INFILTRATOR®
water technologies

Commercial Conundrum

Dennis F. Hallahan, P.E.

Technical Director

Presented at 2025 Mega-Conference, October 19-22, 2025

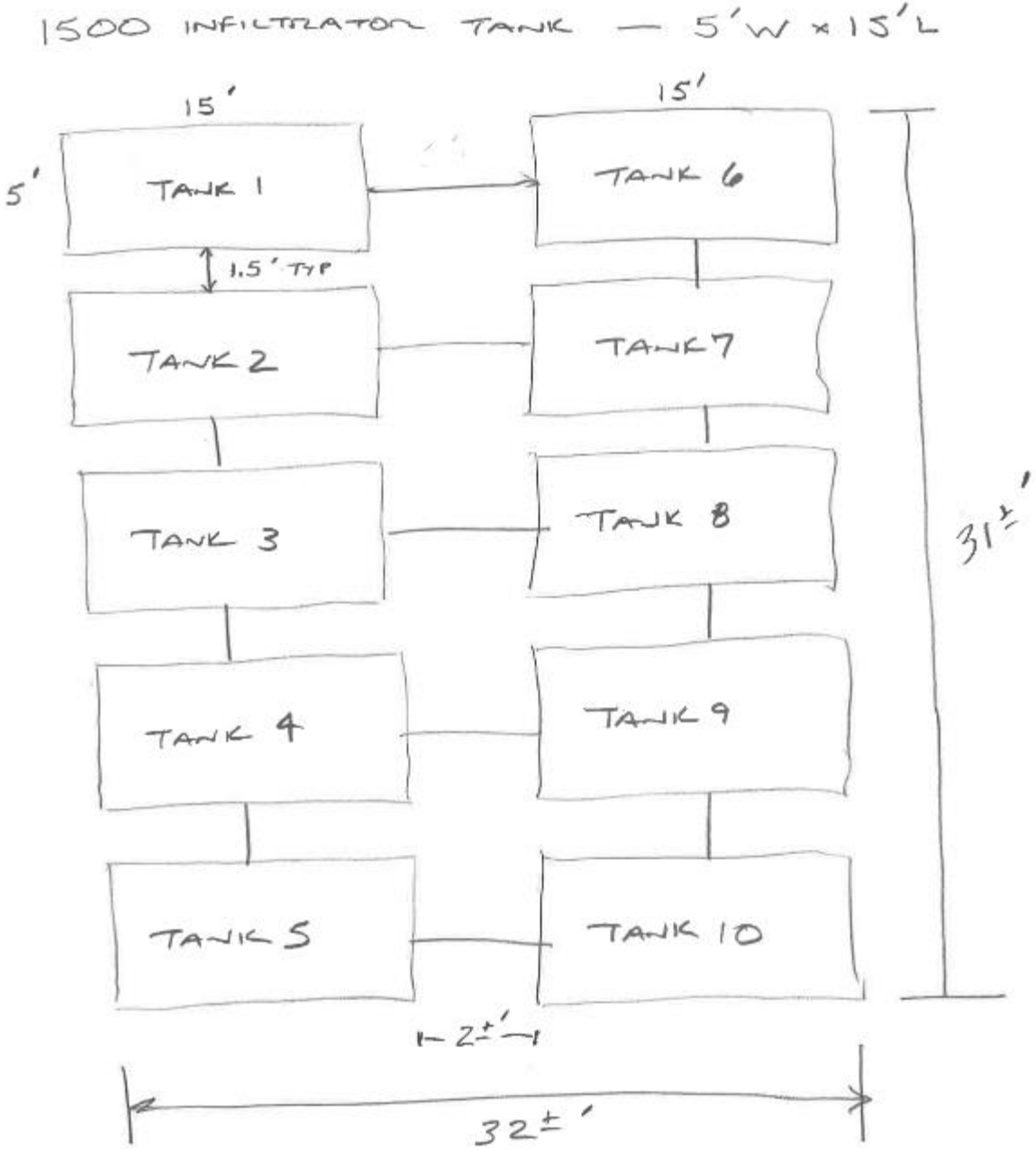
The materials being presented represent the speaker’s own opinions and do NOT reflect the opinions of NOWRA.

Agenda

1. How did I get here? Telling the story, set the stage
2. Review of Actual Projects
3. Questions anytime please
4. Names have been removed to protect the guilty

The Story

- We receive plans, sketches, emails for plan review and design assistance
  - Of course,… in most cases they are in a hurry, need it asap
- We try to make sense of it, offer suggestions
- Typically, several iterations back and forth
- End Goal: Provide recommendations for their Project



Case #1

Tank Conundrum

We receive this sketch

Background Story:

- **Waiting on City Sewer**
- **Future Pump Station**
- **25 townhomes**
- **Pump out every 2 days**

Tanks Installed In-Series

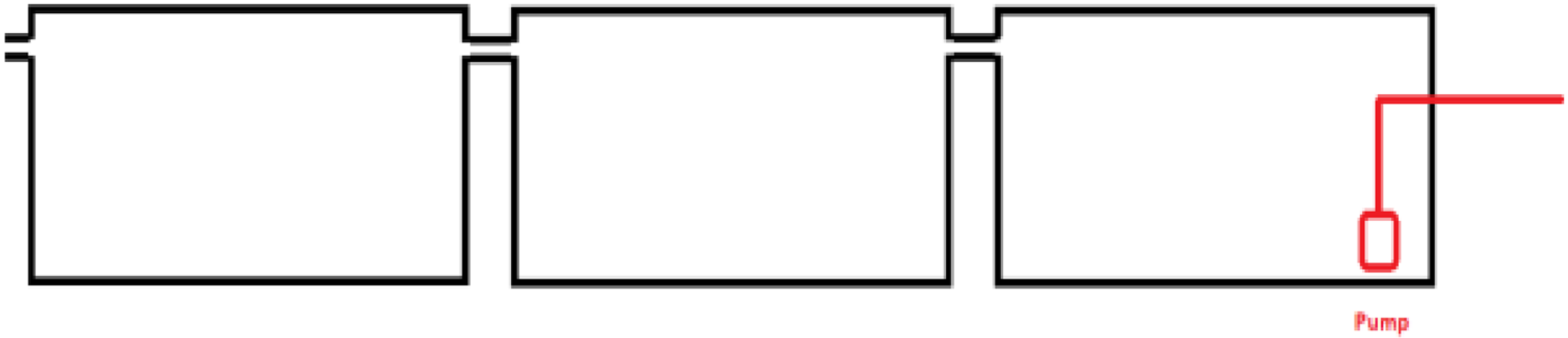
So I ask the Engineer why?

- Temp Installation – No CIP
- Large Conc. Tanks too expensive and not readily available
- Benefits of installing multiple tanks:
- Increase Volume Storage Capacity
- It can save time and labor
- No major Crane required
- Recoverable asset

How Multiple Tanks Operate

Hydraulically

- Designing a multi-tank system to operate as one vessel

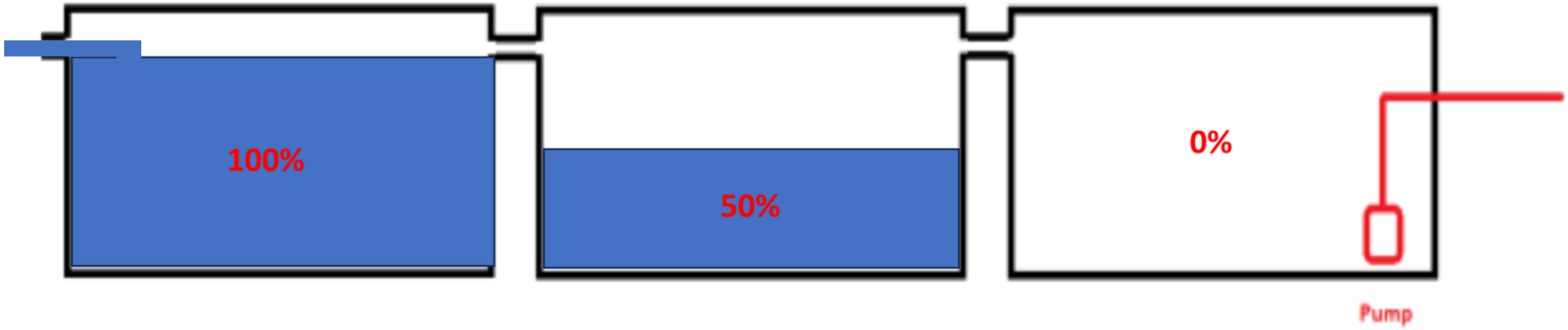


Does this operate like a single tank?

How Multiple Tanks Operate

Hydraulically

- Designing a multi-tank system to operate as one vessel

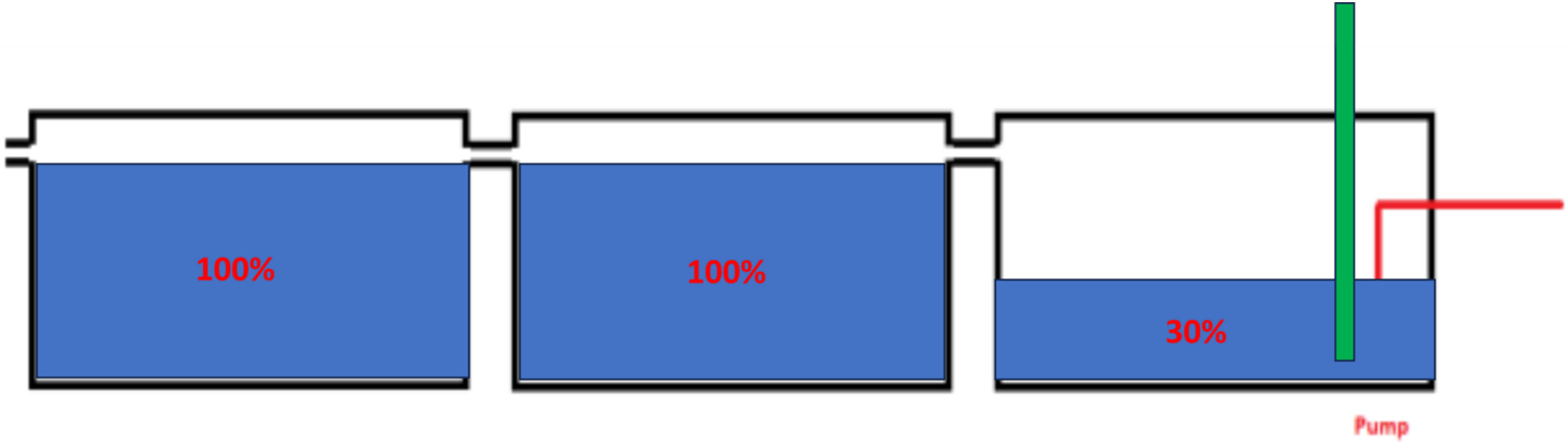


No!

How Multiple Tanks Operate

Hydraulically

- Designing a multi-tank system to operate as one vessel

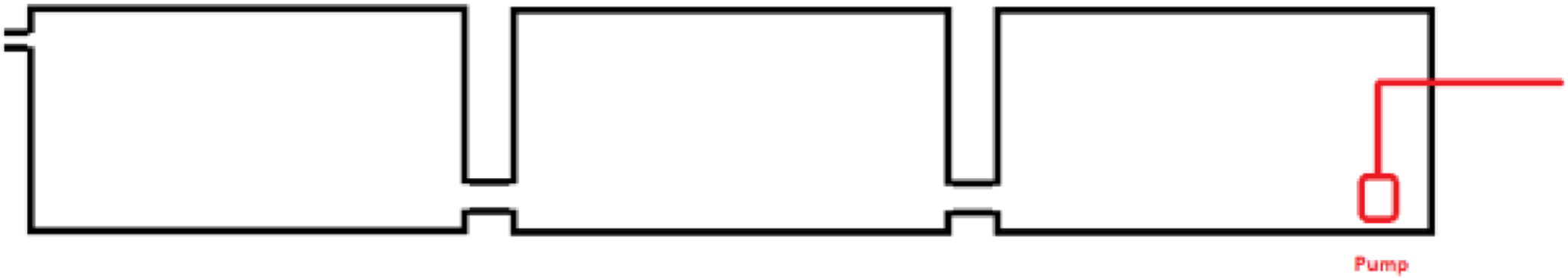


Does this operate like a single tank **when pumped**?

How Multiple Tanks Operate

Hydraulically

- Designing a multi-tank system to operate as one vessel

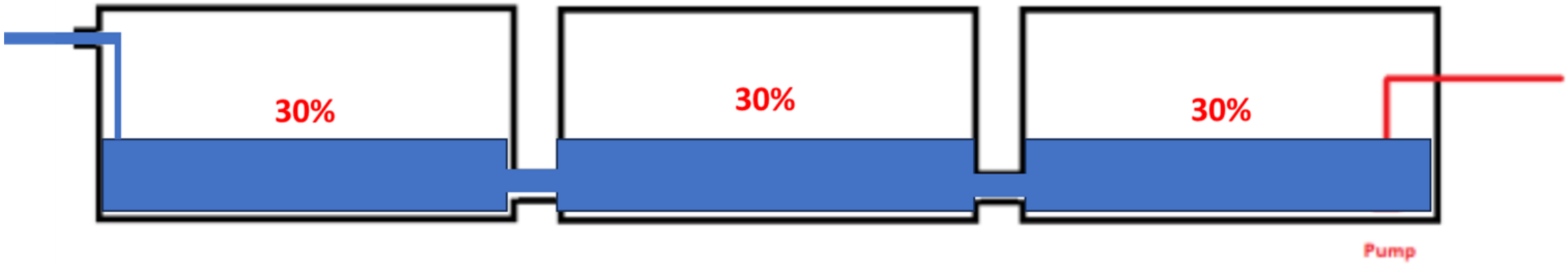


What about this?

How Multiple Tanks Operate

Hydraulically

- Designing a multi-tank system to operate as one vessel

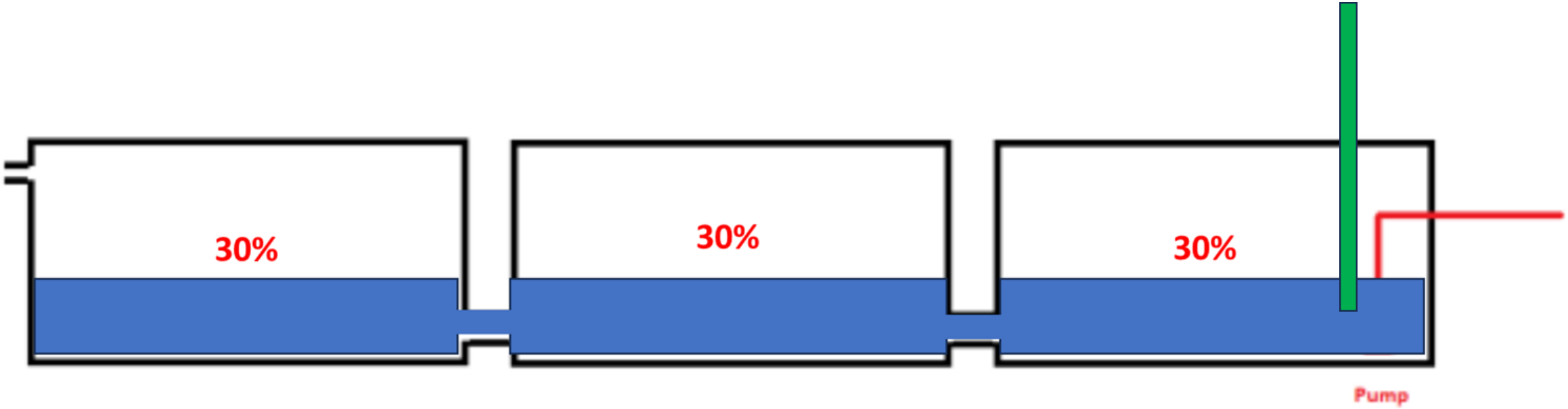


Bottom connections allow wastewater to be equally distributed across all three tanks.

How Multiple Tanks Operate

Hydraulically

- Designing a multi-tank system to operate as one vessel

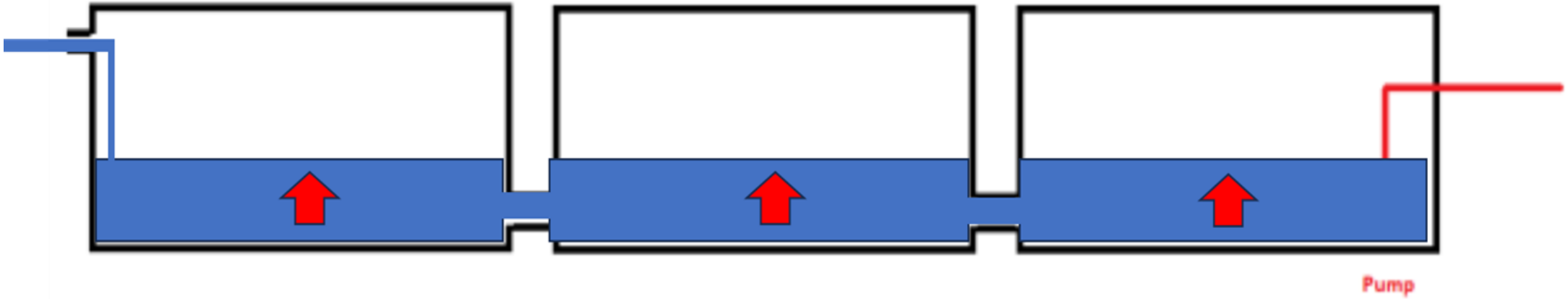


Bottom connections also allow wastewater to be successfully pumped across all three tanks.

How Multiple Tanks Operate

Air Movement

- Designing a multi-tank system to operate as one vessel



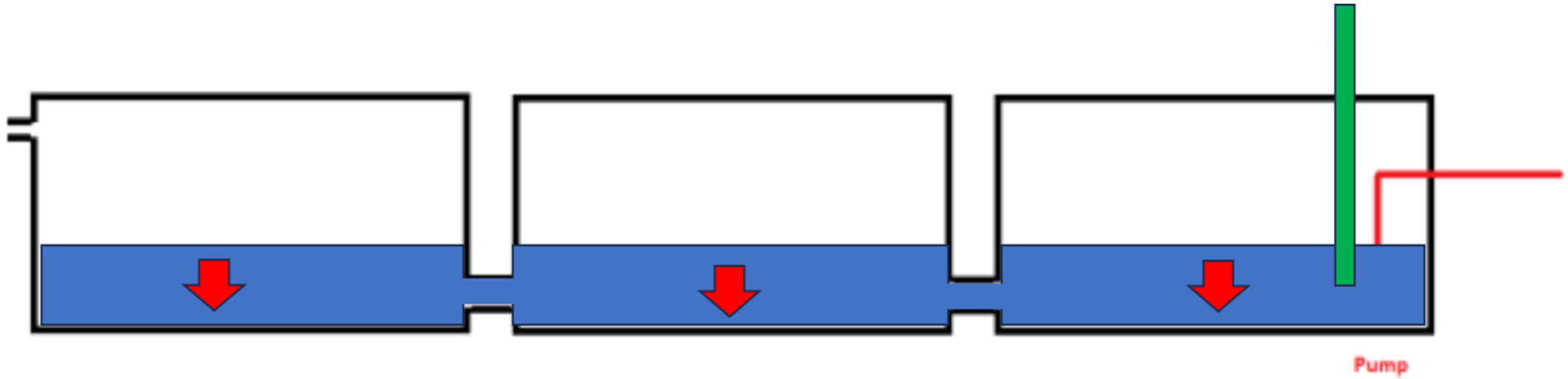
But, what happens as the tanks are filled with wastewater?

AIR IS COMPRESSED

How Multiple Tanks Operate

Air Movement

- Designing a multi-tank system to operate as one vessel



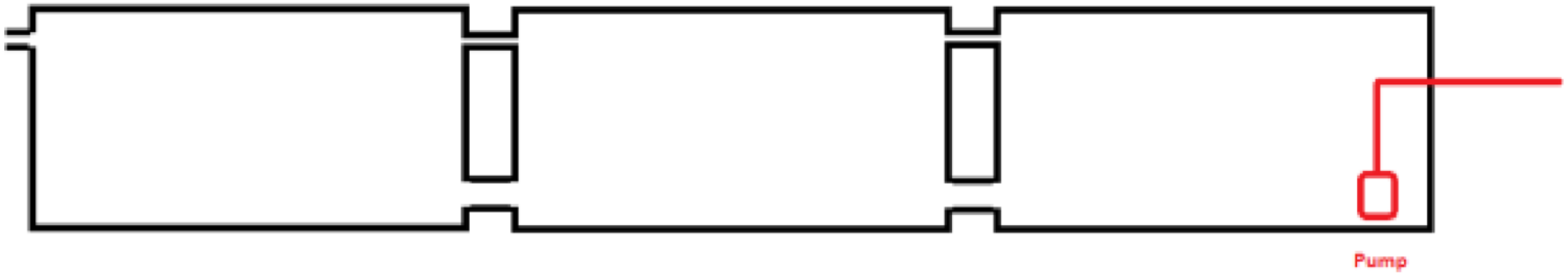
What happens as tanks are pumped?

VACUUM

How Multiple Tanks Operate

Air Movement

- Designing a multi-tank system to operate as one vessel

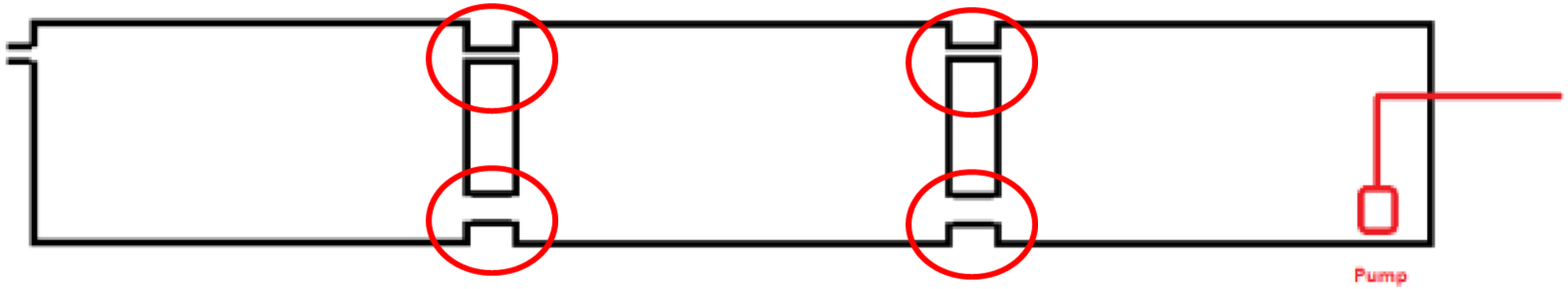


Top connections provide a means of venting to allow air movement and wastewater equalization

How Multiple Tanks Operate

Air Movement

- Designing a multi-tank system to operate as one vessel



Connections should be selected based on pressure.

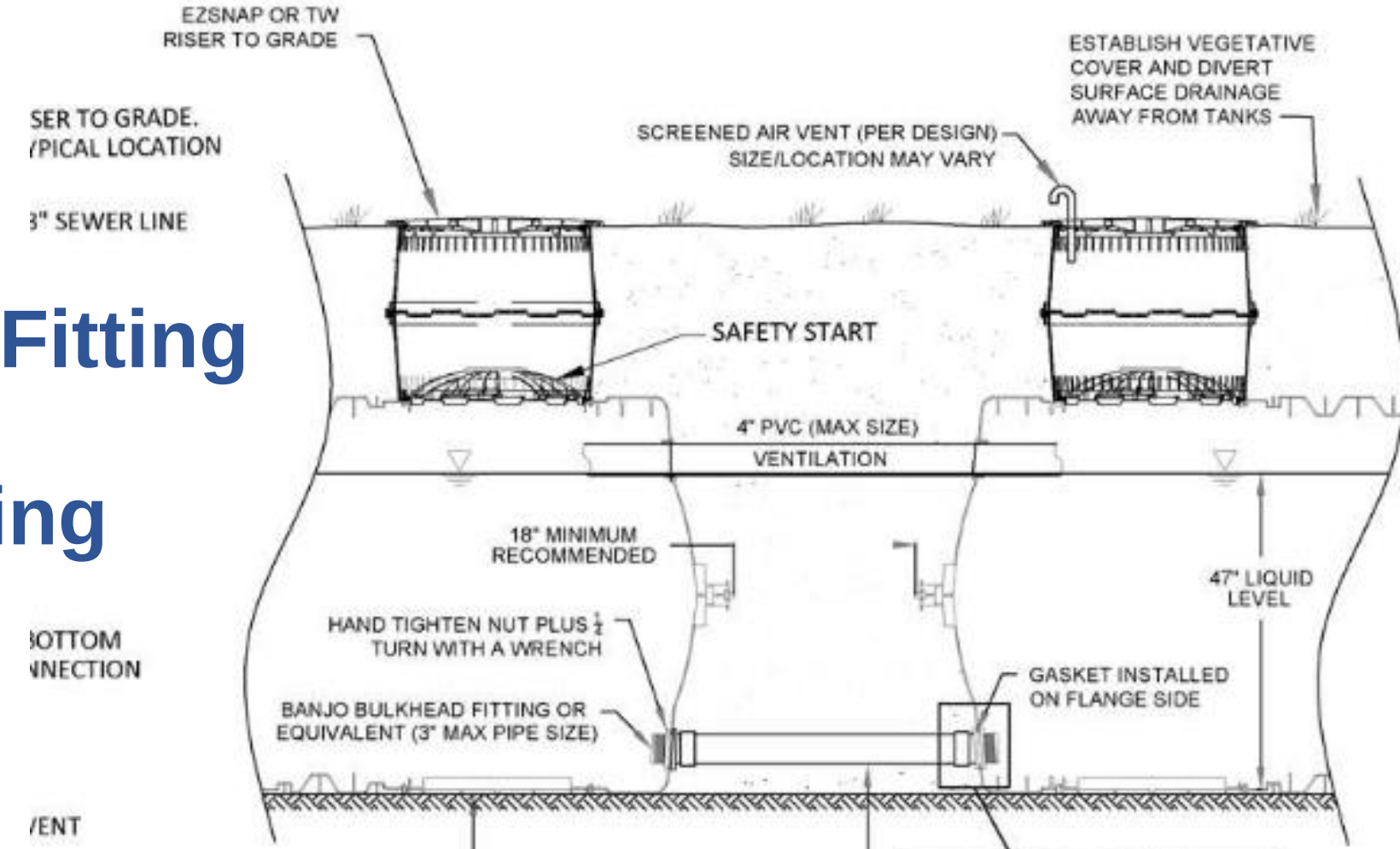
Lower connections will see higher pressures than top connections.

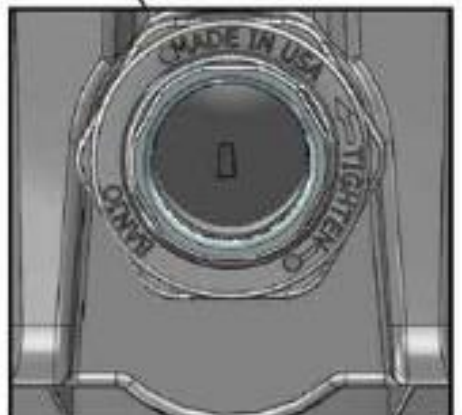
System should be tested (vacuum or hydrostatic) prior to backfill.

Bottom Connection Detail

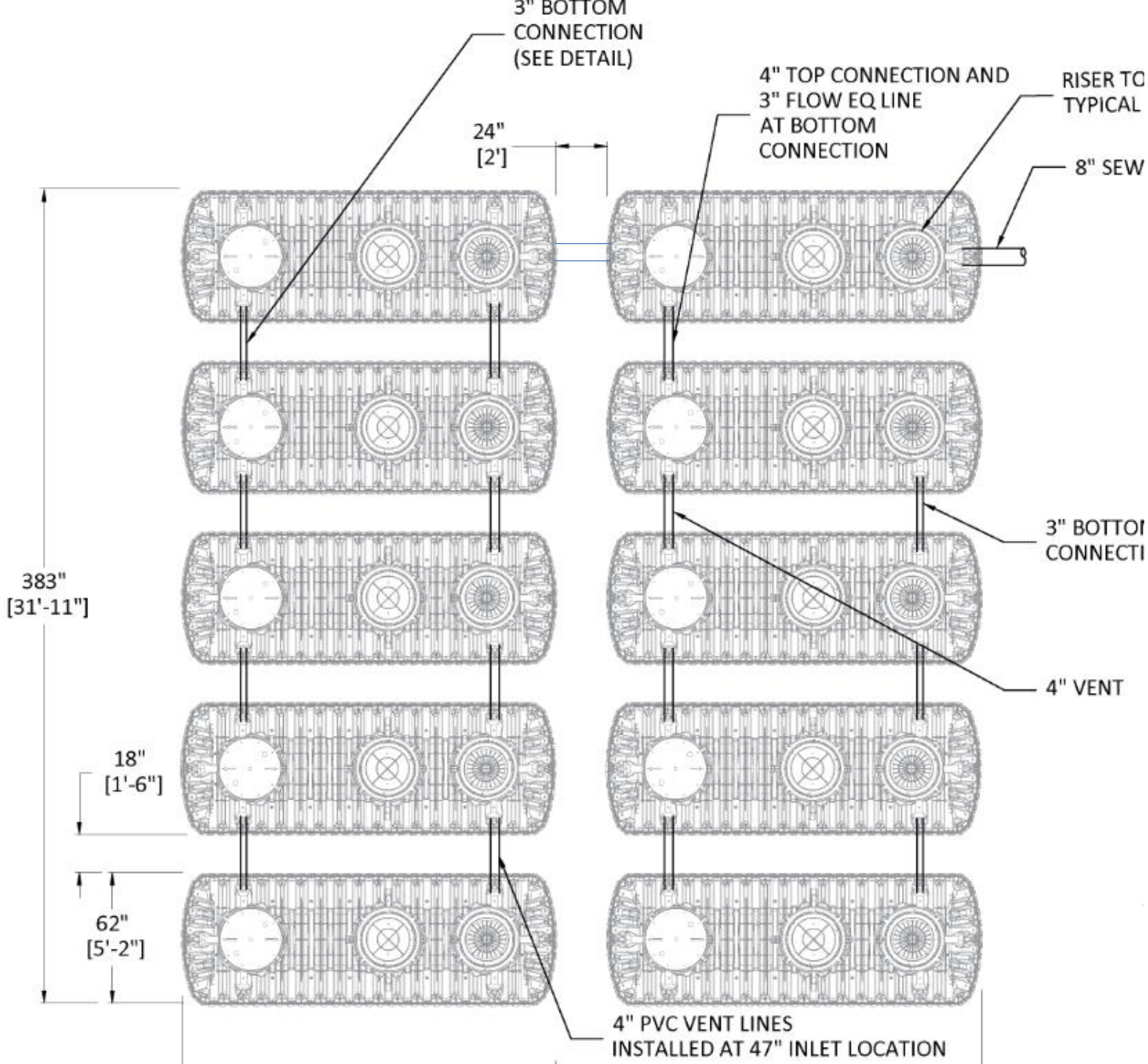
Bulkhead Fitting

Note Venting Provision





NOTES:
1. INSTALL TANKS AND BULKHEAD FITTINGS PER MANUFACTURER'S INSTALLATION INSTRUCTIONS
2. IM/CM-TANK MODEL MAY VARY
3. DESIGN MAY VARY BASED UPON SPECIFIC USE
4. IF THE TANKS ARE NOT VENTED THEN INSTALL VENT ON TANK.



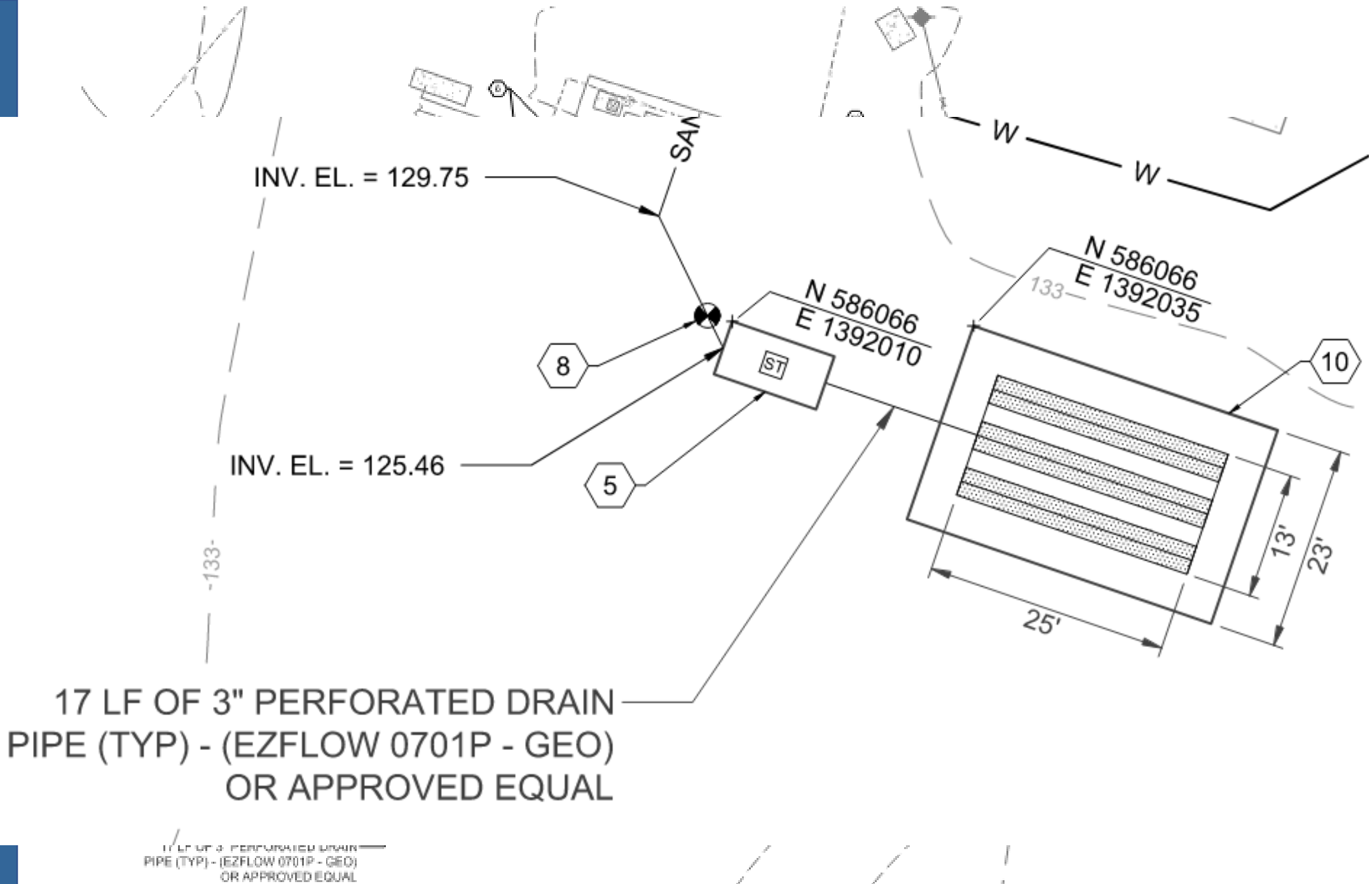
The Final Design

59 emails later

Case #2: Please Determine Quantities

1. We often receive requests to determine quantities
2. Plans are sent in to us
3. The more I look the more I find
4. Tend to note the engineering firm and or facility type
5. “Big Pipe” firms tend to get the Gov’t contracts

Air Force Base
Small Ammo Storage Building



Case #2 Please Determine Quantities

Project in FL – it was already out to bid
- FL allows a 2 ft wide trench, they spec'd a 3 ft wide trench

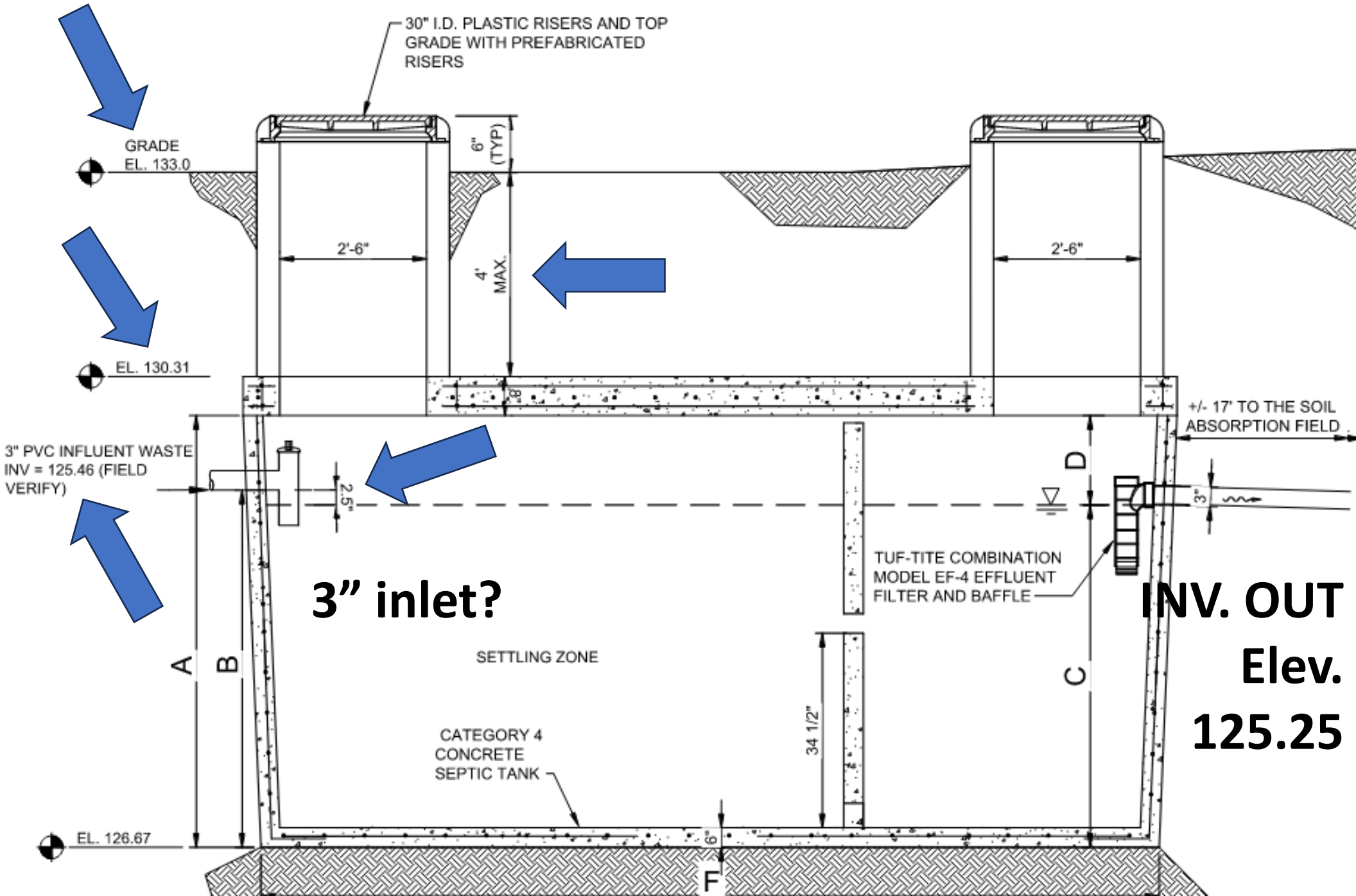
Drainfield product is the wrong spec

Check the Tank spec and detail

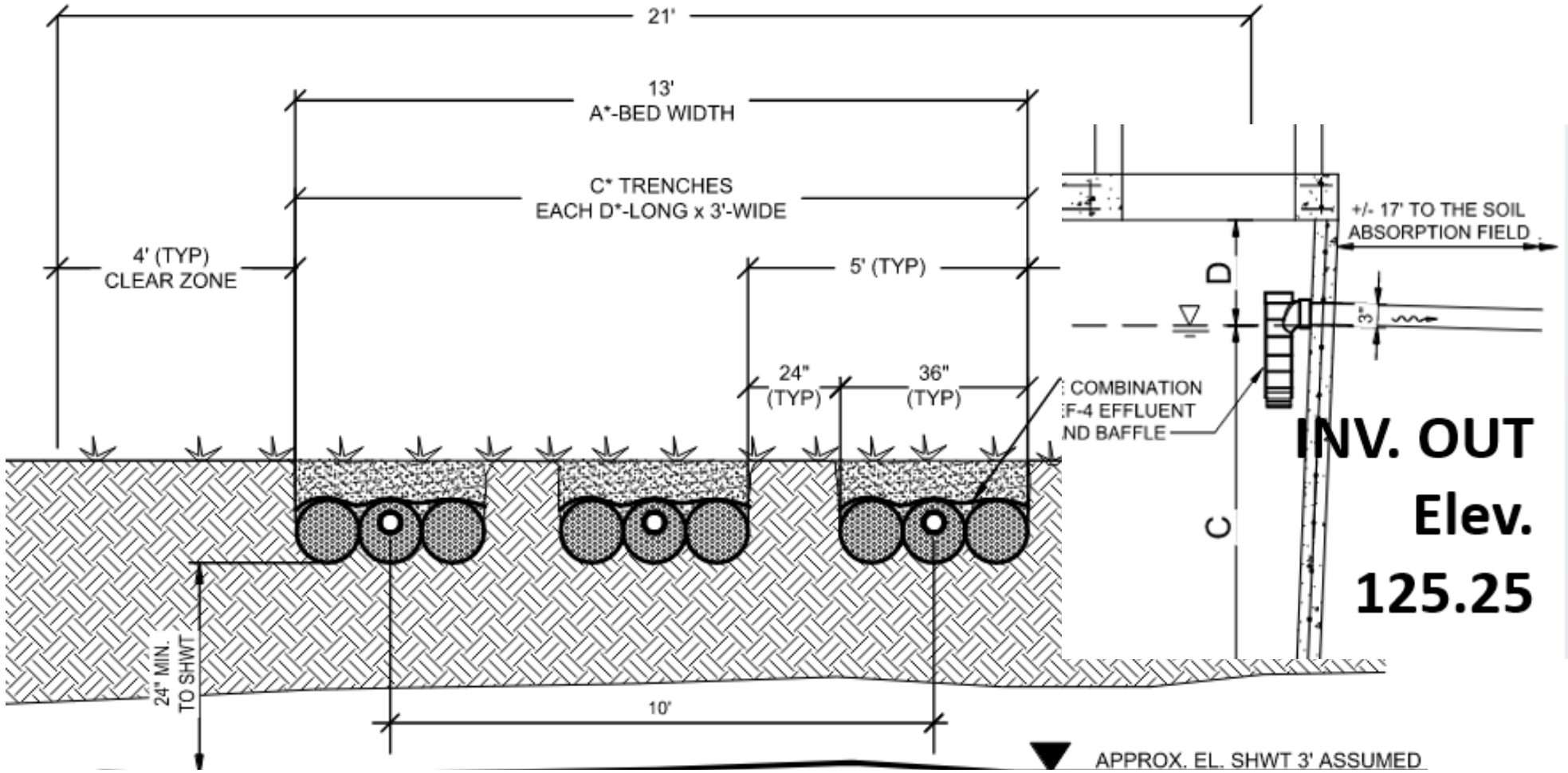
Always check system elevations

A simple small Site Plan, right?

The Tank


30" I.D. PLASTIC RISERS AND TOP GRADE WITH PREFABRICATED RISERS
GRADE EL. 133.0
6" (TYP)
2'-6"
4' MAX.
2'-6"
EL. 130.31
8"
+/- 17' TO THE SOIL ABSORPTION FIELD
3" PVC INFLUENT WASTE INV = 125.46 (FIELD VERIFY)
2.5"
D
3"
3" inlet?
TUF-TITE COMBINATION MODEL EF-4 EFFLUENT FILTER AND BAFFLE
INV. OUT Elev. 125.25
A
B
SETTLING ZONE
C
34 1/2"
CATEGORY 4 CONCRETE SEPTIC TANK
EL. 126.67
6"
F

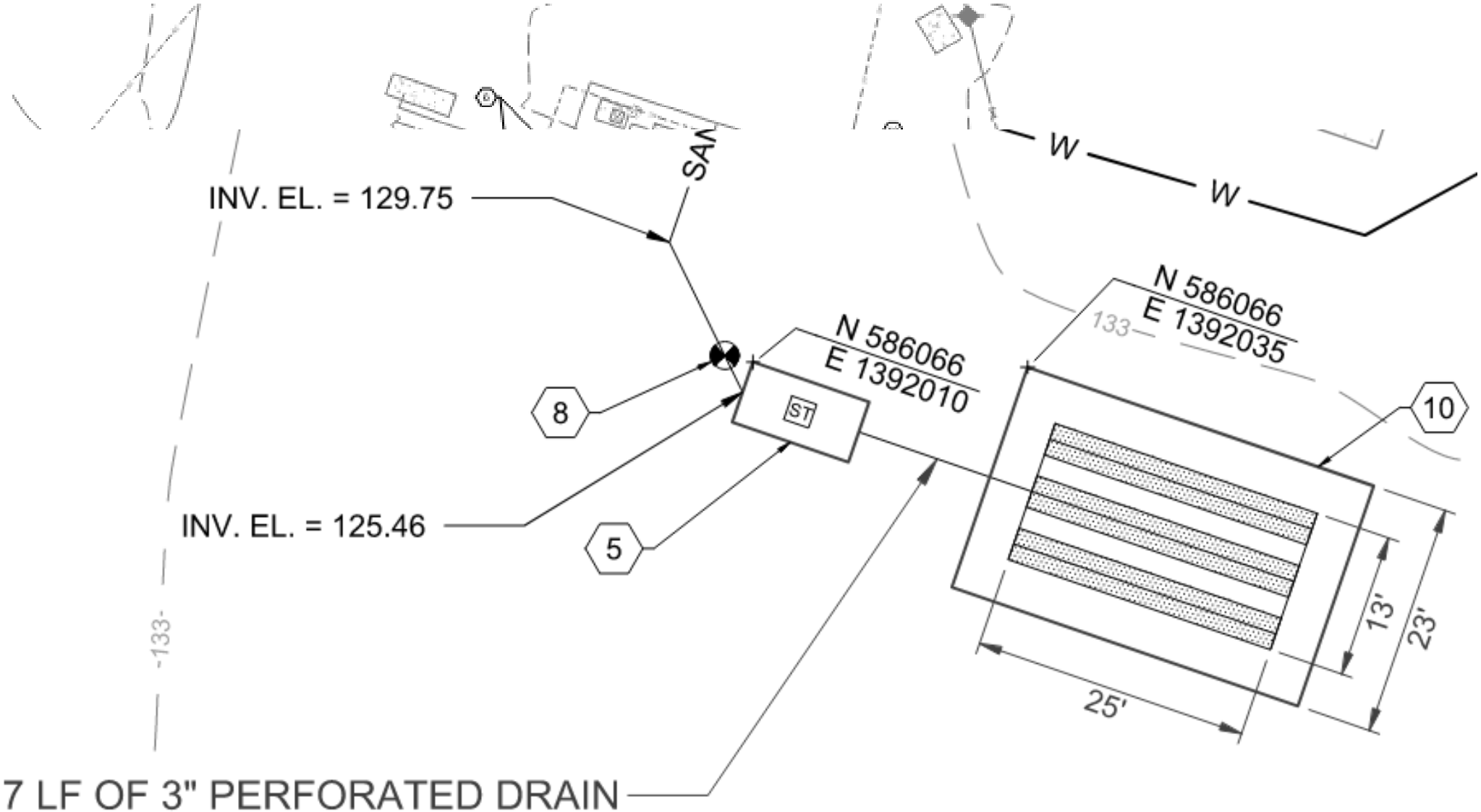
Drainfield Checks



DRAIN FIELD GEOMETRY

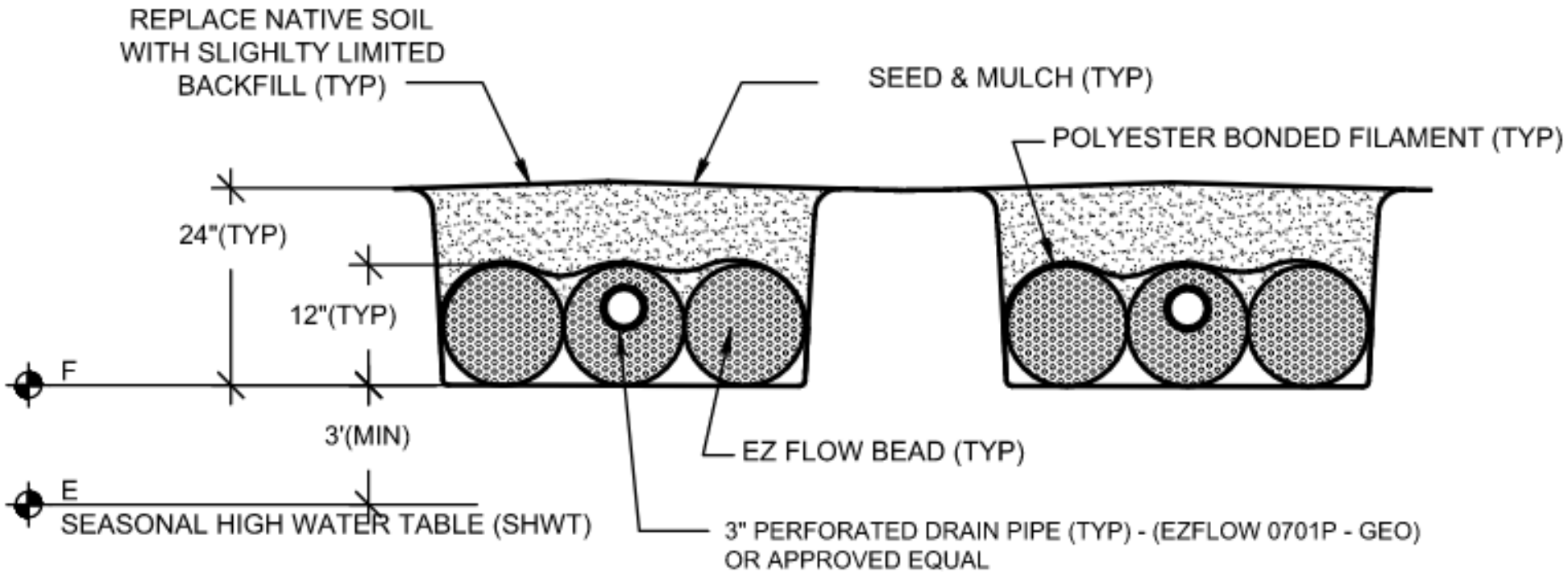
	A.	B.	C.	D.	E.	F.
	BED WIDTH	BED LENGTH	# TRENCHES	TRENCH LENGTH	SEASONAL HIGH WATER ELEV.	TRENCH BOTTOM ELEV.
OFFICE BUILDING/MILITARY INSTALLATIONS	23'	35'	3	25'	3' (ASSUMED)	131.0'

Air Force Base
Small Ammo Storage Building



Anyone see a pump tank?

Drainfield Checks



2 TRENCH DETAIL - SECTION

NTS

GENERAL NOTES:

ASSUMES NO UNSUITABLE SOILS IN THE DRAINFIELD AREA. SOILS WERE BASED ON THE U.S. DEPARTMENT OF AGRICULTURE SOIL SURVEY.

Case #3: Ski Area

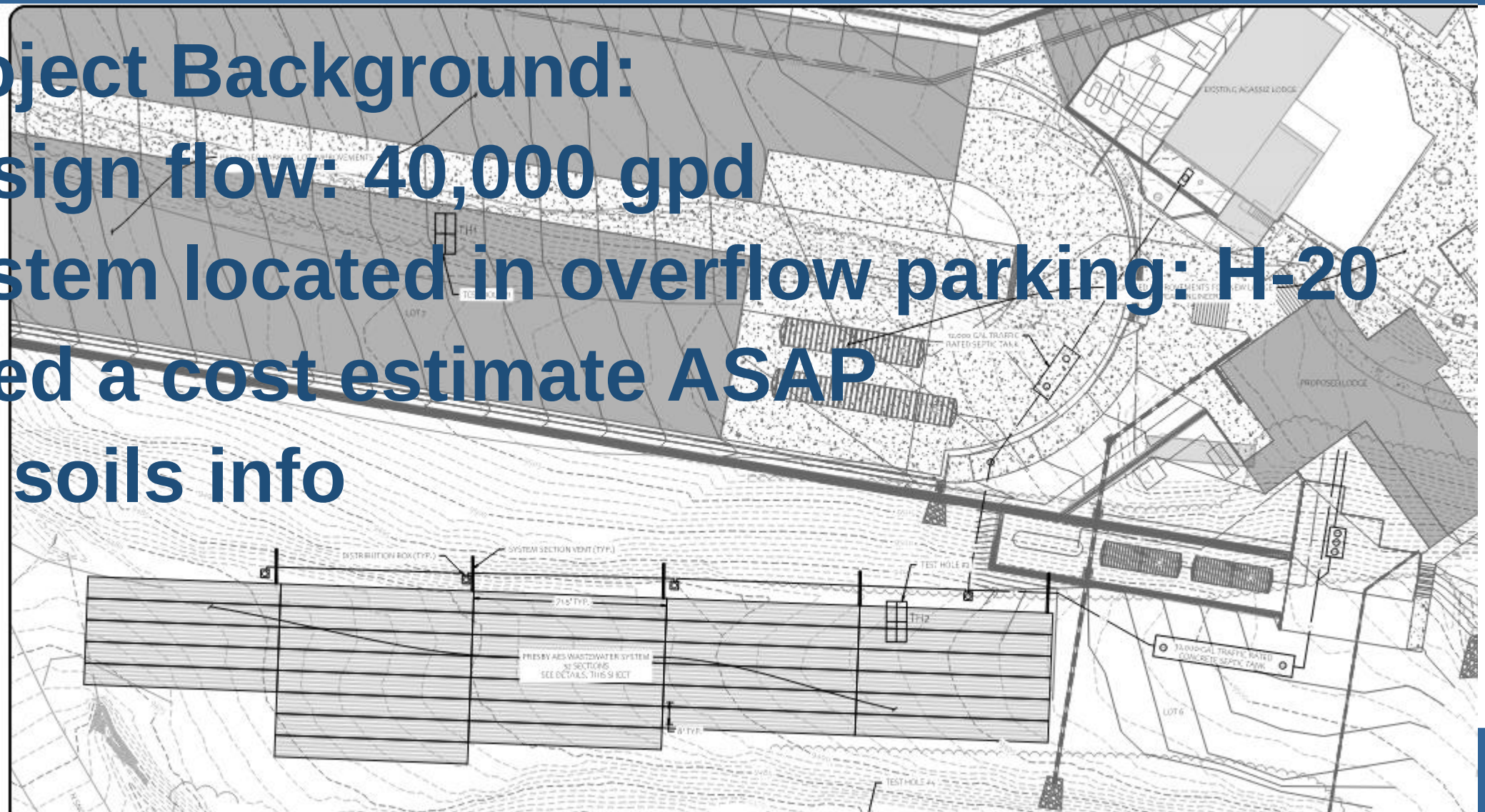
Project Background:

Design flow: 40,000 gpd

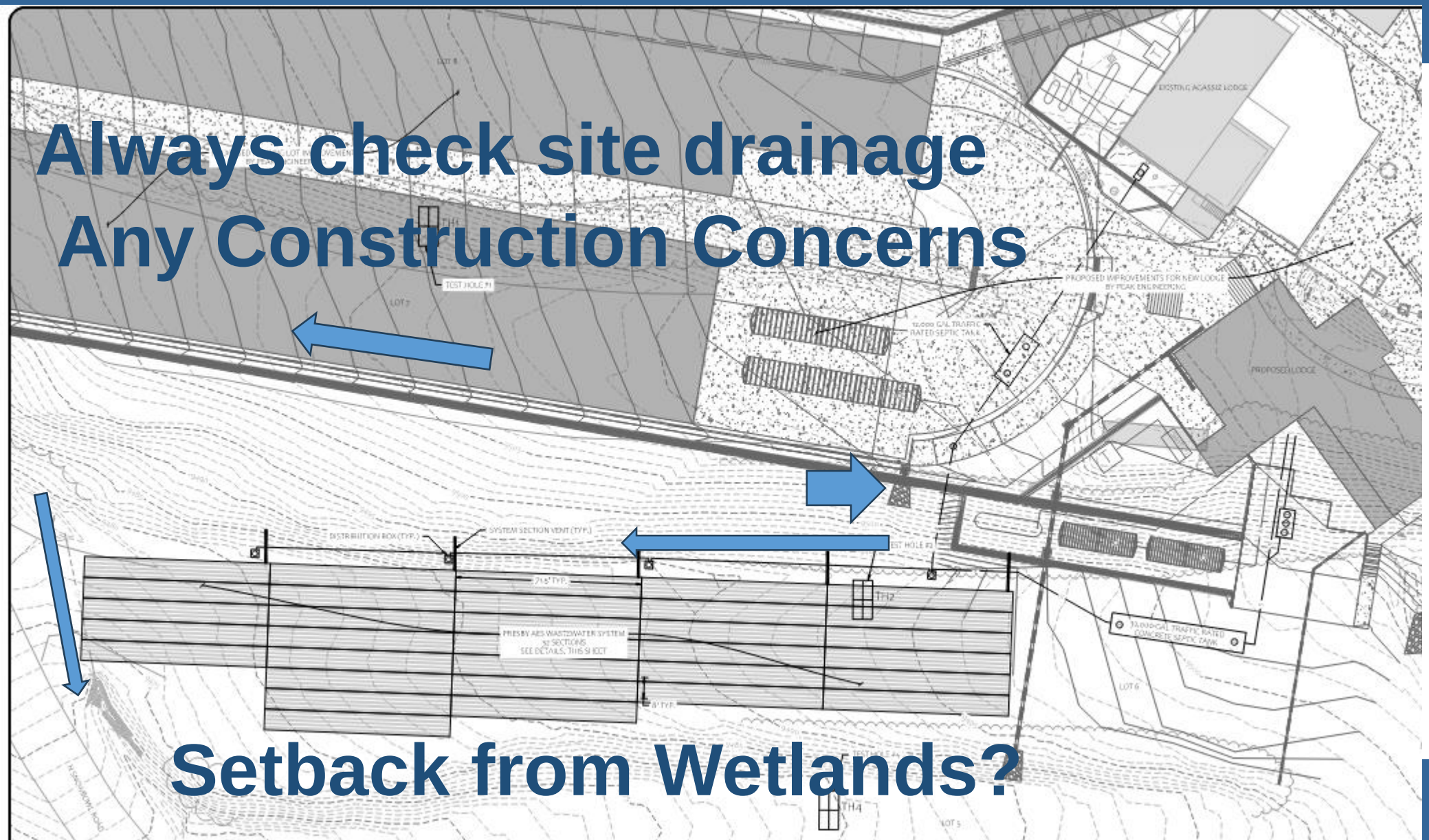
System located in overflow parking: H-20

Need a cost estimate ASAP

No soils info



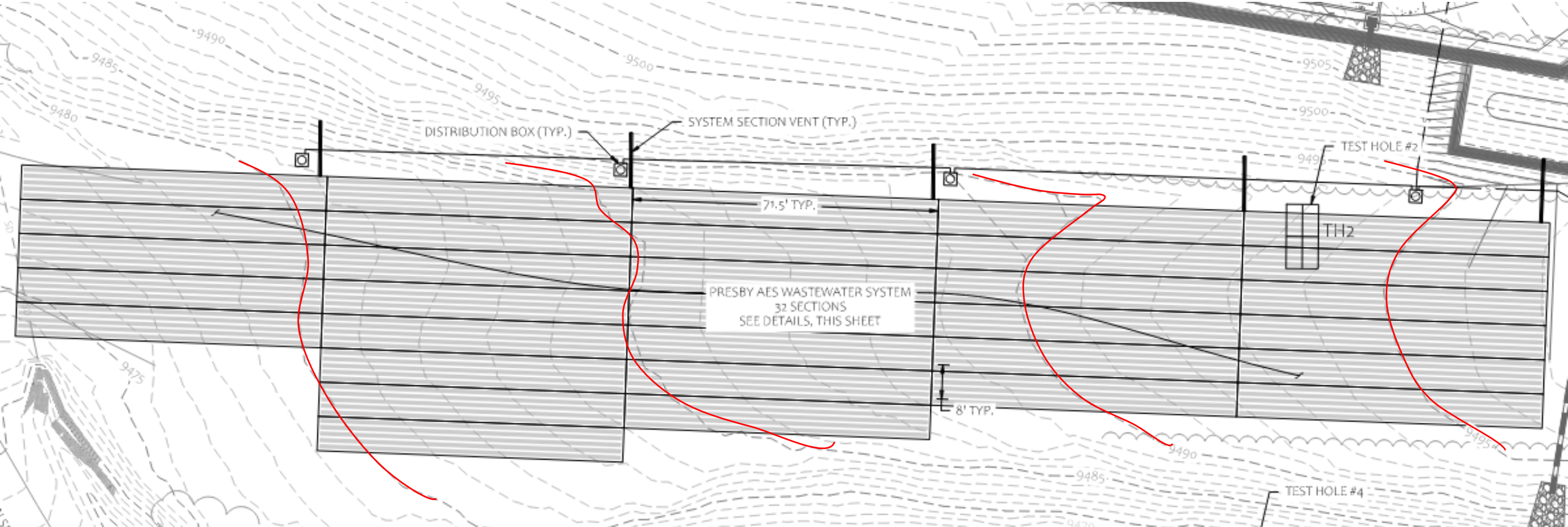
Case #3: Ski Area



Looking Closer

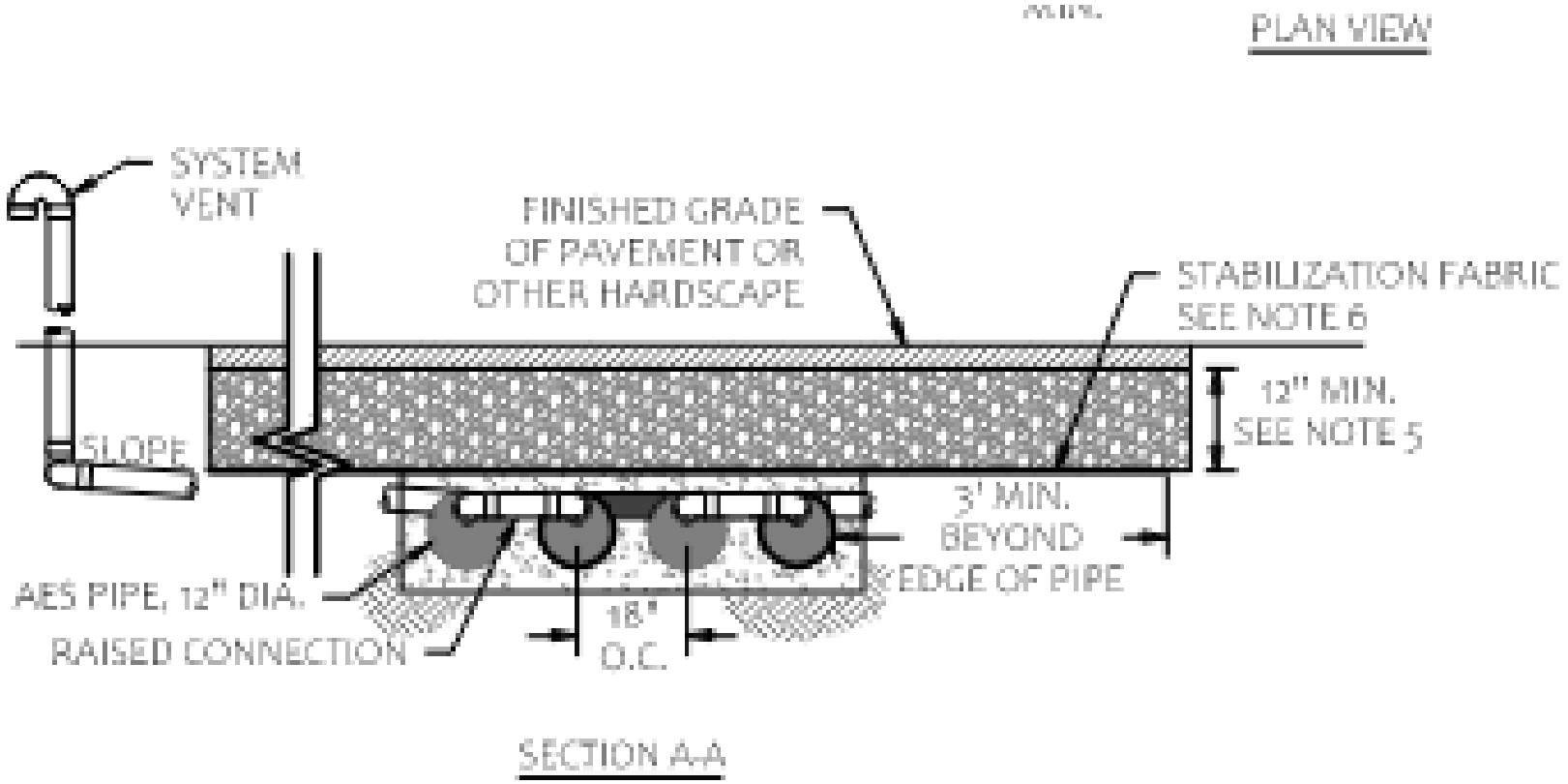
Notice anything?

Slope (7+%), distribution, spacing, stepped beds

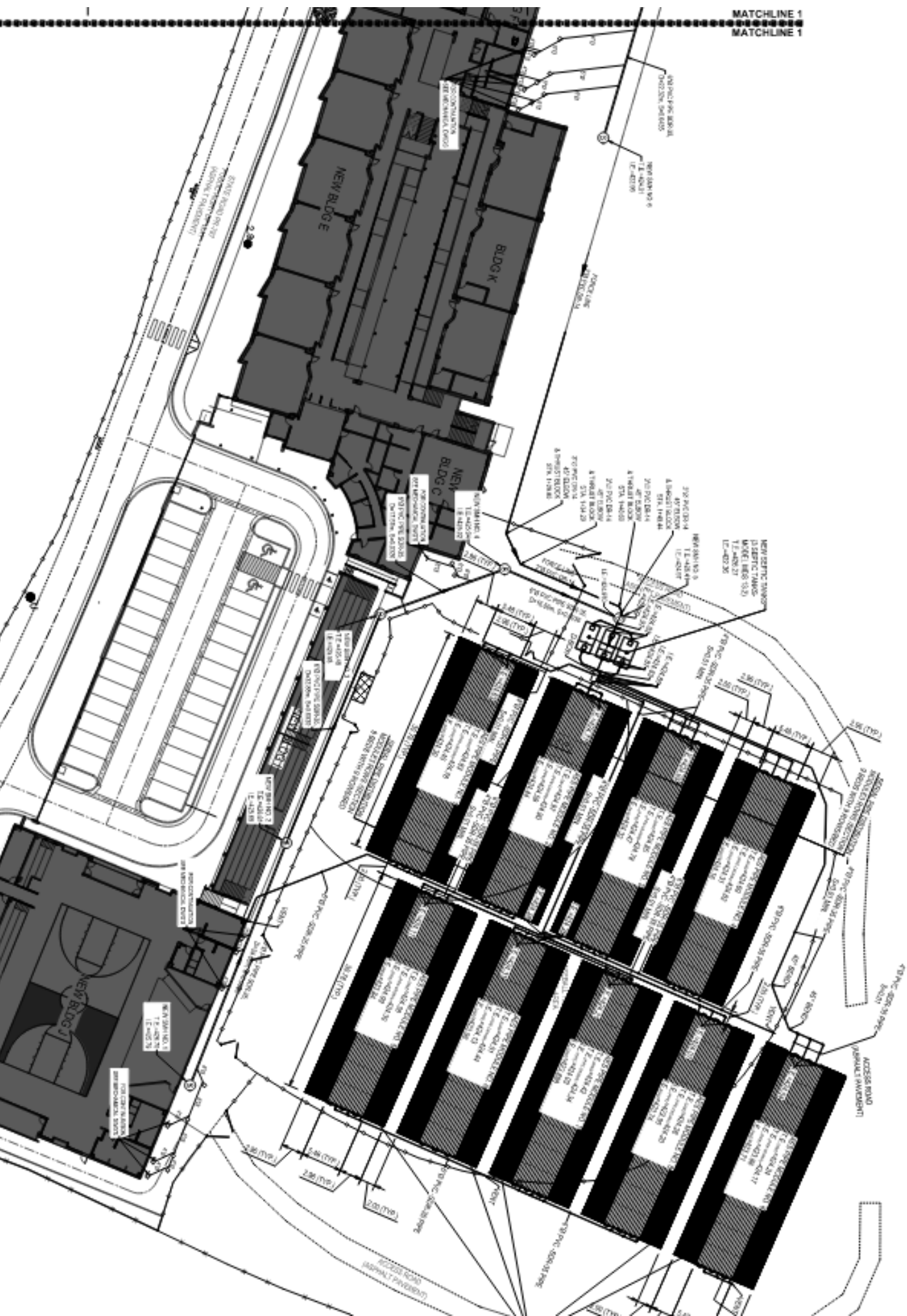


Ski Area

H-20 Detail Provided



Case #4: School



Looking Closer

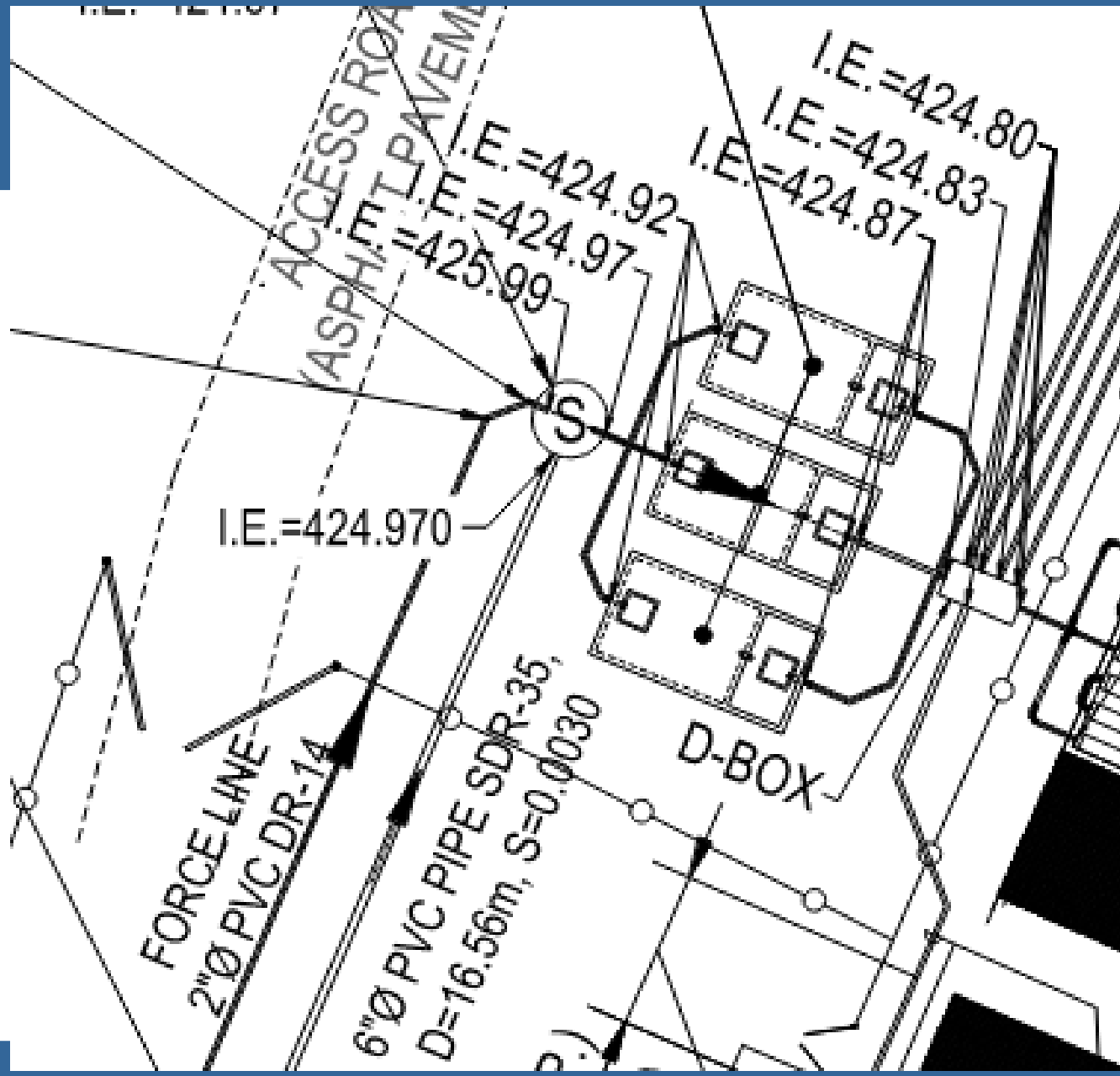
Multiple tanks

Flow Splitting

Sewer Manhole

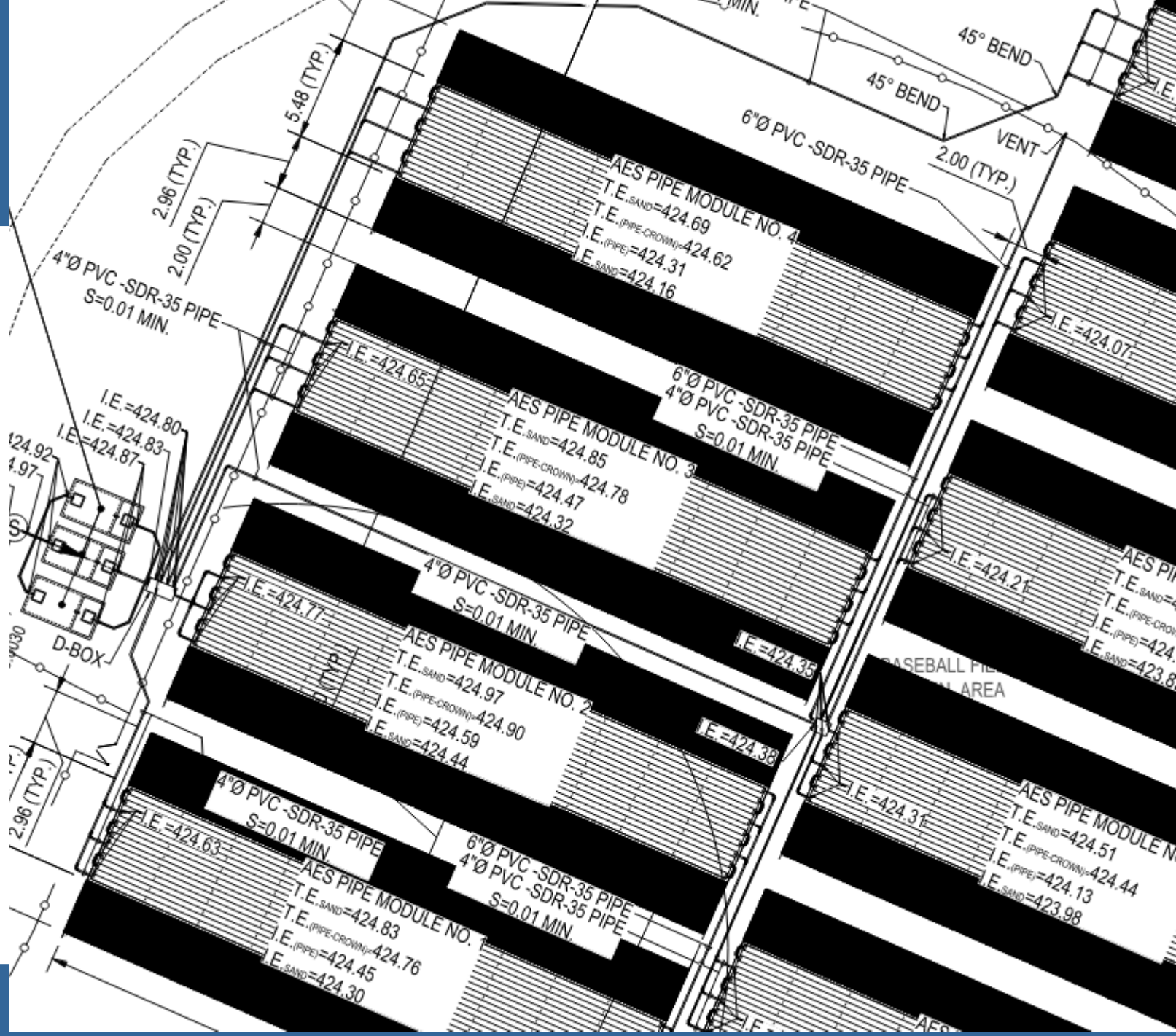
Equal Flow?

What would be a better way to do this?



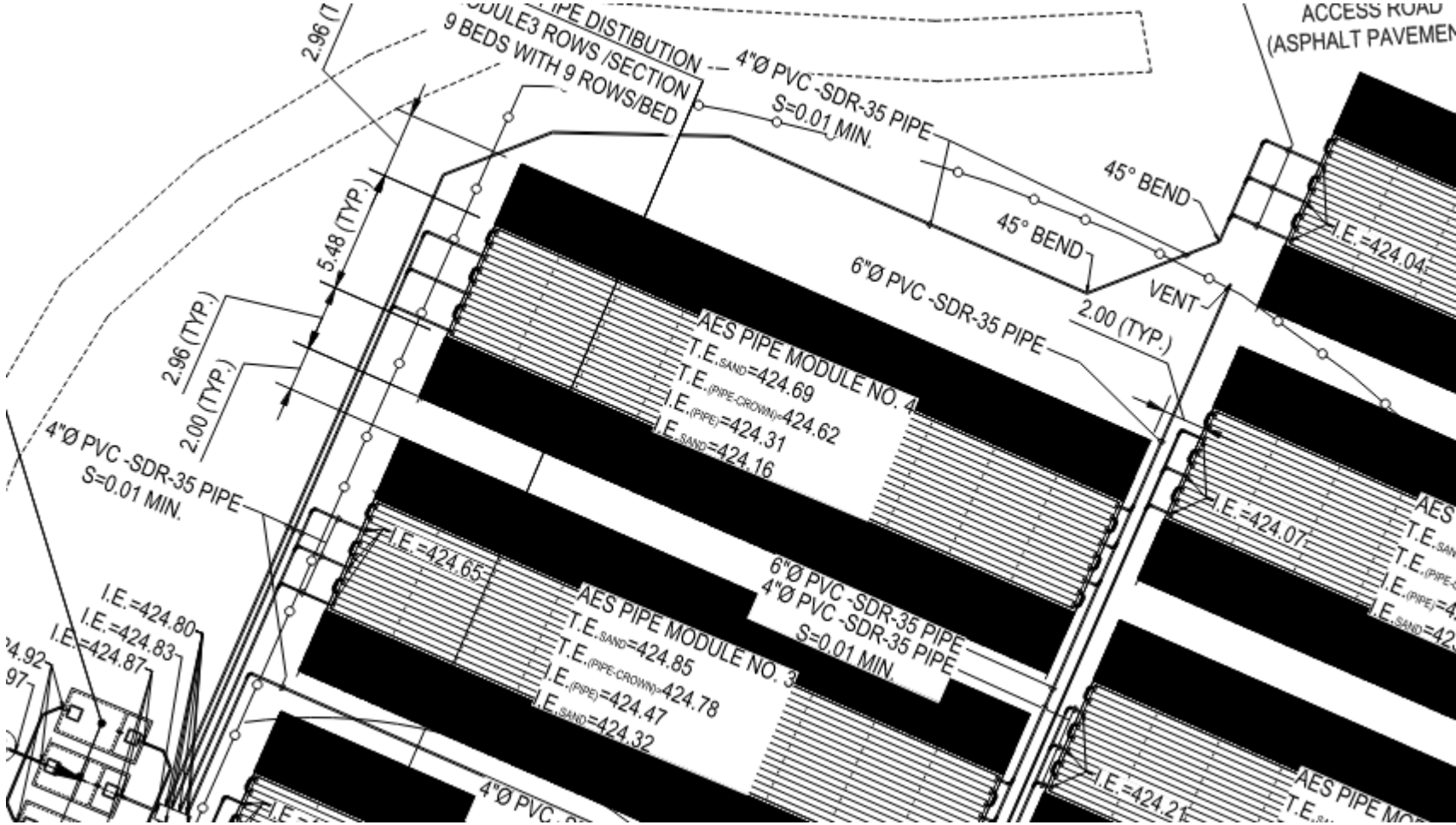
Looking Closer

- Distribution
- Each bed equal distribution?



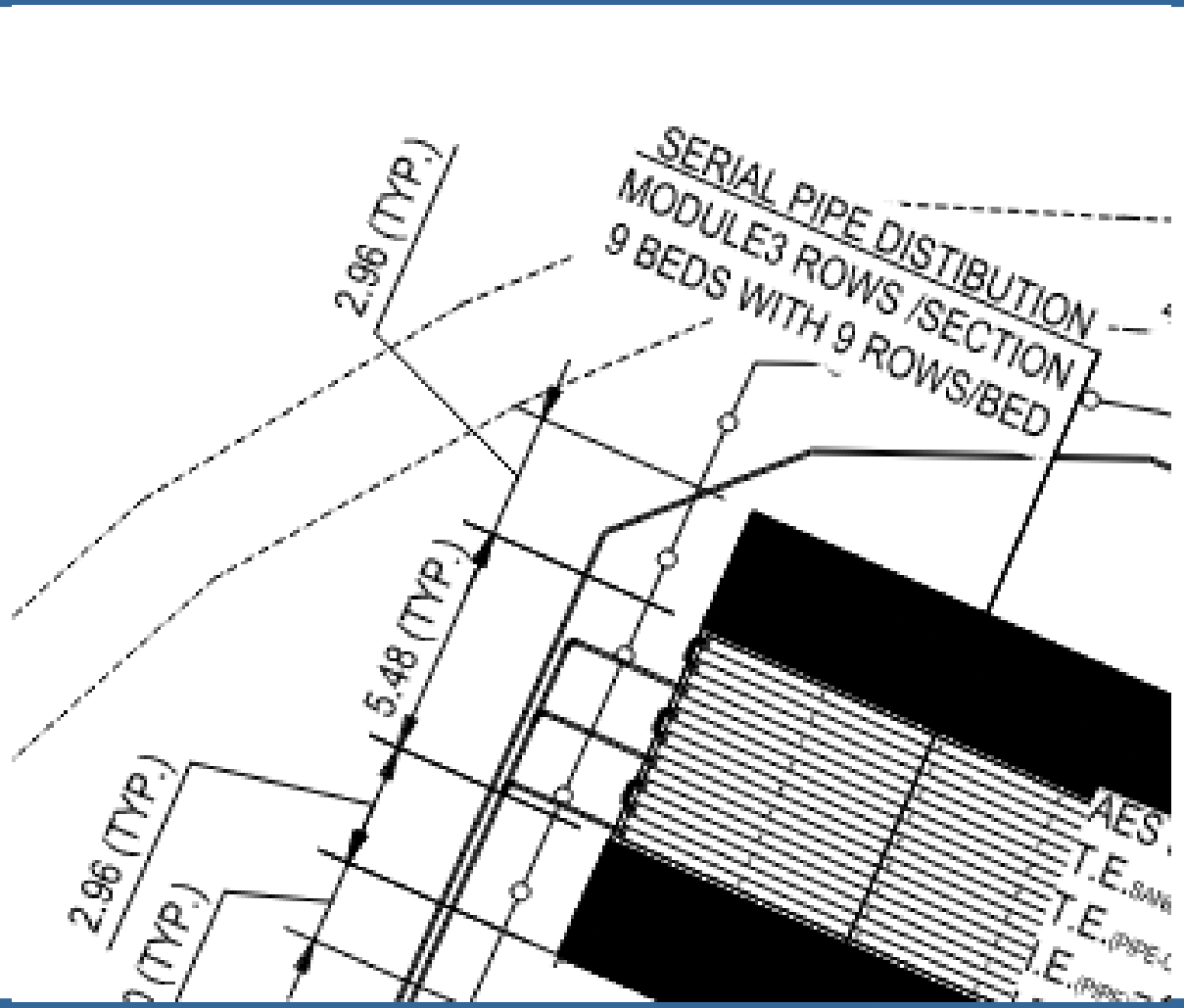
Looking Closer

- Bed #9
- Check Slope
- 1% min?
- Drop 0.76ft
- Run 90 ft
- Slope 0.84%



The more I look, the more I find

- Bed width?
- 9 rows
- 19 ft +/-
- They show 5.48’



Verify that the system will work

From:
Sent: Friday, February 7, 2025 4:25 PM
To:
Subject: Re: Fw: P80 Remediator Tech Data Sheet

Hi guys,

The State Dept of Health wants a statement from you guys that says the P80 unit will work for this project.

Here is what is proposed:

- **500 GPD flow from a small brewery with a tap room/beer garden.**
- **The specialized brew making system will generate 1000 - 2000ppm BOD per day depending on flow. 500 GPD.**
- **The 500 GPD proposed will also include bathroom/handwashing waste from customers in the tap room/beer garden. No food service waste produced.**
- **To reduce the 1000ppm wastewater strength in the 500 GPD flow to "domestic waste strength" of 300 ppm or less, then at least 2.9 lbs of BOD needs to be removed from the wastewater per day.**

Take Home Messages:

1. Get a hold of the plans and review thoroughly
2. Do not be afraid to contact the designer to review
3. Be a Mentor, Pass down your field experience

Questions?

Dennis F. Hallahan, P.E.
dhallahan@infiltratorwater.com