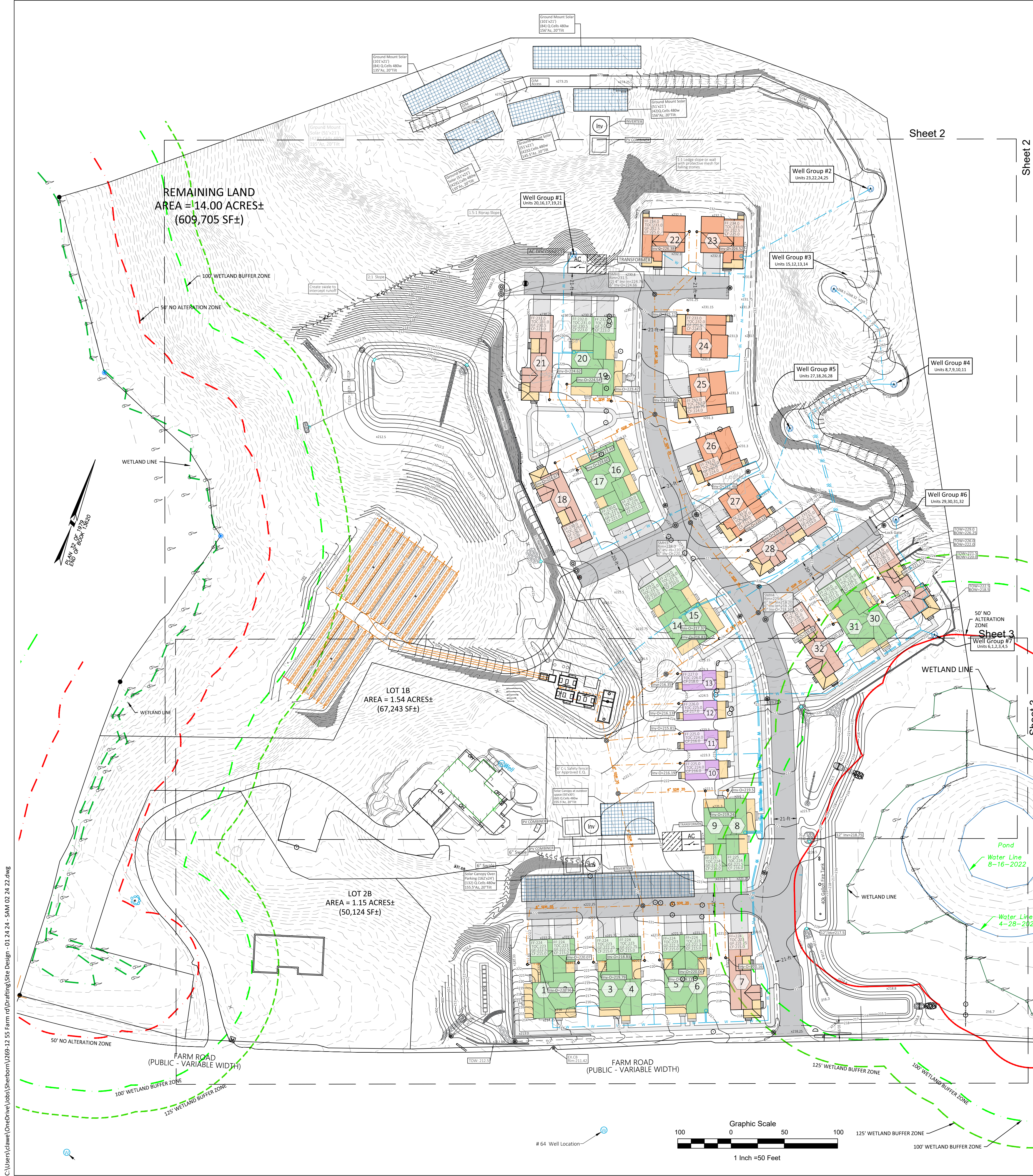


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General Project Notes

- Record owner is Fenix Partners Farm Road Development, LLC of 177 Lake St, Sherborn, MA. See Middlesex County Registry of Deeds Book 81263, Page 205 and Sherborn Assessor's Map 11, Lot 60 for records.
- The Zoning district for the parcel is RA.
- The lot is shown in a FEMA Federal Hazard Zone "X" (unshaded), area of minimal flood hazard and outside the 0.2% annual chance floodplain. FIRM 25017C0651E, Effective 06/04/2010.
- The Horizontal Datum was based on NAD 83.
- This plan is referenced vertically to the North American Vertical Datum of 1988 by RTK GPS observations taken on January 15, 2021. See plan for project benchmark location.
- Owners of abutting properties are according to current assessor's records.
- This plan is for the purpose of comprehensive permitting and septic construction.
- The Wetland Delineation was conducted by Creative Land & Water Engineering, LLC, on December 30, 2020 and approved by The Sherborn Conservation Commission July 21, 2021.
- Existing site details are based on the plan titled "Existing Conditions Plan of Land" by Samietes Consultants, INC., dated 01/26/21 and last revised 9/21/22.
- Locations of all existing utilities shown in the drawings are only approximate and there may be existing liens other than those shown on the plan hereon.
- Based on our record review at Sherborn Board of Health and field investigation, there are no existing wells located within 200' of the proposed septic leaching field unless otherwise noted on the plan.
- The proposed onsite wells serving the proposed 32 units subdivision meets the required 100-ft setback from SAS, the 50-ft setback from septic tank, and other setback requirements per 310 CMR15.211 as shown on the plan.
- The proposed septic soil absorption system (leaching field) for the project is not located within or impacted by any easements, wetlands, vernal pools or flood zones per State Environmental code 310 CMR 15.000 as shown on the plan.
- The project is located within a nitrogen sensitive area with private well water supply. The parcel is 14.00 Acres. (609,705 Sft²) and will accommodate the 32-unit 76-bedroom 408 development using I/A treatment to have effluent nitrogen concentration of 19 mg/L according to 310 CMR 15.217 of 550 gallons per day per acre.
- There are no bordering vegetated wetlands located within 100' of the proposed SAS unless otherwise shown on the plan.
- There are no wetlands bordering surface water supply or tributaries within 200' of the SAS unless otherwise shown on the plan.
- There is no surface, foundation drain or other forms of open, surface or subsurface drains located within 100 ft of the leaching field for the project that intercept high groundwater table, nor any other forms of drains (open, surface, subsurface) intercept high groundwater.
- There is no surface water located within 150' of the SAS unless otherwise shown on the plan.
- There are no surface water supplies located within 400' of the proposed SAS unless otherwise shown on the plan.
- There are no inland banks located within 150' of the proposed SAS unless otherwise shown on the plan.
- Based on our record review at Sherborn Board of Health and field investigation, there are no existing septic leaching fields located within 150-ft upgradient or downgradient of the proposed drinking water well unless otherwise shown on the plan.

Septic Notes

General Septic Notes

- This plan is for a 32 Unit 408 Residential development septic construction and grading purposes.
- This plan and specifications are intended to be explanatory of the work to be done for review, approval, and field construction. Should any omissions, errors, or discrepancies appear, they shall be subject to correction and interpretation by the design engineer to define and fulfill the intent of the plans according to applicable regulations and engineering principles.
- To verify that the plans being utilized for construction are current, call 774-454-0266.
- All erosion control shall be installed according to the plan prior to construction.
- Prior to execution of construction contract or commencement of construction, all B.O.H. permits and relevant Town Permits must be obtained. This plan must be approved by, and a disposal works construction permit issued by the Sherborn board of health.
- All materials and workmanship shall be in compliance with Title V of the state sanitary code.
- An installer certification is required for the installation of the septic system.
- NO GARBAGE GRINDER IS ALLOWED FOR THIS DESIGN. PROOF OF DEED RESTRICTION IS REQUIRED BY THE BOARD OF HEALTH PRIOR TO THE RELEASE OF THE APPROVED PLAN.

Design & Construction Notes

- The design engineer, BOH agent, conservation commission agent, and other relevant town agencies shall be notified for a pre-construction meeting at least 48 hours prior to the commencement of any work. The design engineer can be reached via phone at (774) 454-0266.
 - Prior to construction, the property lines and proposed structures shall be field staked by a Professional Land Surveyor.
 - The leaching area, septic tank, I/A system components and sewer lines shall be located to meet all the applied setbacks and groundwater separation in the State Environmental Code 310 CMR15.211.
 - It shall be the responsibility of the contractor to contact all utility companies for field locations of existing underground pipes, conduits, tanks, structures, etc. Contact DIGSAFE at 1-888-344-7233 or 811.
 - If conditions encountered during construction vary substantially from those shown on this plan, notify CLWWE before proceeding with construction.
 - It is the Contractor's responsibility to notify the design engineer and board of health for all required inspections at least 72 hours in advance.
 - The design performance parameters for the SeptiTech 13.5 are as follows:
- | Parameter | 310 CMR 15.202 (4) | Influent | Effluent | Note |
|------------------|--------------------|----------|----------|------------|
| pH | 6.0-9.0 | | 6.0-9.0 | |
| BOD ₅ | mg/L 30 | 250 | ≤30 | |
| TSS | mg/L 30 | 200 | ≤30 | |
| TN | mg/L 25 | 60 | ≤19 | 24% better |
- Upon completion of excavation for the leaching facility the board of health and design engineer shall be notified for inspection.
 - All loam, subsoil and other unsuitable material below the invert elevation of the leaching facility must be removed within 5 feet of the leaching area and replaced with material having a percolation rate of 2 minutes per inch or less in accordance with 310 CMR 15.255 (3).
 - Limits of excavation of the soil absorption system may be made by mechanical means to assure that the soil at the bottom of the excavation area is not compacted or smeared.
 - All components are not to be backfilled or concealed without inspection by Board of Health and permission obtained by Board of Health.
 - The as-built survey and sieve analysis for the imported fill material shall be provided to the Sherborn Board of Health prior to inspection.
 - After construction, this system will be inspected by the B.O.H. and by the design engineer. After verification of the construction, the engineer will certify that the system is constructed in significant compliance with the design plan and the terms of the permit prior to the final approval of the B.O.H.
 - Fill material for leaching field fill shall be in compliance with 310 CMR 15.255 (3).
 - All system components shall be marked with magnetic tape for future location per 310 CMR 15.221, including:

- four sides of the SAS;
- envelope of the septic tank, processor tanks, dosing chambers, valve vault, force main, distribution manifold, and the distribution laterals.
- any other I/A components not noted.

- Prior to placement of the fill, the bottom surface of the excavation shall be dry and scarified. The fill be stockpiled at the edge of foundation and pushed or cast inward over excavated area. The fill shall not be placed during rain or snow storms. Dewatering is required if fill is to be placed below groundwater.
- A sieve analysis is to be completed on the "in place" imported fill and shall meet the specifications in accordance with 310 CMR 15.255 (3).
- Leaching fields and septic system components are not designed to stand construction equipment loading. The contractor and owner shall be responsible for preventing vehicle or heavy loading over the septic system.
- Where retaining wall is required, it should be constructed to ASTM standards and 310 CMR 15.255(2).
- All disturbed areas shall be stabilized with loam and seed.
- All construction shall follow the design plan, 310 CMR 15.00.

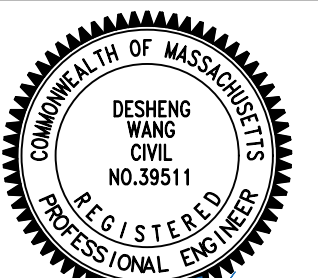
Operation and maintenance notes

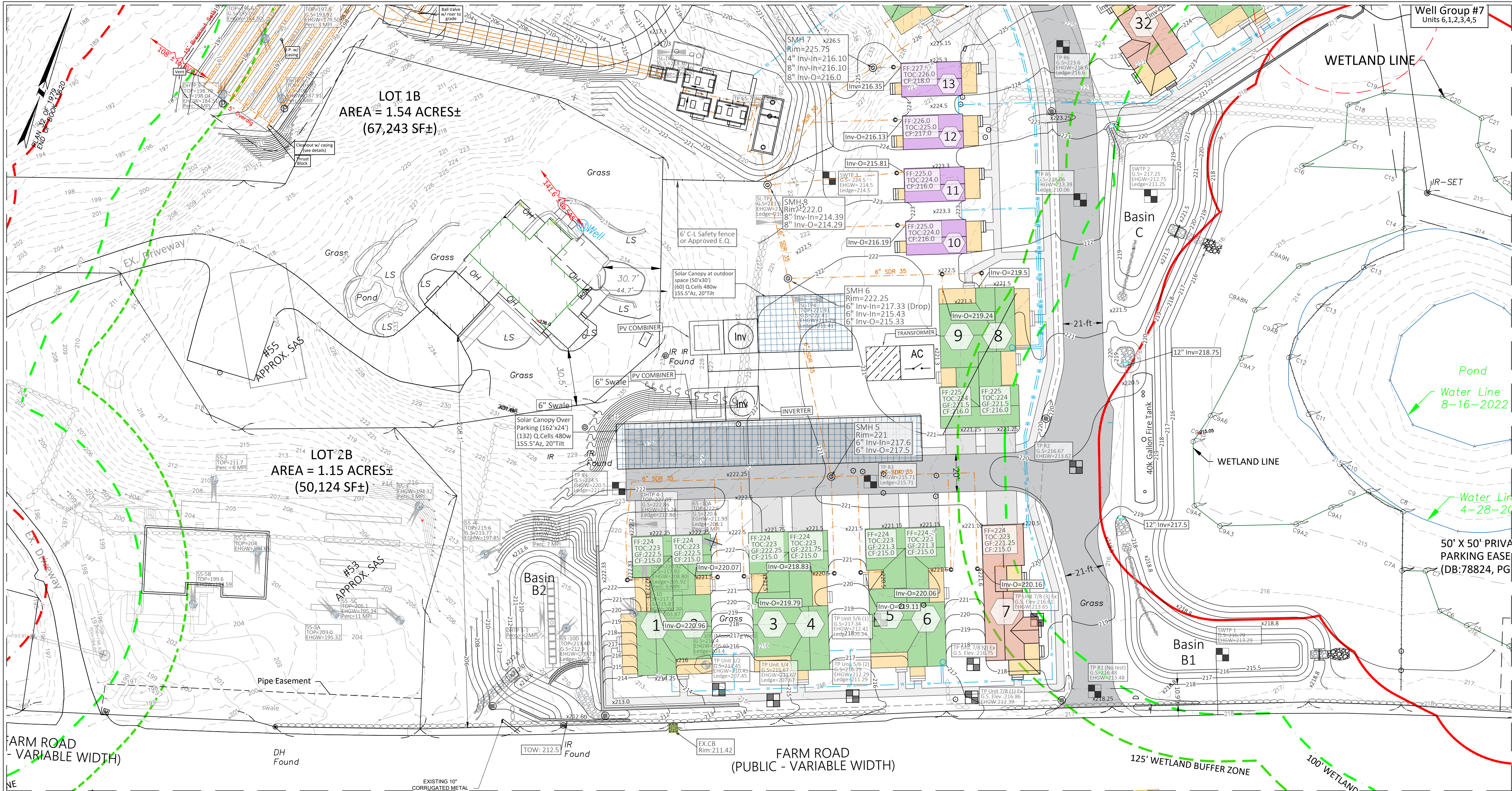
- The septic tank and I/A system shall be maintained in accordance with 310 CMR 15.351 and manufacturers specifications.
- The septic tank and proprietary I/A shall be inspected quarterly by a licensed wastewater treatment operator and pumped as needed and records retained.

Sheet Index	Date	Revision
Sheet 1 - Proposed Septic System Overall Site and Index Plan	11/30/23	02/02/2024
Sheet 2 - Proposed Septic System Proposed Sewer Condition Plan 1	11/30/23	02/02/2024
Sheet 3 - Proposed Septic System Proposed Sewer Condition Plan 2	11/30/23	02/02/2024
Sheet 4 - Proposed Septic System Soil Absorption System Plan	11/30/23	02/02/2024
Sheet 5 - Proposed Septic System Treatment I/A Layout Plan	11/30/23	
Sheet 6 - Proposed Septic System Pressure Dosing and Pipe Analysis	11/30/23	
Sheet 7 - Proposed Septic System Treatment I/A Profile Plan 1	11/30/23	02/02/2024
Sheet 8 - Proposed Septic System Treatment I/A Profile Plan 2	11/30/23	
Sheet 9 - Proposed Septic System Tank, Sewer Manhole and Chamber Details 01	11/30/23	02/02/2024
Sheet 10 - Proposed Septic System Tank, Sewer Manhole and Chamber Details 02	02/02/2024	

Creative Land & Water Engineering, LLC
Environmental Scientists and Engineers
P.O. Box 584 - Southborough - MA - 01772
774-454-0266 www.claweng.com

Plan Title: Proposed Septic System Overall Site and Index Plan			
Project Name: Farm Road Homes			
Site Address: 65 Farm Road, Sherborn, MA			
Owner: Fenix Partners Farm Road Development, LLC		Client: Robert Murchison	
Project No: J269-12	Drawn by: FA	Date: 11/30/23	Sheet No: 1 of 10
Designed by: DSW, FA	Approved by: DSW	Scale: Indicated	
1	02/02/24	Basin Grading, Water Lines	FA/DSW
Rev.:	Date:	Description	By:





LEGEND

- CATCHBASIN
- ROOF DRAIN
- VENT
- WELL
- ELECTRIC METER
- UTILITY POLE
- GUY WIRE
- LIGHT POLE
- HANDHOLE
- SIGN
- MAILBOX
- POST
- WETLAND FLAG
- TEST PIT LOCATED
- DECIDUOUS TREE
- CONIFEROUS TREE
- SHRUB
- OVERHEAD WIRE
- INDEX CONTOUR
- INTERMEDIATE CONTOUR
- SPOT GRADE
- TOP OF WELL
- EDGE OF PAVEMENT
- OVERHANG
- MASONRY BLOCK WALL
- RAILROAD TIE WALL
- TOP OF PIPE

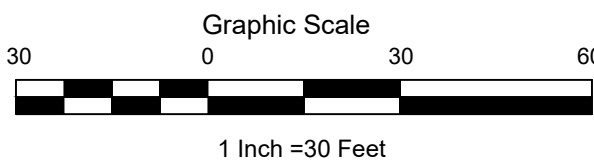
Line Legend

- 50' No Alteration Zone
- 100' Wetland Buffer Zone
- 125' Wetland Buffer Zone

APPROVED UNDER MASSACHUSETTS GENERAL LAW CHAPTER 40B

DATE APPROVED: _____
DATE ENDORSED: _____
SHERBORN ZONING BOARD OF APPEALS

I HEREBY CERTIFY THAT 20 DAYS HAVE LAPSED SINCE THE SHERBORN ZONING BOARD OF APPEALS APPROVAL HAS FILED WITH THE SHERBORN TOWN CLERK AND THAT NO APPEAL HAS BEEN FILED WITH THIS OFFICE.



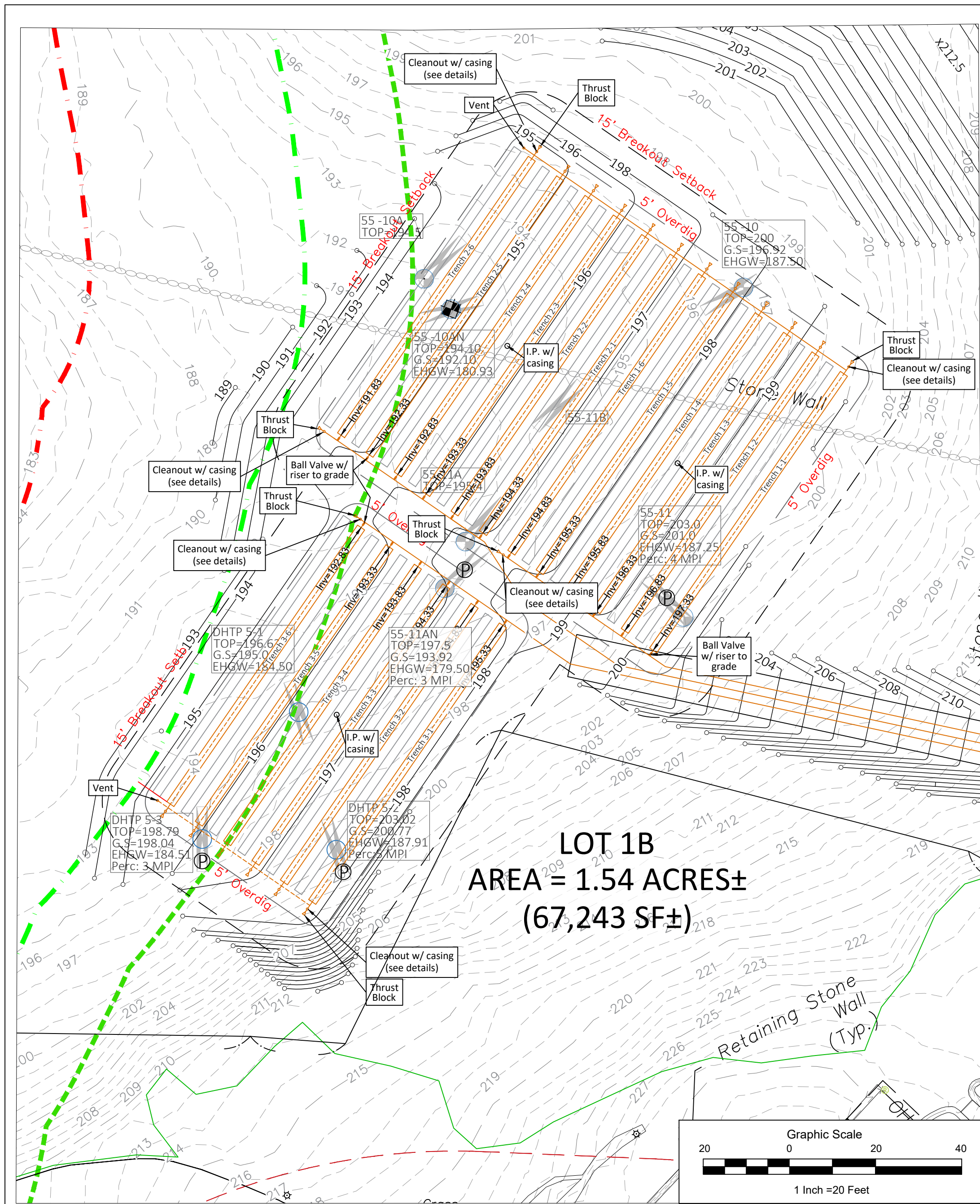
DATE JACKLYN R. MORRIS
SHERBORN TOWN CLERK

Creative Land & Water Engineering, LLC
Environmental Scientists and Engineers
P.O. Box 584 - Southborough - MA - 01772
774-454-0266 www.claweng.com

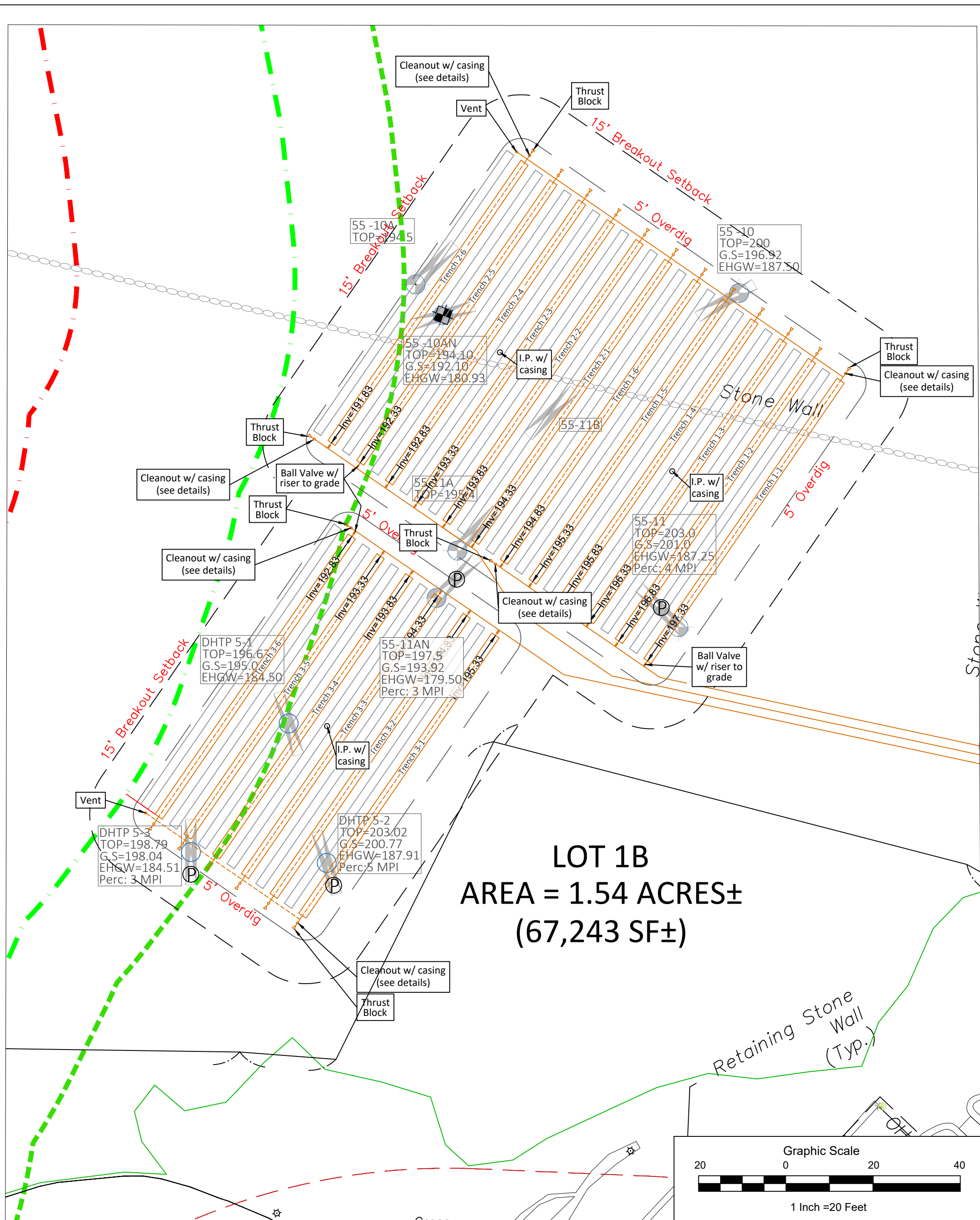
Plan Title: Proposed Septic System Proposed Sewer Condition Plan 2			
Project Name: Farm Road Homes			
Site Address: 65 Farm Road - Sherborn, MA			
Owner: Fenix Partners Farm Road Development, LLC		Client: Robert Murchison	
Project No: J269-12	Drawn by: FA	Date: 11/30/23	Sheet No: 3 of 10
Designed by: DSW, FA	Approved by: DSW	Scale: 1"=30'	
1	02/02/24	Basin Grading, Water Lines	FA/DSW
Rev.:	Date:	Description	By:



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Primary Area Grading



Primary Area Layout

Table 9.1. Hydraulic profile design Summary of SAS (rev 2/2/2024)

Line	Bottom Elev, ft	Dist to Ref well DHTP-11An, ft	EHGW with wet well, ft	Mound EHGW, ft	GW Sep, ft	EHGW with dry well, ft	Mound GW using dry tp, ft	GW Sep, ft
L 1-1	195.33	52.34	180.66	181.57	13.76	187.25	188.16	7.17
L1-2	194.83	50.565	180.62	181.53	13.30	186.68	187.59	7.24
L1-3	194.33	49.235	180.59	181.50	12.83	186.10	187.01	7.32
L1-4	193.83	47.98	180.56	181.47	12.36	185.53	186.44	7.39
L1-5	193.33	47.38	180.55	181.46	11.87	184.95	185.86	7.47
L1-6	192.83	89.75	181.49	182.40	10.43	184.38	185.29	7.54
L2-1	192.33	0	179.50	180.41	11.92	183.80	184.71	7.62
L2-2	191.83	0	179.50	180.41	11.42	183.23	184.14	7.69
L2-3	191.33	47.6	180.56	181.47	9.86	182.66	183.57	7.76
L2-4	190.83	48.2	180.57	181.48	9.35	182.08	182.99	7.84
L2-5	190.33	48.255	180.57	181.48	8.85	181.51	182.42	7.91
L2-6	189.83	51.105	180.63	181.54	8.29	180.93	181.84	7.99
L3-1	193.33	37	180.32	181.13	12.20	184.95	185.76	7.57
L3-2	192.83	35	180.28	181.09	11.74	184.38	185.19	7.64
L3-3	192.33	0	179.50	180.31	12.02	183.80	184.61	7.72
L3-4	191.83	33	180.23	181.04	10.79	183.23	184.04	7.79
L3-5	191.33	36	180.30	181.11	10.22	182.66	183.47	7.86
L3-6	190.83	41	180.41	181.22	9.61	182.08	182.89	7.94
Average					11.16			7.64
Minimum					8.29			7.17

Note: The combined max mounding height in L1 and L2 is 0.91 ft
The max mounding height in L3 is 0.81 ft

Table 9.2 Summary of Groundwater Mounding Analysis - SAS (updated 2/2/2024)

Parameters	Leaching Field	Note
Recharge area	SAS 1+2	SAS3
Dimension, Length, ft	92	82
Dimension, Width, ft	82	46
Area, sq. ft	7544.00	3772.00
Recharge Vol. Cu ft (per day or event)	745.10	372.55
Duration, day	90	90
Recharge rate, cu ft/day/sq. ft	0.10	0.10
Dewater time, day	90	90
GW Separation, ft	8.49	12.58
Distance to wetland, ft	125	125
Maximum mounding height, ft	0.71	0.41
Estimated effective Max MH, ft	0.91	0.81
Impact mounding height by other systems, ft	0.2	0.4
Combined Mound height, ft	0.91	0.81
Bottom of Trench, ft	192.58	192.08
Top of stones, ft		
EHGW, ft	184.09	179.5
Bottom aquifer, ft	average	170
Flood routing elev, ft	291.670	291.670
Top of grade, ft	292.5	275.5
Aquifer depth, ft	14.5	14.5
Hydraulic Conductivity, ft/day	24.00	24.00
Groundwater mound rage, ft	841	841

Table 2.2. SAS Soil Testing Summary

Test Pit #	Test Date	GSE (ft)	Depth to pit bottom (ft)	Soil Texture	Adjusted Depth to HGW (ft)	Water adjustment, ft	EHGW, ft	Perc rate, mpi	Perc depth, in	Bottom Hole El, ft	Ledge Note: L=ledge;N=no ledge;U=unknown	Note
DHTP 55-10	4/23/2021	196.92	11.25	Co. M. L.S.	9.42		187.50			185.67	N	well installed, upslope, dry
DHTP 55-10An	4/23/2021	192.10	14.50	Co. M. L.S.	11.17		180.93			177.60	U	Well installed, lower SLP, some weeping
DHTP 55-11	4/23/2021	201.00	16.00	Co. M. L.S.	13.75	1.83	187.25	4.00	54.00	185.00	N	Well installed, upslope, dry
DHTP 55-11An	4/23/2021	193.92	18.00	Co. M. L.S.	14.42		179.50	3.00	54.00	175.92	U	Well installed, lower SLP, some weeping
DHTP 55-11B	4/23/2021	194.00	10.00	Co. M. L.S.	n/t		n/t			184.00	U	No well, confirm soil, mid slope, dry
DHTP 5-1	11/24/2021	195.04	14.50	Co. M. L.S.	10.54		184.50			180.54	N	Well installed, lower SLP, dry
DHTP 5-2	11/24/2021	200.77	17.49	Co. M. L.S.	12.86	2.38	187.91	5.00	64.00	183.28	N	well installed, upslope, dry
DHTP 5-3	11/24/2021	198.04	16.66	Co. M. L.S.	13.53		184.51	3.00	60.00	181.38	N	well installed, upslope, dry

Note: 1. Nearby downgradient wetland is at elevation of 177-178, which is in line with the weeping water elevation in test pits DHTP-11An and DHTP-10An; 2. Except the two test pits, other test pits were dry and no water measured and the water table based on the depth of hole is a conservative estimate and normally will not be considered.

Creative Land & Water Engineering, LLC

Environmental Scientists and Engineers

P.O. Box 584 - Southborough - MA - 01772

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Plan Title: Proposed Septic System
Soil Absorption System Plan

Project Name: Farm Road Homes

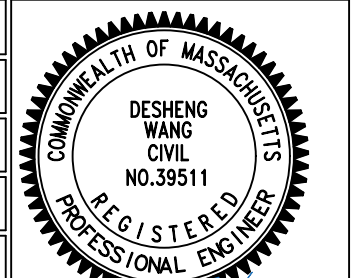
Site Address: 65 Farm Road, Sherborn, MA

Owner: Fenix Partners Farm Road Development, LLC Client: Robert Murchison

Project No: J269-12 Drawn by: FA Date: 11/30/23 Sheet No: 4 of 10

Designed by: DSW, FA Approved by: DSW Scale: Indicated

01	02/02/24	Groundwater Mounding Analysis, Soil Logs, Perc Data	FA/DSW
Rev.:	Date:	Description	By:



Percolation Summary Table:

Observation Hole #	Date	Time	Date	Time	Date	Time	Date	Time
	11/9/2021	3:25 PM	11/10/2021	11:04 PM	4/21/2021	1:05 PM	4/21/2021	1:49 PM
Depth of Perc	DHTP 5-2		DHTP 5-3		DHTP 55-11		DHTP 55-11AN	
Start Pre-Soak	64"		60"		54"		54"	
End Pre-Soak	3:25 PM		11:04 AM		1:05 PM		1:49 PM	
12"	3:40 PM		11:19 AM		1:20 PM		2:04 PM	
11"	3:40 PM		11:20 AM		1:20 PM		2:04 PM	
10"	3:44 PM		11:22 am		1:23 PM		2:06 PM	
9"	3:49 PM		11:25 am		1:26 PM		2:09 PM	
8"	3:54 PM		11:28 AM		1:30 PM		2:12 PM	
7"	3:59 PM		11:31 AM		1:34 PM		2:15 PM	
6"	4:04 PM		11:33 AM		1:38 PM		2:18 PM	
Time (9"-6")	4:09 PM		11:35 AM		1:42 PM		2:21 PM	
Rate (Min./Inch)	5		3		4		3	

Depth (ft)	Soil Horizon	Soil Texture (USDA)	Soil Matrix, Color-Moist (Munsell)	Redi-morphologic Features	Coarse Fragments % by Volume	Soil Structure	Soil Consistence (Moist)	Other
190.04 - 191.24	0-9	A	S.L.	10 YR 3/2			Friable	
191.24 - 192.04	9-36	B	S.L.	2.5 Y 6/6			Friable	
192.04 - 192.84	36-108	C	Co.M.L.S.	2.5 Y 5/4			Dense-Fri	

No Standing. No Weeping. EHGW=184.50. Dry Pit. Deep Hole Only. Depth to refusal = No refusal

Depth (ft)	Soil Horizon	Soil Texture (USDA)	Soil Matrix, Color-Moist (Munsell)	Redi-morphologic Features	Coarse Fragments % by Volume	Soil Structure	Soil Consistence (Moist)	Other
200.77 - 201.57	0-4	A	S.L.	10 YR 3/2			Friable	
201.57 - 202.37	4-30	B	S.L.	2.5 Y 6/6			Friable	
202.37 - 203.17	30-180	C	Co.M.L.S.	2.5 Y 5/4			Fri-Loose	

No Standing. No Weeping. EHGW=187.91. Dry Pit. Perc Rate=5 MPI. Perc Depth=64" (Elev=195.44). Depth to refusal = No refusal

Depth (ft)	Soil Horizon	Soil Texture (USDA)	Soil Matrix, Color-Moist (Munsell)	Redi-morphologic Features	Coarse Fragments % by Volume	Soil Structure	Soil Consistence (Moist)	Other
192.71 - 193.51	0-4	A	S.L.	10 YR 3/2			Friable	
193.51 - 194.31	4-30	B	S.L.	2.5 Y 6/6			Fri. L. Boulders	
194.31 - 195.11	30-54	C1	M.S.	2.5 Y 6/4			Loose	
195.11 - 195.91	54-180	C2	Co.M.L.S.	2.5 Y 5/4			Dense-Fri	

No Standing. No Weeping. EHGW=184.51. Dry Pit. Perc Rate=3 MPI. Perc Depth=60" (Elev=193.04). Depth to refusal = No refusal

Depth (ft)	Soil Horizon	Soil Texture (USDA)	Soil Matrix, Color-Moist (Munsell)	Redi-morphologic Features	Coarse Fragments % by Volume	Soil Structure	Soil Consistence (Moist)	Other
196.92 - 197.72	0-6	A	S.L.	10 YR 3/2			Friable	
197.72 - 198.52	6-30	B	S.L.	2.5 Y 6/6			Friable	
198.52 - 199.32	30-135	C	L.S.	2.5 Y 6/4			Dense-Fri	

No Standing. No Weeping. EHGW=187.50. Dry Pit. Deep Hole Only. Depth to refusal = No refusal

Depth (ft)	Soil Horizon	Soil Texture (USDA)	Soil Matrix, Color-Moist (Munsell)	Redi-morphologic Features	Coarse Fragments % by Volume	Soil Structure	Soil Consistence (Moist)	Other
192.10 - 192.90	0-6	A	S.L.	10 YR 3/2			Friable	
192.90 - 193.70	6-30	B	S.L.	2.5 Y 6/6			Friable	
193.70 - 194.50	30-174	C	L.S.	2.5 Y 6/4			Fri-Dense	

Standing @168" (Elev=178.1). Weeping @168" (Elev=178.1). EHGW=180.93. Deep Hole Only. Depth to refusal = No Refusal

Depth (ft)	Soil Horizon	Soil Texture (USDA)	Soil Matrix, Color-Moist (Munsell)	Redi-morphologic Features	Coarse Fragments % by Volume	Soil Structure	Soil Consistence (Moist)	Other
201.00 - 201.80	0-4	A	S.L.	10 YR 3/2			Friable	
201.80 - 202.60	4-30	B	S.L.	10 YR 6/6			Friable	
202.60 - 203.40	30-192	C	L.S.	2.5 Y 5/4			Dense-Fri	

No Standing. No Weeping. EHGW=187.25. Dry Pit. Perc Rate=4 MPI. Perc Depth=54" (Elev=196.5). Depth to refusal = No Refusal

Depth (ft)	Soil Horizon	Soil Texture (USDA)	Soil Matrix, Color-Moist (Munsell)	Redi-morphologic Features	Coarse Fragments % by Volume	Soil Structure	Soil Consistence (Moist)	Other
193.92 - 194.72	0-4	A	S.L.	10 YR 3/2			Friable	
194.72 - 195.52	4-32	B	S.L.	2.5 Y 6/6			Friable	
195.52 - 196.32	32-216	C	L.S.	2.5 Y 5/4			Friable	

Standing @204" (Elev=176.92). Weeping @204" (Elev=176.92). EHGW=179.50. Perc Rate=3 MPI. Perc Depth=54" (Elev=189.42). Depth to refusal = No Refusal

Depth (ft)	Soil Horizon	Soil Texture (USDA)	Soil Matrix, Color-Moist (Munsell)	Redi-morphologic Features	Coarse Fragments % by Volume	Soil Structure	Soil Consistence (Moist)	Other
194.00 - 194.80	0-6	A	S.L.	10 YR 3/2			Friable	
194.80 - 195.60	6-30	B	S.L.	2.5 Y 6/6			Friable	
195.60 - 196.40	30-120	C	L.S.	2.5 Y 6/4			Dense-Fri	

No Standing. No Weeping. EHGW=Below pit bottom and the pit is only for conformation purpose. Dry Pit. Deep Hole Only. Depth to refusal = No Refusal

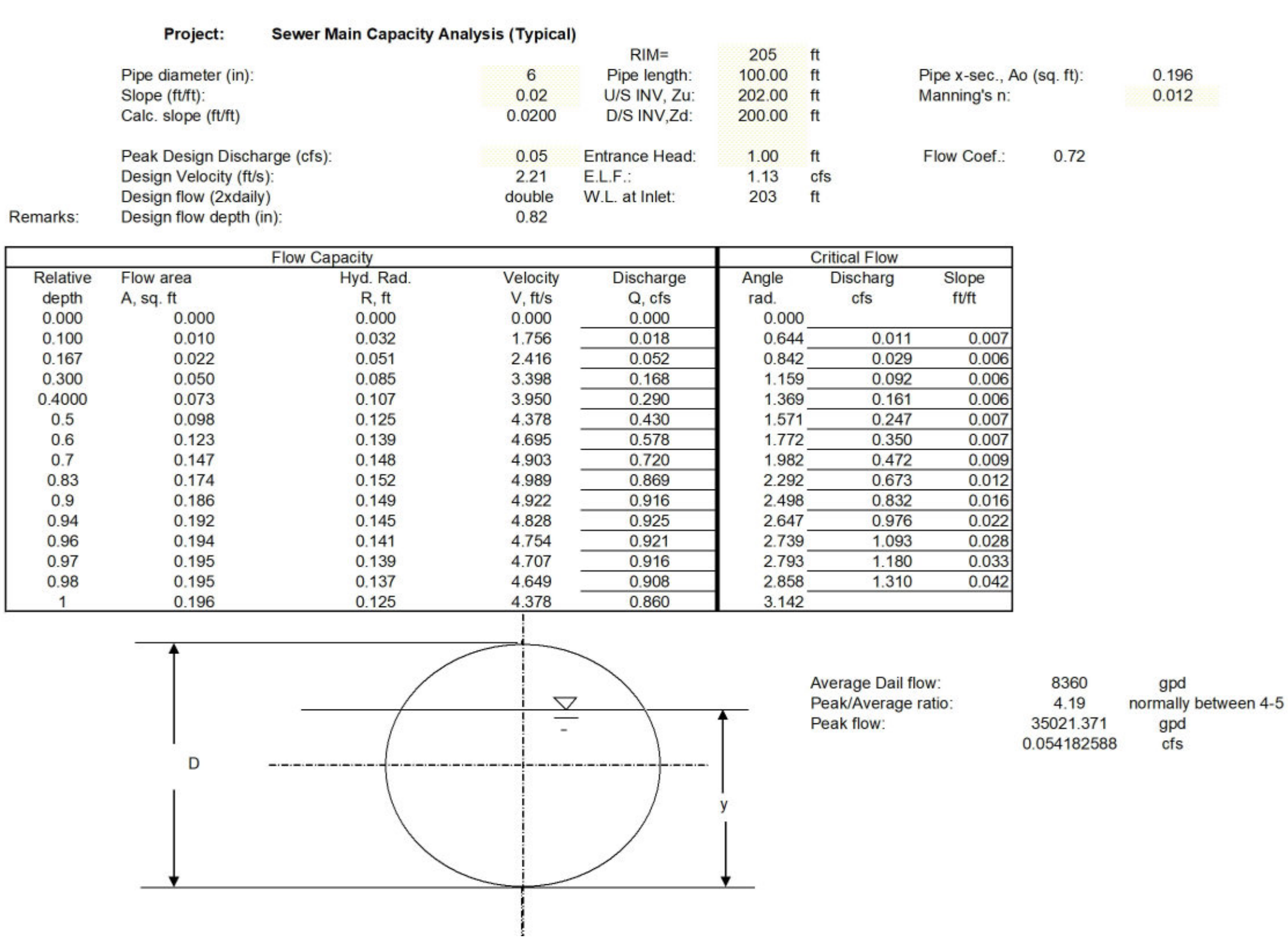
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Septic System Invert Sheet										
		Invert (Ft)								
Septic Tank -In		213.99								
Septic Tank - Out		213.74								
I/A Tank - In		213.39								
I/A - Out		214.47								
Secondary Tank (Pump Chamber) - In		214.41								
Secondary Tank (Pump Chamber) - Out		207.08								
Primary Tank (Pump Chamber) - In		206.99								
Primary Tank (Pump Chamber) - Out		214.16								

		size, in	Invert (Ft)	Length (Ft)	Slope (ft/ft)	Drop/Stepdown (In)		Bottom of Chamber	EHGW	M.HGW	Design pipe Storage, gal
						F.Main to Lateral	F.Main to F.Main				
Pump 1	Pump to tank outlet										
	Force Main (@ Pump)	4	214.16	135.06	0.1234	-	-				
	To Manifold (Trench 1-1)	2	197.50	1.5	0.1111	2	6				
	To Dist. Lateral (Trench 1-1)	2	197.33	78	0	-	-	195.33			
	Force Main (@ Pump)	4	214.16	143.06	0.1199	-	-				
	To Manifold (Trench 1-2)	2	197.00	1.5	0.1111	2	6	194.83			
	To Dist. Lateral (Trench 1-2)	2	196.83	78	0	-	-				
	Force Main (@ Pump)	4	214.16	151.06	0.1169	-	-				
	To Manifold (Trench 1-3)	2	196.50	1.5	0.1111	2	6	194.33			
	To Dist. Lateral (Trench 1-3)	2	196.33	78	0	-	-				
Pump 2	Force Main (@ Pump)	4	214.16	159.06	0.1142	-	-				
	To Manifold (Trench 1-4)	2	196.00	1.5	0.1111	2	6	193.83			
	To Dist. Lateral (Trench 1-4)	2	195.83	78	0	-	-				
	Force Main (@ Pump)	4	214.16	167.06	0.1117	-	-				
	To Manifold (Trench 1-5)	2	195.50	1.5	0.1111	2	6	193.33			
	To Dist. Lateral (Trench 1-5)	2	195.33	78	0	-	-				
	Force Main (@ Pump)	4	214.16	175.06	0.1094	-	-				
	To Manifold (Trench 1-6)	2	195.00	1.5	0.1111	2	6	192.83			
	To Dist. Lateral (Trench 1-6)	2	194.83	78	0	-	-				
	Total laterals:	6						192.58			192.14

		size, in	Invert (Ft)	Length (Ft)	Slope (ft/ft)	Drop/Stepdown (In)		Bottom of Chamber	EHGW	M.HGW	Design pipe Storage, gal
						F.Main to Lateral	F.Main to F.Main				
Pump 2	Force Main (@ Pump)	4	214.16	185.8561	0.1058	-	-				
	To Manifold (Trench 2-1)	2	194.50	1.5	0.1111	2	6	192.33			
	To Dist. Lateral (Trench 2-1)	2	194.33	78	0	-	-				
	Force Main (@ Pump)	4	214.16	193.8561	0.1040	-	-				
	To Manifold (Trench 2-2)	2	194.00	1.5	0.1111	2	6	191.83			
	To Dist. Lateral (Trench 2-2)	2	193.83	78	0	-	-				
	Force Main (@ Pump)	4	214.16	201.8561	0.1024	-	-				
	To Manifold (Trench 2-3)	2	193.50	1.5	0.1111	2	6	191.33			
	To Dist. Lateral (Trench 2-3)	2	193.33	78	0	-	-				
	Force Main (@ Pump)	4	214.16	209.8561	0.1008	-	-				
Pump 3	To Manifold (Trench 2-4)	2	193.00	1.5	0.1111	2	6	190.83			
	To Dist. Lateral (Trench 2-4)	2	192.83	78	0	-	-				
	Force Main (@ Pump)	4	214.16	217.8561	0.0994	-	-				
	To Manifold (Trench 2-5)	2	192.50	1.5	0.1111	2	6	190.33			
	To Dist. Lateral (Trench 2-5)	2	192.33	78	0	-	-				
	Force Main (@ Pump)	4	214.16	225.8561	0.0981	-	-				
	To Manifold (Trench 2-6)	2	192.00	1.5	0.1111	2	6	189.83			
	To Dist. Lateral (Trench 2-6)	2	191.83	78	0	-	-				
	Total laterals:	6									225.30

		size, in	Invert (Ft)	Length (Ft)	Slope (ft/ft)	Drop/Stepdown (In)		Bottom of Chamber	EHGW	M.HGW	Design pipe Storage, gal
						F.Main to Lateral	F.Main to F.Main				
Pump 3	Force Main (@ Pump)	4	214.16	170.26	0.1096	-	-				
	To Manifold (Trench 3-1)	2	195.50	1.5	0.1111	2	6	193.33			
	To Dist. Lateral (Trench 3-1)	2	195.33	78	0	-	-				
	Force Main (@ Pump)	4	214.16	178.26	0.1075	-	-				
	To Manifold (Trench 3-2)	2	195.00	1.5	0.1111	2	6	192.83			
	To Dist. Lateral (Trench 3-2)	2	194.83	78	0	-	-				
	Force Main (@ Pump)	4	214.16	186.26	0.1056	-	-				
	To Manifold (Trench 3-3)	2	194.50	1.5	0.1111	2	6	192.33			
	To Dist. Lateral (Trench 3-3)	2	194.33	78	0	-	-				
	Force Main (@ Pump)	4	214.16	194.26	0.1038	-	-	192.08			
Pump 3	To Manifold (Trench 3-4)	2	194.00	1.5	0.1111	2	6	191.83			
	To Dist. Lateral (Trench 3-4)	2	193.83	78	0	-	-				
	Force Main (@ Pump)	4	214.16	202.26	0.1021	-	-				
	To Manifold (Trench 3-5)	2	193.50	1.5	0.1111	2	6	191.33			
	To Dist. Lateral (Trench 3-5)	2	193.33	78	0	-	-				
	Force Main (@ Pump)	4	214.16	210.26	0.1006	-	-				
	To Manifold (Trench 3-6)	2	193.00	1.5	0.1111	2	6	190.83			
	To Dist. Lateral (Trench 3-6)	2	192.83	78	0	-	-				
	Total laterals:	6									215.12



Creative Land & Water Engineering, LLC

Environmental Scientists and Engineers
P.O. Box 584 - Southborough - MA - 01772
774-454-0266 www.claweng.com

Plan Title: Proposed Septic System Treatment I/A Layout Plan

Project Name: Farm Road Homes

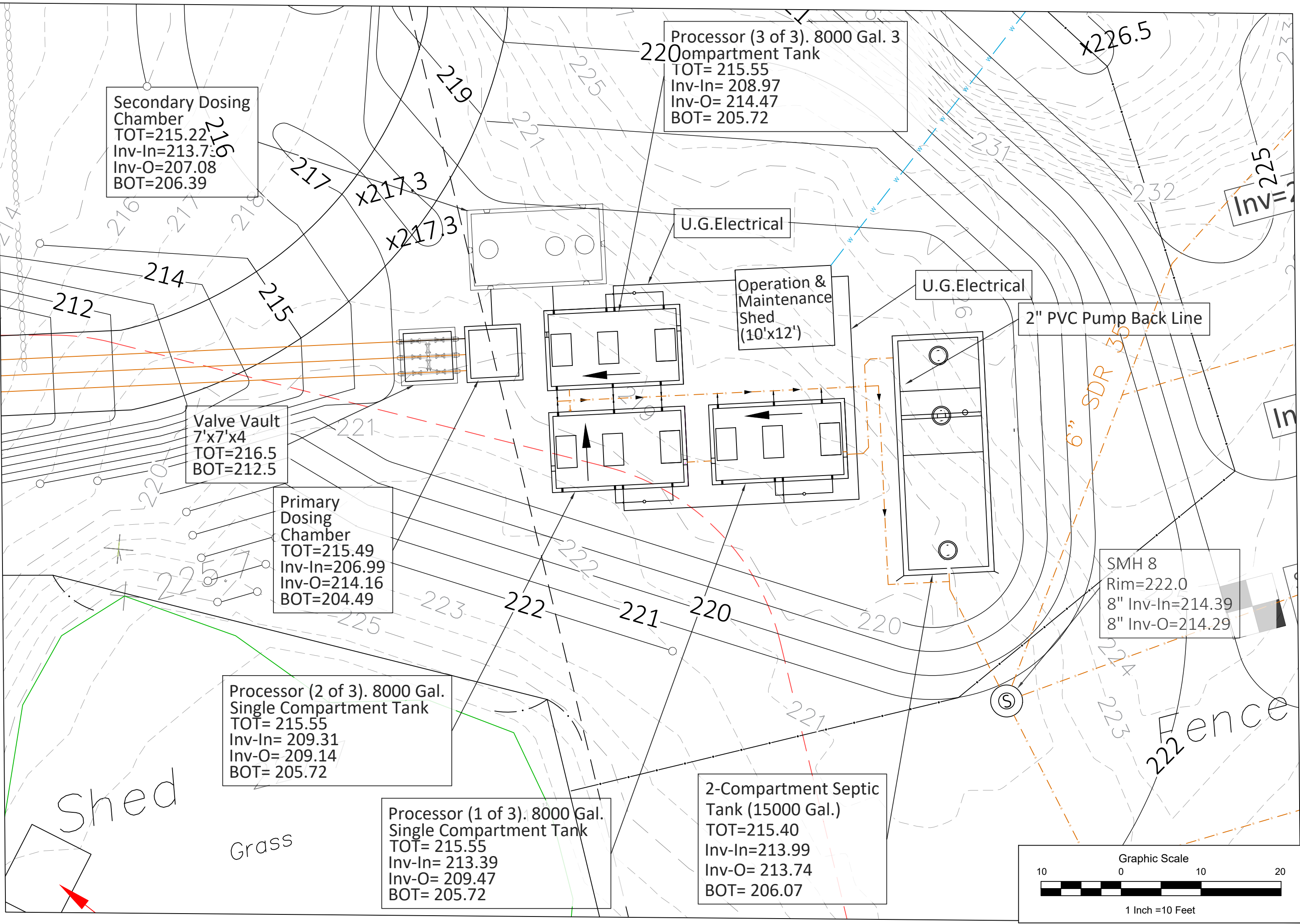
Site Address: 65 Farm Road, Sherborn, MA

Owner: Fenix Partners Farm Road Development, LLC Client: Robert Murchison

Project No: J269-12 Drawn by: FA Date: 11/30/23 Sheet No: 5 of 10

Designed by: DSW, FA Approved by: DSW Scale: Indicated

Rev.:	Date:	Description	By:



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Total Dynamic Head Calculations											
Head Loss from pump to F. Main				Equivalent Lengths (Le)							
Item (Fittings)	Units	Pump # 1 Le/unit Total Le	Total MLC	Units	Pump # 2 Le/unit Total Le	Total MLC	Units	Pump # 3 Le/unit Total Le	Total MLC		
Expansion coupling (3"x4")	1	1 1		1	1 1		1	1 1			
90° Bend (4")	1	10 10		1	10 10		1	10 10			
Check Valve (4")	1	26 26		1	26 26		1	26 26			
Gate Valve (4")	2	2.3 4.6		2	2.3 4.6		2	2.3 4.6			
Tee (4")	0	7 0		0	7 0		0	7 0			
Transition Coupling (4"x4")	0	2 0		0	2 0		0	2 0			
22.5° Bend (4")	1	2.5 2.5		3	2.5 7.5		1	2.5 2.5			
45° Bend (4")	0	5 0		0	5 0		0	5 0			
Reducer Tee (4"x4"x2")	0	2 0		0	2 0		0	2 0			
Ball Valve (4")	0	14 0		0	14 0		0	14 0			
4" Equivalent Pipe Fittings Subtotals (Ft.)	-	- 44.1		-	- 49.1		-	- 44.1			
Linear Feet of 4" pipe: from pump to force main	-	- 182.82		-	- 233.62		-	- 218.02			
Friction loss @270GPM in 4" pipe: pump to force main (Ft.head/100-ft)	-	- 3.70		-	- 3.70		-	- 3.70			
Subtotal: 4" fittings + 4" pipe	-	- 8.40		-	- 10.46		-	- 9.70			

Head Loss from F. Main to Beg. Lateral											
Head Loss from F. Main to Beg. Lateral				Equivalent Lengths (Le)							
Item (Fittings)	Pump # 1			Total MLC	Pump # 2			Total MLC	Pump # 3		
	Units	Le/unit	Total Le		Units	Le/unit	Total Le		Units	Le/unit	Total Le
Expansion coupling (3"x4")	0	1	0		0	1	0		0	1	0
90° Bend (2")	0	5.5	0		0	5.5	0		0	5.5	0
Check Valve (2")	0	13	0		0	13	0		0	13	0
Gate Valve (2")	0	1.2	0		0	1.2	0		0	1.2	0
Tee (2")	0	4	0		0	4	0		0	4	0
Transition Coupling (2"x2")	0	1	0		0	1	0		0	1	0
22.5° Bend (2")	1	1.25	1.25		1	1.25	1.25		1	1.25	1.25
45° Bend (2")	0	2.5	0		0	2.5	0		0	2.5	0
Reducer Tee (4"x4"x2")	1	1	1		1	1	1		1	1	1
Ball Valve (2")	1	7	7		1	7	7		1	7	7
4" Equivalent Pipe Fittings Subtotals (Ft.)	-	- 9.25		-	- 9.25		-	- 9.25		-	- 9.25
Length of 2" pipe from force main to beg. Lateral (Ft)	-	- 1.5		-	- 1.5		-	- 1.5		-	- 1.5
Friction loss @ 45GPM in 2" pipe:force main to Beg. Lateral (Ft.head/100-ft)	-	- 3.43		-	- 3.43		-	- 3.43		-	- 3.43
Subtotal: 2" fittings + 2" pipe	-	- 0.37		-	- 0.37		-	- 0.37		-	- 0.37

Head Loss from Beg. Lateral to end Lateral											
Head Loss from Beg. Lateral to end Lateral				Equivalent Lengths (Le)							
Item (Fittings)	Pump # 1			Total MLC	Pump # 2			Total MLC	Pump # 3		
	Units	Le/unit	Total Le		Units	Le/unit	Total Le		Units	Le/unit	Total Le
Expansion coupling (3"x4")	0	1	0		0	1	0		0	1	0
90° Bend (2")	0	5.5	0		0	5.5	0		0	5.5	0
Check Valve (2")	0	13	0		0	13	0		0	13	0
Gate Valve (2")	0	1.2	0		0	1.2	0		0	1.2	0
Tee (2")	0	4	0		0	4	0		0	4	0
Transition Coupling (2"x2")	0	1	0		0	1	0		0	1	0
22.5° Bend (2")	0	1.25	0		0	1.25	0		0	1.25	0
45° Bend (2")	0	2.5	0		0	2.5	0		0	2.5	0
Reducer Tee (4"x4"x2")	0	1	0		0	1	0		0	1	0
Ball Valve (2")	0	7	0		0	7	0		0	7	0
2" Equivalent Pipe Subtotals	-	- 0		-	- 0		-	- 0		-	- 0
Linear Feet of 2" pipe from beg lateral to end lateral (Ft)	-	- 78.0		-	- 78.0		-	- 78.0		-	- 78.0
Friction loss@ 45GPM in 2" pipe Beg. Lateral to End. Lateral (Ft.head/100-ft)	-	- 3.43		-	- 3.43		-	- 3.43		-	- 3.43
Subtotal: 2" fittings + 2" pipe	-	- 2.68		-	- 2.68		-	- 2.68		-	- 2.68

	Pump # 1		Pump # 2		Pump # 3
Friction Loss	11.44		13.50		12.74
Static Head	-6.43		-6.43		-6.43
Total: Friction Loss + Static Head	5.01		7.07		6.31

SAS, Dosing Chamber and Pump Design

Project: Farm Road 40B
Engineer: Desheng Wang
Site: Farm Rd
Date: 2/16/2023

Design Parameters				
Total	32	3 Bdrm	2 Bdrm	20
Units	76			40
Bdrm				
Design Flow	2786.666667	GPD/Field		
# Fields	3			
Total Flow	8360	GPD/Field		

Leaching Area Sizing: w/ Cultec Contactor 202
Cultec Contactor 202 Approved Effective Width (Ft) 8.10
Design Perc. Rate 5 mpi
ELR 0.74 gpsps
Trench Width (In) 24
Number of Lines 465
Line Spacing C-C (Ft) 6
Line Length (Ft) 8
Field Width (Ft) 78
Overdig Length (Ft) 46
Overdig Width (Ft) 88
Overdig Width (Ft) 56

Pumping Rate:
Design Point: End of Laterals
Laterals: 2 inches
Flow rate per L.: 42.8938365 gpm
Design lateral invert, ft: 197.33 ft
Static Head: -10.08 ft
Residual Head: 3.65 ft
Manifold/Delivery pipe: 20.71 ft
Lateral: 2.93 ft
Total Dynamic Head: **17.21** ft
Residual Pressure = 3.65 ft
Perforations: 0.3125 inches
Perforation O.C.: 48 inches
of Per L.: 20
Flow rate per hole: 2.20 gpm
of Laterals: 6
Total flow: 270.56 gpm

Head Loss: Delivery Lateral Required Flow
Head loss coef, ξ 5.77 1.83 (elbows+chk valve+Ts)
Fitting head loss, ft: 4.32 0.60886585 ft
L, ft: 225.86 79.50 ft
r, in.: 2 1.00 in
Manning's n: 0.011 0.011
Min. Flow Q, gpm: **271.80** 45.30 gpm >= 270.56 gpm
Friction, HL: **16.39** 2.32 ft 272.3559446
Velocity, ft/s 6.94 4.63
Velocity head, ft: 0.75 0.33
Pump to use: Triplex Barnes 3SE 1524DS 1.5 hp, 230 volt, 1 Phase
Dosing Volume (gallons):
Daily Design Volume: 8360.00 gpd
Dose/day/field: **2.00** total doses: 6
Volume per dose: 1393.33 gallons
Pipe Volume:
Laterals: 77.81 Diameter (in): 2 Length (ft): 78
(Backflow) Manifold: 147.38 Diameter (in): 4 Length (ft): 160
Total pipe vol.: 225.19 gallons
Min. dosing volume: 736.88 to 1473.758 gallons (5 -10 times of pipe volume)
Dosing volume = 1393.33 gallons OK
Dosing time= 5.13 minutes

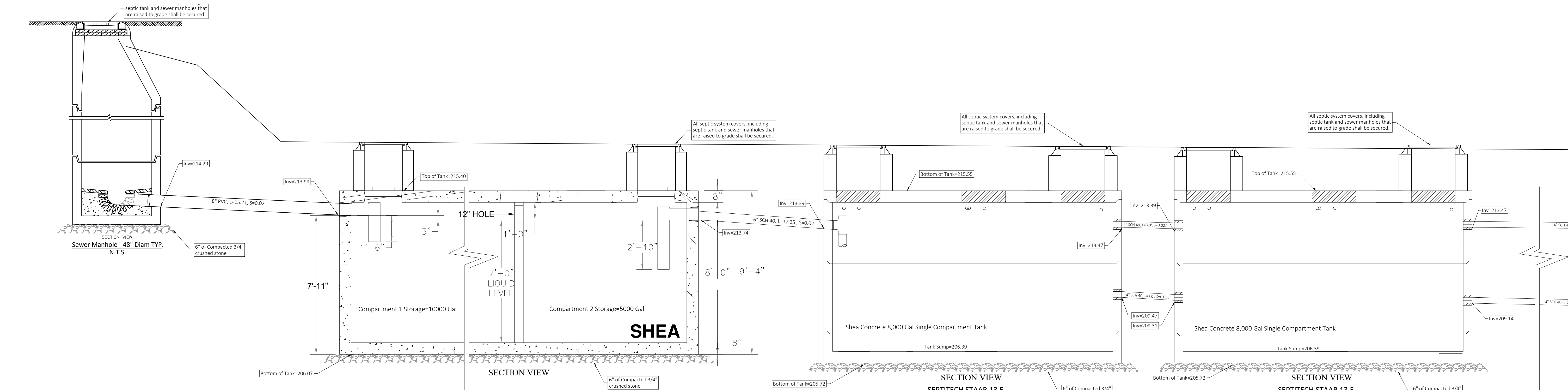
Dosing Chamber:
(Shea Concrete 9400 gallon tanks, primary 2400 gal + 7000 secondary tank)
Width (internal): see plan ft 6 6 Prim. T
Length (internal): ft 16 9 Sec. T
Sec. Area: 180.00 sq. ft
Pump off to lead on: 1.03 ft
Grade: see plan ft
Top of tank: see plan ft
Sump floor (primary): 205.16 ft Secondary 207.06
Pump off: 207.41 ft
Lead on: 208.44 ft
Lag on: 208.64 ft
Alarm on: 208.64 ft
Inlet invert: 213.73 ft
Outlet invert >=: 214.16 ft
Emergency storage: 7427 gal above alarm to outlet

Creative Land & Water Engineering, LLC
Environmental Scientists and Engineers
P.O. Box 584 - Southborough - MA - 01772
774-454-0266 www.claweng.com

Plan Title: Proposed Septic System Pressure Dosing and Pipe Analysis			
Project Name: Farm Road Homes			
Site Address: 65 Farm Road, Sherborn, MA			
Owner: Fenix Partners Farm Road Development, LLC		Client: Robert Murchison	
Project No: J269-12	Drawn by: FA	Date: 11/30/23	Sheet No: 6 of 10
Designed by: DSW, FA	Approved by: DSW	Scale: Indicated	
Rev.:	Date:	Description	By:



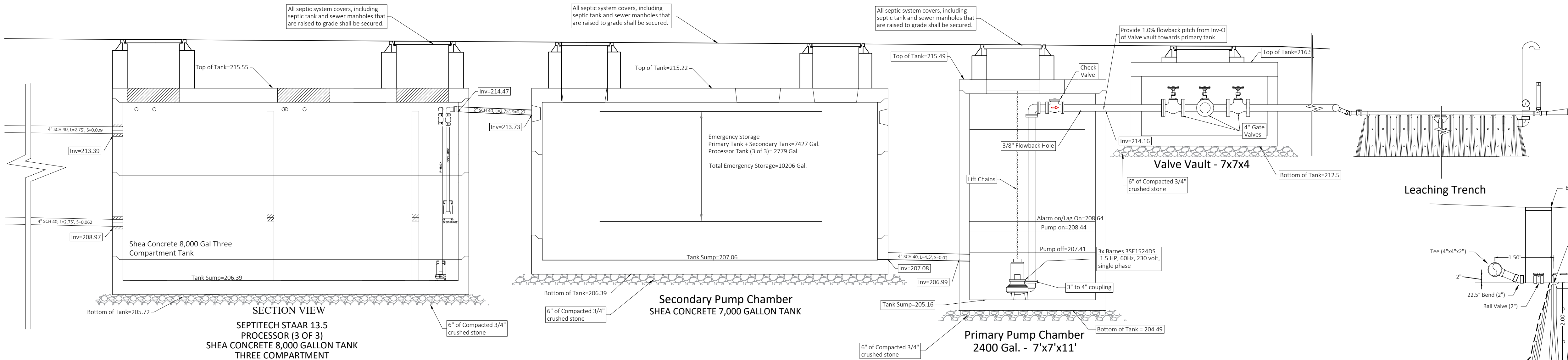
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SHEA CONCRETE 15000 Gal. 2 COMPARTMENT SEPTIC TANK (Required is 12540 Gal. for design)
(SEPTIC TANK SHOULD BE SIZED TO A MINIMUM OF 1.5 TIMES DAILY FLOW OR TO LOCAL
REGULATORY REQUIREMENTS-WHICHEVER IS GREATER)

SECTION VIEW
SEPTITECH STAAR 13.5
PROCESSOR (1 OF 3)
SHEA CONCRETE 8,000 GALLON TANK
SINGLE COMPARTMENT

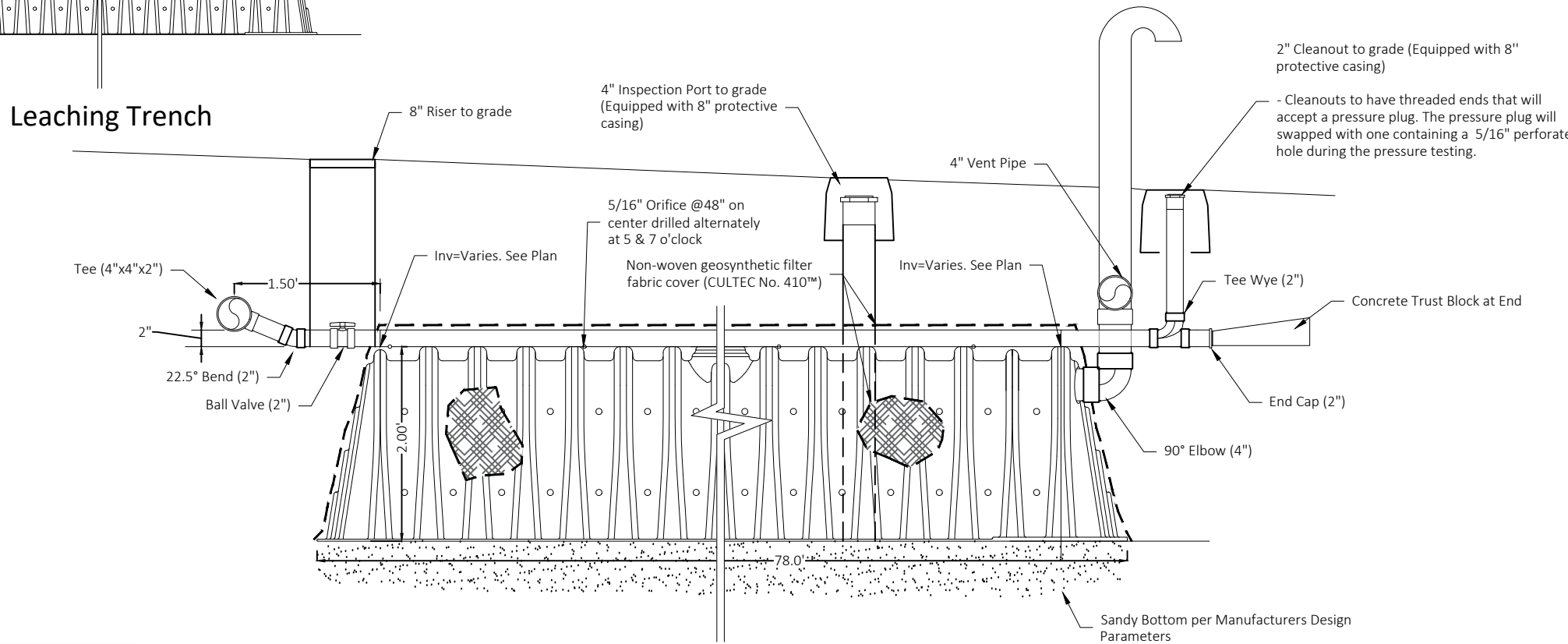
SECTION VIEW
SEPTITECH STAAR 13.5
PROCESSOR (2 OF 3)
SHEA CONCRETE 8,000 GALLON TANK
SINGLE COMPARTMENT



Pressure System Notes

1. After system installation but prior to backfilling, a full pressure test of the system shall be conducted. The pump chamber shall be filled and a supply of water provided to the pump chamber.
2. The design engineer shall be contacted to conduct the pressure test and to obtain the initial calibration data.
3. The pressure system shall provide for a minimum distal head of 2.5 feet.
4. The system shall be inspected as required by Title 5, as stated in 310 CMR 15.254 (2)(d). Every three months.

Leaching Trench

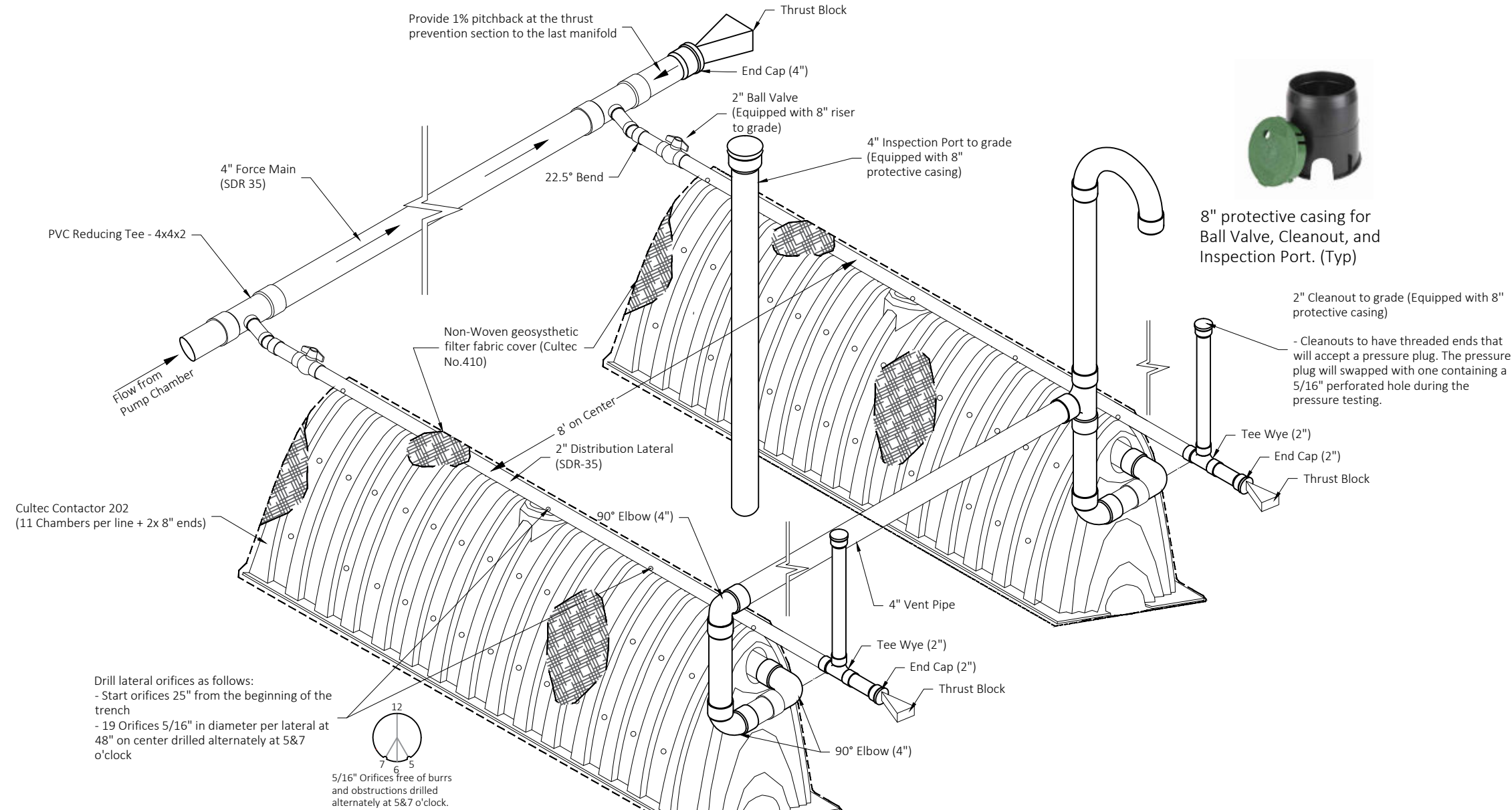


Leaching Trench Profile
N.T.S

Estimated High Groundwater at Tanks and Buoyance Check

Structure	Est. Grade	EHGW	Btm of Tank Elev	Tank area, sf	Bouyance, lbs	Weight of Tank, lbs	Friction, lbs	balast, lbs	Check	Note
Septic Tank	222.00	212.4	206.07	340	134257.781	136000	NN	NN	ok	EHGW Interpolated between SLTP#2 and SWTP#3
Processor Tank #1	218.84	209.75	205.72	170	42750.24	66250	NN	NN	ok	
Processor Tank #2	220.00	210.73	205.72	170	53146.08	66250	NN	NN	ok	
Processor Tank #3	219.00	209.89	205.72	170	44235.36	74250	NN	NN	ok	
Secondary Pump Chamber	218.38	209.37	206.39	170	31611.84	65731	NN	NN	ok	
Primary Pump Chamber	219.92	210.66	204.49	49	18865.392	27750	NN	NN	ok	
Valve Vault	219.78	210.54	212.5			above EHGW				

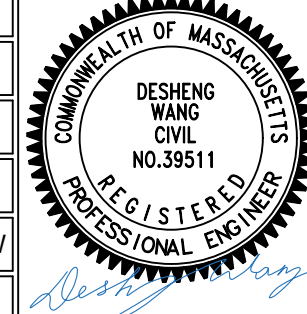
Note: NN= Not Needed



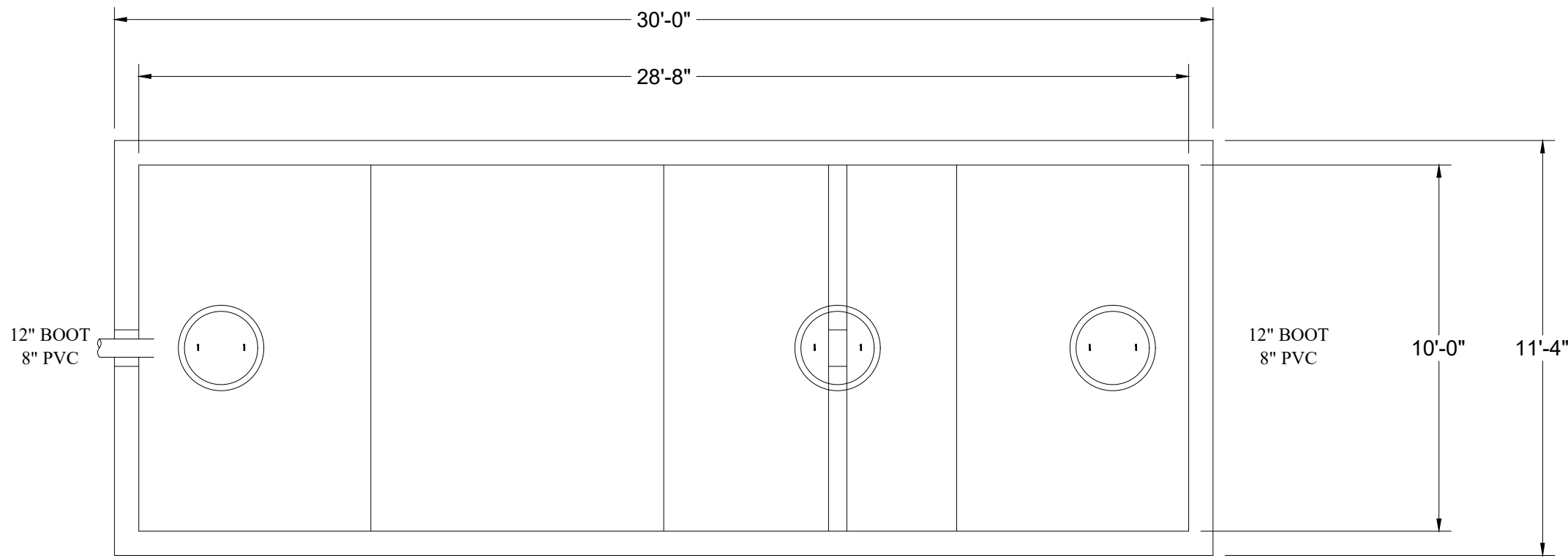
Leaching Trench Isometric View
N.T.S

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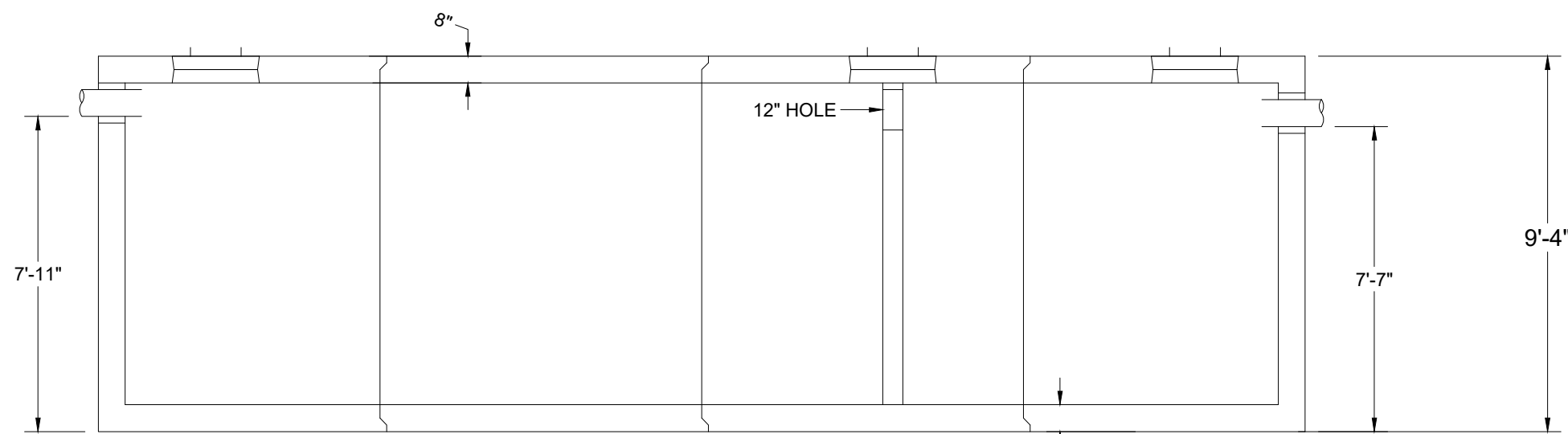
Plan Title:		Proposed Septic System Treatment I/A Profile Plan 1					
Project Name:		Farm Road Homes					
Site Address:		65 Farm Road, Sherborn, MA					
Owner:		Fenix Partners Farm Road Development, LLC		Client: Robert Murchison			
Project No:	J269-12	Drawn by:	FA	Date:	11/30/23	Sheet No:	7 of 10
Designed by:	DSW, FA	Approved by:	DSW	Scale:	Indicated		
01	02/02/24	Profile Details. EHGW at tanks & Buoyancy Calcs			FA/DSW		
Rev.:	Date:	Description			By:		







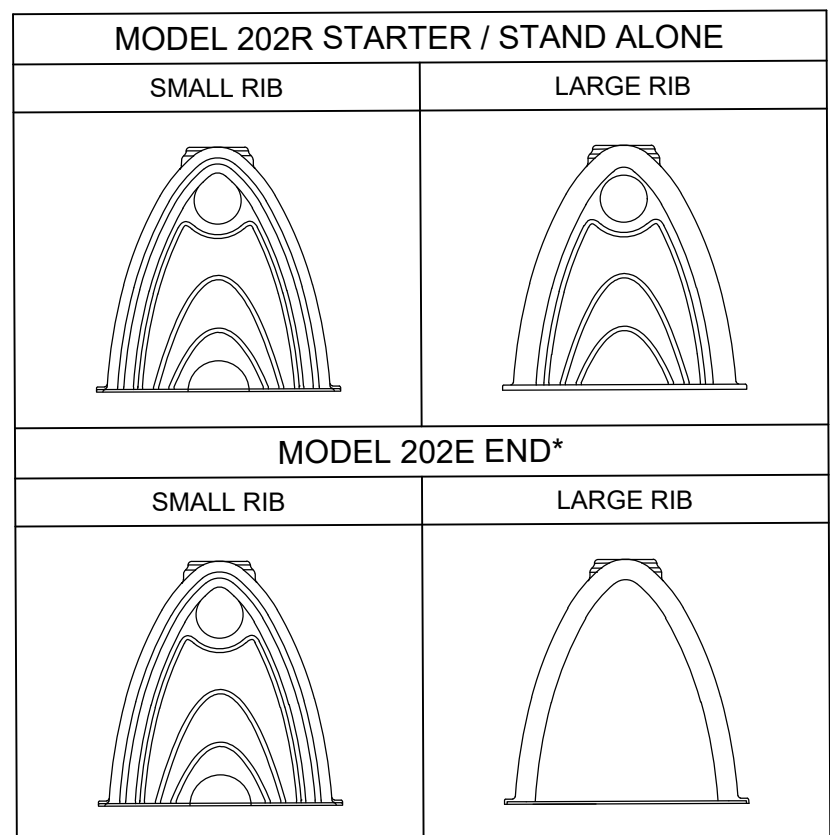
PLAN VIEW



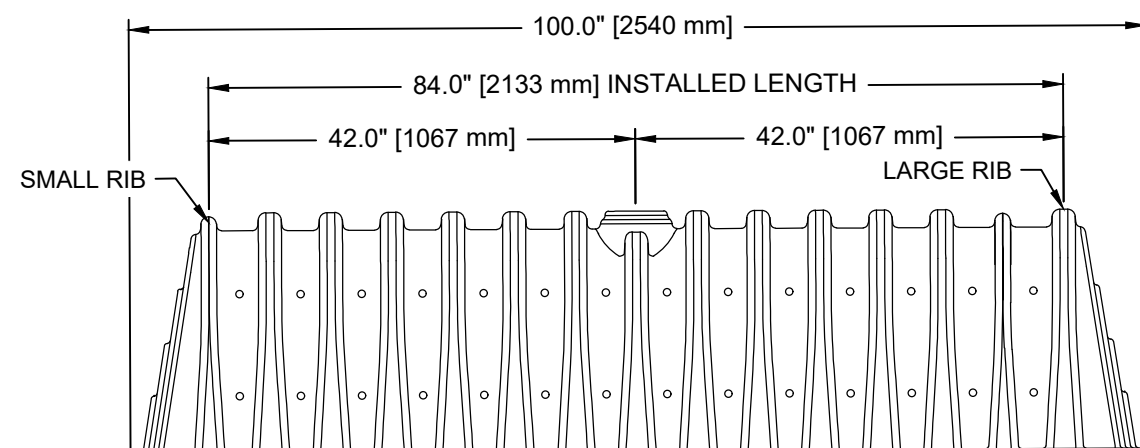
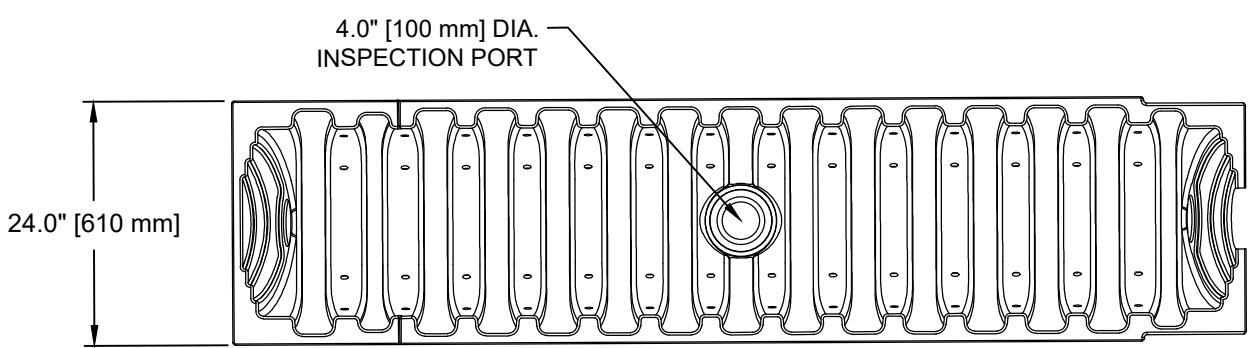
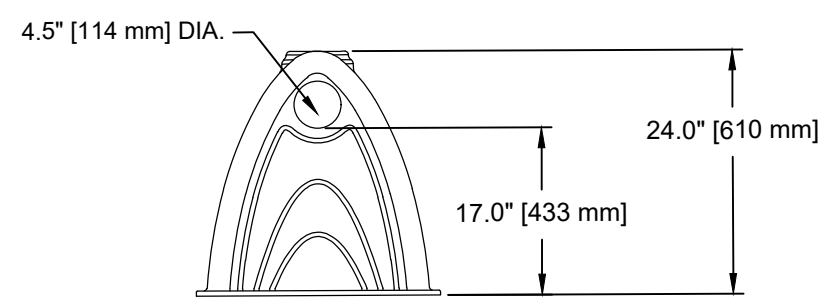
SECTION VIEW

- NOTES:
1. CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS.
 2. DESIGN CONFORMS WITH 310 CMR 15.00, DEP TITLE 5 REGS, FOR SEPTIC TANKS.
 3. ALL REINFORCEMENT PER ASTM A-615, GRADE 60.
 4. DESIGNED LOADING AASHTO HS20-44, 2 TO 5 FEET COVER.
 5. TONGUE AND GROOVE JOINT SEALED WITH BUTYL RESIN AND BOLTED WITH 3/4" DIA BOLTS.
 6. ALL PIPE PENETRATIONS TO USE FLEXIBLE WATERTIGHT CONNECTORS PER ASTM C923.
 7. OPTIONAL EXTERIOR COATING AVAILABLE.
 8. DIMENSIONS DO NOT INCLUDE JOINT CREEP. ACTUAL LENGTH MAY BE LONGER DUE TO JOINT CREEP.
 9. WEIGHT:
8'-0" MIDDLE 15TON; 6'-4" END 17TON

SEPTIC TANK (15000 GALLON/2-COMP)
TUNNEL TANK

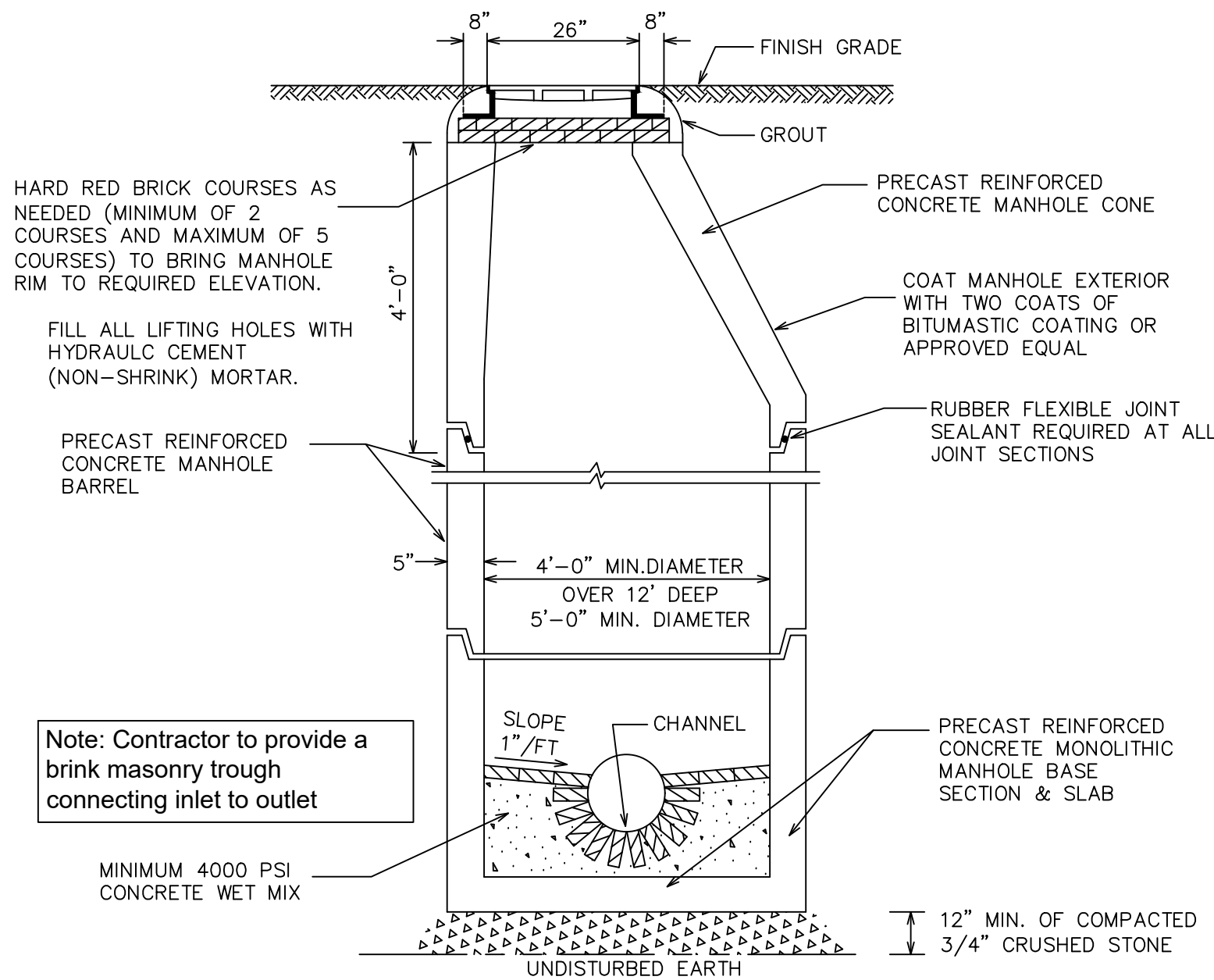


*MAY ALSO BE USED AS AN INTERMEDIATE UNIT TO EXTEND THE LENGTH OF A RUN



CULTEC CONTACTOR 202 CHAMBER STORAGE = 2.18 CF/FT [0.20 m³/m]
INSTALLED LENGTH ADJUSTMENT = 1.33' [0.41 m]

Cultec Contactor 202 Details
N.T.S.

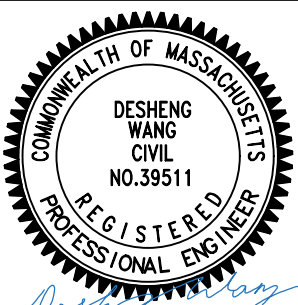


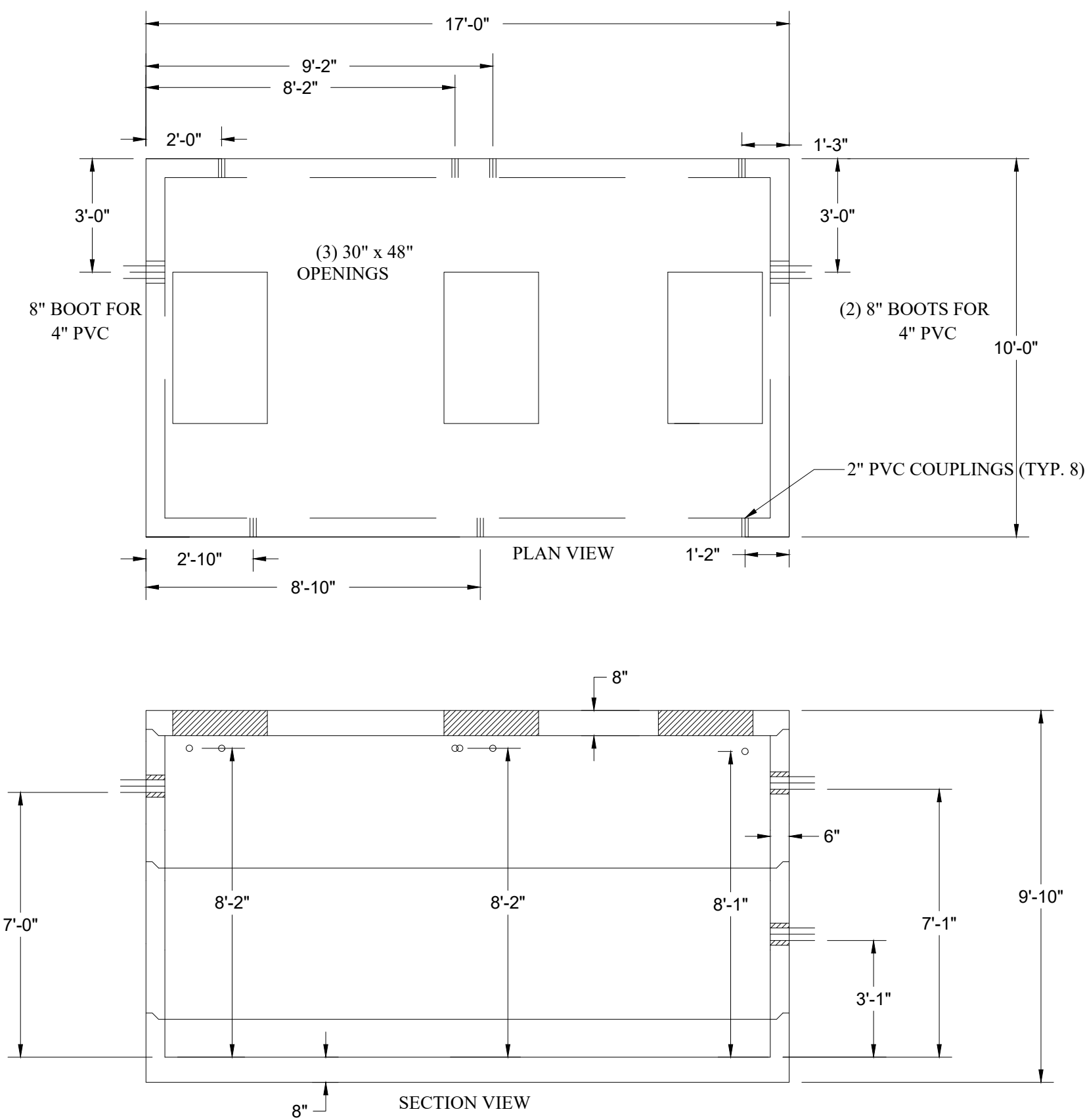
1. TYPICAL SANITARY MANHOLE TO BE 4 FEET IN DIAMETER.
2. 5'-0" DIAMETER FOR ALL MANHOLE DEPTHS GREATER THAN 12 FEET
3. 6" MIN. WALL THICKNESS AND 7" BASE THICKNESS FOR 5'-0" DIAMETERS MANHOLES.
4. INNER EDGE OF BRICK TABLE TO BE AT ELEVATION OF CROWN OF TOP OF PIPE.
5. DESIGN LOAD = HS20
6. ALL INVERTS SHALL BE 4,000 PSI CEMENT CONCRETE IN VOID AREAS ND RED SEWER BRICK CONSTRUCTION.
7. INVERTS SHALL NOT BE BUILT ABOVE GRADE. ALL INVERTS SHALL BE BUILT IN PLACE AFTER ALL PIPES HAVE BEEN INSTALLED.

SEWER MANHOLE (TYP.) – N.T.S.

Creative Land & Water Engineering, LLC
Environmental Scientists and Engineers
P.O. Box 584 - Southborough - MA - 01772
774-454-0266 www.claweng.com

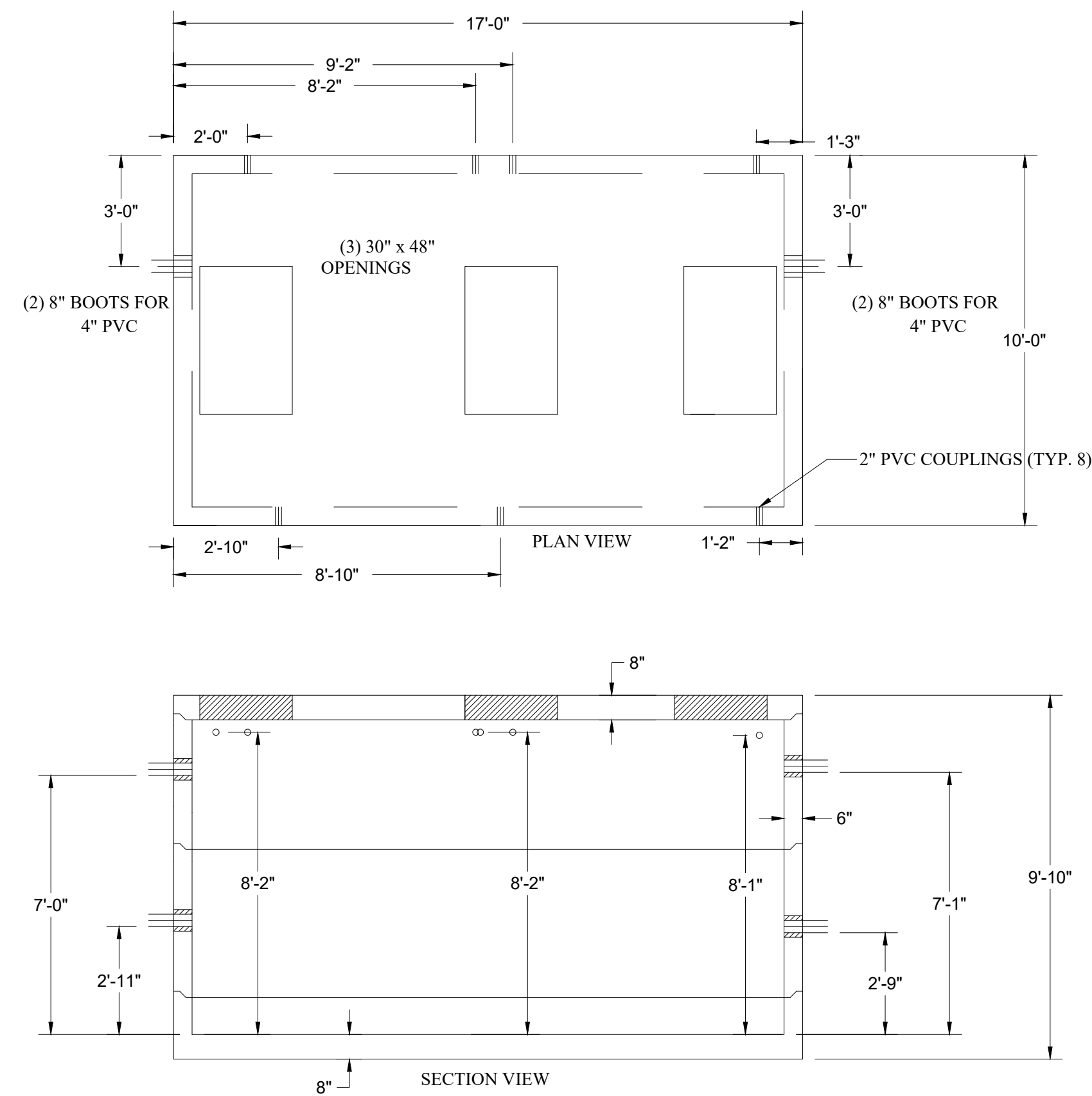
Plan Title: Proposed Septic System Tank, Sewer Manhole and Chamber Details 01			
Project Name: Farm Road Homes			
Site Address: 65 Farm Road, Sherborn, MA			
Owner: Fenix Partners Farm Road Development, LLC		Client: Robert Murchison	
Project No: J269-12	Drawn by: FA	Date: 11/30/23	Sheet No: 9 of 10
Designed by: DSW, FA	Approved by: DSW	Scale: Indicated	
01	02/02/24	Manhole Detail	FA/DSW
Rev.:	Date:	Description	By:





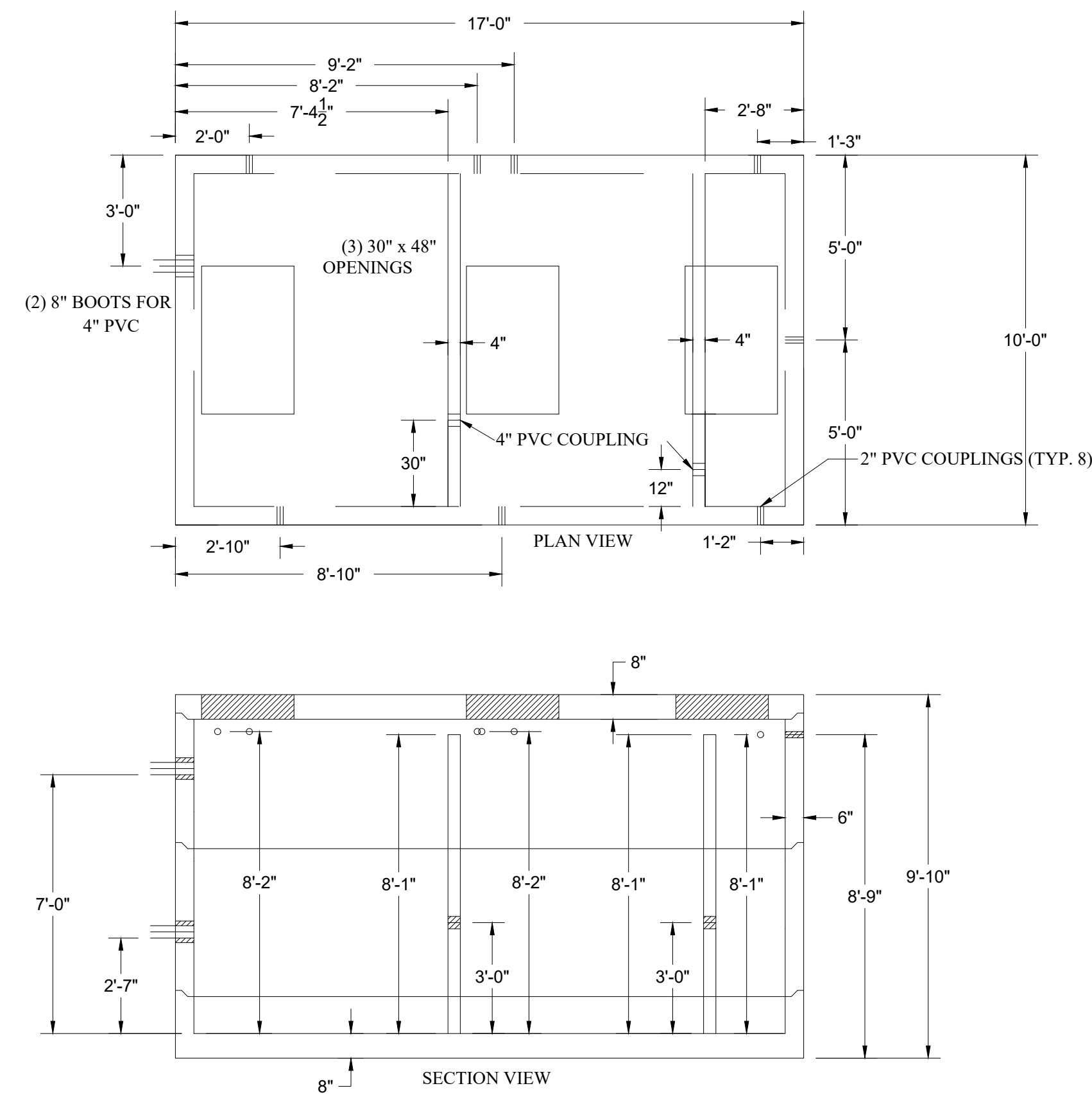
NOTES:

1. CONCRETE: 5,000 PSI MINIMUM AFTER 28 DAYS.
2. DESIGN CONFORMS WITH 310 CMR 15.00, DEP TITLE 5 REGS, FOR SEPTIC TANKS.
3. ALL REINFORCEMENT PER ASTM C1227-93.
4. DESIGNED FOR H-20 LOADING, COVER 1-5 FT.
5. TONGUE AND GROOVE JOINT SEALED WITH BUTYL RESIN. INLET HEIGHT MAY INCREASE SLIGHTLY DUE TO THE BUTYL RESIN USED.



NOTES:

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NOTES:

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5. TONGUE AND GROOVE JOINT SEALED WITH BUTYL RESIN. INLET HEIGHT MAY INCREASE SLIGHTLY DUE TO THE BUTYL RESIN USED.