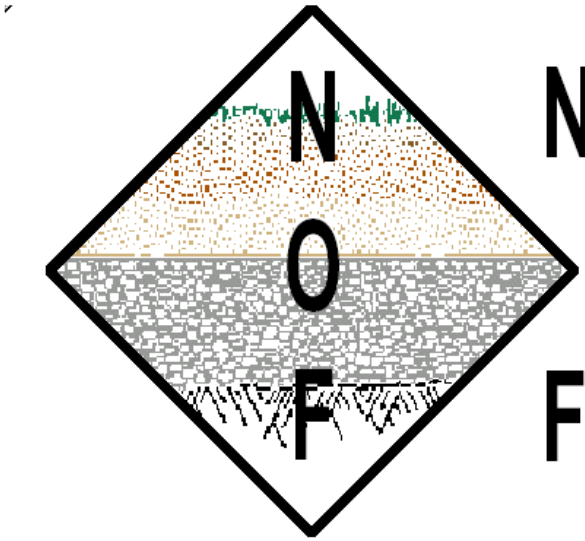
TRAINING PARTNERS



National Onsite Foundation

Pennsylvania College of Technology

PENNSTATE

Pennsylvania Septage Management Association

Drip Irrigation Inspection - AM

Continuing Ed Credit

Drip Inspection Endorsement

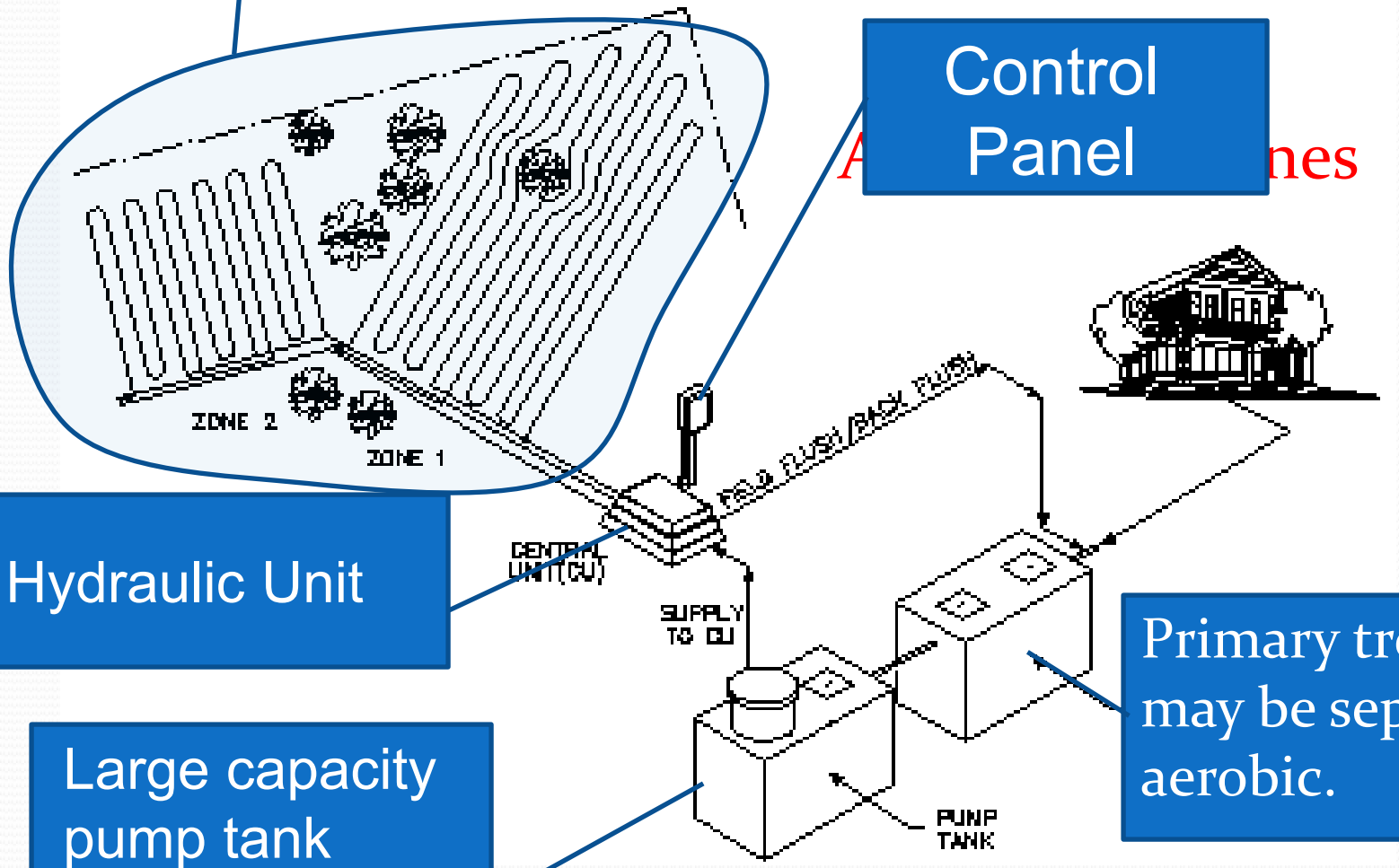
Understanding the Basic Operation

- Good Quality Effluent/Wastewater – Essential
- Low Volume Doses Applied Evenly and Around The Clock – No Aggregate – Liquid Must Dissipate Promptly.
- Final Treated Effluent Applied to larger then conventional areas at shallow depths in upper/top soils, (6 to 10 inches deep), on an Alternating Schedule.
- Additional Storage of Wastewater provided in a larger pump tank for higher/peak use periods.
- Systems have multiple filtering and self cleaning functions to minimize potential clogging of small emitter passages and holes.

Typical

Drip Field – Minimum of Two Zones

Control Panel



Hydraulic Unit

Primary treatment may be septic or aerobic.

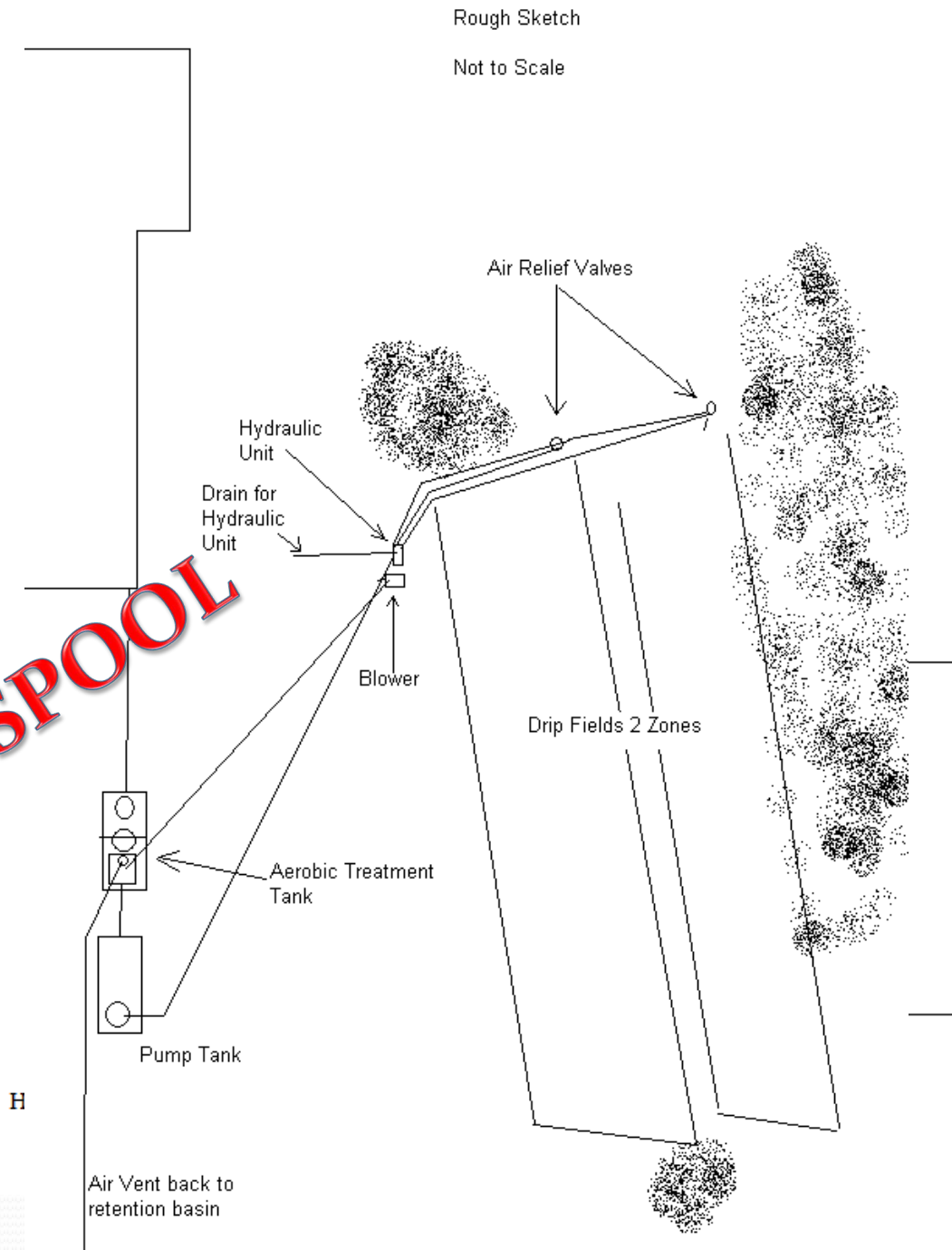
Large capacity pump tank

Each Operating Function is

- Critical
- All functions depend upon the others for the concept to work successfully.
- So, how many functions should an inspector verify?
- Hint, ALL, at least **twice** for each function. Second round testing has revealed defective issues on multiple occasions. I will elaborate, Oooo-goodie.

ACTUAL EXAMPLES

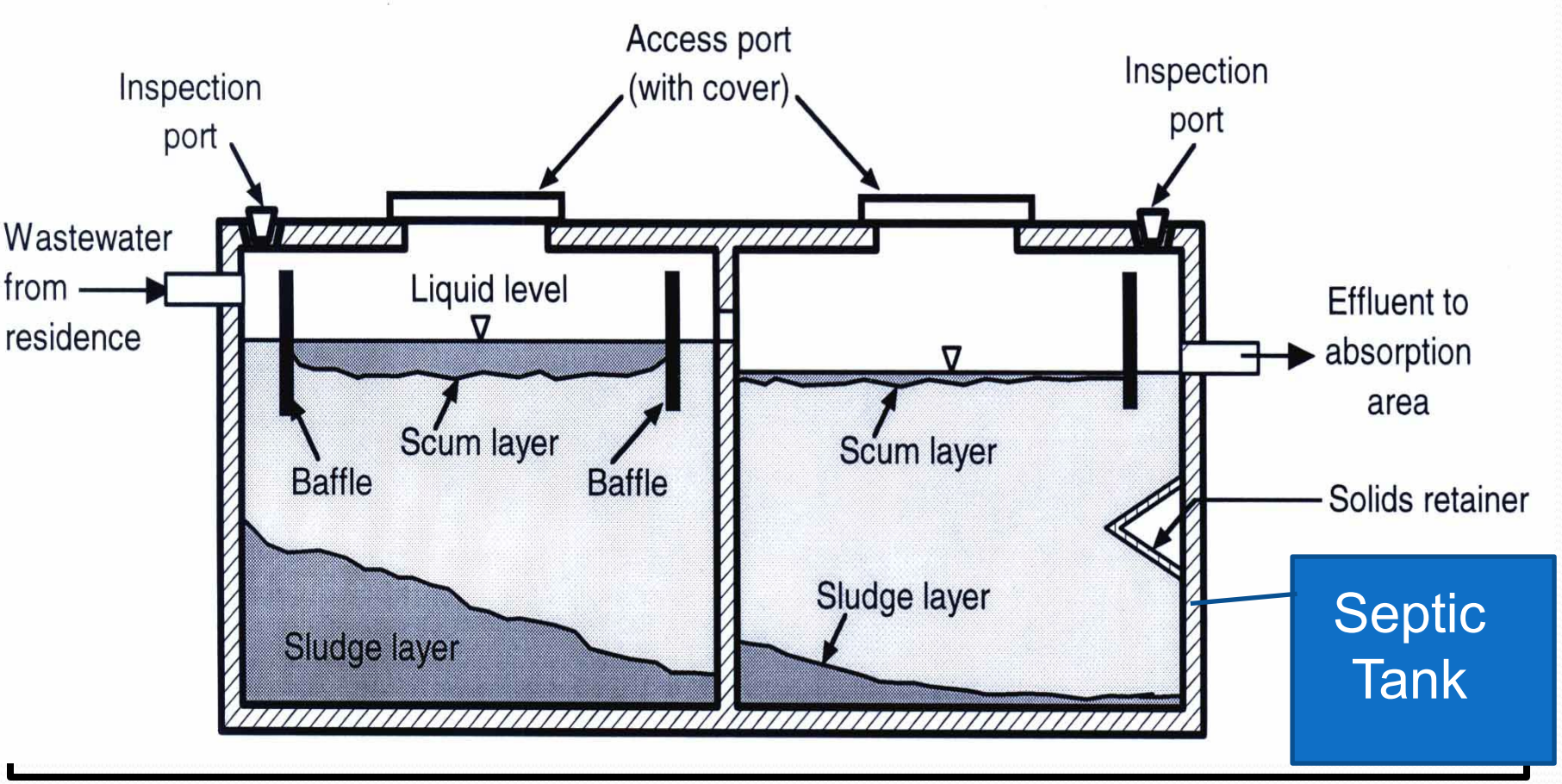
NOT YOUR GRANDMOM'S CESSPOOL



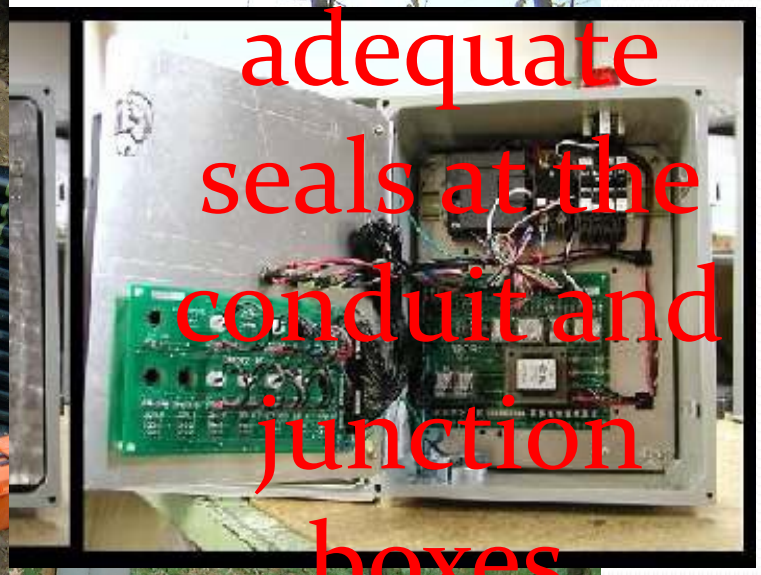
Design/Permit Information

- The design specifications need to be studied for bedroom/design flow adequacy. (Not unheard of to find more bedrooms then approved)
- Dosing Rates will need to be found for system operation testing.
- Length of Doses will be needed, (minutes of run time).
- Forward Flow/Flush Rates will need to be found for testing, as well.
- This and other information can only be gotten from the design and, or start up information.

Inspect Pretreatment Tanks as Instructed in the PSMA Standards



Drip Control Panel - Outdoors



Look for adequate seals at the conduit and junction boxes.

Nerve Center – Must be in Control of Panel

Corrosion and Gases don't mix with Electronics

Enclosure/Housing

Box mounting on a structural post or the house wall

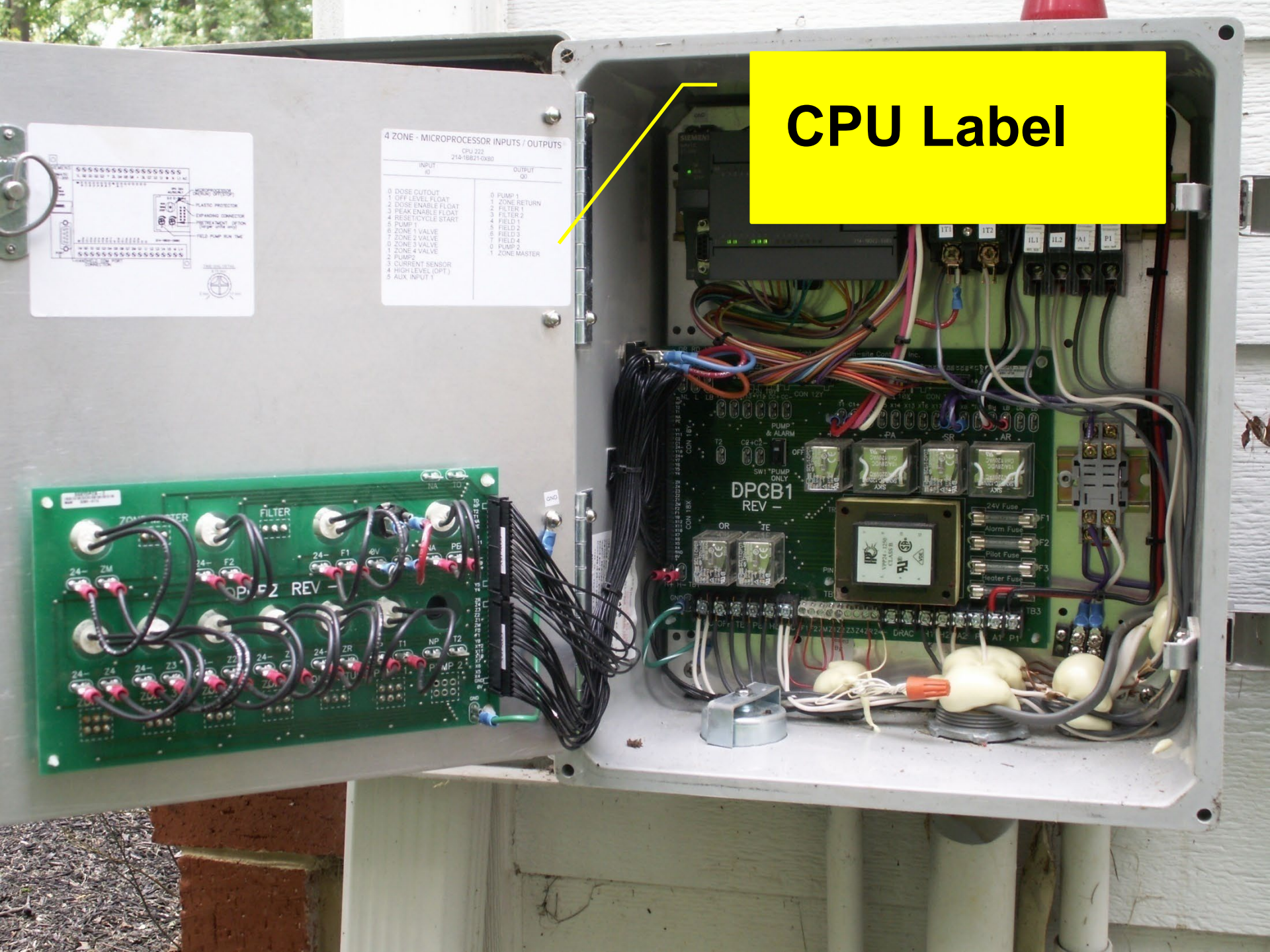
You may think Water and Electricity don't mix, the fact is they do but you may not like the outcome.

LETS REVIEW WHAT WE JUST SAW-

A box of many switches

•There is complexity in these boxes, with switches, lights, relays, fuses, a CPU (computer processing unit) and labeling.

1. It is strongly recommended you take a picture of all switches and status lights within the control box prior to making any changes.
2. Focus on the labeling second.
3. What is the positioning of all breakers?
4. What is the status of the CPU light array? Check interior reference label.
5. Note the exterior switch positions and lights upon opening/arrival.
6. With this information, initially, you gain status of basic electrical function, pump tank liquid level, number of installed and active drip zones, etc.


CPU Label
4 ZONE - MICROPROCESSOR INPUTS / OUTPUTS
DPCB1
REV –
FILTER

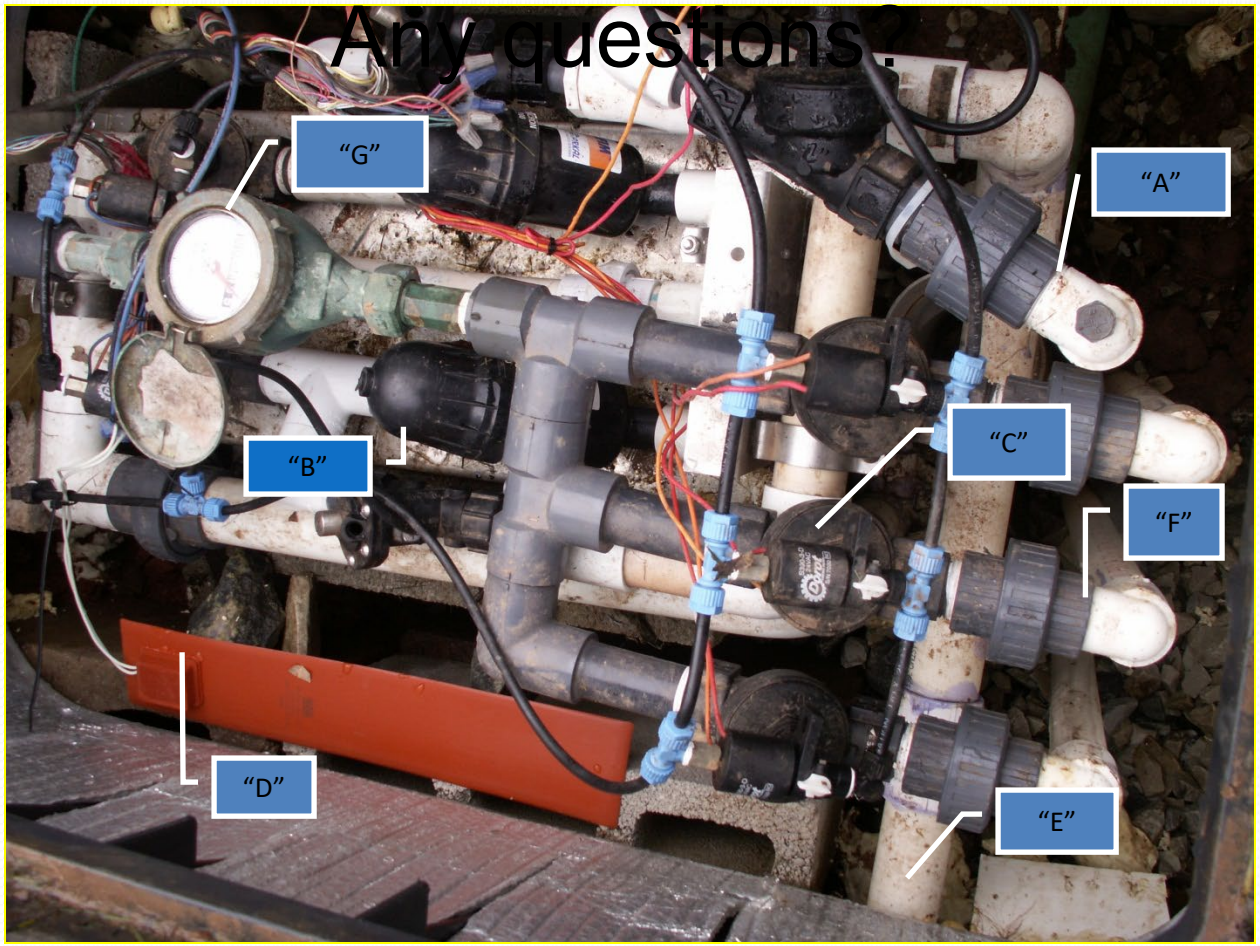
Any questions?

Lets see the panel in operation

Any Questions about the panel?

What is this Unit?

Any questions?



Can You Name the Components?

Lets look at safety practices and procedures as we begin the inspection of the hydraulic unit.

Judging a Book By It's Cover

- Provides access to a complex hydraulic distribution unit
- Provides protection from surface water, if properly installed and graded
- Provides an insulated environment to protect from freezing conditions

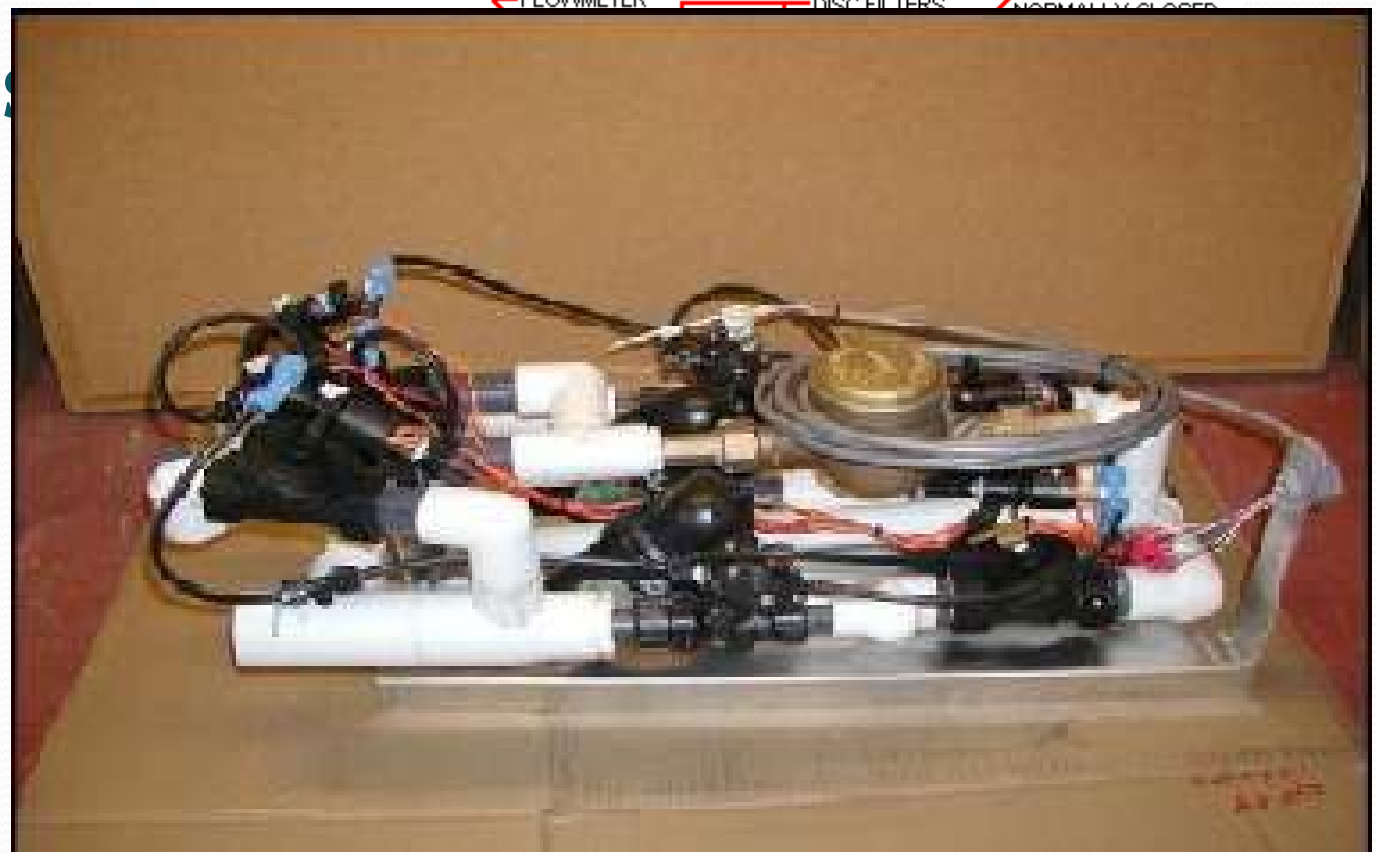
- Enclosure must be intact, free from damage, breaks, missing bolts, etc.
- Grading around enclosure must deter surface water away from unit
- Insulation within walls and underlayer are crucial to retain warmth
- Enclosure must not be negatively impacted by earthen settlement/shifting

Protective Enclosures and Water

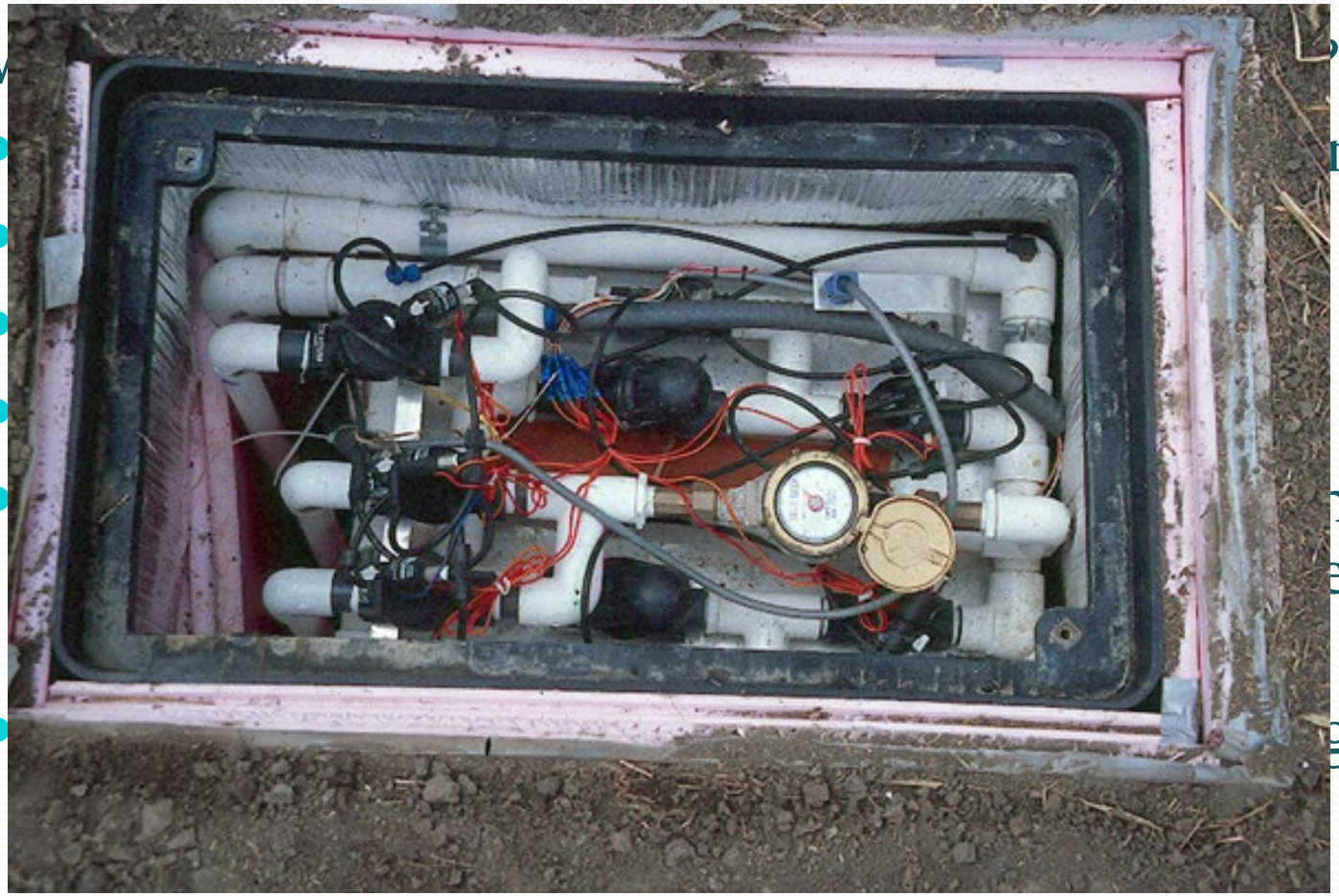
- When should a daylight drain be required?
- What is a daylight drain?
- Code does not mandate it.
- If silt staining or evidence of past submersion exist within the hydraulic unit, a daylight drain should be present if not it is an unsatisfactory condition.
- If an enclosure fills with water, what are the risks with solenoids, valves, a heating element, wire splicing, etc.?
- How might past water have gotten into the unit? Eliminate the source, too, if possible.

The Hydraulic Unit Array

Ins



The Hydraulic Unit



- nts
- ng of the
  ent slide,
- g to be

Testing of this component will need to happen in two ways.

Manual and Automatic

Please note that it is best if you first – Take a picture of the hydraulic unit. Note the position of all the little valves on the pressure valves.

Timing is important in this process.

System Operation at the Box

Automatic Functions Testing

Fill the pump tank to a level between the dose enable float and the peak enable floats

Filter flushing prior to each dose start – Both Filters are cleaned, with flushing, wasted water discharging to the head of the treatment tank. Observe the activation light and alternate filter flush, followed by the beginning of the dose, and to which zone. Then perform a reset and allow the auto filter flushing to reoccur, followed by the start of a dose to the other, or next, zone in sequence. Continue this until all zone doses have been started and showed auto filter flushing normally.

- Dose Cycle Testing – Begin a dose on Automatic, note the start time, allow the zone to pressurize and then time the gallons per minute flow rate. Note the dose shut down time and compare to the design information, (filter flushing could interrupt a dose after about 5 minutes, allow time).
- Compare the rate to the design information and, or startup sheet.
- How does the rate compare? If off by more then 10% = Unsatisfactory, retest the dosing rate regardless to recreate the condition. Being tested within automatic functions, rather then manual will identify defects not found during manual operations.
- Repeat dosing rate and time duration testing for each zone.

Time for some math questions

How do we get 10% of a value (a number)?

Answer:

Multiply a given number by .1

Flow rate evaluation formulas.

Determination of satisfactory flow range

Example:
Flow rate of 5.6GPM times .1 = .56
5.6 - .56= 5.04
5.6 + .56= 6.16

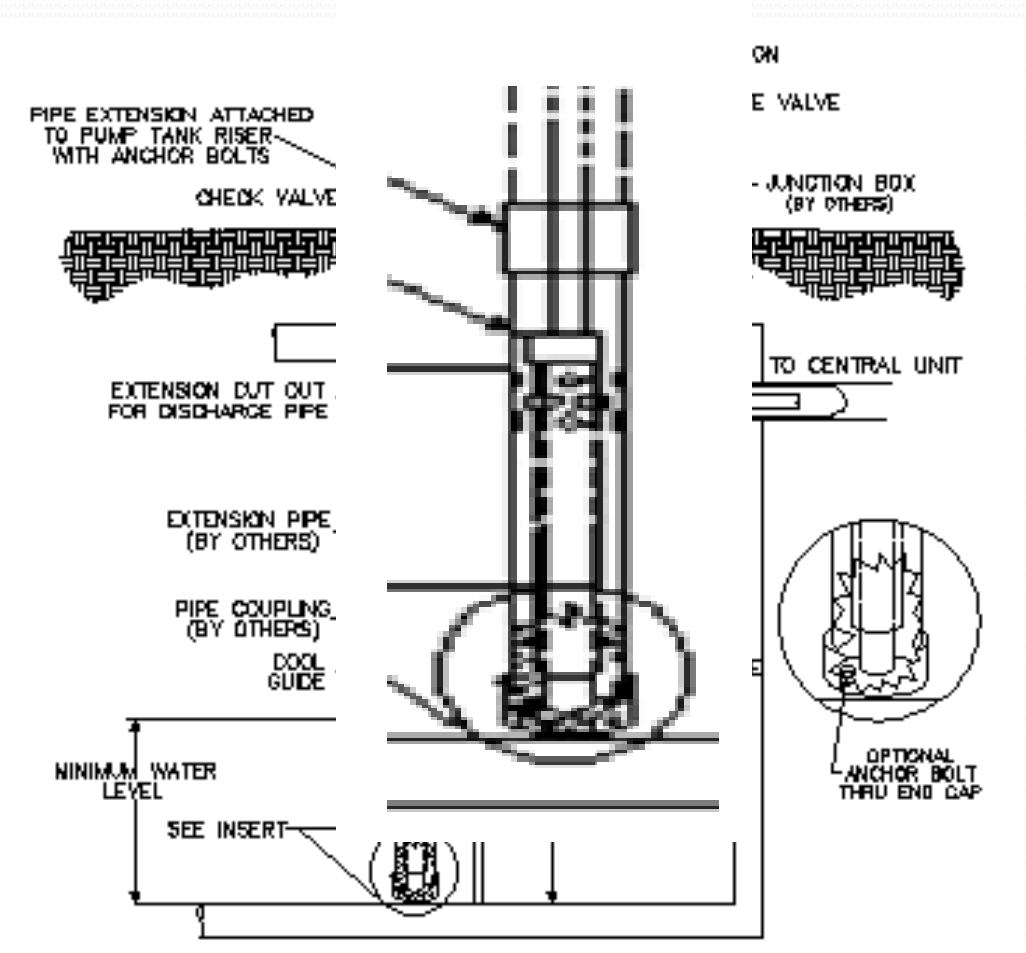
Pump Tanks

- Pump Tanks are sized two and three times larger then the common pump tank.
- Capacity for Storage of Wastewater
- Large Capacity allows time for a spaced and rationed application of the wastewater to the dispersal fields.
- Operating ranges, dose enable, peak enable, alarm.
- These functions will need to be tested for each range. Asking questions like does the appropriate panel light activate, i.e. alarm, peak enable and alternating switch over.
- Float switches will need to be verified for correct position at the control cpu, i.e. float #1 reversed position with #2.

What makes a drip pump tank different from most pump or dosing tanks?

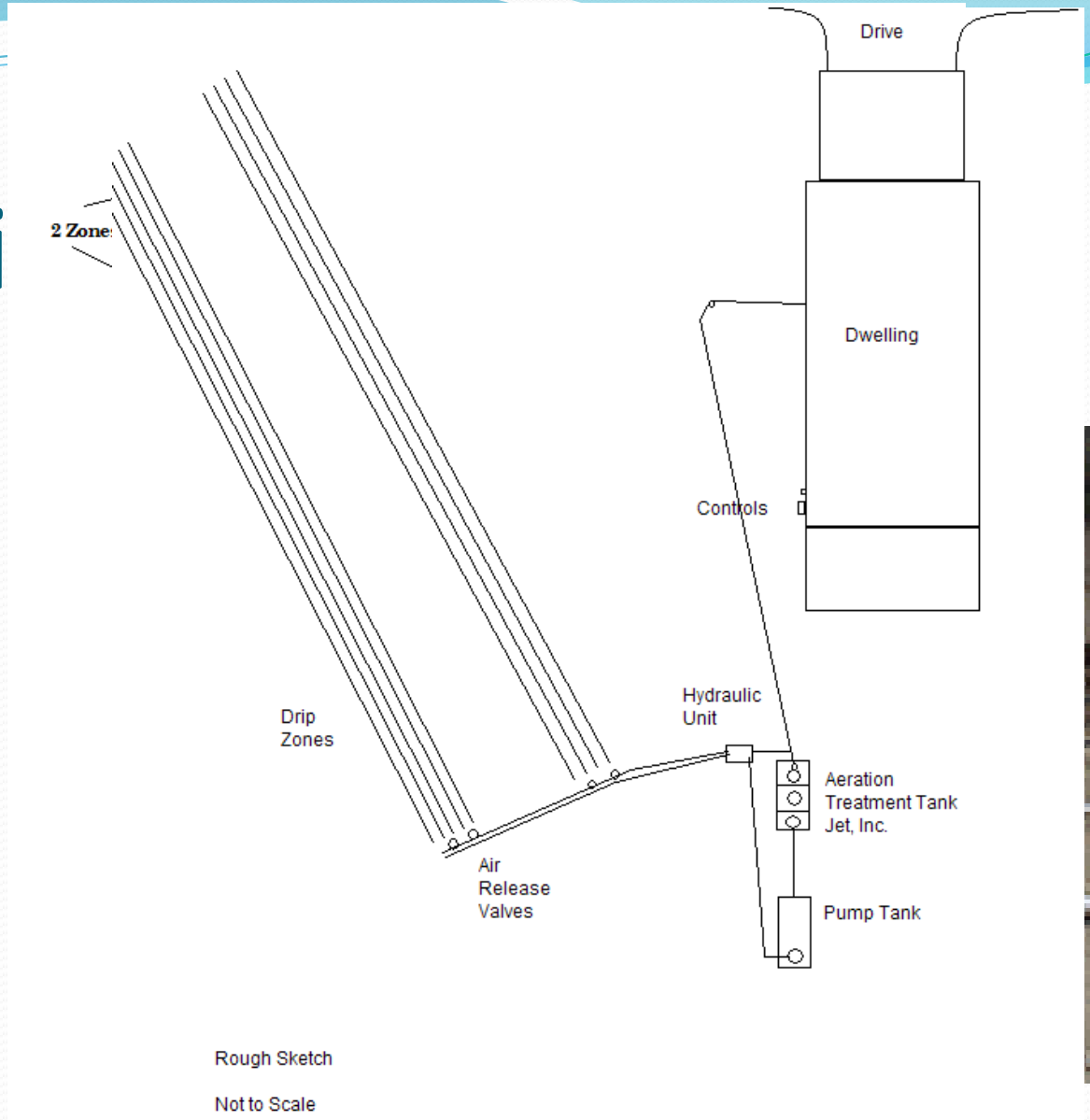
Capacity

The Pump Tank

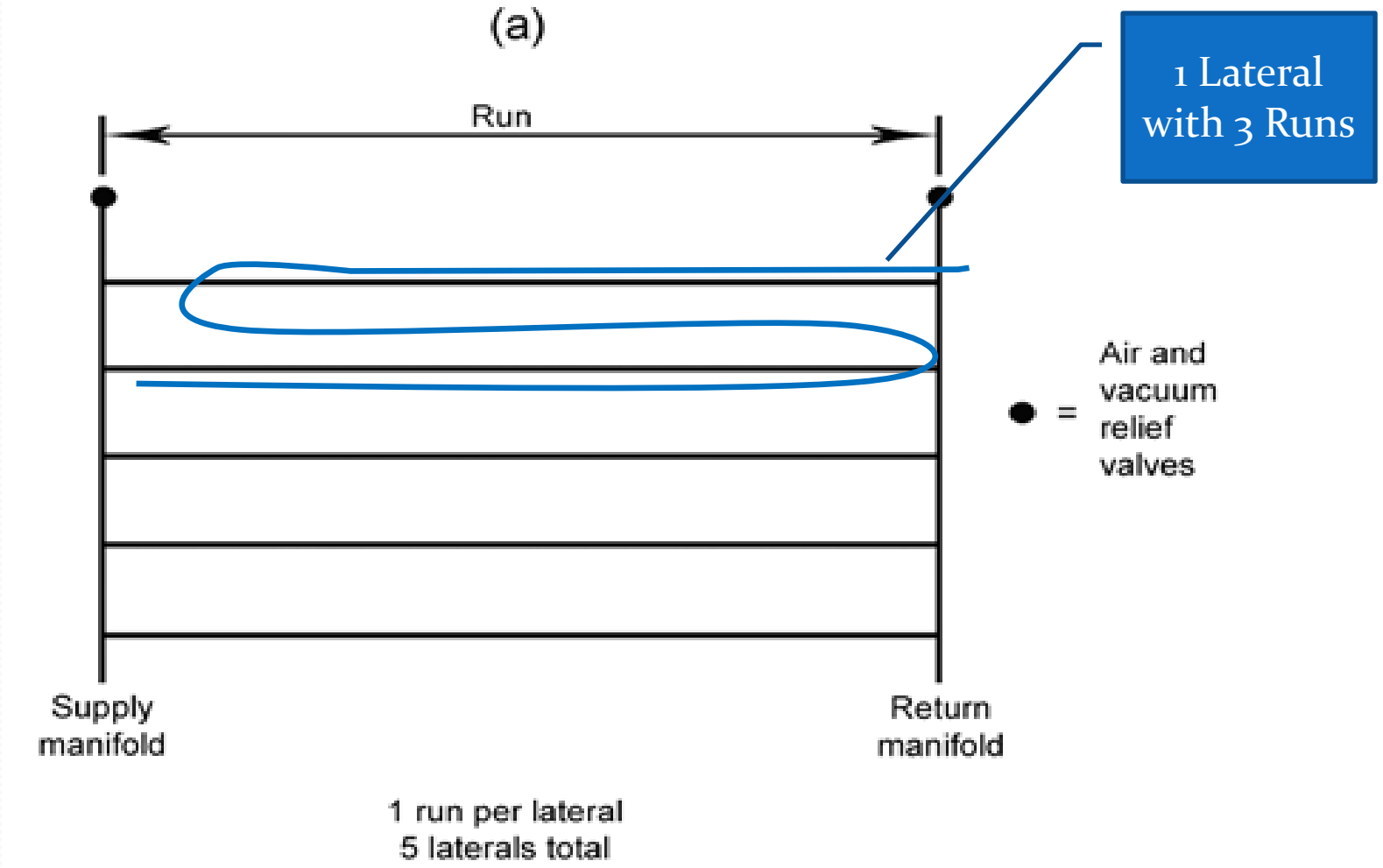


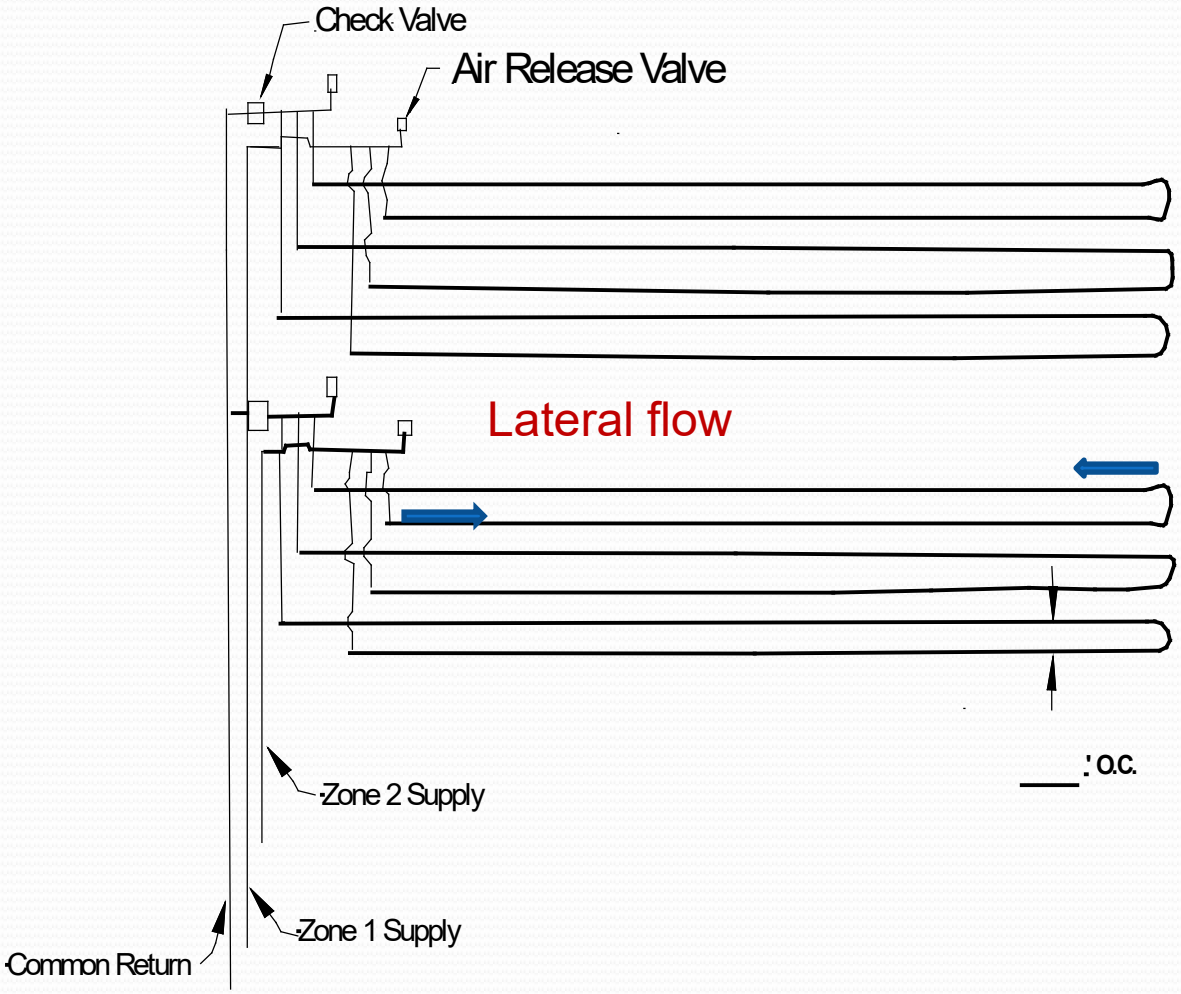
Pump Intake Screen and Cooling Guide

Drip Di


Drive
2 Zone
Dwelling
Controls
Hydraulic
Unit
Drip
Zones
Aeration
Treatment Tank
Jet, Inc.
Air
Release
Valves
Pump Tank
Rough Sketch
Not to Scale

Run: Length of drip tubing placed on a single contour of a drip distribution lateral.




Check Valve
Air Release Valve
Lateral flow
: o.c.
Zone 2 Supply
Zone 1 Supply
Common Return

Inspection of the dispersal fields

- No probing – to avoid damage to tubing – 6 to 10 inches deep
- Surface viewing and walkover – during dosing cycles, looking for leaks, spouts, moisture
- Locate Air Release Valve Covers
- Look for exposed tubing – Not as rare as one might think – Animal Attraction to Chew
- Look for changes or plantings over, or near the dispersal fields – Did a small tree planting potentially encroach on a drip zone? Could tubing have been damaged by the planting? Flow rates may help answer such questions.

Air Release Valves

- Critical function to allow the system drain down
- Release valves must be within a prote a 7 inch, round plastic irrigation box
- The valve must function, with slight pressurization, but then complete se
- Release valves are generally located c
- The valve and protective cover must should be positioned at a height whi close normally, and without imposin release valve, itself.

Fill out the check list

Gather your information

Complete sketch

and

write your report.

Questions?

Comments?

Insert a Client Advisory

High Technology System - While the system type and design, in place, has been shown to be reasonably dependable throughout our region, it does utilize some fairly advanced technologies.

These technologies combine various principals of wastewater technology, such as, aerobic treatment, small batch time dosing, self cleaning filters, and re-circulating maintenance flushes.

All of these principles are favorable in logic and application, however, they require the use of electrical motors, valves, switches and a computer, used in adverse conditions

Inevitably, this kind of circumstance will mean that routine monitoring, adjustments and, or parts replacements will become necessary to keep the system functioning and at peak performance. The client should simply be aware that this will mean annual maintenance/operations costs in today's dollars of about $400 to $500. We strongly recommend that the client enter into or continue a maintenance agreement with a Responsible Management Entity(RME).

The Overview

- What is the condition of the system?
- What is the status of any maintenance contracts and the associated costs?
- Is the client, (buyer), familiarized with the advanced nature of the system and the critical need for operation and maintenance services?
- It has been uncommon, in my experience, to find drip systems, in place, which do not need some type of repair as a result of inspection for real estate activity. All, however, were resolvable.

THANK YOU FOR COMING

Discussion