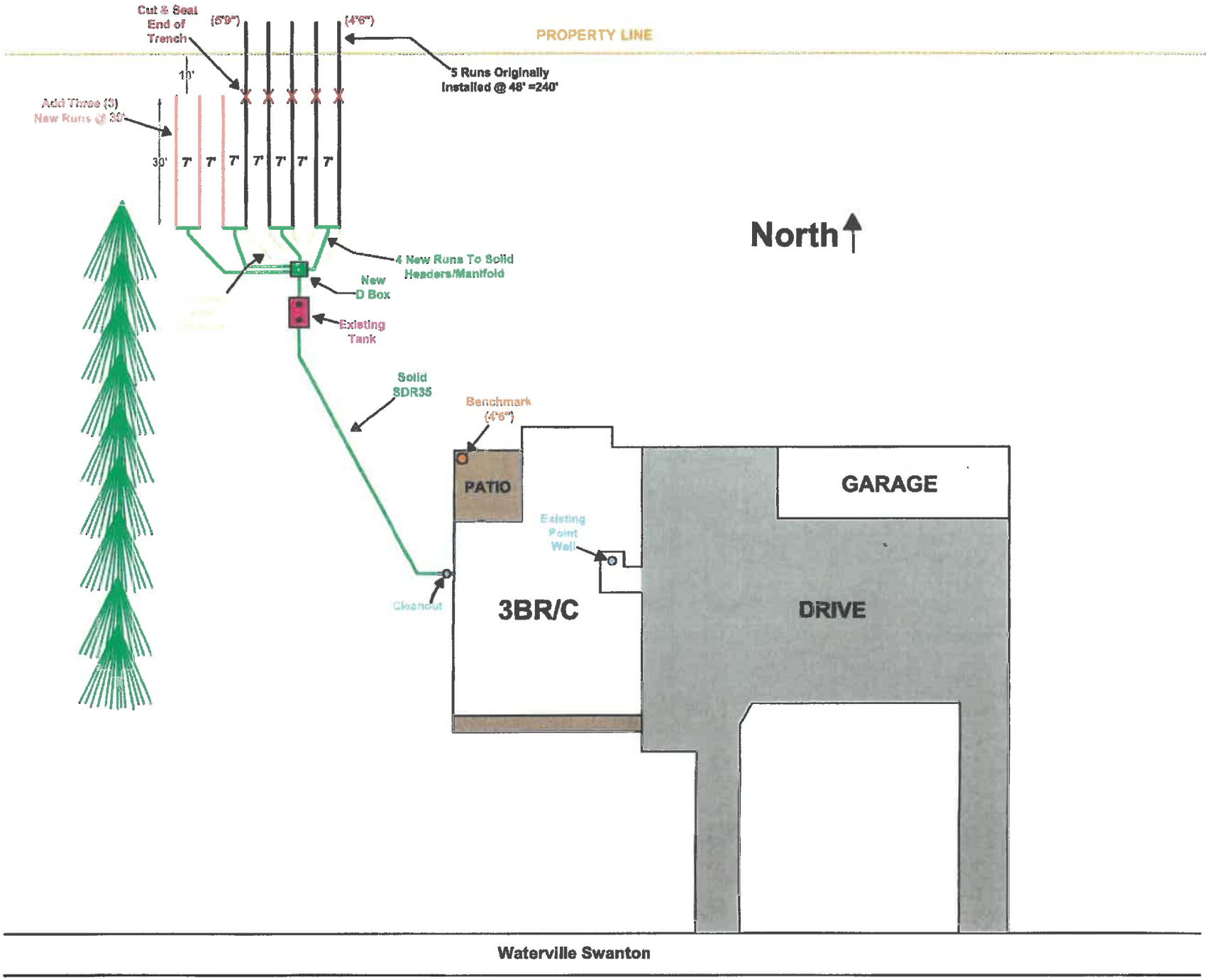
REVISED DESIGN SPECIFICS FOR 13640 WATERVILLE SWANTON - 3BR/C MODIFICATION TO EXISTING REPLACEMENT SYSTEM (SWANTON TOWNSHIP – LUCAS COUNTY)

1. STS Rules 3701-29 of the OAC shall be followed.
2. LHD, septic installer and/or designer must discuss any questions, changes or concerns prior to/during the installation of the system as needed.
3. Replace the existing distribution box with a new Poly-lok distribution box with **only four (4) outlets.** A cap or elbow is required to allow one run/set of runs (60') to "rest". Only the bottom of the distribution box should be bedded in leach field stone. Lines will exit distribution box and feed each series of runs independently. The manifold connecting the two (2) 30' runs and the lines exiting the **distribution box** must be **solid SDR 35**, shall be at the same elevation and shall be bedded in the in-situ soil/sand (not leach field stone).
4. Owner was unable to obtain the needed easement which would have allowed for the previously installed leaching runs to extend over the rear neighboring property line. For this reason, eighteen feet (18') of the five (5) original 48' runs will be removed to allow for a new trench length of 30'. [NOTE: *Contractor must assure that all pipe and stone are removed from each run and that the end of each new 30' run is capped off*].
5. **Bench Mark** is the northwest corner of the patio. Three (3) new 30' runs will be installed *west of the originally installed five (5) runs*. The total number of 30' runs will be eight (8) equaling 240 lineal feet. New runs will be installed to match the exiting trench specifications established during the original installation: **Trench width**: 36"; **Trench depth** near northwest corner of property: *approximately 15"* (may vary due to uneven topography). **Trench bottom** along length of contour: *30" below* the benchmark. System design based on utilizing a standard stone/pipe leaching trench with three **(3) hole ASTM 2729 or SDR 35** pipe. **Top of pipe in leaching trenches** will be *20" below* the benchmark. **Total stone depth**: 12" (use stone that is clean and sized between ¾" to 1 ½") A minimum 24" VSD will be maintained from the bottom of the leaching trench to the perched water table as specified on the original soil evaluation.
6. Soil from trench excavation can be utilized to grade/level off area of leach field as needed. Final overall trench depth will average 28" – 30" and the final grade will be **level with** the bench mark.
7. Plant grass ASAP after system is backfilled.

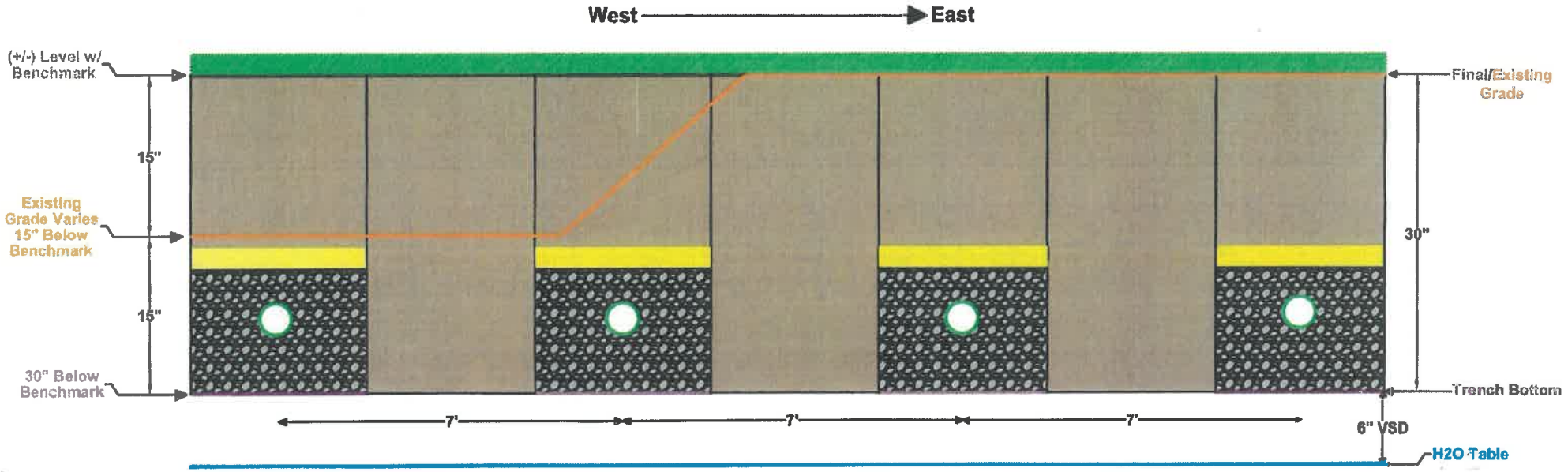
REVISED - Septic Design Proposal

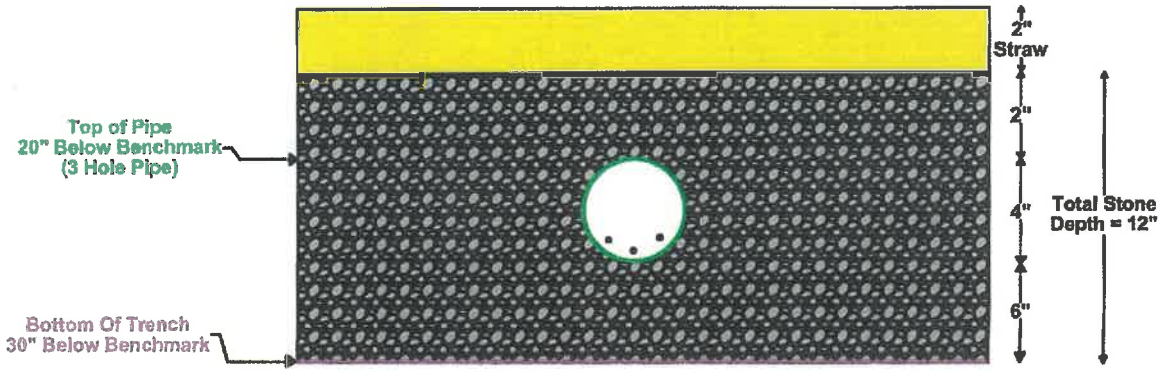
13640 Waterville Swanton Rd (Waterville Twp)



REVISED - Leach Field - Trench Detail

13640 Waterville Swanton Rd (Swanton Twp)





Standard Stone/Pipe Trench

(N.T.S.)

Leaching Trench Design Calculations

REVISED - MODIFICATION TO EXISITNG REPLACMENT LEACHING TRENCHES

Information from soil evaluation	
Hydraulic Linear Loading Rate (gpd/ft)	6
Soil Infiltration Loading Rates (gpd/ft²)	0.8
Number of Bedrooms	3
Depth to limiting layer (inches)	>60
Width of Trenches (inches)	36
*Max. Trench Width Allowed: New-24" Replacement-36"	

Property Information			
Owner	PENNINGTON		
Address	18640 WATERVILLE SWANTON		
Township	SWANTON		
New		Replacement	x

Overview of System Requirements	
Number of Trenches	4
Length of Trenches	60
Width of Trenches (feet)	3
Total Lineal Feet	240
Width Between Trenches(on center)	7
Drainage	N/A

* Due to lot restrictions and the enability to obtain an easement the runs will be divided into two (2) 30' run via a manifold as shown on the design proposal

Daily Design Flow

(120 gpd) X (Number of Bedrooms)

120 gpd 3 Bedrooms = 360 gpd

Minimum Length of Leach Lines

Daily Design Fl / Hydraulic Linear Loading Rate

360 / 6 = 60 ft

Minimum Length of Leach Lines Rounded To Next Whole Number 60 ft

Total Length of Leach Lines

Minimum Absorption Area / Width of the Trench

562.5 / 3 = 187.5 ft

Number of Trenches

Total Length / Trench Length

187.5 / 60 = 3.125

Round Number of trenches to next whole number 4 Trenches

Minimum Absorption Area Width

Min. Absorption Area / Min. Absorption Area Length

562.5 / 60 = 9.375 ft

Minimum Absorption Area

Daily Design Flow / Soil Infiltration Loading Rate

360 / 0.8 = 450 ft²

Additional Area Required for 25% Resting

Minimum Absorption Area X 0.25

450 X 0.25 = 112.5 ft²

Total Absorption Area

Minimum Absorption Area + 25% Resting

450 + 112.5 = 562.5 ft²

Number of Trenches to Maintain Total Absorption Area

Trench Length X Trench Width = Absorption Area Per Trench

60 X 3 = 180 ft²

Min. Absorption Area / Absorption Area Per Trench

450 / 180 = 2.5 Trenches

3 Trenches in use at all times

Add'l 25% absorption area for resting / absorption area per trench

112.5 / 180 = 0.625

1 Trench(es) to rest at all times

**** CHAMBERS ONLY ** with *25% Reduction***

Number of Trenches to Maintain Total Absorption Area

Minimum Absorption Area * 25% = Reduction for Chamber System

450 * 0.25 = 112.5 ft²

25% Reduction for Chamber System

Minimum Absorption Area - 25% Reduction = New Min. Absorption Area for Chamber System

450 - 112.5 = 337.5 ft²

Additional Area Required for 25% Resting

Minimum Absorption Area X 0.25

337.5 X 0.25 = 84.375 ft²

Total Absortion Area for Chambers

Minimum Absorption Area + 25% Resting

337.5 + 84.375 = 421.875 ft²

NEW Min. Absorption Area / Absorption Area Per Trench

337.5 / 180 = 1.875 Trenches

2 Trenches in use at all times

Add'l 25% absorption area for resting / absorption area per trench

84.375 / 180 = 0.46875

1 Trench(es) to rest at all times

If Replacement System:

Up to 20% can be cut in the length of the leach lines. BUT...the Total surface area must be maintained.

Total Surface Area = 562.5 ft.²

Original Calculated Length = 60 ft.

20% of Original Calculated Length = 12 ft.

Reduced Length = 48 ft.

Trench Length X Trench Width = Absorption Area Per Trench

48 X 3 = 144 ft2

Min. Required Absorption Area / Absorption Area Per Trench = Number of trenches in use a all times

450 / 144 = 3.125 Trenches

4 Trenches in use at all times

Add'l 25% absorption area for resting / absorption area per trench = Number of trenches to rest

112.5 / 144 = 0.78125

1 Trench(es) to rest at all times

REPLACEMENT System Overview	
Number of Trenches	5
Length of Trenches	48
Width of Trenches (feet)	36
Total Lineal Feet	240
Width Between Trenches (on center)	7
Drainage	N/N

**** CHAMBERS ONLY*** (Replacement)**

[Up to 20% can be cut in the length of the leach lines. BUT...the Total surface area must be maintained]

Chambers Total Surface Area = 337.5 ft.²

Original Calculated Length = 60 ft.

20% of Original Calculated Length = 12 ft.

Reduced Length = 48 ft.

Trench Length X Trench Width = Absorption Area Per Trench

48 X 3 = 144 ft2

Min. Required Absorption Area / Absorption Area Per Trench = Number of trenches in use a all times

337.5 / 144 = 2.34375 Trenches

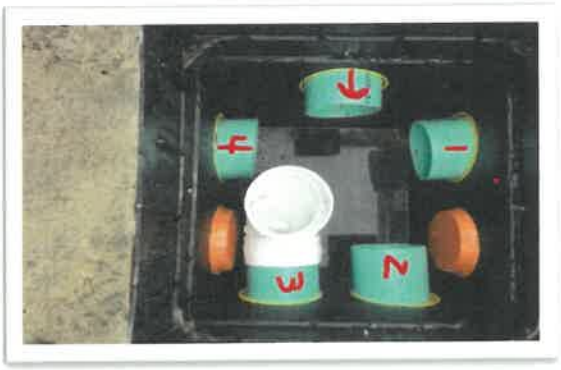
3 Trenches in use at all times

Add'l 25% absorption area for resting / absorption area per trench = Number of trenches to rest

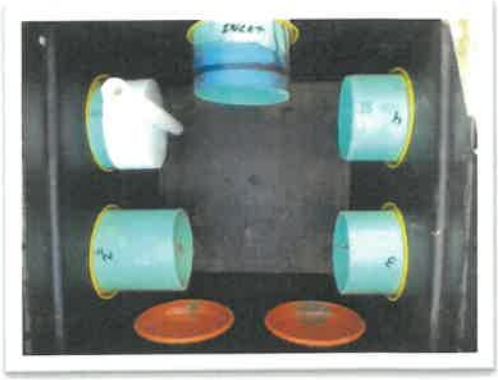
84.375 / 144 = 0.5859375

1 Trench(es) to rest at all times

Poly Lock Distribution Box (Recommended)



Distribution Box with "Elbow" Style Divertor



Distribution Box with "Cap with Handle"