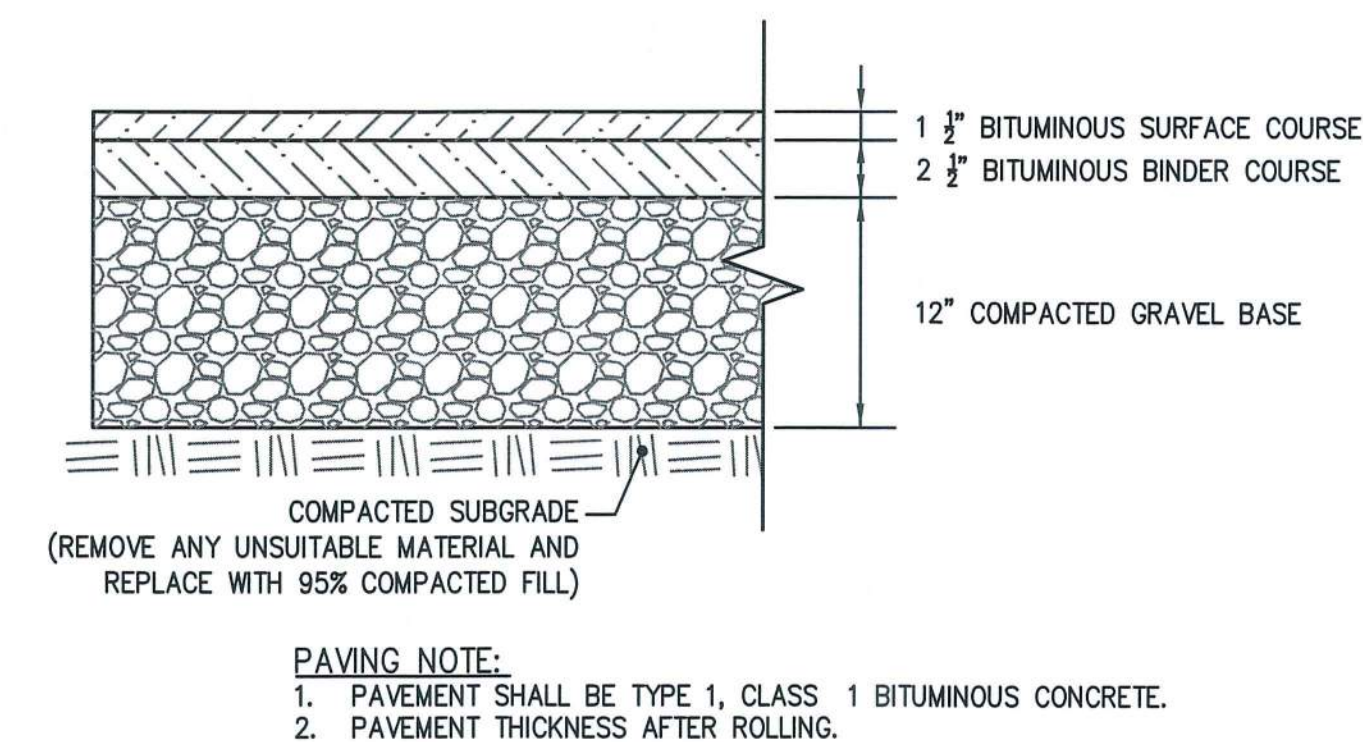
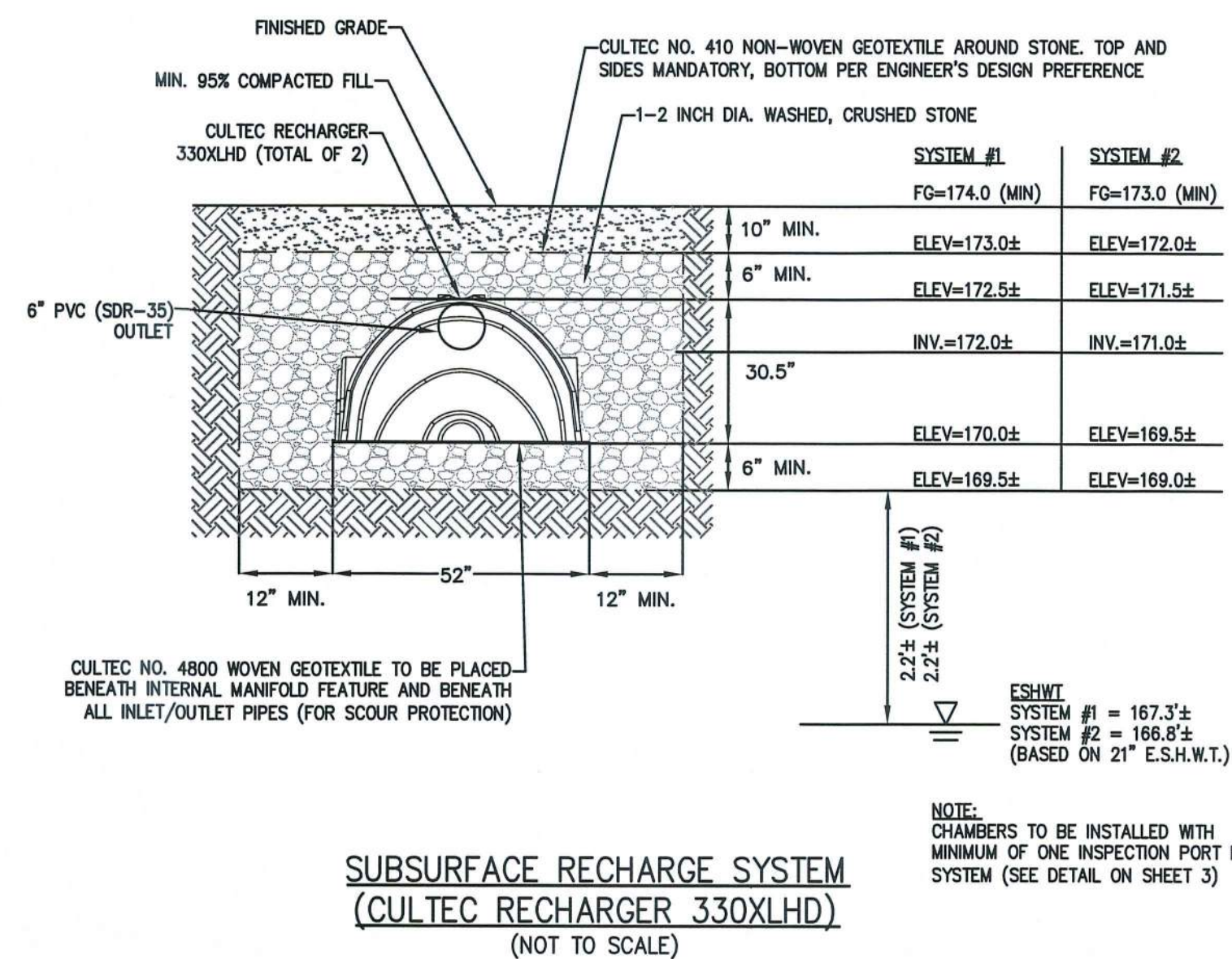
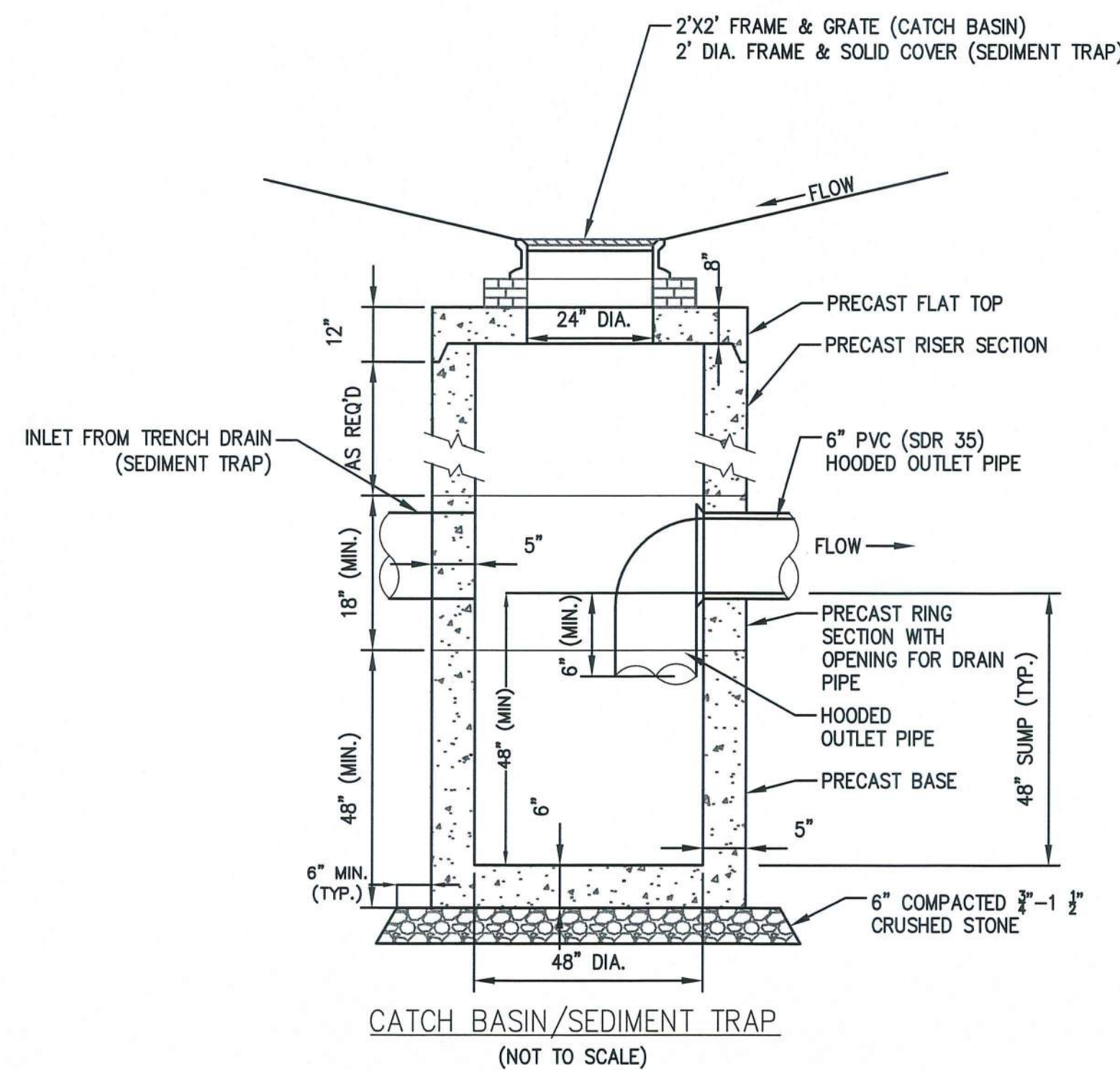


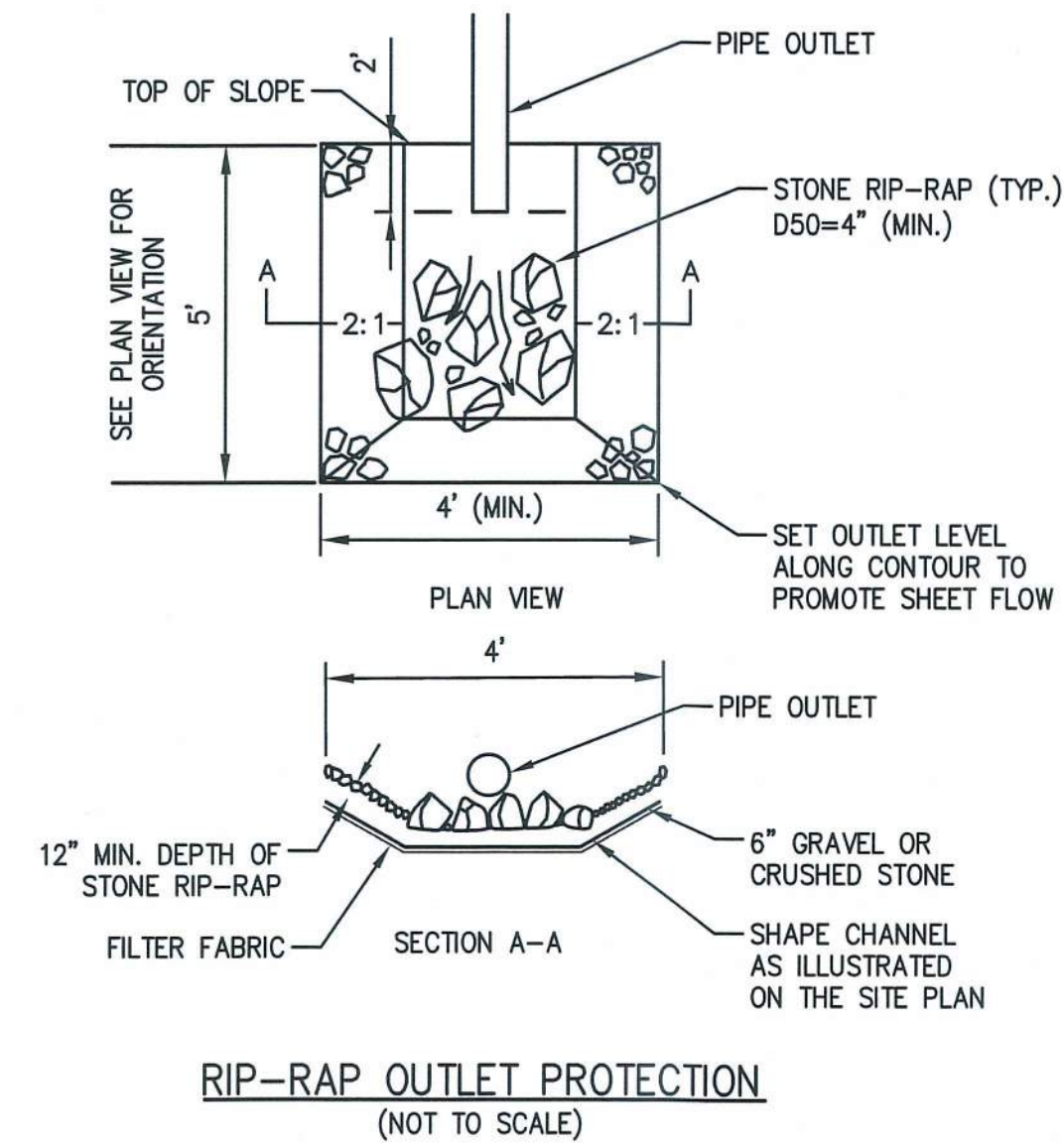
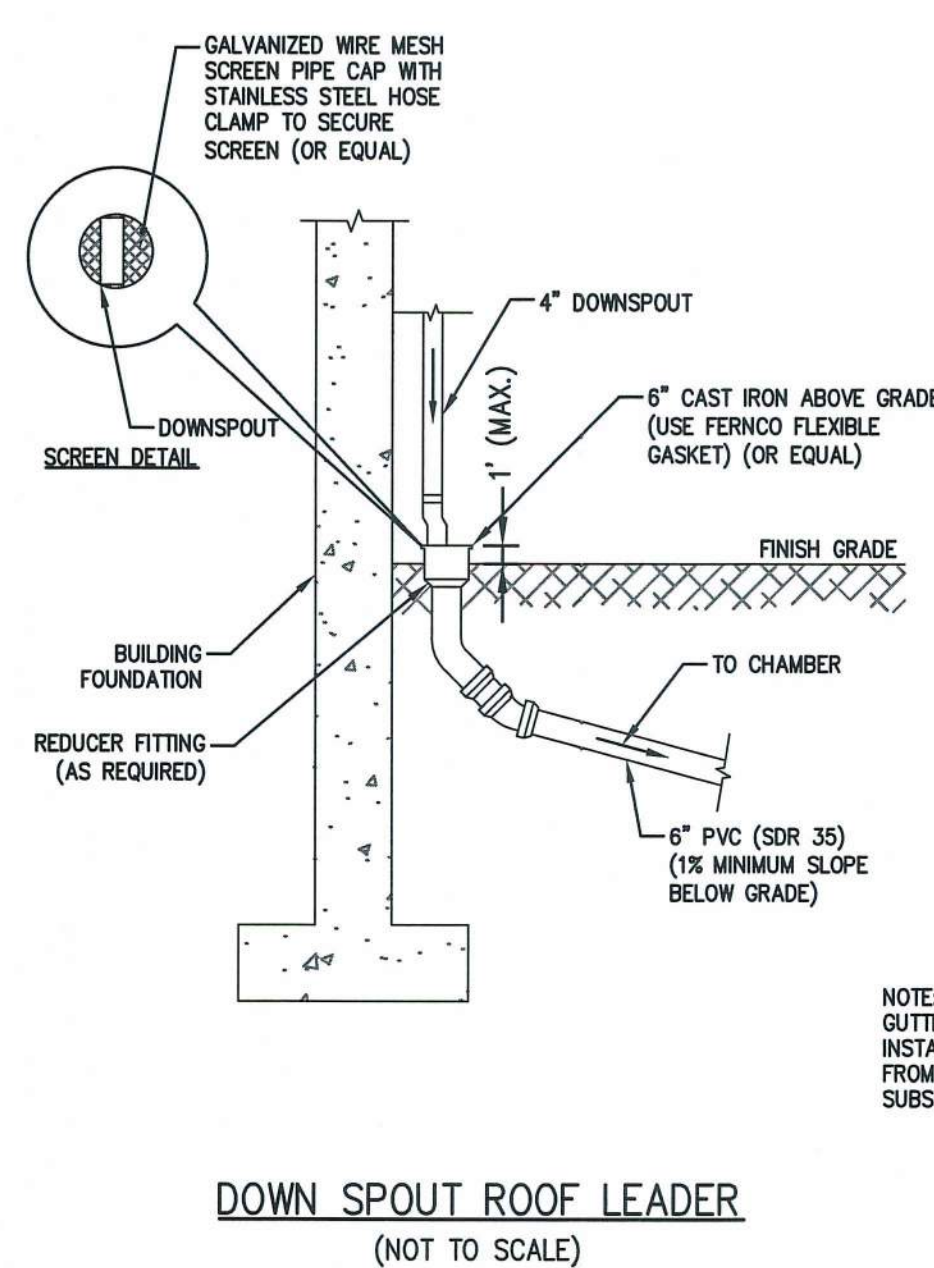
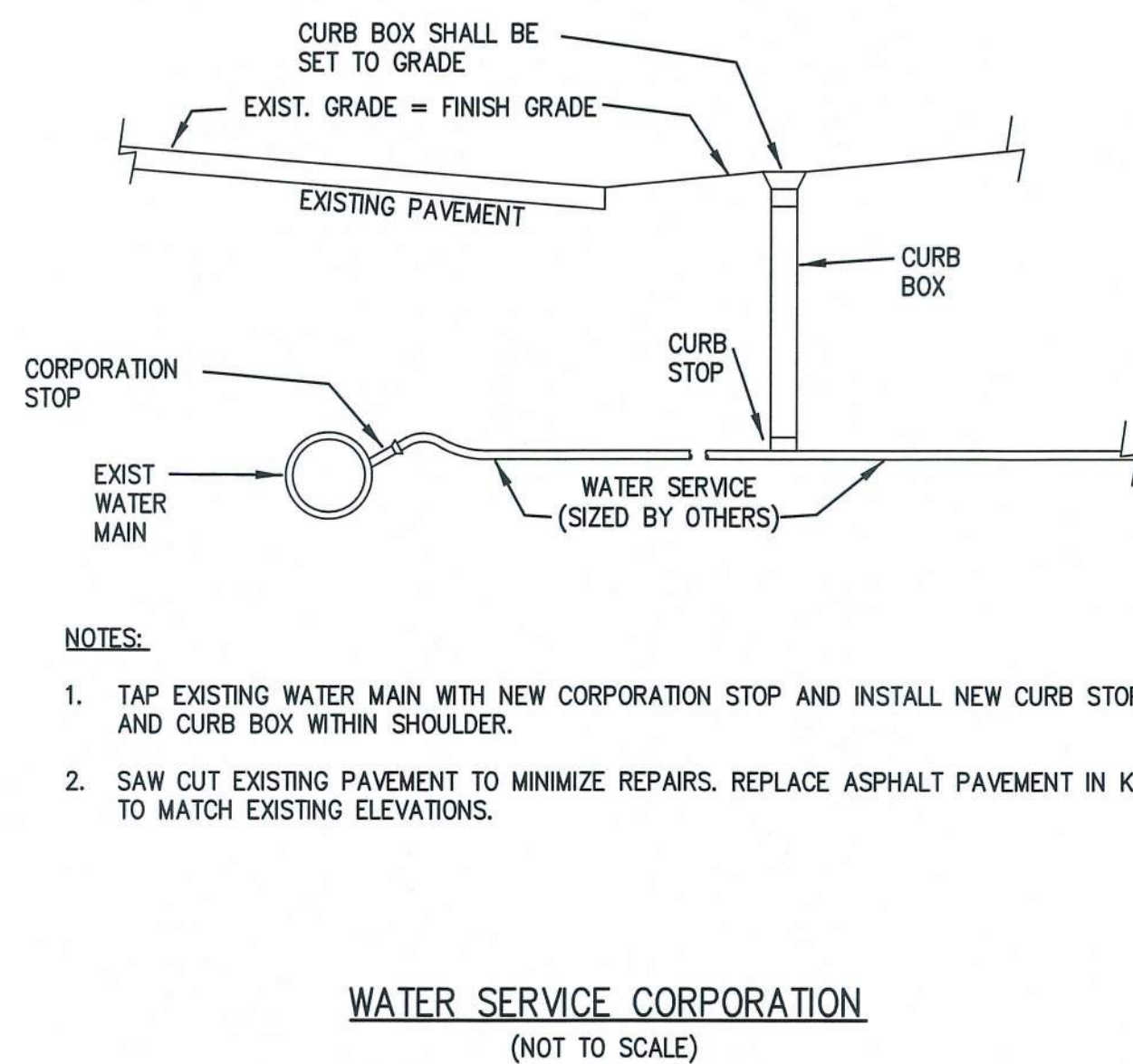
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WILLIAM A. MORIN  
REGISTERED PROFESSIONAL ENGINEER  
MASSACHUSETTS  
No. 56616  
8/10/2023

SURVEY BY: MCG  
DRAFTED BY: DJP  
CHECKED BY: WAS  
APPROVED BY: WAS  
SCALE: AS NOTED  
DATE: JULY 10, 2023

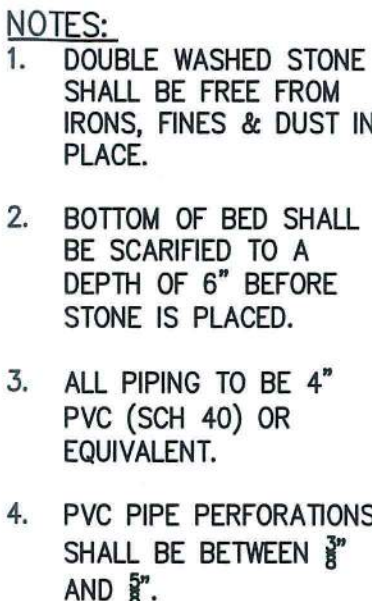
NO.	REVISIONS	DATE
1	MODIFY DRAINAGE SYSTEM	7/18/2023
2	REVISE PER BOH COMMENTS	8/10/2023



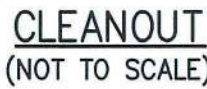
SITE DEVELOPMENT PLAN  
IN  
TOPSFIELD, MASSACHUSETTS  
73 HILL STREET - LOT 11  
(ASSESSOR'S MAP 89, LOT 19)  
PREPARED FOR:  
PAUL DANIELS

DRAWING NO.  
S - 3407  
SHEET NO.  
2 OF 4



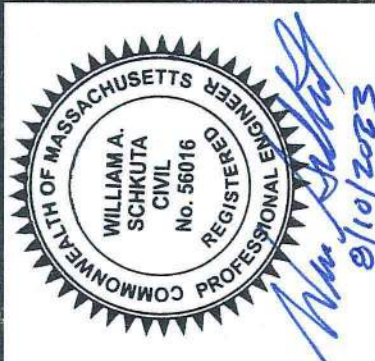


TOTAL WEIGHT (↓) = 10,800 + 10,648 = 21,448 LBS  
21,448 LBS (↓) > 7,475 LBS (↑)  
(F.S. = 2.8)



**The.  
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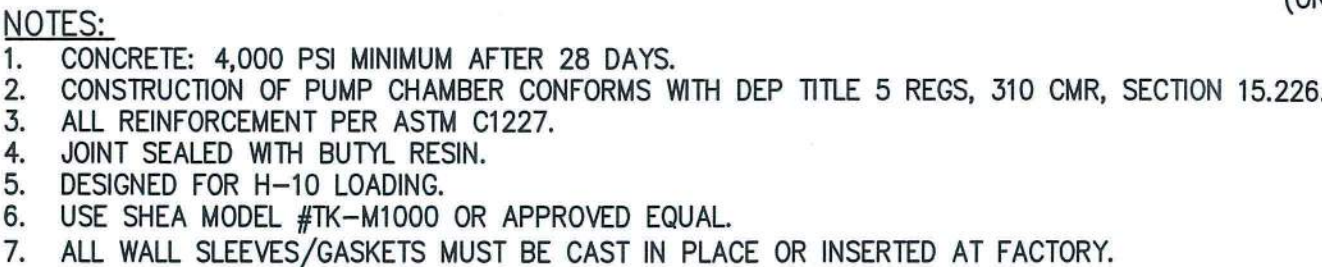
SURVEY BY: MCG  
DRAFTED BY: DJP  
CHECKED BY: WAS  
APPROVED BY: WAS  
SCALE: AS NOTED  
DATE: JULY 10, 2008

R E V I S I O N S		
NO.	DESCRIPTION	DATE
1	MODIFY DRAINAGE SYSTEM	7/18/2023
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**SITE DEVELOPMENT PLAN**  
**IN**  
**TOPSFIELD, MASSACHUSETTS**  
**73 HILL STREET – LOT 11**  
**(ASSESSOR'S MAP 69, LOT 19)**  
**PREPARED FOR:**  
**PAUL DANIELS**

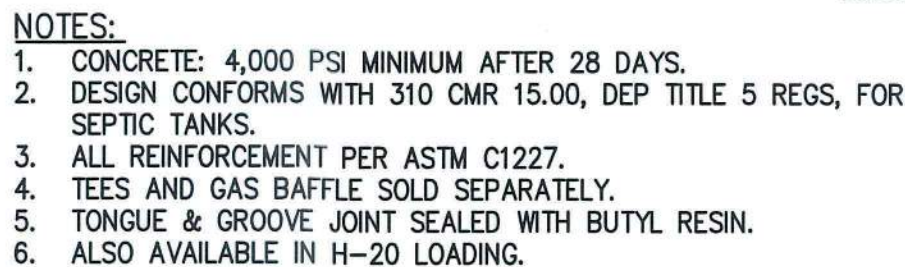
DRAWING NO.  
S - 3407

SHEET NO.  
3 OF 4

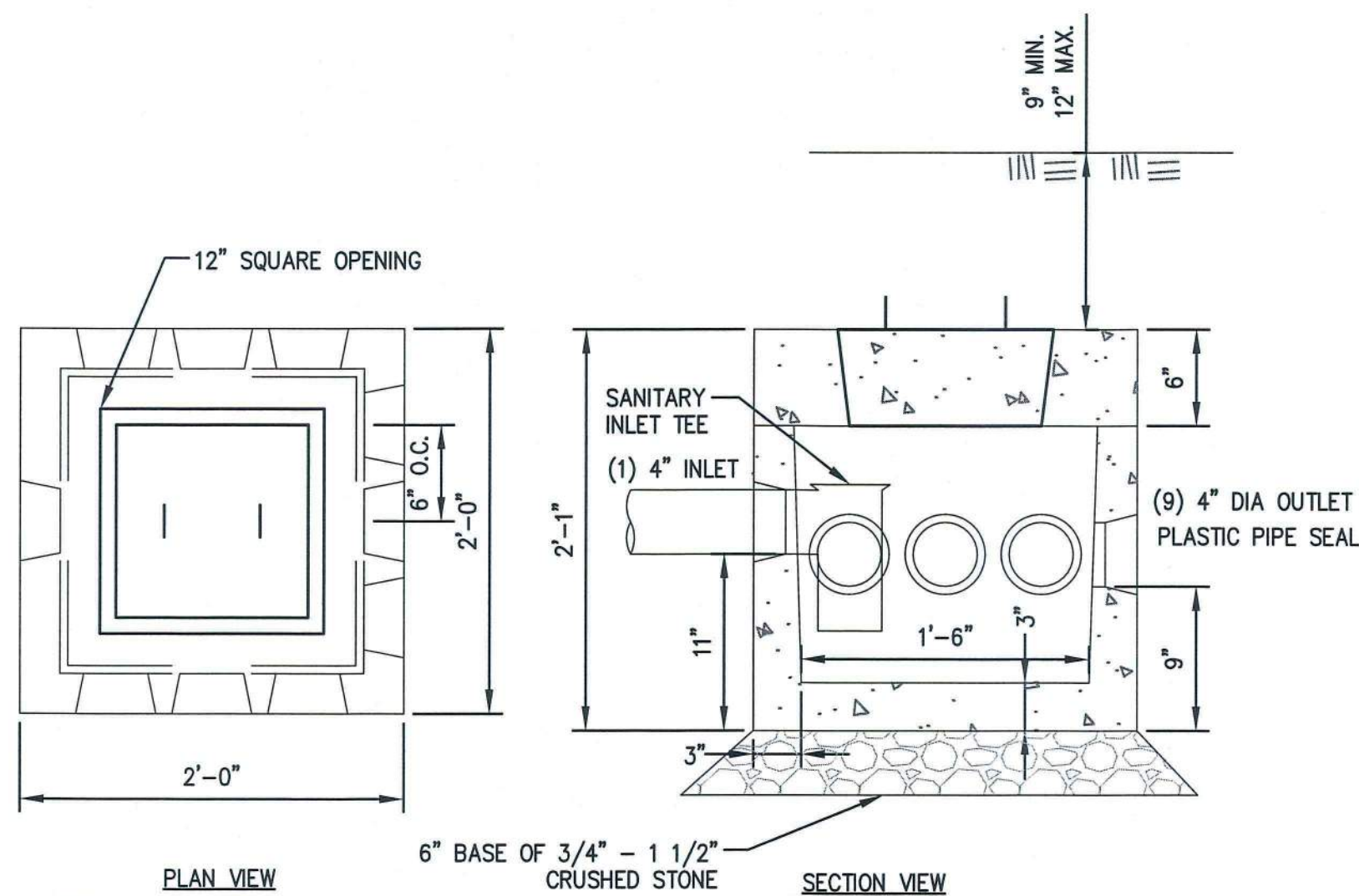
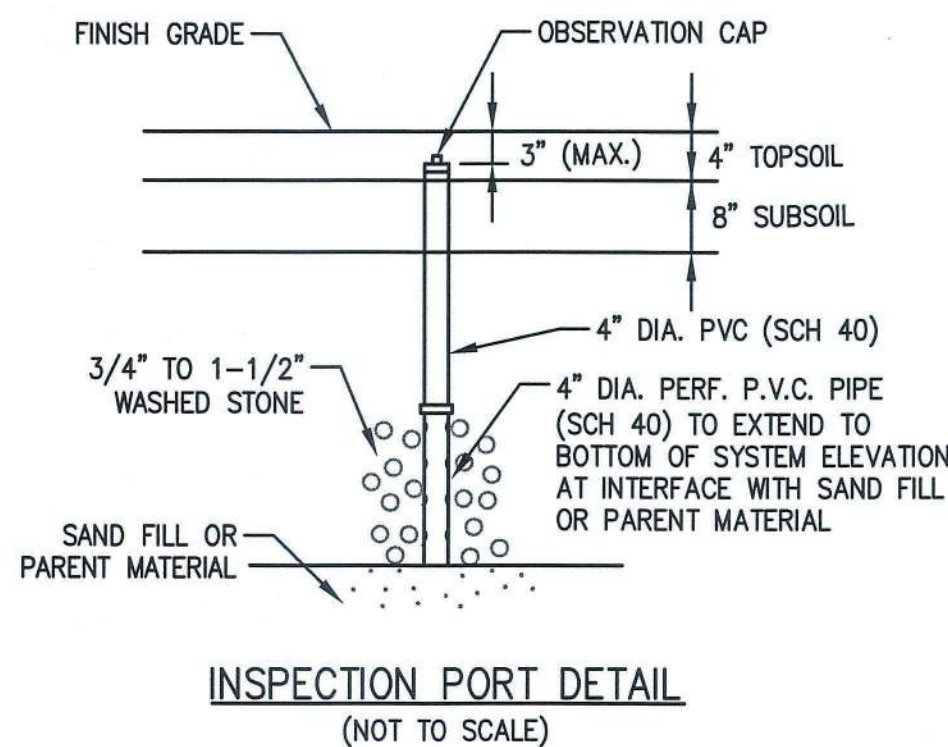
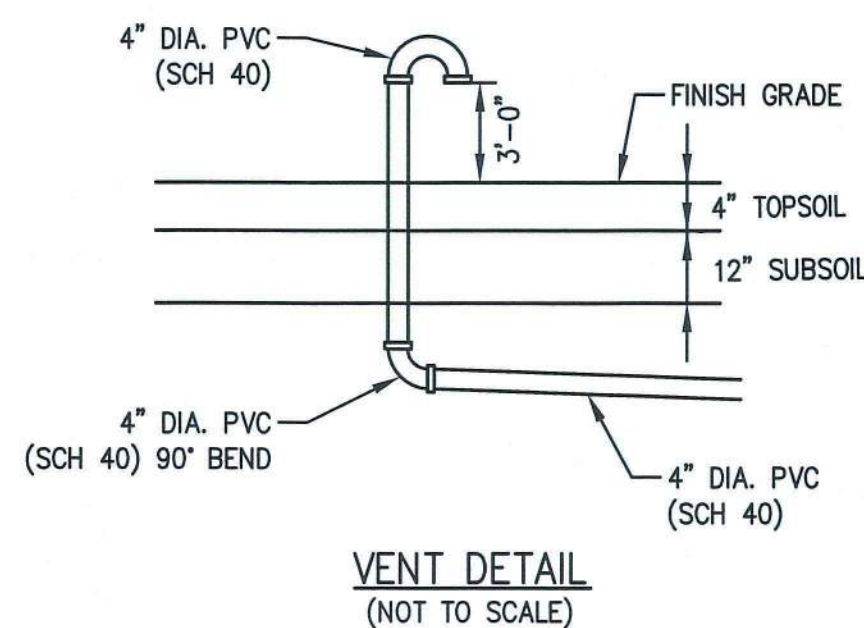


**EMERGENCY STORAGE  
ABOVE ALARM**  
VOL=9'-6" X 4'-8" X 2.5'  
= 111 CF X (7.48 GAL/CF)  
= 830 GAL

1,000 GALLON (MONOLITHIC) PUMP CHAMBER  
(NOT TO SCALE)



1,500 GALLON (MONOLITHIC) SEPTIC TANK  
(NOT TO SCALE)

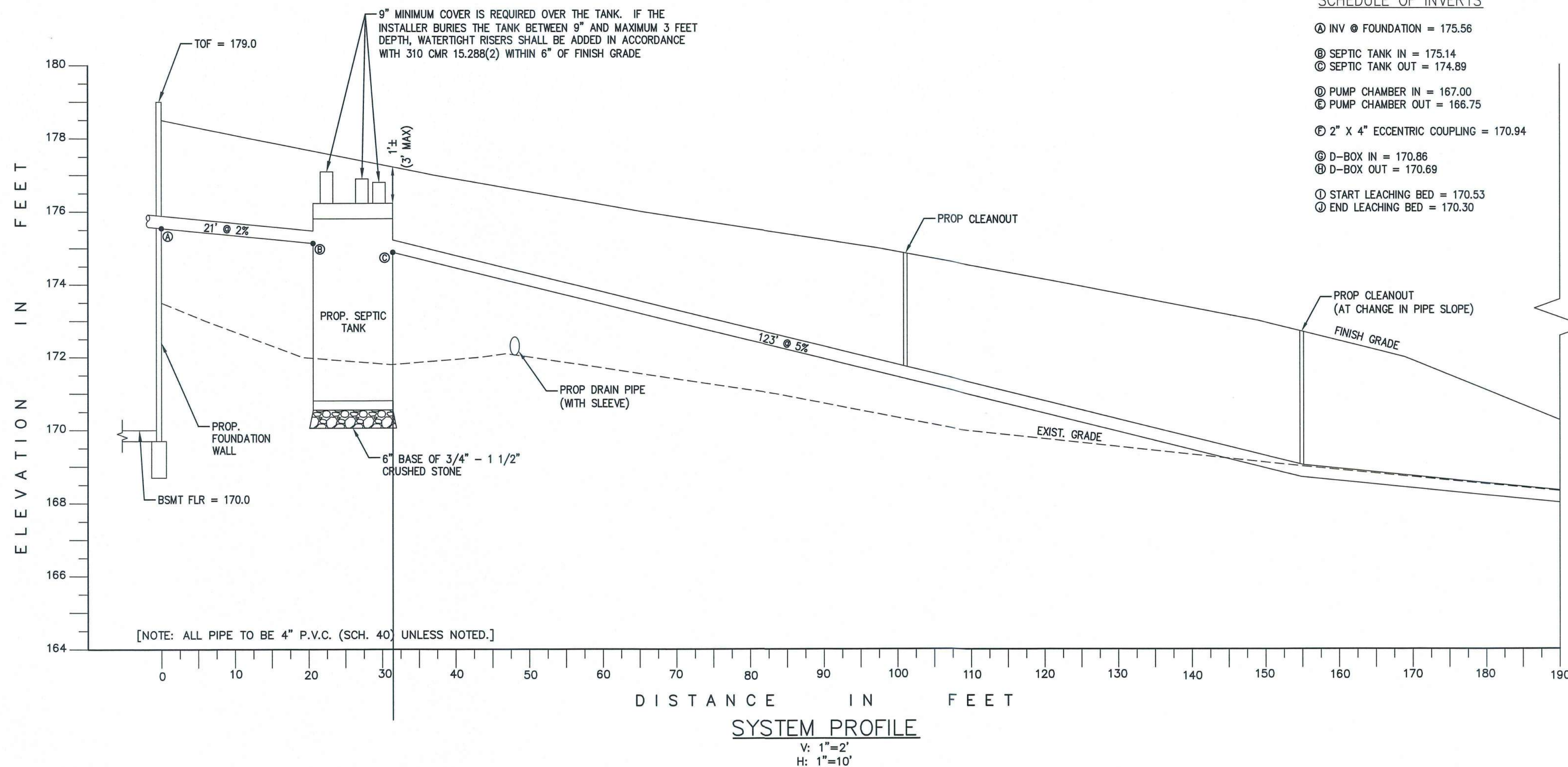


NOTES:

1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
2. DESIGN CONFORMS WITH 310 CMR 15.000, DEP TITLE 5 REGS, FOR DISTRIBUTION BOXES.
3. DESIGNED FOR H-20 LOADING.
4. OPTIONAL 18" ROUND OR SQUARE CAST IRON COVER AVAILABLE IN PLACE OF CONCRETE COVER.

9-OUTLET (H-20) DISTRIBUTION BOX  
(NOT TO SCALE)





#### SCHEDULE OF INVERTS

- ① INV @ FOUNDATION = 175.56
- ② SEPTIC TANK IN = 175.14
- ③ SEPTIC TANK OUT = 174.89
- ④ PUMP CHAMBER IN = 167.00
- ⑤ PUMP CHAMBER OUT = 166.75
- ⑥ 2" X 4" ECCENTRIC COUPLING = 170.94
- ⑦ D-BOX IN = 170.86
- ⑧ D-BOX OUT = 170.69
- ⑨ START LEACHING BED = 170.53
- ⑩ END LEACHING BED = 170.30

#### PUMP CALCULATIONS:

##### BACKFLOW CALCULATION:

38 FT X  $[3.14(0.75/12)^2] \times 0.8$  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:

$10.6 \text{ CF} / (9' - 6" \times 4' - 8") = 0.24 \text{ FT (USE 3")}$

##### ACTUAL DOSE TO SAS:

$[(9' - 6" \times 4' - 8" \times 3") \times 7.48 \text{ GAL/CF}] - 6.2 \text{ GAL} = 76.8 \text{ GAL}$

##### STATIC HEAD (HS):

● COUPLING-PUMP ON = 170.94 - 164.00 = 6.94

● 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'

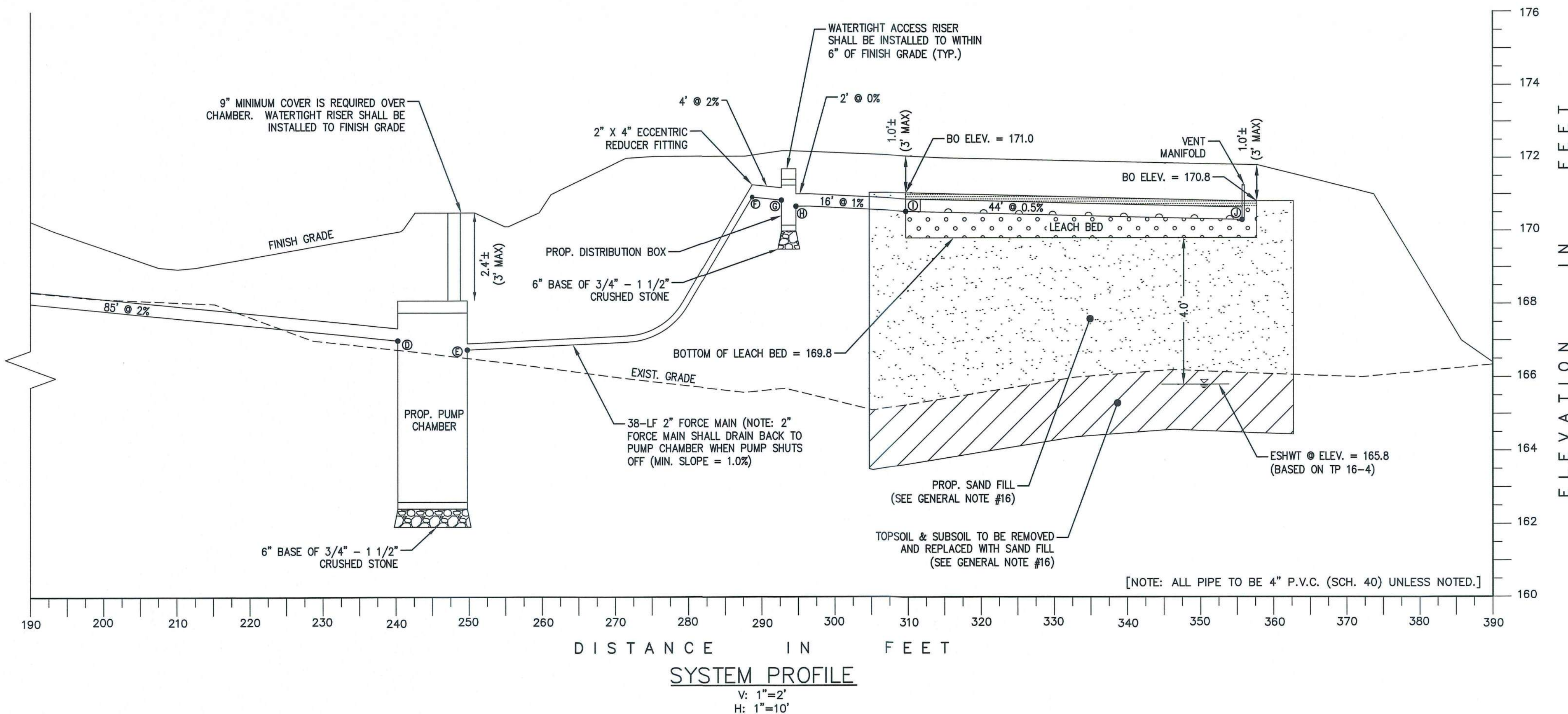
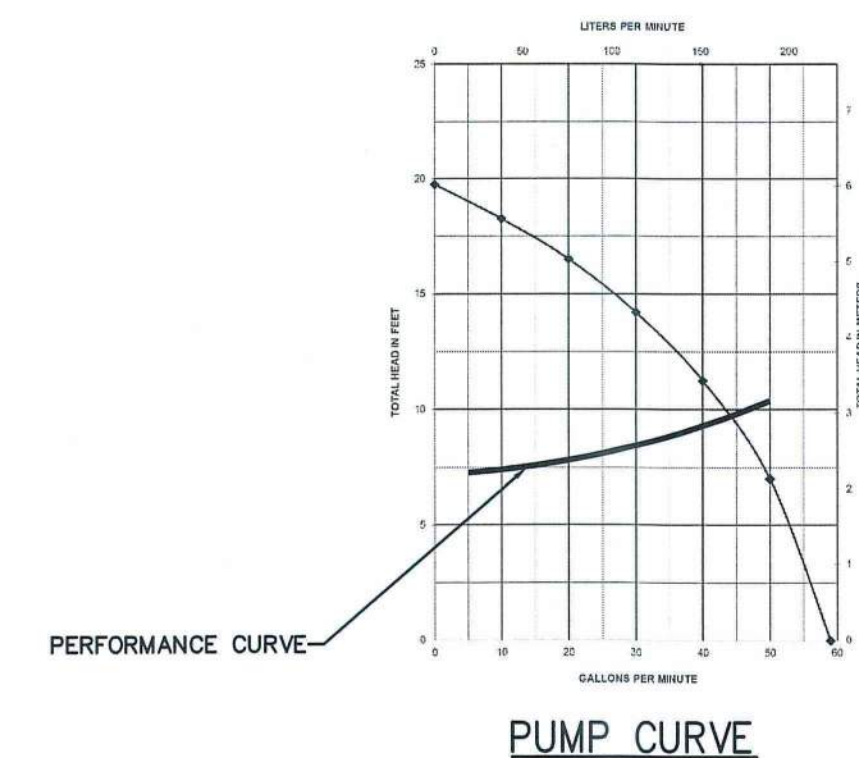
HEAD LOSS IN PIPE @ 44 GPM = 3.29 FT/100 FT

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 PLACED IN A LOCATION SO IT IS BOTH VISIBLE 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.

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