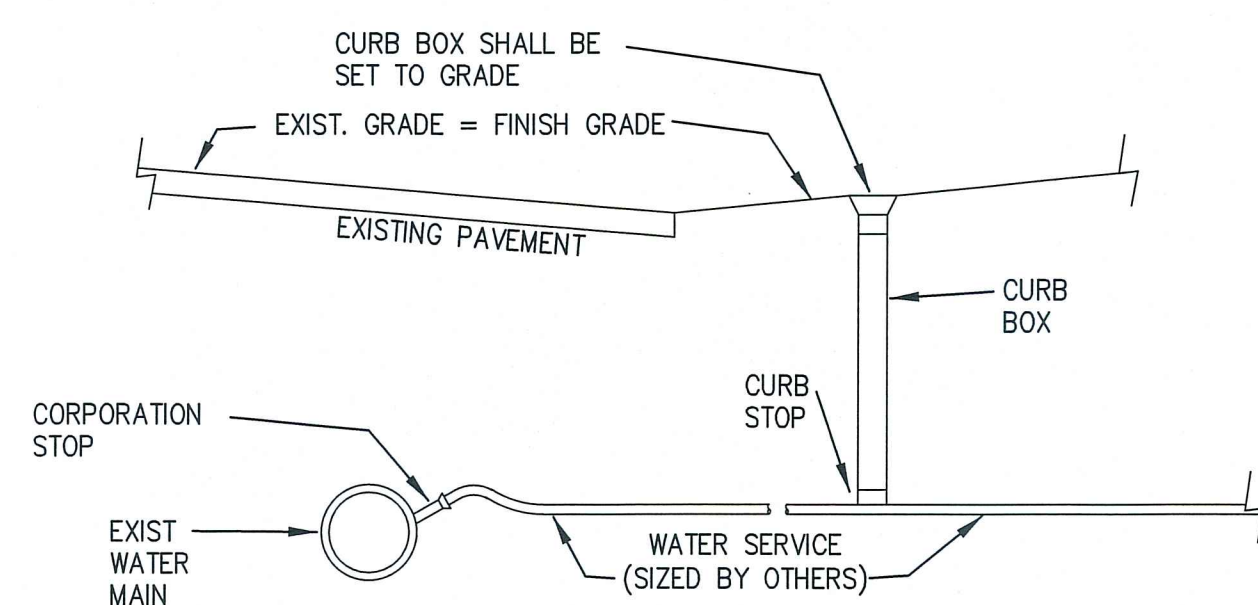


SUBSURFACE RECHARGE SYSTEM
(CULTEC RECHARGER 330XLHD)
(NOT TO SCALE)



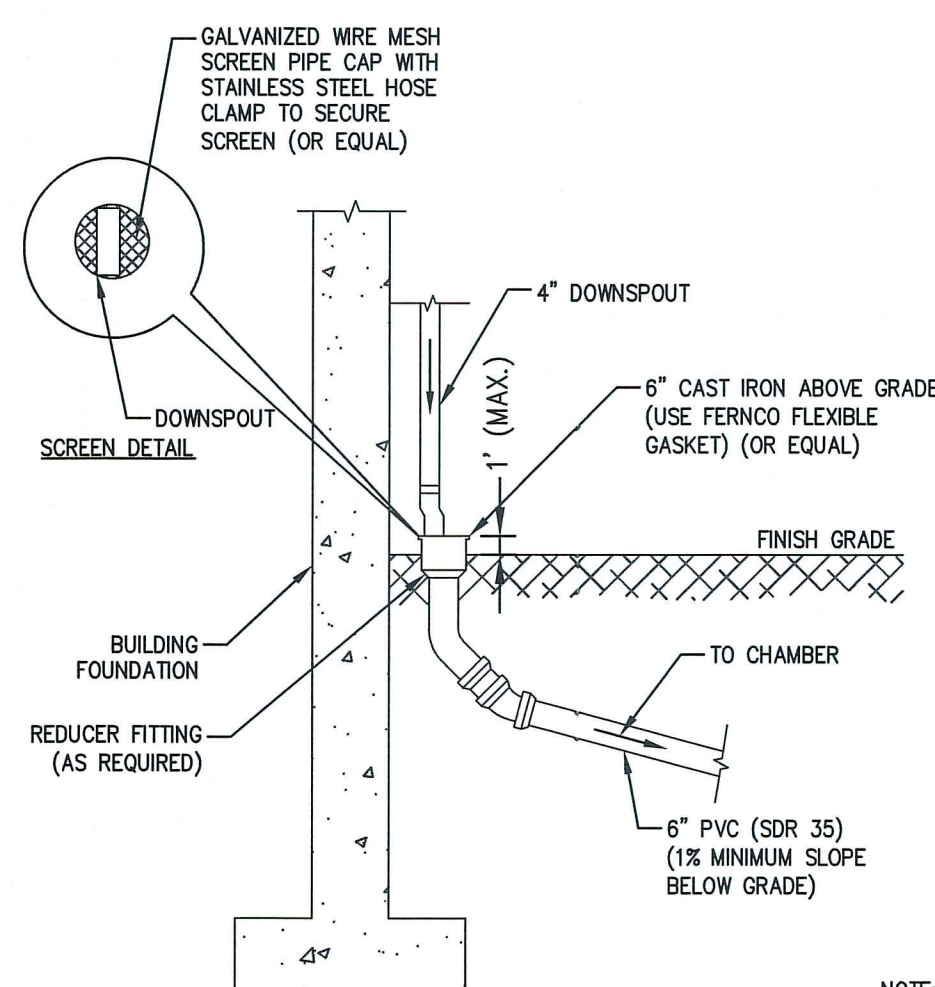
- PAVING NOTE:**
1. PAVEMENT SHALL BE TYPE 1, CLASS 1 BITUMINOUS CONCRETE.
 2. PAVEMENT THICKNESS AFTER ROLLING.

PAVEMENT DETAIL
(NOT TO SCALE)



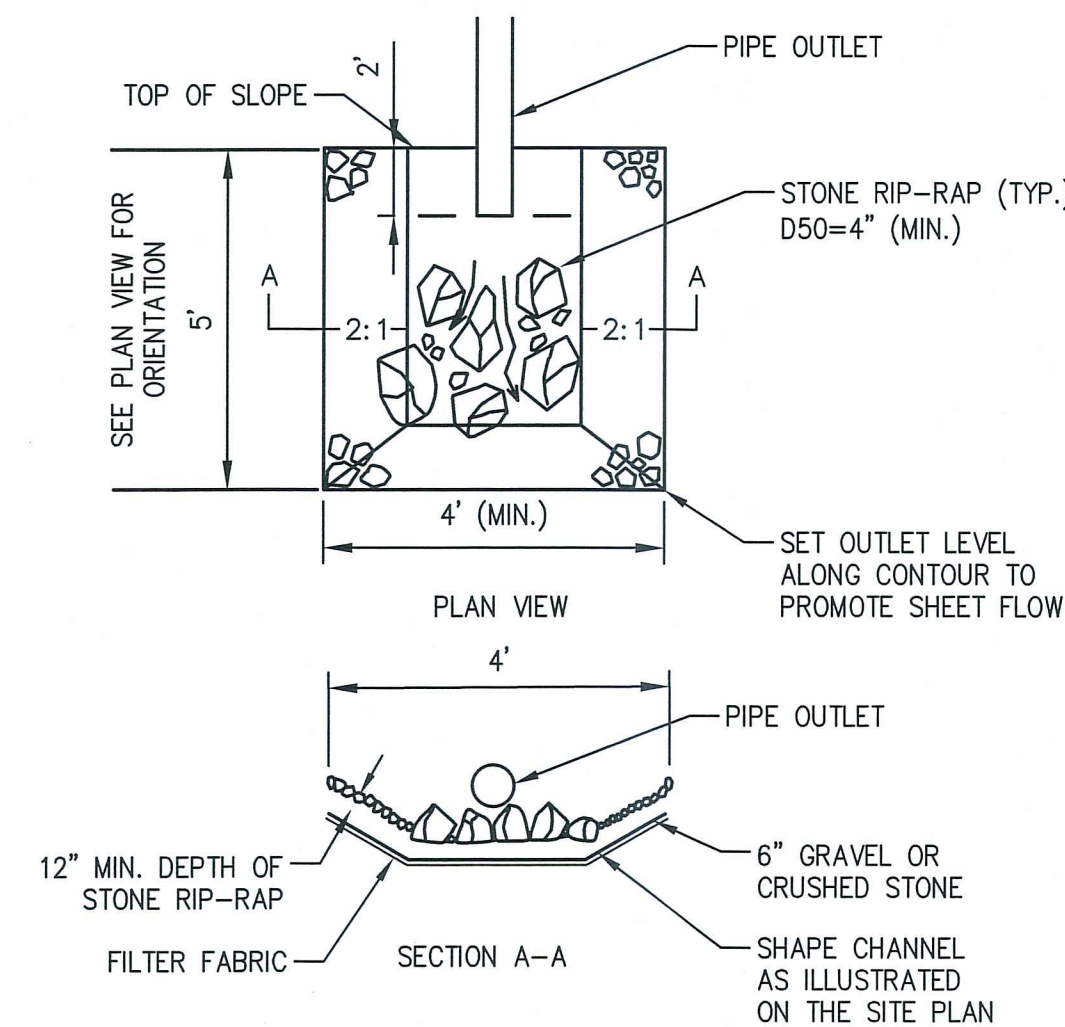
- NOTES:**
1. TAP EXISTING WATER MAIN WITH NEW CORPORATION STOP AND INSTALL NEW CURB STOP AND CURB BOX WITHIN SHOULDER.
 2. SAW CUT EXISTING PAVEMENT TO MINIMIZE REPAIRS. REPLACE ASPHALT PAVEMENT IN KIND TO MATCH EXISTING ELEVATIONS.

WATER SERVICE CORPORATION
(NOT TO SCALE)



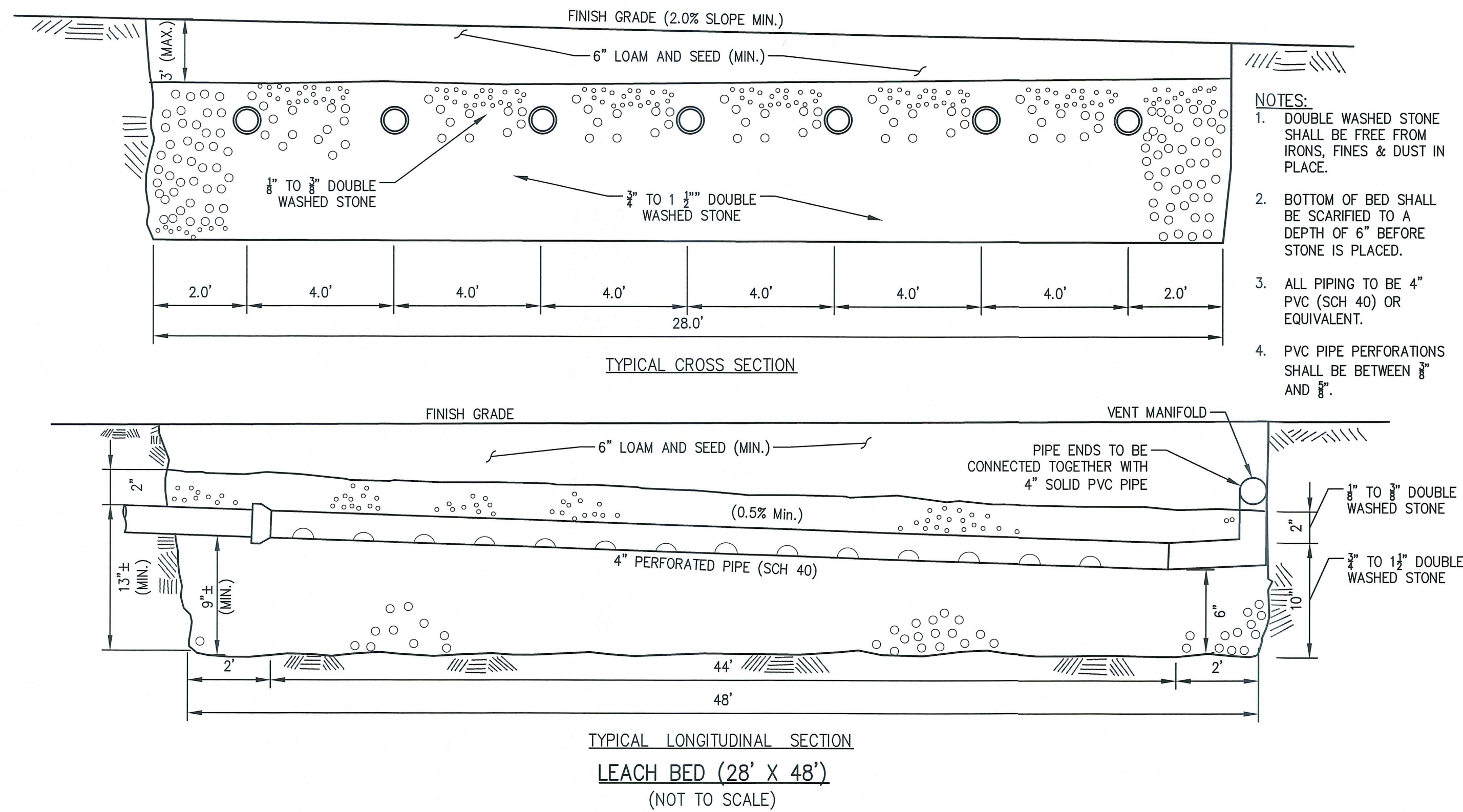
- NOTE:**
- GUTTERS AND DOWNSPOUTS SHALL BE INSTALLED TO COLLECT ALL ROOF RUNOFF FROM THE HOUSE AND CONVEY IT TO THE SUBSURFACE RECHARGE SYSTEMS.

DOWN SPOUT ROOF LEADER
(NOT TO SCALE)



RIP-RAP OUTLET PROTECTION
(NOT TO SCALE)

NO.	REVISIONS	
	DESCRIPTION	DATE



BUOYANCY CALCULATIONS:

SEPTIC TANK

EXISTING GRADE @ TANK = 172.0
ESHWT @ 170.2 (21" AT TP 16-7)

BOT. OF TANK = 170.5

FB (BUOYANT FORCE) = 0 LBS → NO BUOYANT FORCE SINCE BOTTOM OF TANK IS ABOVE ESHWT

PUMP CHAMBER

EXISTING GRADE @ CHAMBER = 166.8

ESHWT @ 165.1 (21" AT TP 16-7)

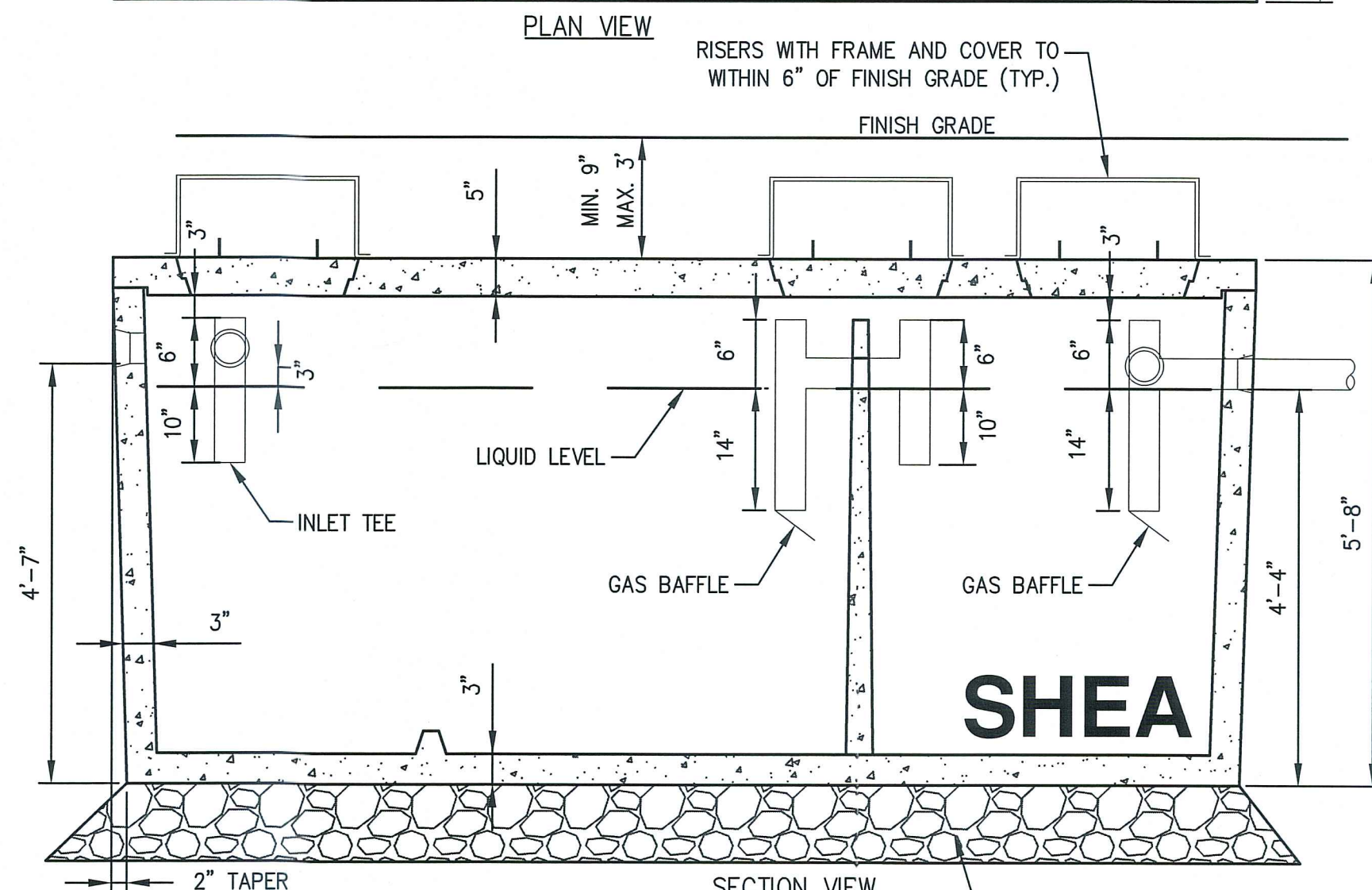
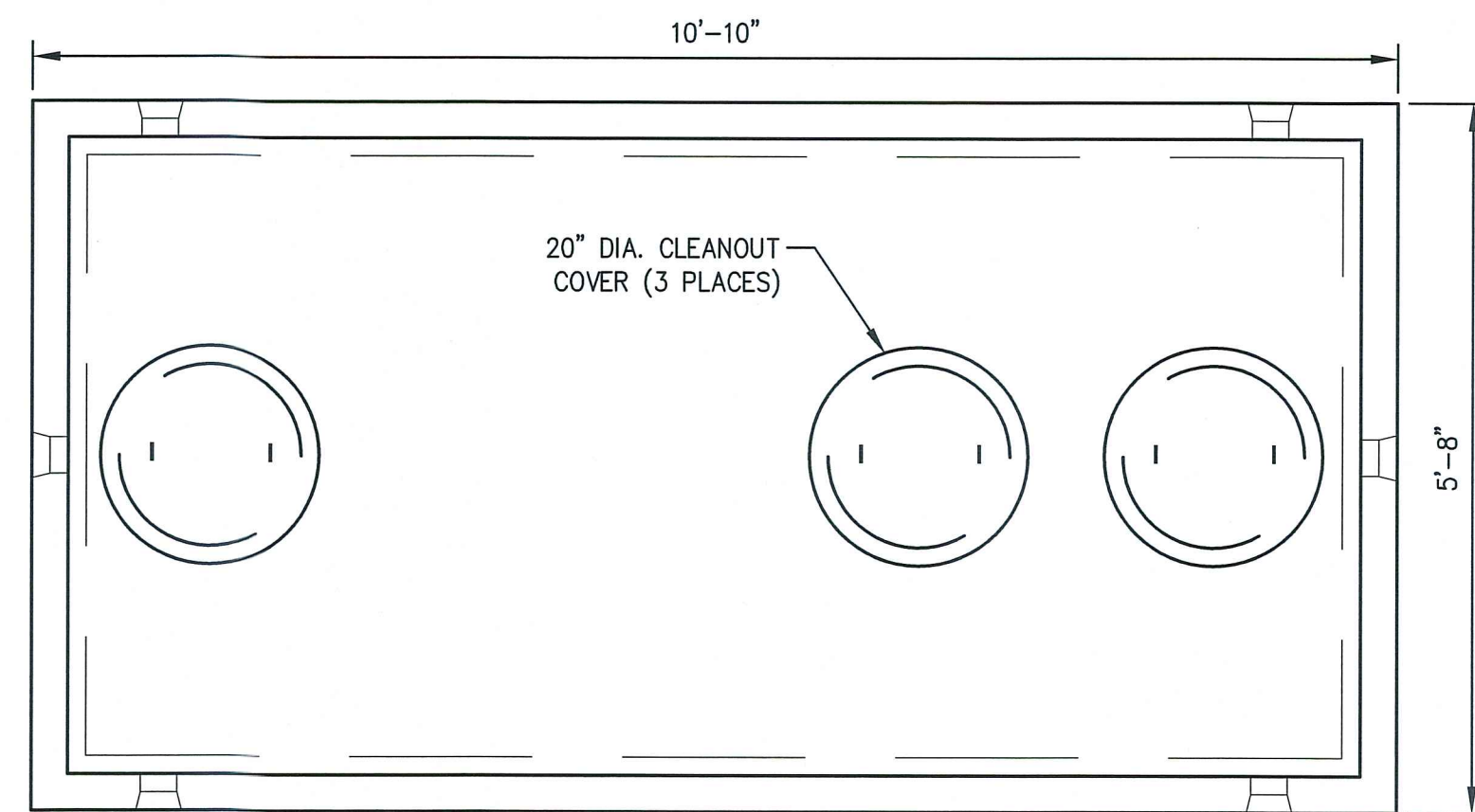
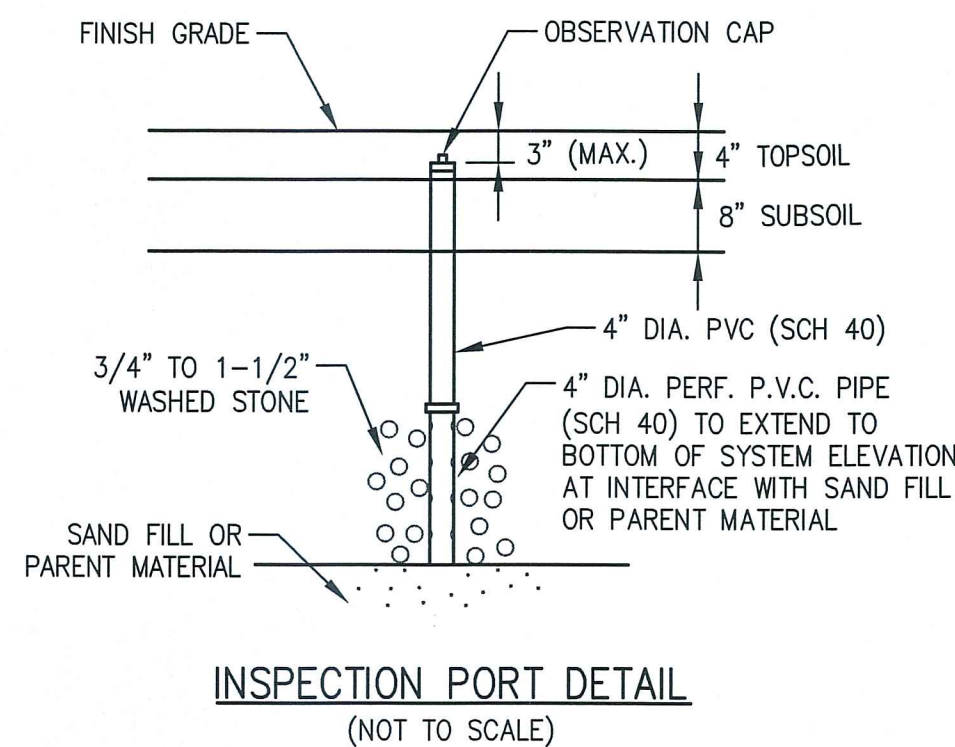
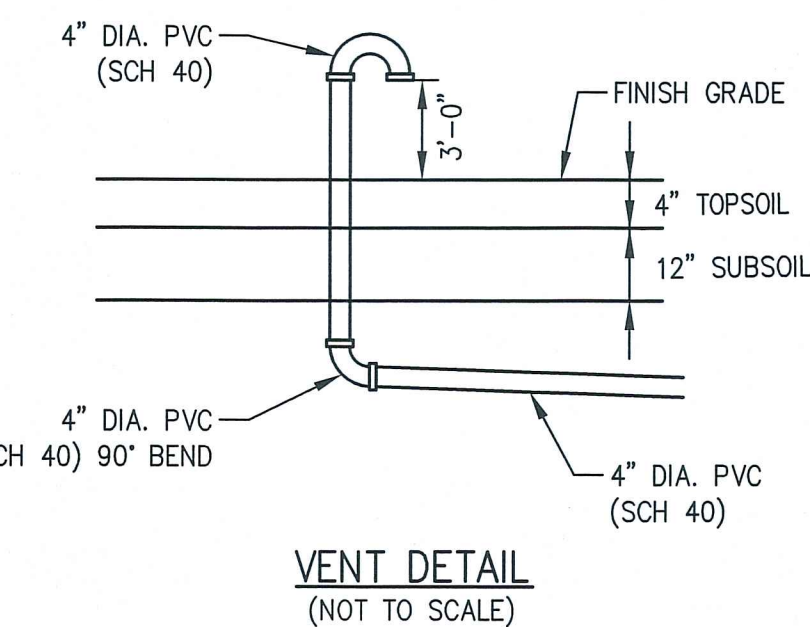
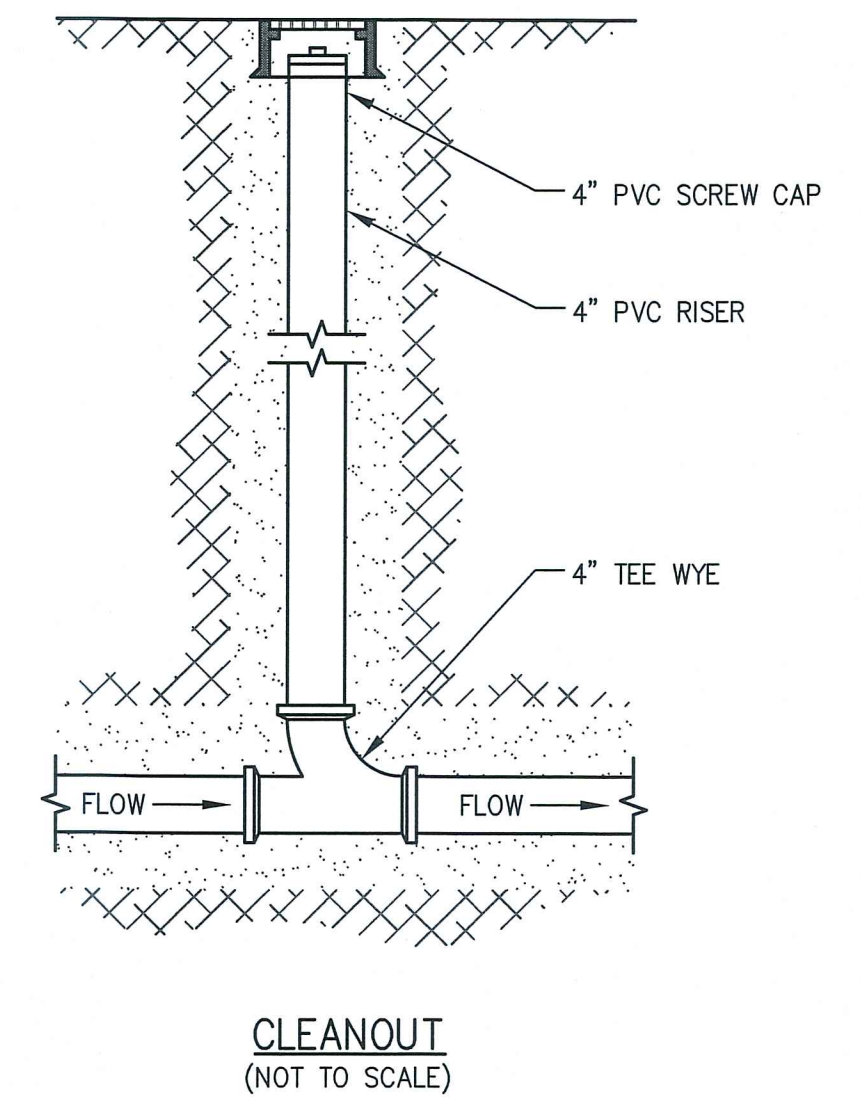
FINISH GRADE @ CHAMBER = 170.5
TOP OF CHAMBER = 168.1
BOT. OF CHAMBER = 162.4

WEIGHT OF CHAMBER = 10,800 LBS.

WEIGHT OF FILL = (9'-6" X 4'-8" X 2.4') X 100 PCF = 10,648 LBS

FB (BUOYANT FORCE) = (9'-6" X 4'-8" X 2.7') X 62.4 PCF = 7,475 LBS

TOTAL WEIGHT (Ψ) = 10,800 + 10,648 = 21,448 LBS
21,448 LBS (Ψ) > 7,475 LBS (↑)
(F.S. = 2.8)



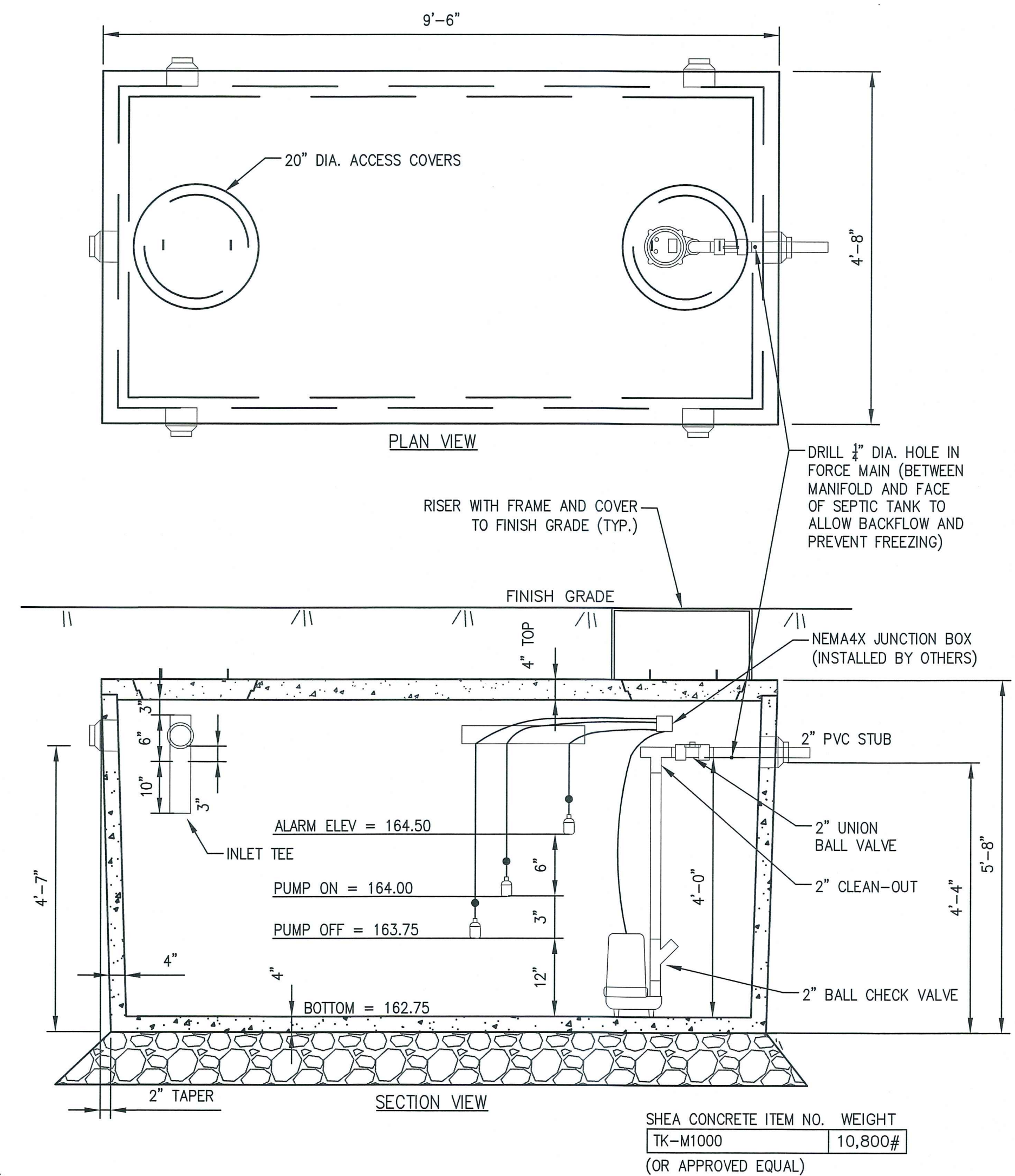
- NOTES:
- CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
 - DESIGN CONFORMS WITH 310 CMR 15.00, DEP TITLE 5 REGS, FOR SEPTIC TANKS.
 - ALL REINFORCEMENT PER ASTM C1227.
 - TEES AND GAS Baffle SOLD SEPARATELY.
 - TONGUE & GROOVE JOINT SEALED WITH BUTYL RESIN.
 - ALSO AVAILABLE IN H-20 LOADING.

SHEA ITEM NO.
(OR APPROVED EQUAL) WEIGHT

TK M15002C 11,841#

1,500 GALLON (MONOLITHIC) SEPTIC TANK

(NOT TO SCALE)



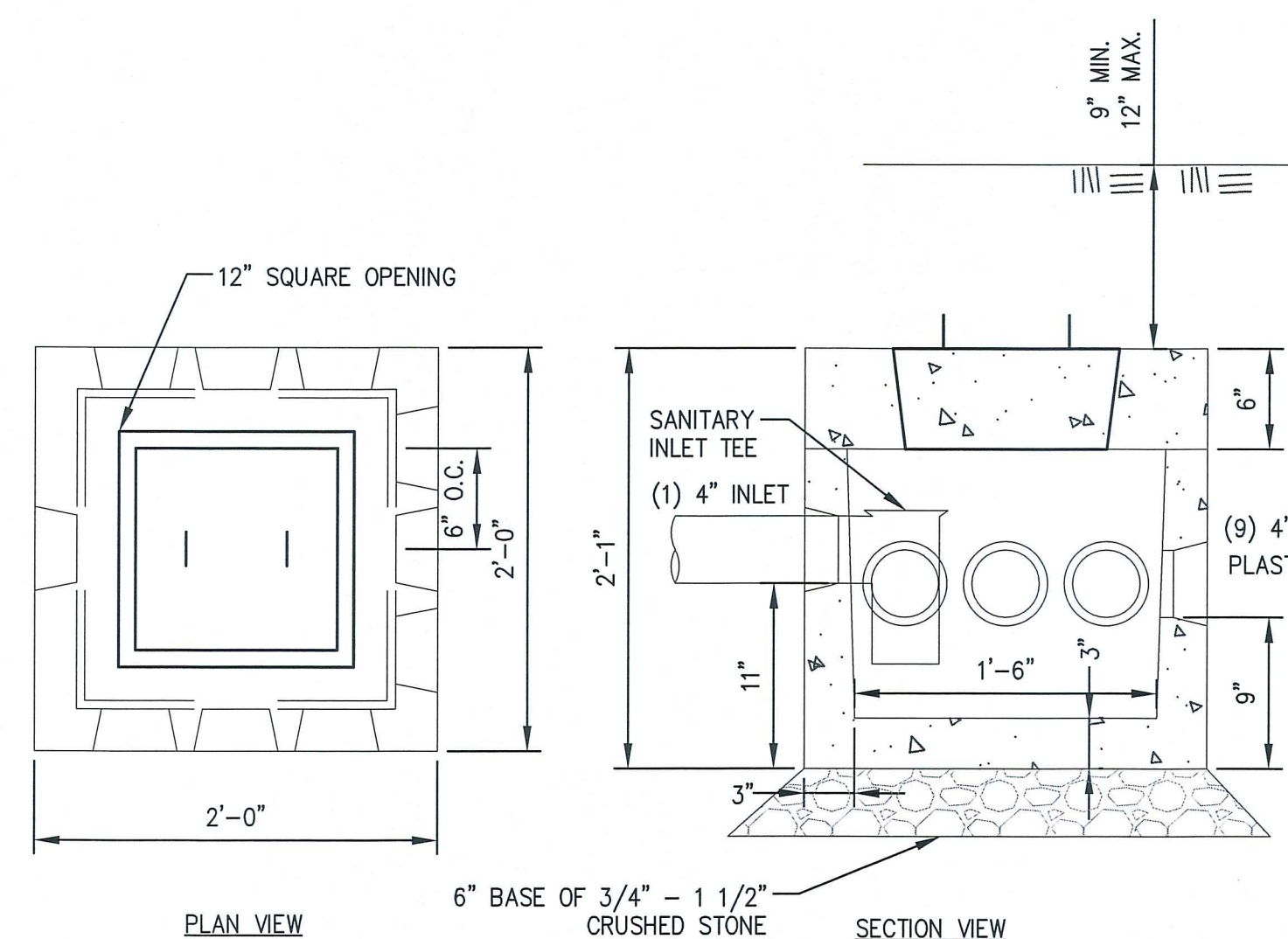
- NOTES:
- CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
 - CONSTRUCTION OF PUMP CHAMBER CONFORMS WITH DEP TITLE 5 REGS, 310 CMR, SECTION 15.226.
 - ALL REINFORCEMENT PER ASTM C1227.
 - JOINT SEALED WITH BUTYL RESIN.
 - DESIGNED FOR H-10 LOADING.
 - USE SHEA MODEL #TK-M1000 OR APPROVED EQUAL.
 - ALL WALL SLEEVES/GASKETS MUST BE CAST IN PLACE OR INSERTED AT FACTORY.

EMERGENCY STORAGE
ABOVE ALARM

VOL=9'-6" X 4'-8" X 2.5'
= 111 CF X (7.48 GAL/CF)
= 830 GAL

1,000 GALLON (MONOLITHIC) PUMP CHAMBER

(NOT TO SCALE)



- NOTES:
- CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
 - DESIGN CONFORMS WITH 310 CMR 15.00, DEP TITLE 5 REGS, FOR DISTRIBUTION BOXES.
 - DESIGNED FOR H-20 LOADING.
 - OPTIONAL 18" ROUND OR SQUARE CAST IRON COVER AVAILABLE IN PLACE OF CONCRETE COVER.

9-OUTLET (H-20) DISTRIBUTION BOX

(NOT TO SCALE)

REVISIONS		DATE
NO.	DESCRIPTION	

SITE DEVELOPMENT PLAN

IN

TOPSFIELD, MASSACHUSETTS

79 HILL STREET - LOT 11

(ASSESSOR'S MAP 68, PORTION OF LOT 14)

PREPARED FOR:

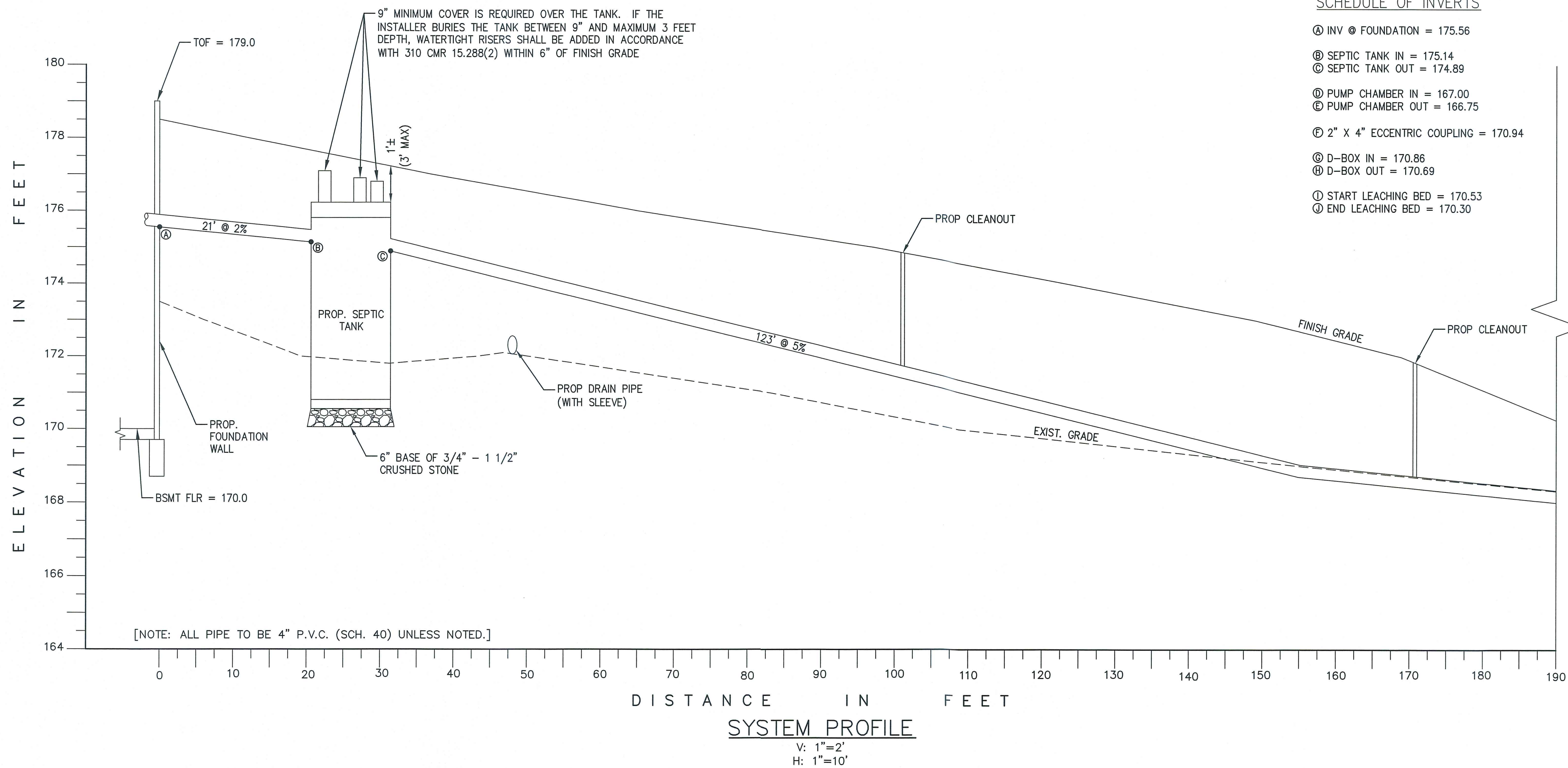
PAUL DANIELS

DRAWING NO.

S - 3407

SHEET NO.

3 OF 4



PUMP CALCULATIONS:

BACKFLOW CALCULATION:
38 FT X [3.14(0.75/12)²]SOFT = 0.8 CU FT = 6.2 GAL.

DOSE CALCULATION:
DOSE = DAILY FLOW/6 = 440 GAL/6 = 73.3 GAL
TOTAL DOSE = (DOSE + BACKFLOW) = 73.3 + 6.2 = 79.5 GAL. (10.6 CF)

DOSE HEIGHT REQ'D:
10.6 CF/(9'-6" X 4'-8") = 0.24 FT (USE 3")

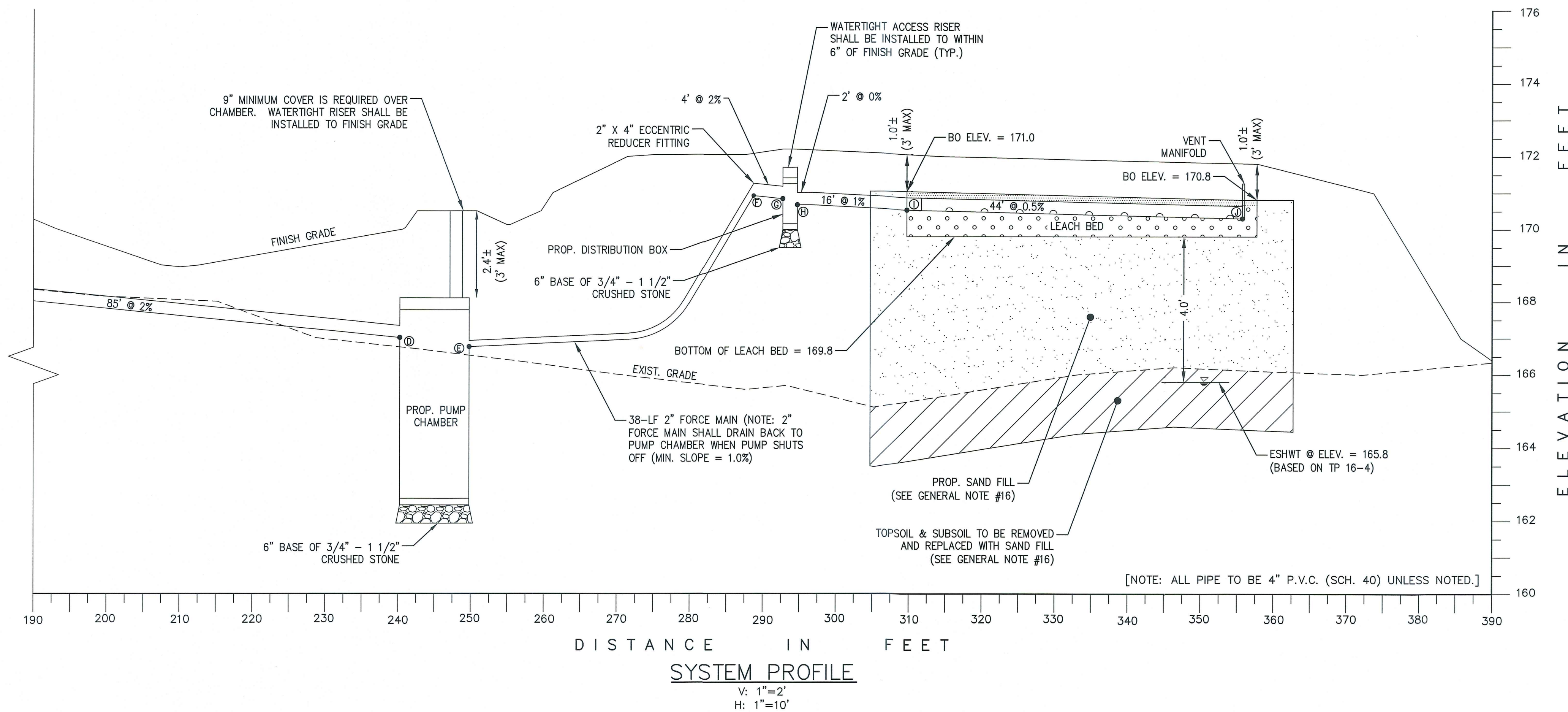
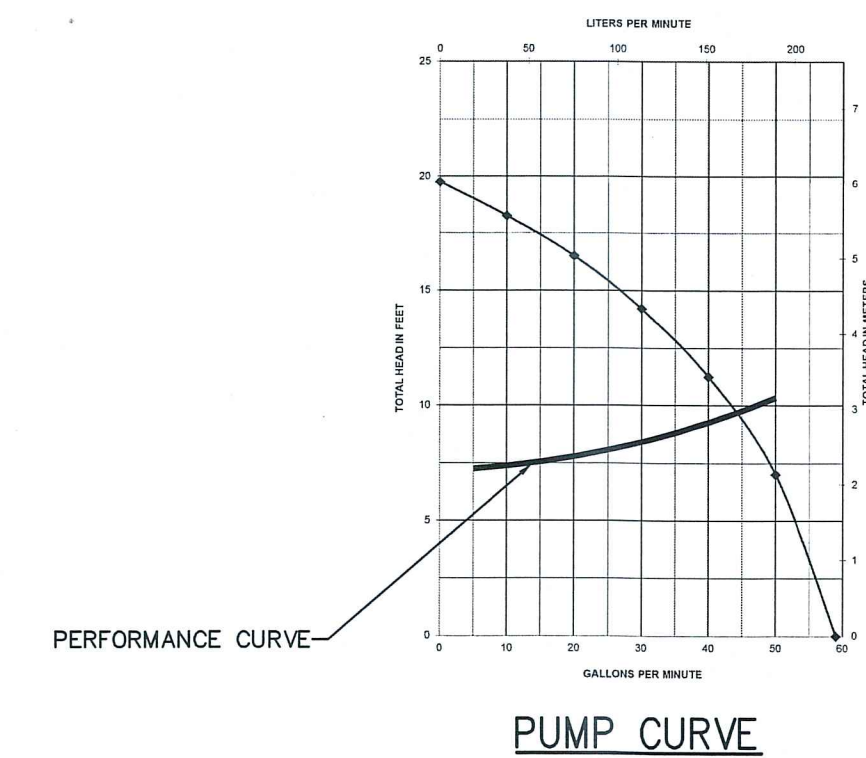
ACTUAL DOSE TO SAS:
[(9'-6" X 4'-8" X 3") X 7.48 GAL/CF] - 6.2 GAL. = 76.8 GAL.

STATIC HEAD (HS):
⑩ COUPLING-PUMP ON = 170.94 - 164.00 = 6.94
⑩ COUPLING-PUMP OFF = 170.94 - 163.75 = 7.19

DYNAMIC HEAD (HD):
FORCE MAIN: 2" DIAMETER
EQUIVALENT LENGTH METHOD:
2-90° BEND + 2-45° BENDS + 1 CHECK VALVE + 1 GATE VALVE + 1 UNION = (2 X 5.7') + (2 X 2.6') + 14' + 1.2' + 4.3' = 36.1'
TOTAL LENGTH = 38' + 36.1' = 74.1'
HEAD LOSS IN PIPE @ 44 GPM = 3.29 FT/100 FT
HD = 74.1' X (3.29 FT/100FT) = 2.44'

PUMP PARAMETERS:
T.D.H. = 5.38' - 9.63' @ 39 GPM

USE LIBERTY FL31M EFFLUENT PUMP OR APPROVED EQUAL.



- PUMP NOTES:**
- CONTROL PANEL SHALL BE EQUIPPED WITH A RUNNING TIME METER AND EVENT COUNTER.
 - TO RECORD ACTUAL PUMP RUN TIME, THE RUNNING TIME METER SHALL BE A MINIMUM OF 3 DIGITS AND BE WIRED TO THE PUMP POWER CIRCUIT, NOT THE PUMP CONTROL CIRCUIT.
 - THE HIGH WATER ALARM SHALL BE BOTH VISUAL AND AUDIBLE.
 - THE CONTROL BOX SHALL BE WATERPROOF AND LOCKABLE, BE NEMA1 RATED (MINIMUM) AND INCLUDE THE FOLLOWING:
 - HAND-OFF-AUTO SWITCH
 - MAGNETIC CONTACTOR
 - CIRCUIT BREAKER
 - "PUMP ON" PILOT LIGHT
 - RUNNING TIME METER
 - FLASHING ALARM LIGHT
 - AUDIBLE ALARM BUZZER
 - TEST AND SILENCE SWITCHES
 - DEAD FRONT INTERIOR SHIELD
 - EVENT COUNTER
 - PUMP SHALL BE WIRED TO OPERATE IN THE FOLLOWING SEQUENCE:
 - PUMP OFF
 - PUMP ON
 - ALARM ON
 - PUMP CONTROLS SHALL INCLUDE INTEGRATED OVERLOAD PROTECTION AND BE CAPABLE OF 10 STARTS PER HOUR.
 - THE ALARM FLOAT SHALL BE POWERED BY A CIRCUIT SEPARATE FROM THE CIRCUIT TO THE PUMPS.

NO.	REVISIONS DESCRIPTION	DATE