

GENERAL NOTES

RECORD OF OWNERSHIP

Hillview Heights, LLC
1 Green Tree Drive
South Burlington, VT 05403

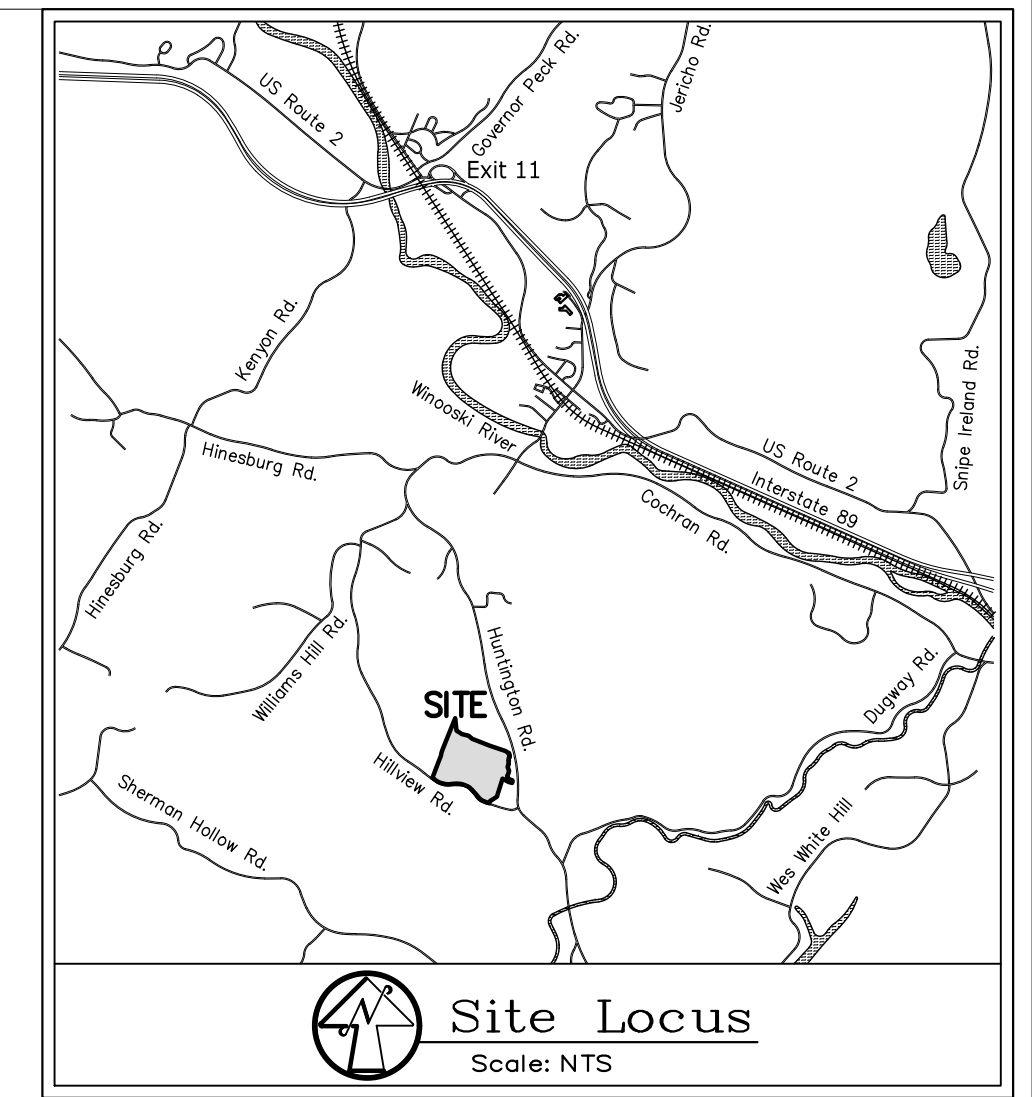
TOPOGRAPHY PROVIDED BY:
CROSS CONSULTING ENGINEERS, P.C.
103 FAIRFAX ROAD
ST. ALBANS, VT 05478

ANTICIPATED CONSTRUCTION SCHEDULE:

Start: Spring 2022
Complete: Fall 2024

- The contractor shall be responsible for verifying and determining the location, size and elevation of all existing utilities shown or not shown on this plan prior to the start of construction. The engineer shall be notified, in writing, of any utilities found interfering with the proposed construction and appropriate remedial action shall be taken before proceeding with the work. The contractor shall verify all dimensions and elevations in the field before commencing construction and notify the engineer, in writing, of any discrepancy found.
- See specifications for Soil Test Pit Logs. See sheet C-2 for test pit locations.

Sheet Number	Sheet Title
C-1	Master Site Plan
C-2	Existing Conditions Plan
C-3	Grading Plan - Lots 1 & 2
C-4	Grading Plan - Lots 3, 4 & 5
C-5	Grading Plan - Lot 7
C-6	Grading Plan - Lot 6
C-7	Sanitary and Potable Water Plan - Lots 1 & 2
C-8	Sanitary and Potable Water Plan - Lot 3
C-9	Sanitary and Potable Water Plan - Lots 4 & 5
C-10	Sanitary and Potable Water Plan - Lot 7
C-11	Sanitary and Potable Water Plan - Lot 6
C-12	Sanitary and Potable Water Specifications & Details
C-13	Road Plan and Profile
C-14	Filtering System Plan and Profile
C-15	Gravel Wetland 1 Plan and Profile
C-16	Gravel Wetland 2 Plan and Profile
C-17	Gravel Wetland 3 Plan and Profile
C-18	Post-Construction Soil Depth Plan
C-19	Stormwater Maintenance Plan
C-20	Details
EX-2	Partial Wetland Exhibit



LEGEND

	EXISTING	PROPOSED
DRAINAGE MANHOLE		
CATCH BASIN		
END SECTION		
SEWER MANHOLE		
SEWER CLEANOUT		
HYDRANT		
END CAP		
GATE VALVE		
WELL		
UTILITY POLE		
GUY WIRE		
LIGHT POLE		
WALL PACK LIGHT		
TRANSFORMER BOX		
TELEPHONE BOX		
ELEVATION BENCHMARK		
PROPERTY LINE		
RIGHT-OF-WAY		
CENTERLINE OF ROAD		
STORMDRAIN		
UNDERDRAIN		
GRAVITY SANITARY SEWER		
PRESSURE SANITARY SEWER		
WATER MAIN/SERVICE		
GAS MAIN/SERVICE		
OVERHEAD UTILITY		
UNDERGROUND UTILITY		
OVERHEAD ELECTRICAL		
UNDERGROUND ELECTRICAL		
OVERHEAD TELEPHONE		
UNDERGROUND TELEPHONE		
STREAM/DRAINAGE SWALE		
WETLAND DELINEATION		
WETLAND BUFFER		
EDGE OF WOODS		
CONTOURS		

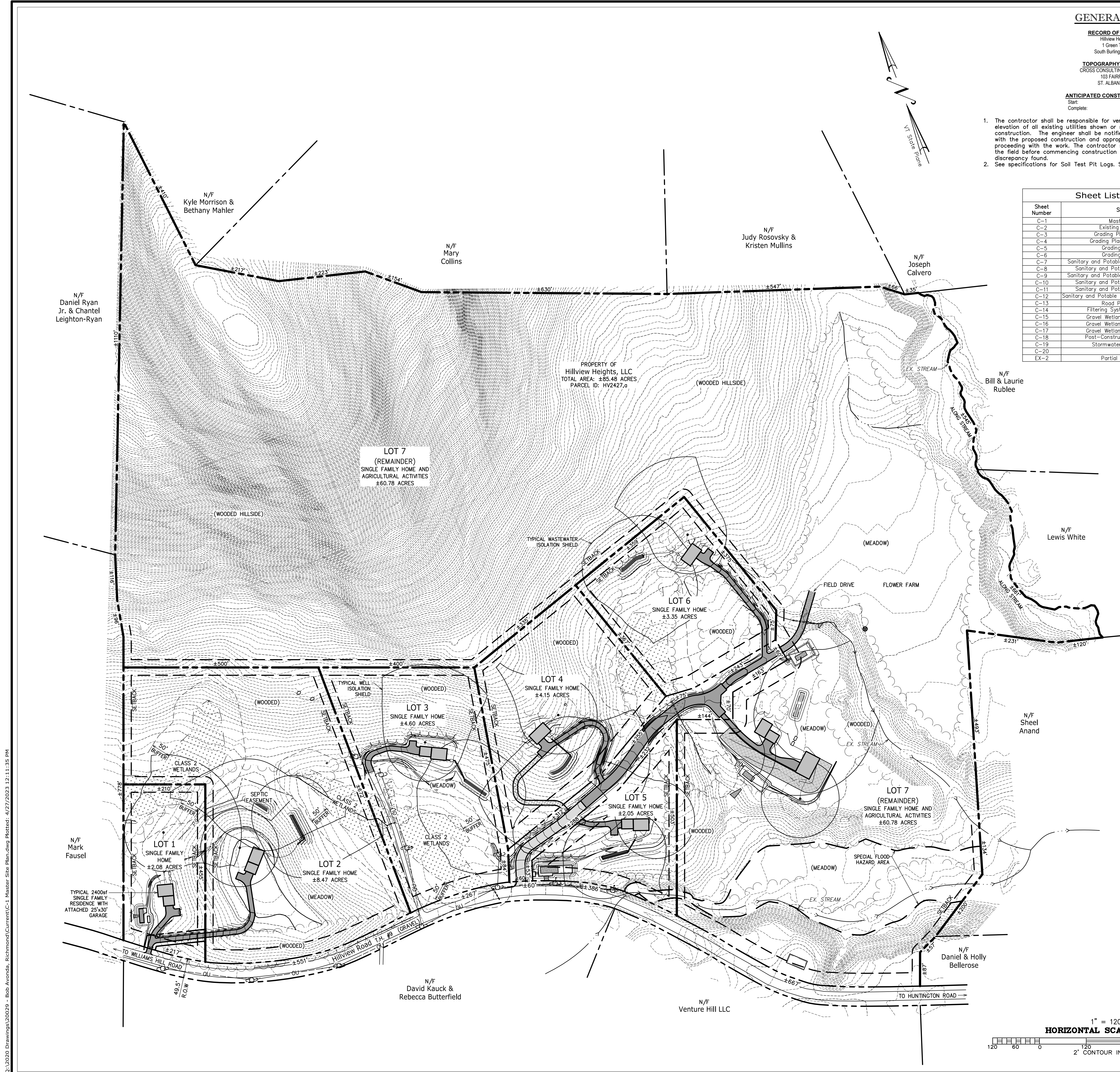
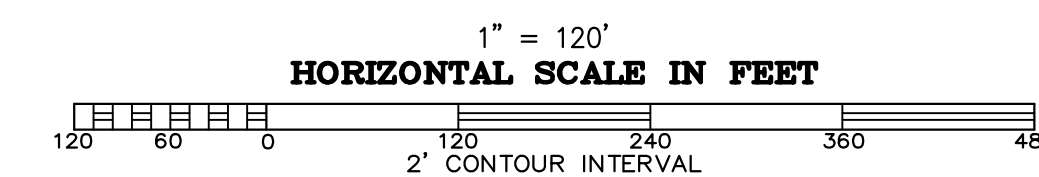
NOTE: LEGEND MAY INCLUDE SYMBOLS AND LINES NOT RELEVANT TO THIS PROJECT

TOWN OF RICHMOND ZONING DATA

ZONING DISTRICT: Agricultural/Residential (AR)
ZONING OVERLAY: Special Flood Hazard Area (SFHA)
EXISTING LAND USE: Residential and Agricultural
PROPOSED LAND USE: Residential and Agricultural

	Requirements	Proposed
Min. Lot Area	1 acre	>2.05 acres
Min. Lot Width	50 FT	>100 FT
Front Yard Setback	35 FT	>35 FT
Side Yard Setback	20 ft	>50 FT
Rear Yard Setback	20 ft	>50 FT
Max. Lot Coverage	30%	<10%
Max. Building Height	35 ft	<35 FT

Source: Town of Richmond Land Development Regulations, 2020



Q:\2020 Drawings\20029 - Bob Avondis, Richmond\Current\C-1 Master Site Plan.dwg PlotDate: 4/27/2023 12:11:35 PM

PROJECT: 20029
DATE: February 23, 2022
DESIGN: PJG
DRAWN: RHW/NRB
CHECKED: PJG
APPROVED: PJG

Tel: 802-524-2113
Fax: 802-524-9681

CROSS CONSULTING ENGINEERS, P.C.
103 FAIRFAX ROAD
ST. ALBANS, VERMONT 05478
© COPYRIGHT 2021
Cross Consulting Engineers, P.C.

Hillview Heights, LLC
South Burlington, VT

Hillview Heights Subdivision
Hillview Road

Master Site Plan

CIVIL
C-1

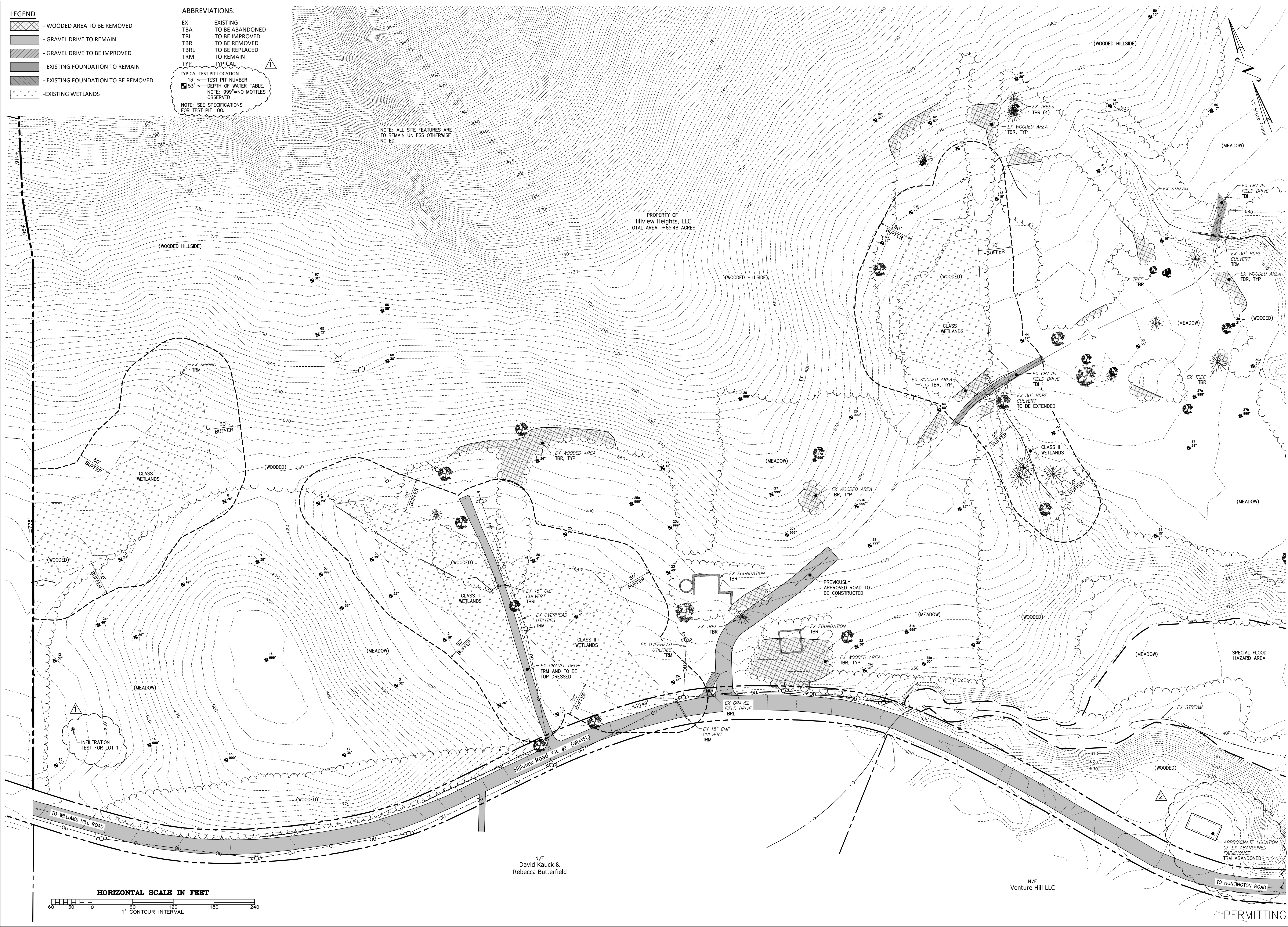
SHEET C-1 OF 20

- LEGEND**
- WOODED AREA TO BE REMOVED
 - GRAVEL DRIVE TO REMAIN
 - GRAVEL DRIVE TO BE IMPROVED
 - EXISTING FOUNDATION TO REMAIN
 - EXISTING FOUNDATION TO BE REMOVED
 - EXISTING WETLANDS

- ABBREVIATIONS:**
- EX EXISTING
 - TBA TO BE ABANDONED
 - TBI TO BE IMPROVED
 - TBR TO BE REMOVED
 - TBRM TO BE REPLACED
 - TRM TO REMAIN
 - TYP TYPICAL
- TYPICAL TEST PIT LOCATION
 13 TEST PIT NUMBER
 53' DEPTH OF WATER TABLE
 NOTE: 999' - NO MOTTLES OBSERVED
- NOTE: SEE SPECIFICATIONS FOR TEST PIT LOG.

NOTE: ALL SITE FEATURES ARE TO REMAIN UNLESS OTHERWISE NOTED.

PROPERTY OF Hillview Heights, LLC
 TOTAL AREA: ±65.48 ACRES



N/F David Kauck & Rebecca Butterfield

N/F Venture Hill LLC

PERMITTING

Q:\2020 Drawings\20029 - Bob Avondale, Richmond\Current\C-2 Existing Conditions Plan.dwg Plotted: 4/27/2023 11:43:23 AM

PROJECT: 20029
 DATE: February 23, 2022
 DESIGN: PJG
 DRAWN: RHW/NRB
 CHECKED: PJG
 APPROVED: PJG

CCE CROSS
 CONSULTING ENGINEERS, P.C.
 103 Fairfax Rd.
 St. Albans, Vermont 05478
 © COPYRIGHT 2023
 Cross Consulting Engineers, P.C.

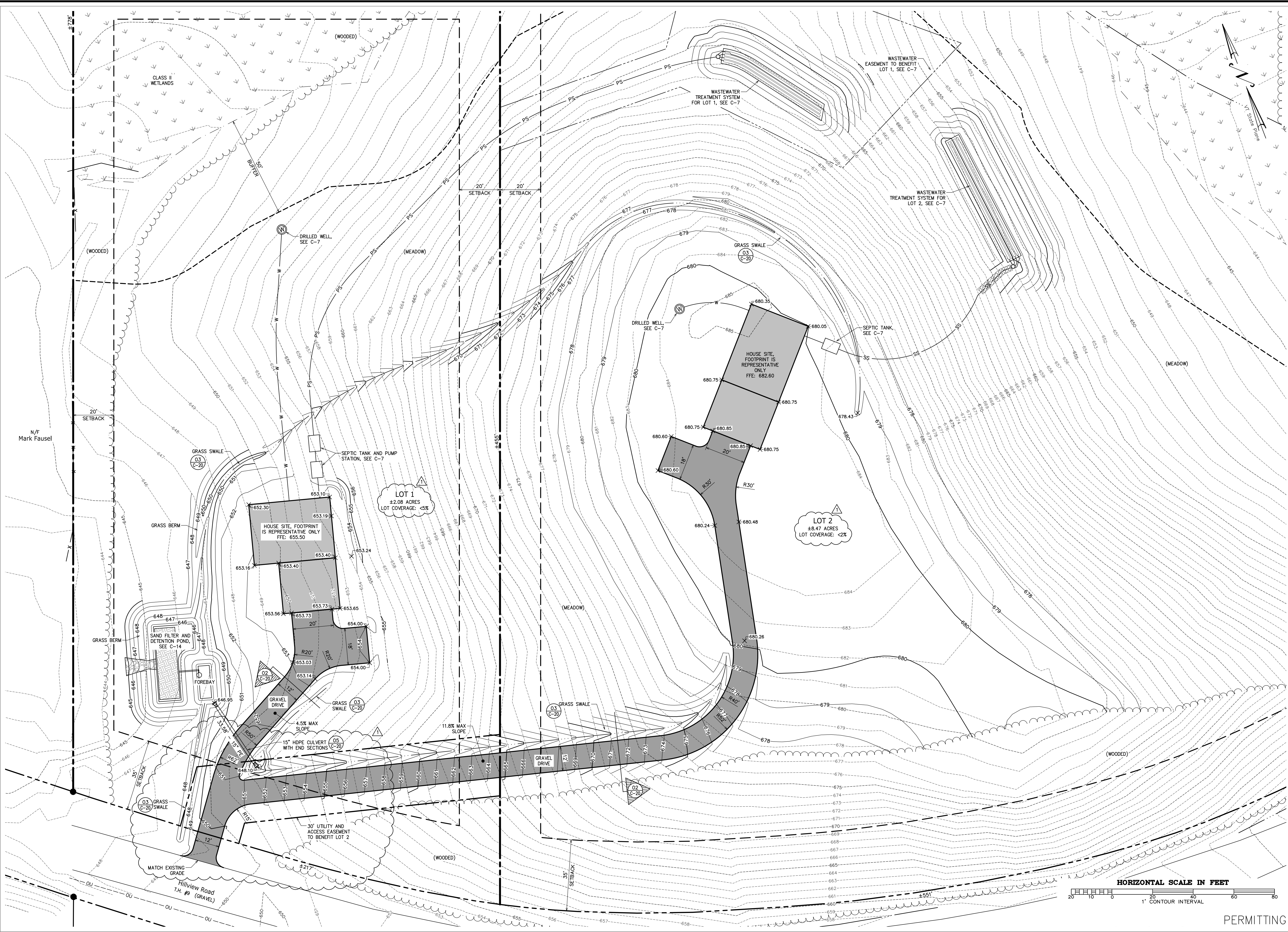
Existing Conditions Plan

Hillview Heights, LLC
 South Burlington, VT
Hillview Heights Subdivision
 Hillview Road
 Richmond, VT

CIVIL
C-2
 SHEET C-2 OF 20

REVISIONS:
 2022-06-21: REVISED TEST PIT SYMBOLS AND ADDED THE INFILTRATION TEST LOCATION.
 2022-12-27: ADDED THE ABANDONED HOUSE ALONG HILLVIEW ROAD TO THE PLAN.

Q:\2020 Drawings\20029 - Bob Avonds, Richmond\Current\C-3 Grading Plan - Lots 1 & 2.dwg Plotter: 4/27/2023 11:28:28 AM



PROJECT: 20029
 DATE: February 23, 2022
 DESIGN: PJG
 DRAWN: RHW/NRB
 CHECKED: PJG
 APPROVED: PJG

TEL: 802-524-2113
 FAX: 802-524-9681
CROSS
 CONSULTING ENGINEERS, P.C.
 103 Fairfax Rd.
 St. Albans, Vermont 05478
 © COPYRIGHT 2023
 Cross Consulting Engineers, P.C.

Grading Plan - Lots 1 & 2

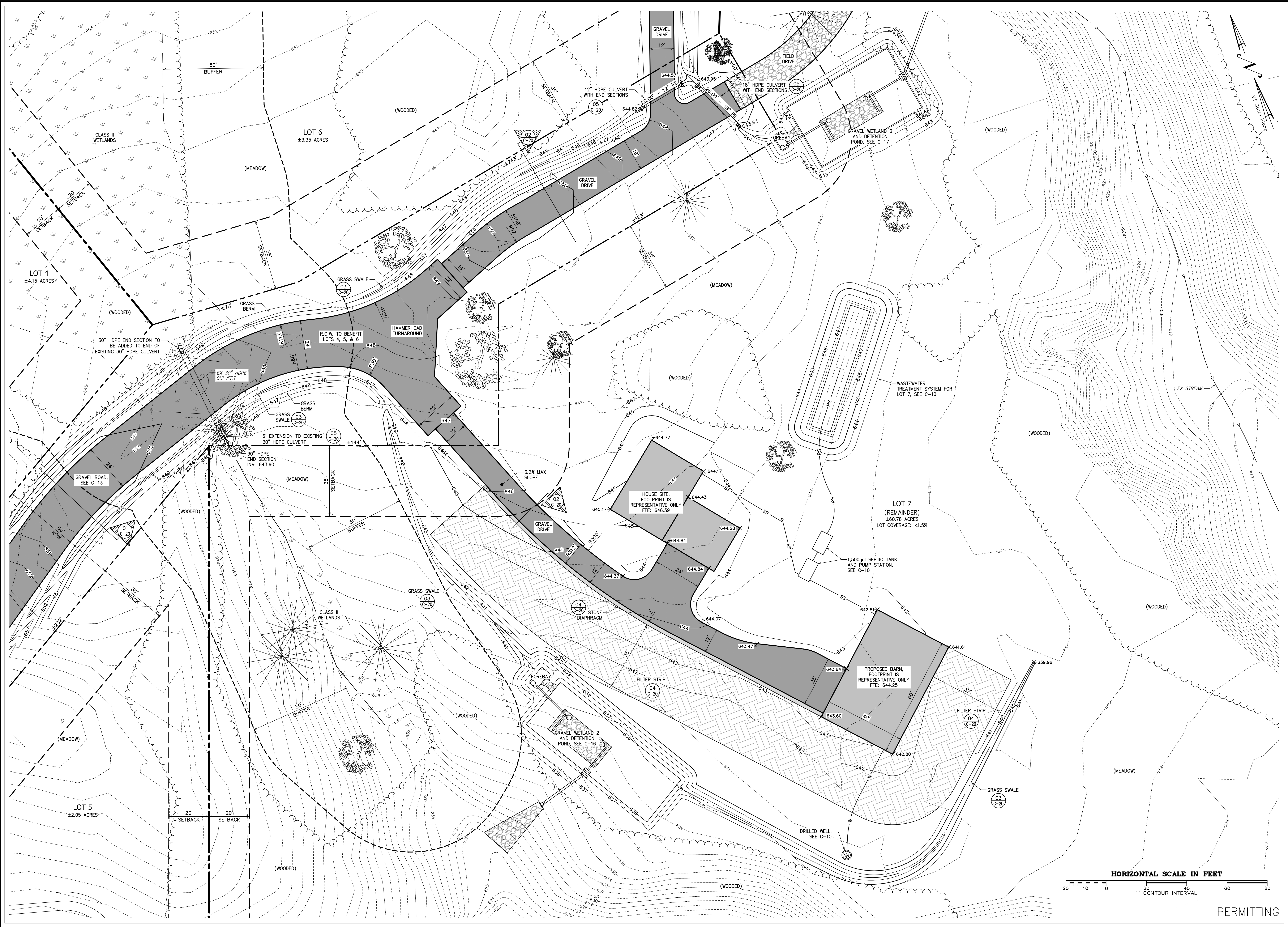
REVISIONS: REVISIONS OF LOTS 1 AND 2, CORRECTED THE TWO CURB CUTS INTO ONE AND ADDED AN EASEMENT FOR LOT 2.

Hillview Heights, LLC
 South Burlington, VT
Hillview Heights Subdivision
 Hillview Road
 Richmond, VT

CIVIL
C-3
 SHEET C-3 OF 20

HORIZONTAL SCALE IN FEET
 1" = 80'
 1' CONTOUR INTERVAL
 PERMITTING

Q:\2020 Drawings\20029 - Bob Avondis, Richmond\Current\C-5 Grading Plan - Lot 7.dwg Plotted: 4/27/2023 11:55:08 AM



PERMITTING

PROJECT: 20029
DATE: February 23, 2022
DESIGN: PJG
DRAWN: RHW/NRB
CHECKED: PJG
APPROVED: PJG

TEL: 802-524-2113
FAX: 802-524-9661
CCE CROSS
CONSULTING ENGINEERS, P.C.
103 Fairfax Rd.
St. Albans, Vermont 05478
© COPYRIGHT 2023
Cross Consulting Engineers, P.C.

Grading Plan - Lot 7

Hillview Heights, LLC
South Burlington, VT

Hillview Heights Subdivision

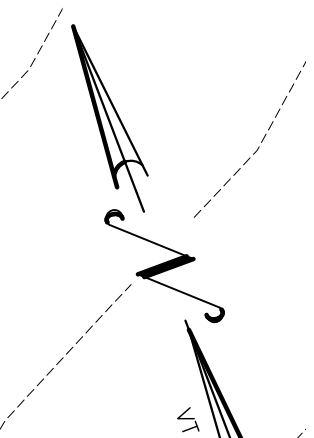
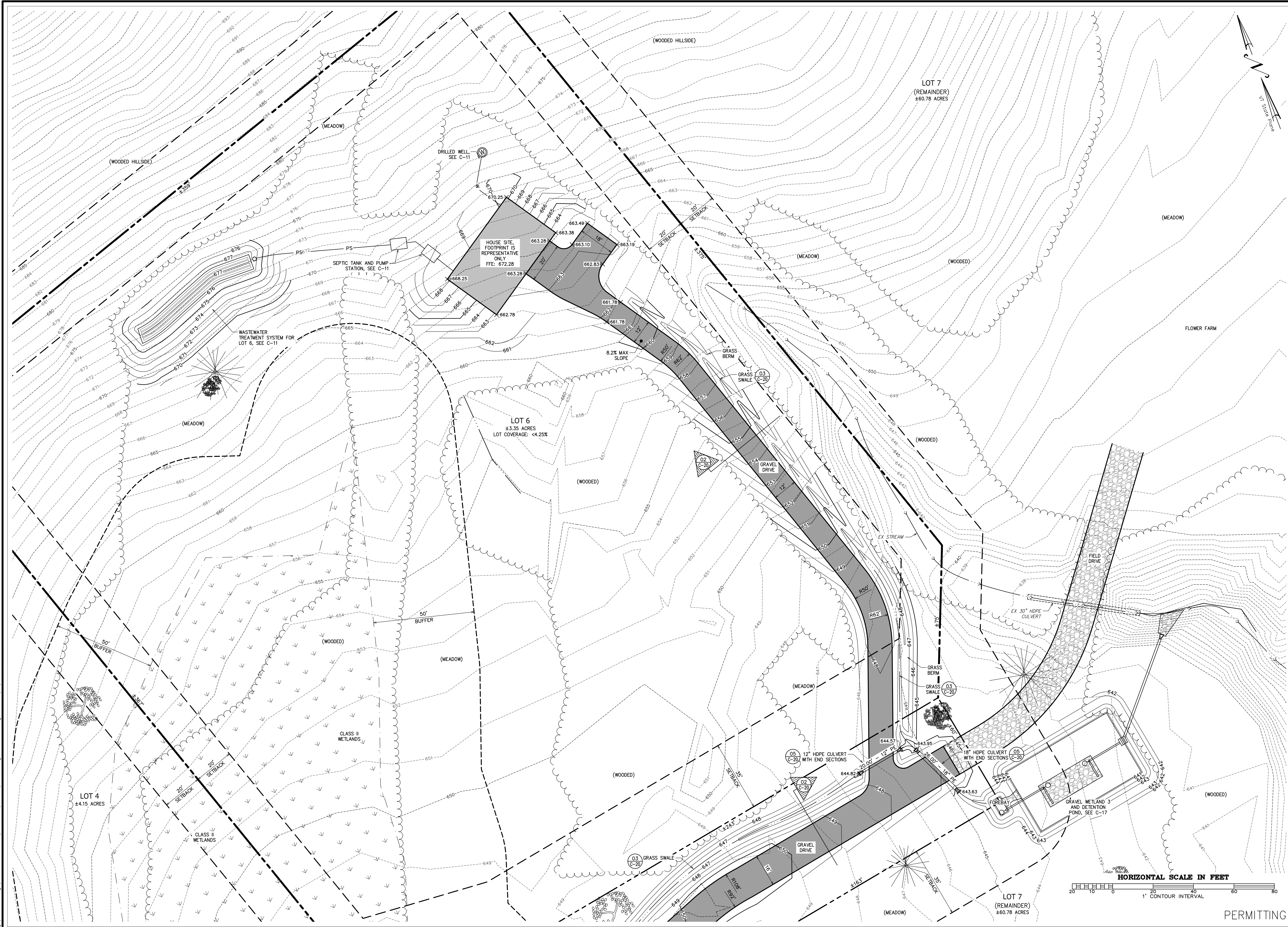
Hillview Road

CIVIL

C-5

SHEET C-5 OF 20

Q:\2020 Drawings\20029 - Bob Avondis, Richmond\Current\C-6 Grading Plan - Lot 6.dwg Plotted: 4/27/2023 11:56:46 AM



PERMITTING

PROJECT: 20029
 DATE: February 23, 2022
 DESIGN: PJG
 DRAWN: RHW/NRB
 CHECKED: PJG
 APPROVED: PJG

CE CROSS
 CONSULTING ENGINEERS, P.C.
 103 Fairfax Rd.
 St. Albans, Vermont 05478
 © COPYRIGHT 2023
 Cross Consulting Engineers, P.C.

Grading Plan - Lot 6

Hillview Heights, LLC
 South Burlington, VT
 Hillview Heights Subdivision
 Hillview Road
 Richmond, VT

CIVIL
 C-6
 SHEET C-6 OF 20

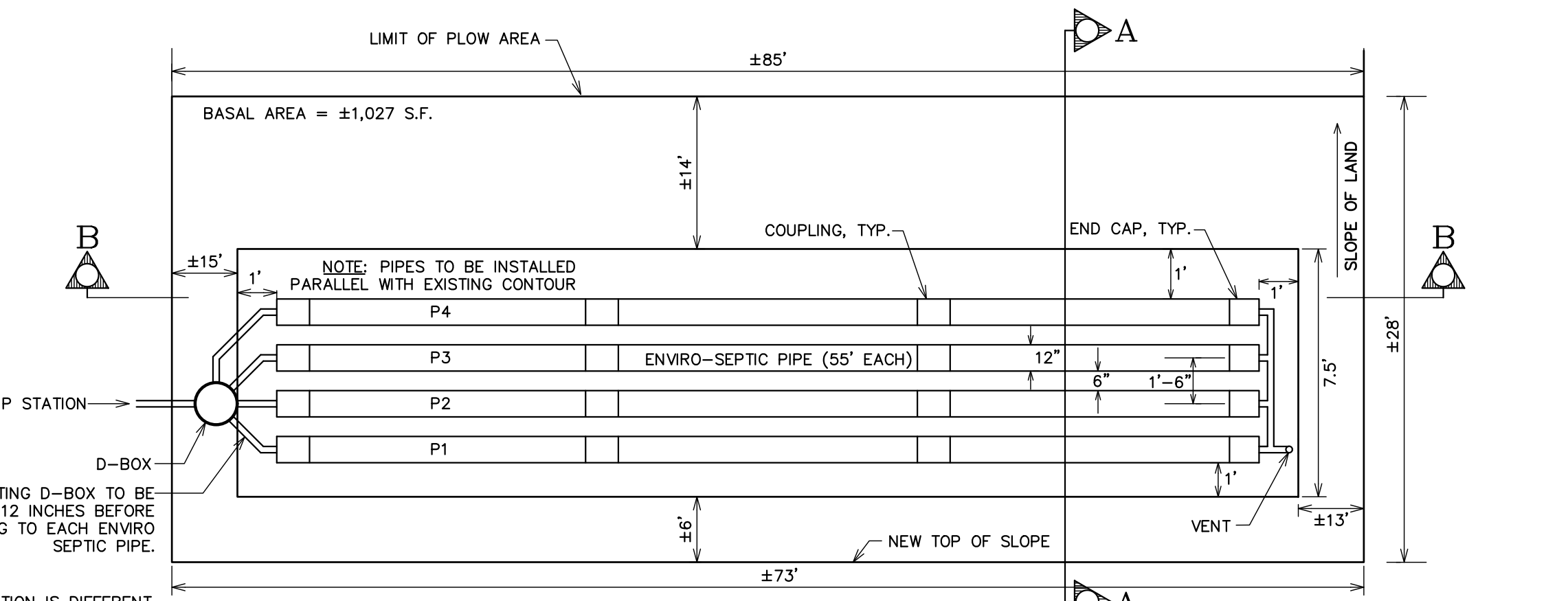
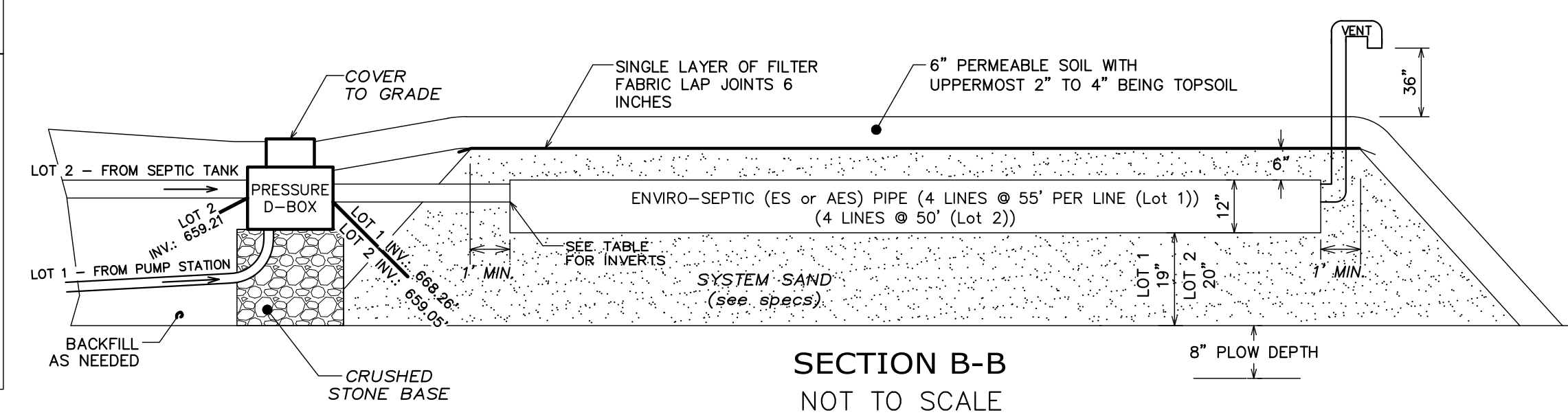
DESIGN CALCULATIONS FOR PRESBY SYSTEM

STEP	LOT BEDROOMS	1	2
1	DETERMINE THE APPLICATION RATE & MINIMUM BED AREA REQUIRED CORRESPONDING TO SOIL TEXTURE AND STRUCTURE (TABLE B)	SL - SBK APPLICATION RATE = 1.0gpd/sf & MINIMUM BED AREA = 350sf	SL - SBK APPLICATION RATE = 1.2gpd/sf & MINIMUM BED AREA = 408sf
2	DETERMINE MINIMUM LENGTH OF AES OR AE PIPE REQUIRED (TABLE A) USING NUMBER OF BEDROOMS AND APPLICATION RATE	3 BEDROOMS WITH A 1.2gpd/sf APPLICATION RATE = MINIMUM OF 210' OF PIPE	4 BEDROOMS WITH A 1.2gpd/sf APPLICATION RATE = MINIMUM OF 245' OF PIPE
3	DETERMINE NUMBER OF ROWS OF PRESBY PIPE & SPACING USING MINIMUM PIPE LENGTH FROM TABLE A	4 ROWS @ 55' = 220', 7.5' TOTAL WIDTH	4 ROWS @ 65' = 260', 7.5' TOTAL WIDTH
4	CALCULATE & CHECK SYSTEM LENGTH BY CALCULATING THE MOUNDING AND THE LONG TERM RATE	SL @ 10-15% SLOPE f=33.7 420gpd/(55')(33.7) = 0.27' = 3" (3/2)(33.7) = 8.425 420gpd/8.425 = 49.85' MIN SYSTEM LENGTH (GO WITH 57')	SL @ 15-20% SLOPE f=33.7 490gpd/(50')(33.7) = 0.22' = 3.0" (3/2)(33.7) = 8.425 490gpd/8.425 = 58.16' MIN SYSTEM LENGTH (GO WITH 67')
5	CALCULATE & CHECK SYSTEM WIDTH	420gpd/57' = 7.37' MINIMUM WIDTH (GO WITH 7.5')	490gpd/67' = 7.313' MINIMUM WIDTH (GO WITH 7.5')
6	CALCULATE TOTAL SYSTEM SAND USING SEASONAL HIGH WATER TABLE AND CALCULATED MOUNDING	TP6 HAS 20" TO ESHWT 36"-20"+3"(MOUND) = 19" MINIMUM OF SAND	TP5A HAS A ESHWT AT 19" 36"-19"+3"(MOUND) = 20.5" USE MINIMUM OF 20" OF SAND
5	TOTAL SYSTEM SIZE	57'x7.5' = 427.5 S.F. > VT. REGS REQ. OF 420 S.F., WITH 19" OF PRESBY SAND	67'x7.5' = 502.5 S.F. > VT. REGS REQ. OF 490 S.F., WITH 20" OF PRESBY SAND

Performance Based Design Criteria

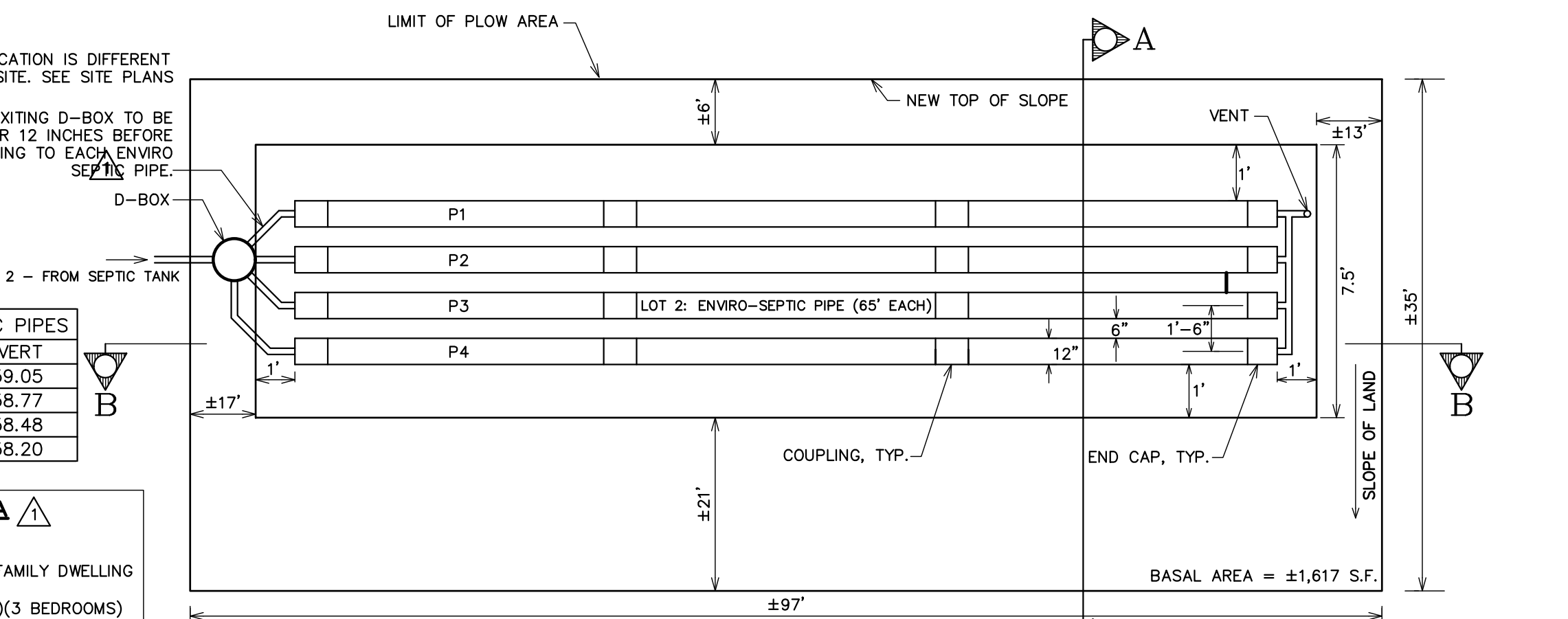
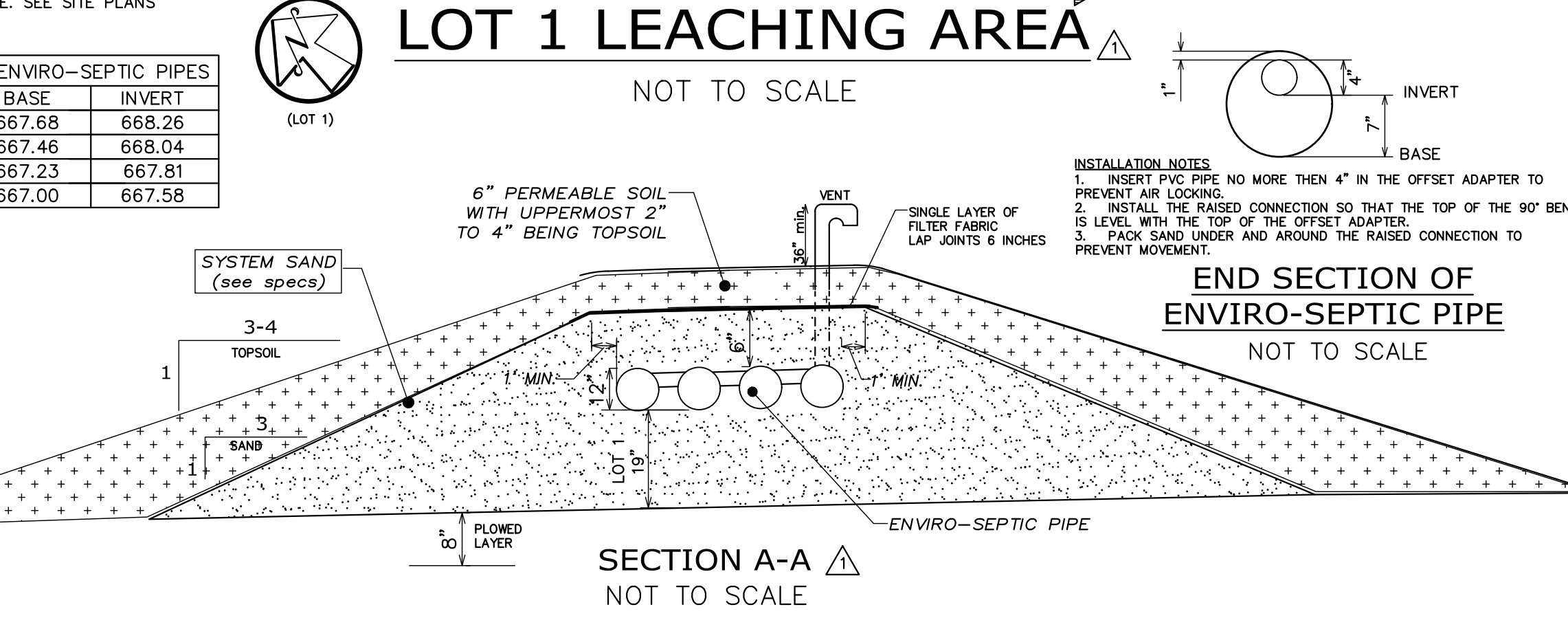
	Lot 1	Lot 2
Design Basis	20	19
Available for mounding (inches)	FSL	SL
Soil Texture	15.0	18.5
Natural Ground Slope (%)	33.7	33.7
Linear Loading Factor	8.425	8.425
Long Term Rate (Gpd/lf)	49.85	58.16
Length Calculated (feet)	3	3
Calculated Mounding (inches)	19	20
Mound sand needed (inches)	55	65
Pipe length to use (feet)	57	67
Bed length to use (feet)	43	44

LOT 1 - PUMP DOSE NOTES
DOSE VOLUME TO FIELD = DAILY DESIGN FLOW / 4
DOSE PER DAY - DRAIN BACK TO PUMP STATION VOLUME
FORCEMAIN VOLUME: 300' OF 2" SDR 21 PVC = 45gal
DOSE = 420gpd / 4(dose) + 45.0gal
= 150gal/DOSE TO LEACHFIELD



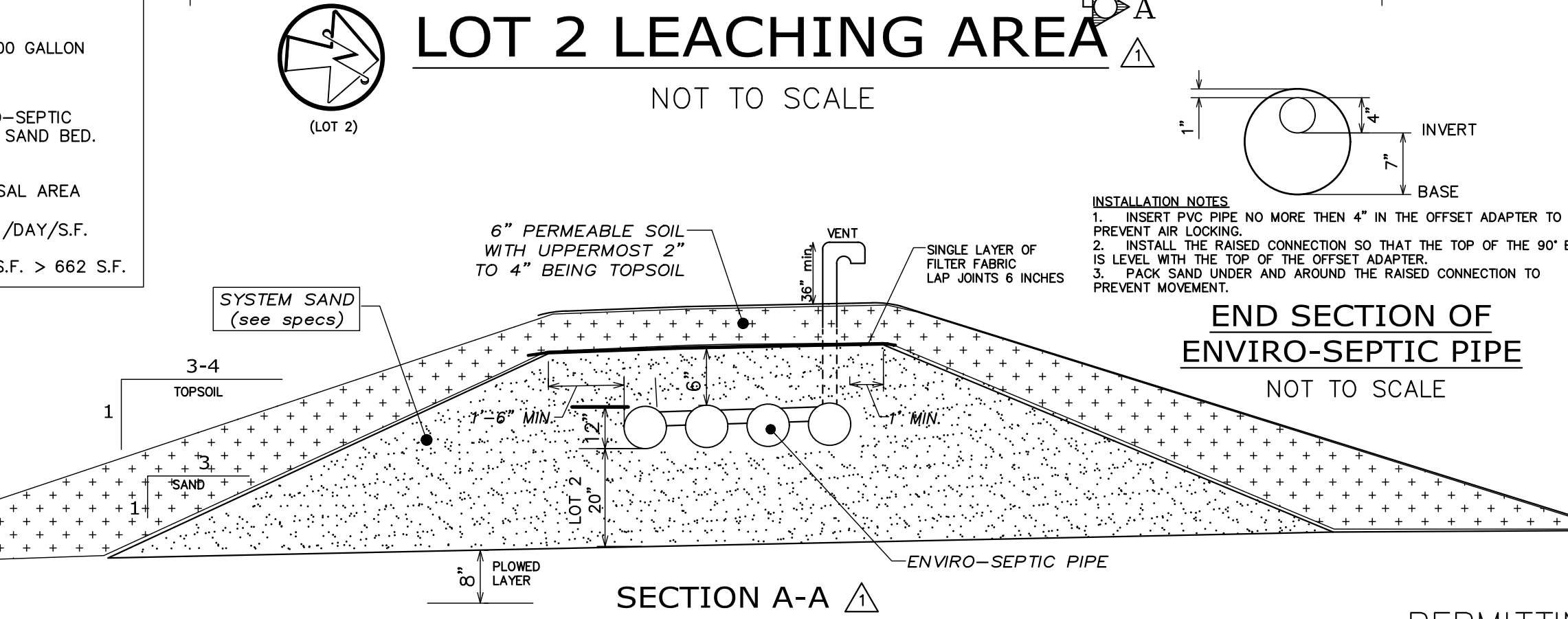
ELEV'S OF ENVIRO-SEPTIC PIPES

LOT 1	BASE	INVERT
P1	667.68	668.26
P2	667.46	668.04
P3	667.23	667.81
P4	667.00	667.58



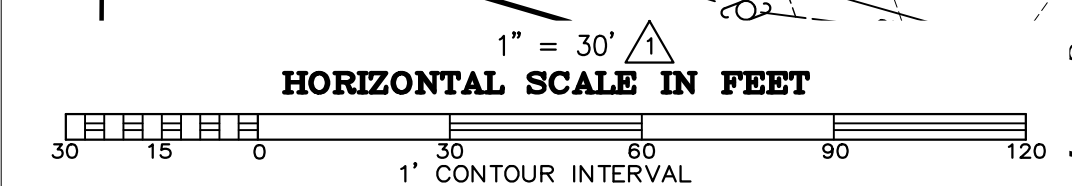
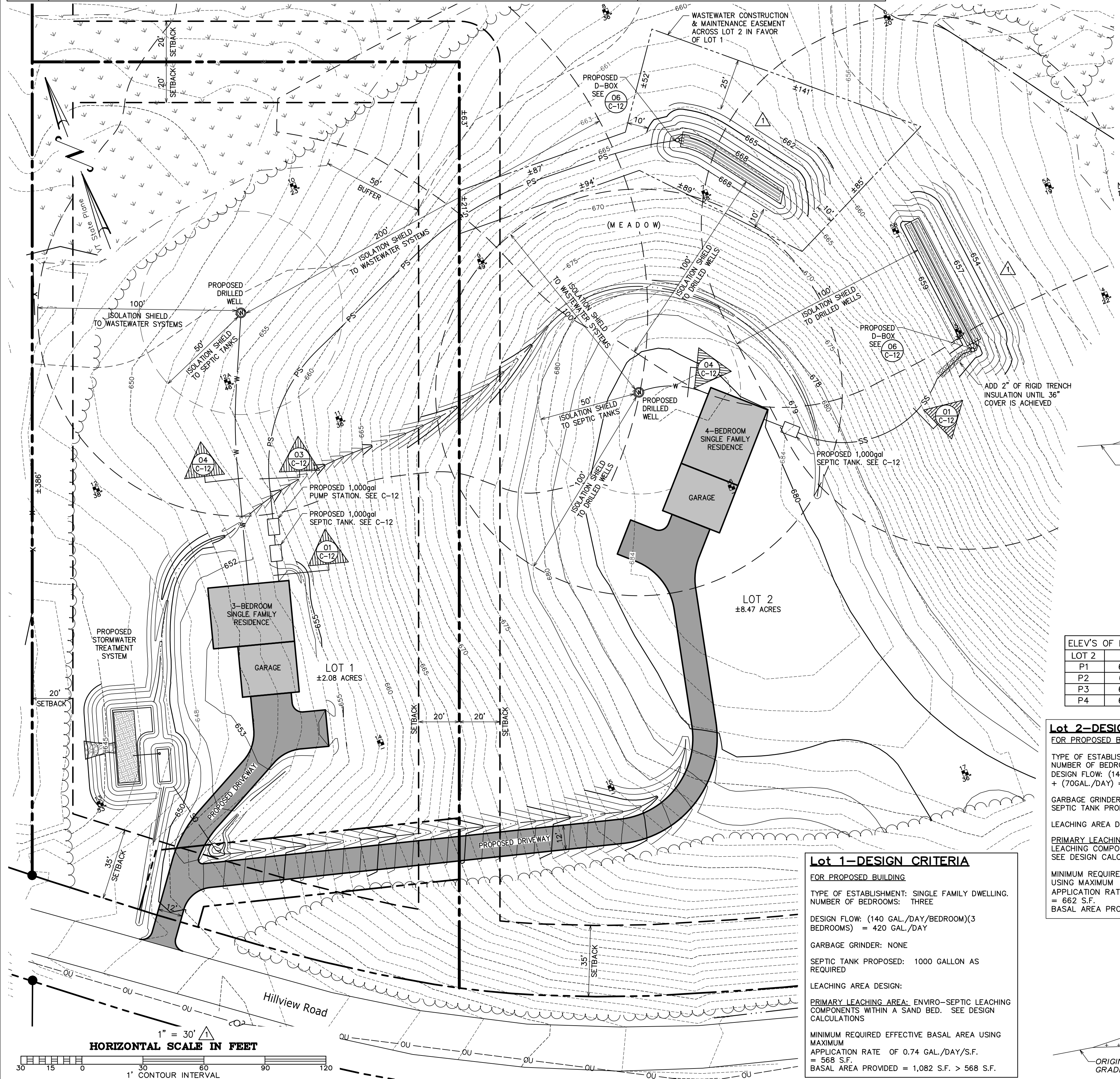
ELEV'S OF ENVIRO-SEPTIC PIPES

LOT 2	BASE	INVERT
P1	658.47	659.05
P2	658.19	658.77
P3	657.90	658.48
P4	657.62	658.20



Lot 1-DESIGN CRITERIA
FOR PROPOSED BUILDING
TYPE OF ESTABLISHMENT: SINGLE FAMILY DWELLING.
NUMBER OF BEDROOMS: THREE
DESIGN FLOW: (140 GAL./DAY/BEDROOM)(3 BEDROOMS) = 420 GAL./DAY
GARBAGE GRINDER: NONE
SEPTIC TANK PROPOSED: 1000 GALLON AS REQUIRED
LEACHING AREA DESIGN:
PRIMARY LEACHING AREA: ENVIRO-SEPTIC LEACHING COMPONENTS WITHIN A SAND BED. SEE DESIGN CALCULATIONS
MINIMUM REQUIRED EFFECTIVE BASAL AREA USING MAXIMUM APPLICATION RATE OF 0.74 GAL./DAY/S.F. = 568 S.F.
BASAL AREA PROVIDED = 1,082 S.F. > 568 S.F.

Lot 2-DESIGN CRITERIA
FOR PROPOSED BUILDING
TYPE OF ESTABLISHMENT: SINGLE FAMILY DWELLING
NUMBER OF BEDROOMS: 4
DESIGN FLOW: (140 GAL./DAY/BEDROOM)(4 BEDROOMS) + (70GAL./DAY) = 490 GAL./DAY
GARBAGE GRINDER: NONE
SEPTIC TANK PROPOSED: NEW 1000 GALLON
LEACHING AREA DESIGN:
PRIMARY LEACHING AREA: ENVIRO-SEPTIC LEACHING COMPONENTS WITHIN A SAND BED. SEE DESIGN CALCULATIONS
MINIMUM REQUIRED EFFECTIVE BASAL AREA USING MAXIMUM APPLICATION RATE OF 0.74 GAL./DAY/S.F. = 662 S.F.
BASAL AREA PROVIDED = 1,617 S.F. > 662 S.F.



PROJECT: 20029
DATE: February 23, 2022
DESIGN: PJG
DRAWN: RHW/NRB
CHECKED: PJG
APPROVED: PJG

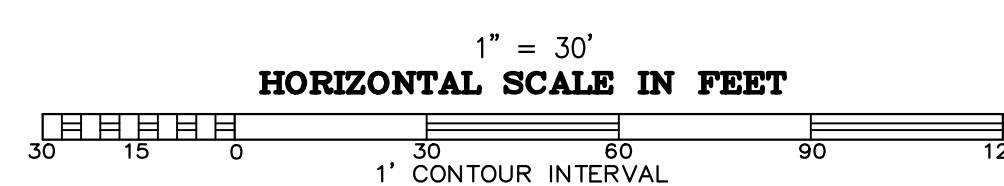
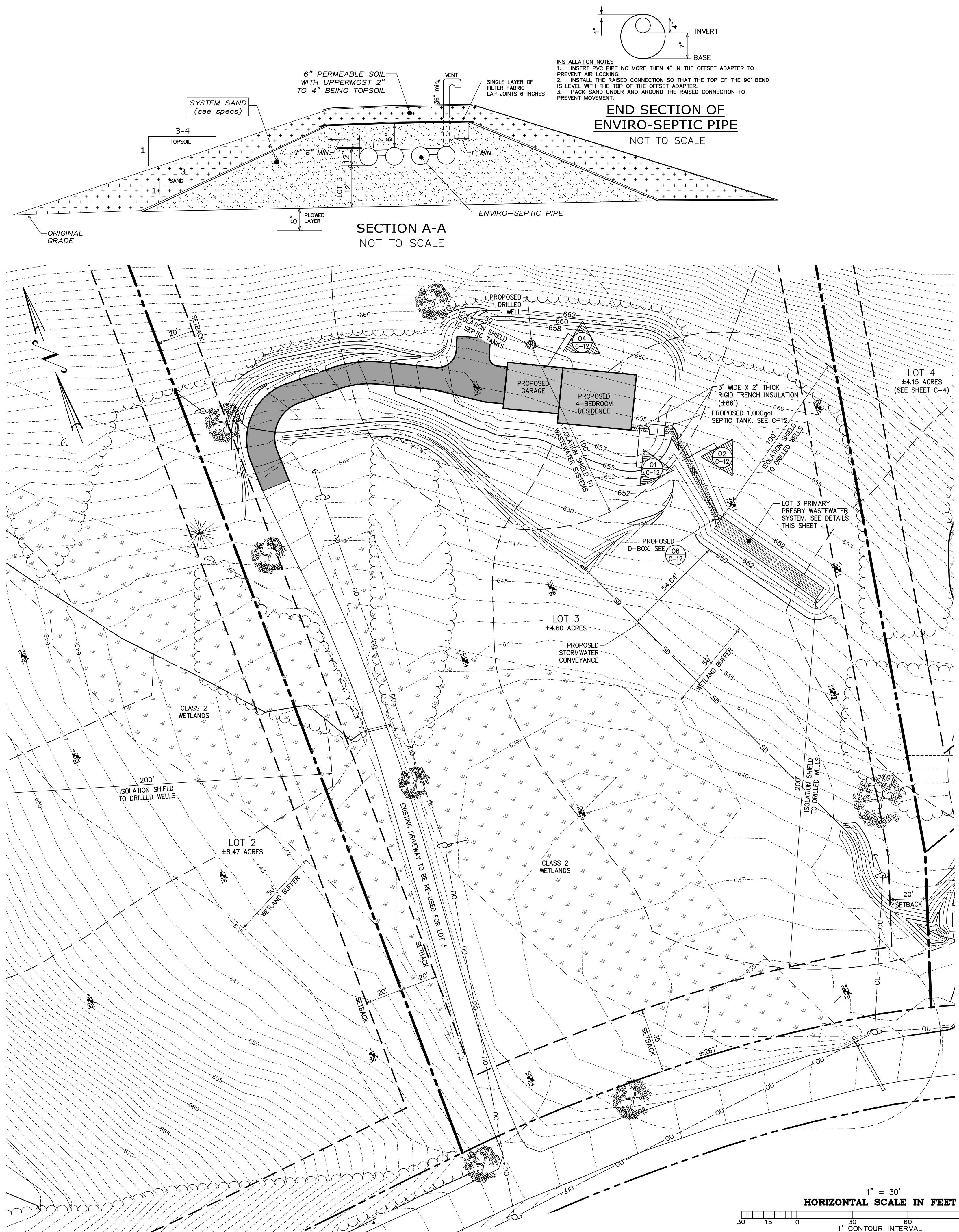
TEL: 802-524-2113
FAX: 802-524-9681
CROSS CONSULTING ENGINEERS, P.C.
103 Fairfax Rd.
St. Albans, Vermont 05478
© COPYRIGHT 2023
Cross Consulting Engineers, P.C.

Sanitary And Potable Water Plan - Lots 1 & 2

Hillview Heights, LLC
South Burlington, VT
Hillview Heights Subdivision
Richmond, VT
Hillview Road

CIVIL
C-7
SHEET C-7 OF 20

Q:\2020 Drawings\20029 - Bob Avondis, Richmond\Current\C-8 Sanitary And Potable Water Plan - Lot 3.dwg Plotted: 4/27/2023 11:58:44 AM



DESIGN CALCULATIONS FOR PRESBY SYSTEM		
STEP	LOT	3
	BEDROOMS	4
1	DETERMINE THE APPLICATION RATE & MINIMUM BED AREA REQUIRED CORRESPONDING TO SOIL TEXTURE AND STRUCTURE (TABLE B)	FSL - SBK APPLICATION RATE = 1.0gpd/sf & MINIMUM BED AREA = 490sf
2	DETERMINE MINIMUM LENGTH OF AES OR AE PIPE REQUIRED (TABLE A) USING NUMBER OF BEDROOMS AND APPLICATION RATE	4 BEDROOMS WITH A 1.0gpd/sf APPLICATION RATE = MINIMUM OF 245' OF PIPE
3	DETERMINE NUMBER OF ROWS OF PRESBY PIPE & SPACING USING MINIMUM PIPE LENGTH FROM TABLE A	4 ROWS @ 65' = 260', 7.5' TOTAL WIDTH
5	CALCULATE & CHECK SYSTEM WIDTH	490gpd/67' = 7.3' MINIMUM WIDTH (STAY WITH 7.5')
6	CALCULATE TOTAL SYSTEM SAND USING SEASONAL HIGH WATER TABLE	TP25 HAS 26" TO ESHWT 36"-26" = 10" (MIN. 12" OF SAND REQUIRED) 12" OF SAND TO BE USED
5	TOTAL SYSTEM SIZE	67'x7.5' = 502.5 S.F. > VT. REGS. REQ. OF 490 S.F., WITH 12" OF PRESBY SAND

DESIGN CRITERIA - Lot 3
 FOR PROPOSED BUILDING

TYPE OF ESTABLISHMENT: SINGLE FAMILY DWELLING.
 NUMBER OF BEDROOMS: FOUR

DESIGN FLOW: (140 GAL./DAY/BEDROOM)(3 BEDROOMS) + (70 GAL./DAY) = 490 GAL./DAY

GARBAGE GRINDER: NONE

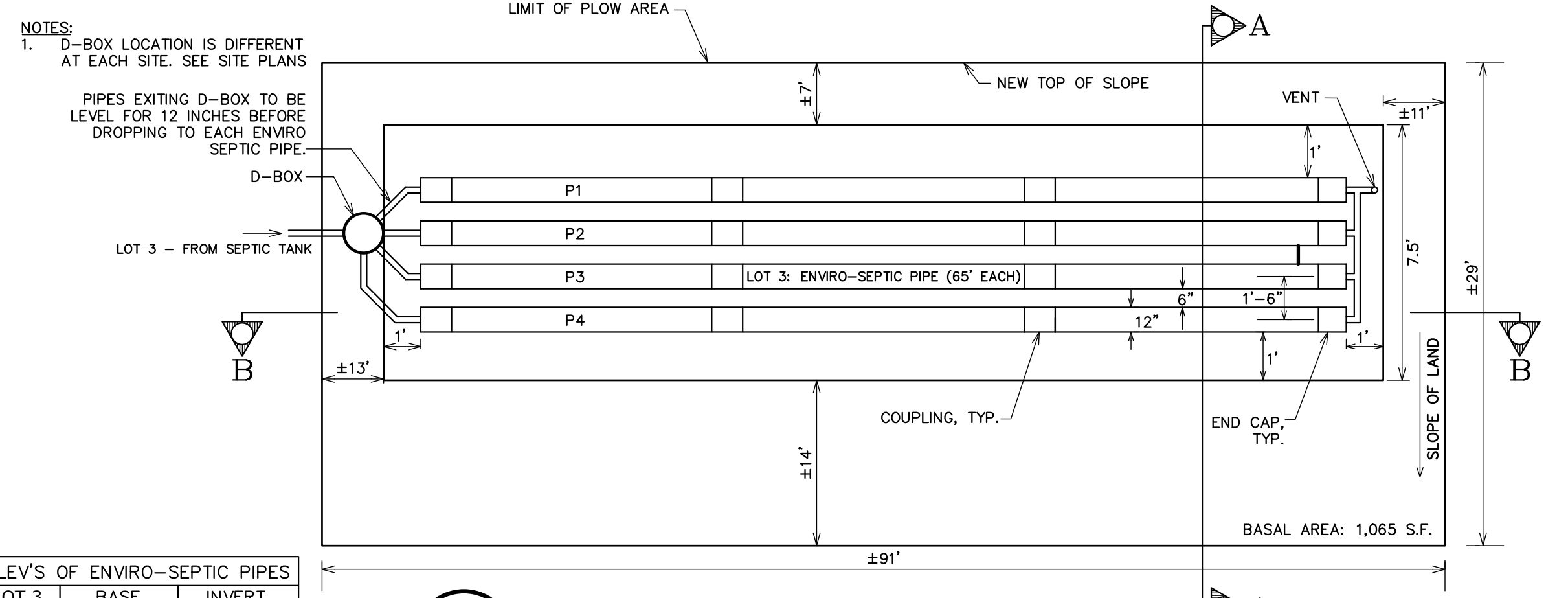
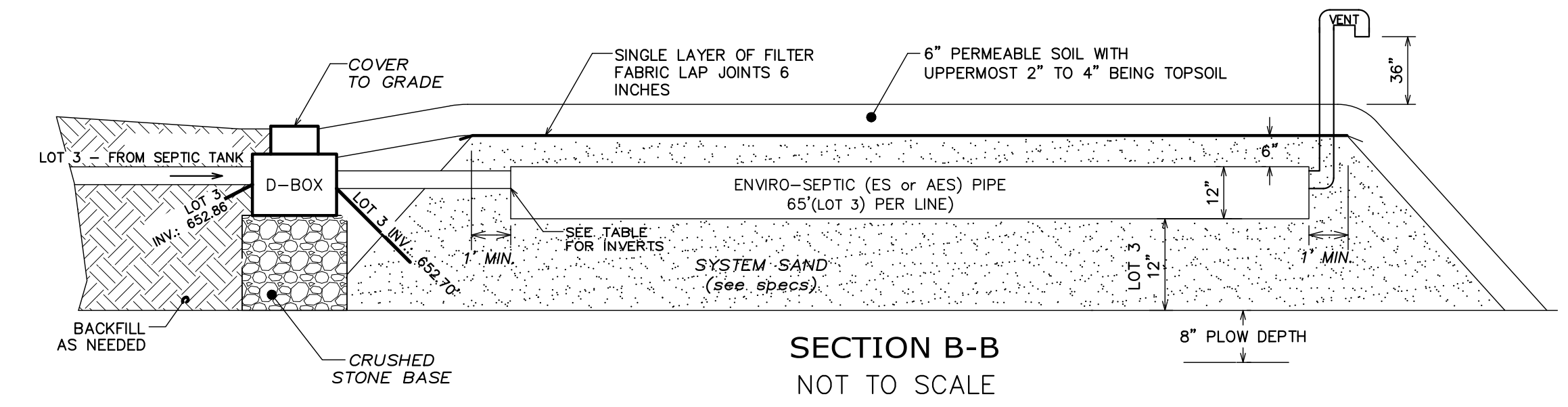
SEPTIC TANK PROPOSED: 1000 GALLON AS REQUIRED

LEACHING AREA DESIGN:

PRIMARY LEACHING AREA: ENVIRO-SEPTIC LEACHING COMPONENTS WITHIN A SAND BED. SEE DESIGN CALCULATIONS

MINIMUM REQUIRED EFFECTIVE BASAL AREA USING MAXIMUM APPLICATION RATE OF 0.74 GAL./DAY/S.F. = 568 S.F. BASAL AREA PROVIDED = 1,065 S.F. > 568 S.F.

Performance Based Design Criteria	
Design Basis	Lot 3 Performance
Available for mounding (inches)	26
Soil Texture	FSL
Natural Ground Slope (%)	8-10
Linear Loading Factor	13.5
Mound sand needed (inches)	12
Pipe length to use (feet)	65
Bed length to use (feet)	67
Total system height (inches)	36



ELEV'S OF ENVIRO-SEPTIC PIPES		
LOT 3	BASE	INVERT
P1	652.12	652.70
P2	652.00	652.58
P3	651.87	652.45
P4	651.74	652.32

PROJECT: 20029
 DATE: February 23, 2022
 DESIGN: PJG
 DRAWN: RHW/NRB
 CHECKED: PJG
 APPROVED: PJG

TEL: 802-524-2113
 FAX: 802-524-9681

CROSS CONSULTING ENGINEERS, P.C.
 103 Fairfax Rd.
 St. Albans, Vermont 05478
 © COPYRIGHT 2023
 Cross Consulting Engineers, P.C.

Sanitary And Potable Water Plan - Lot 3

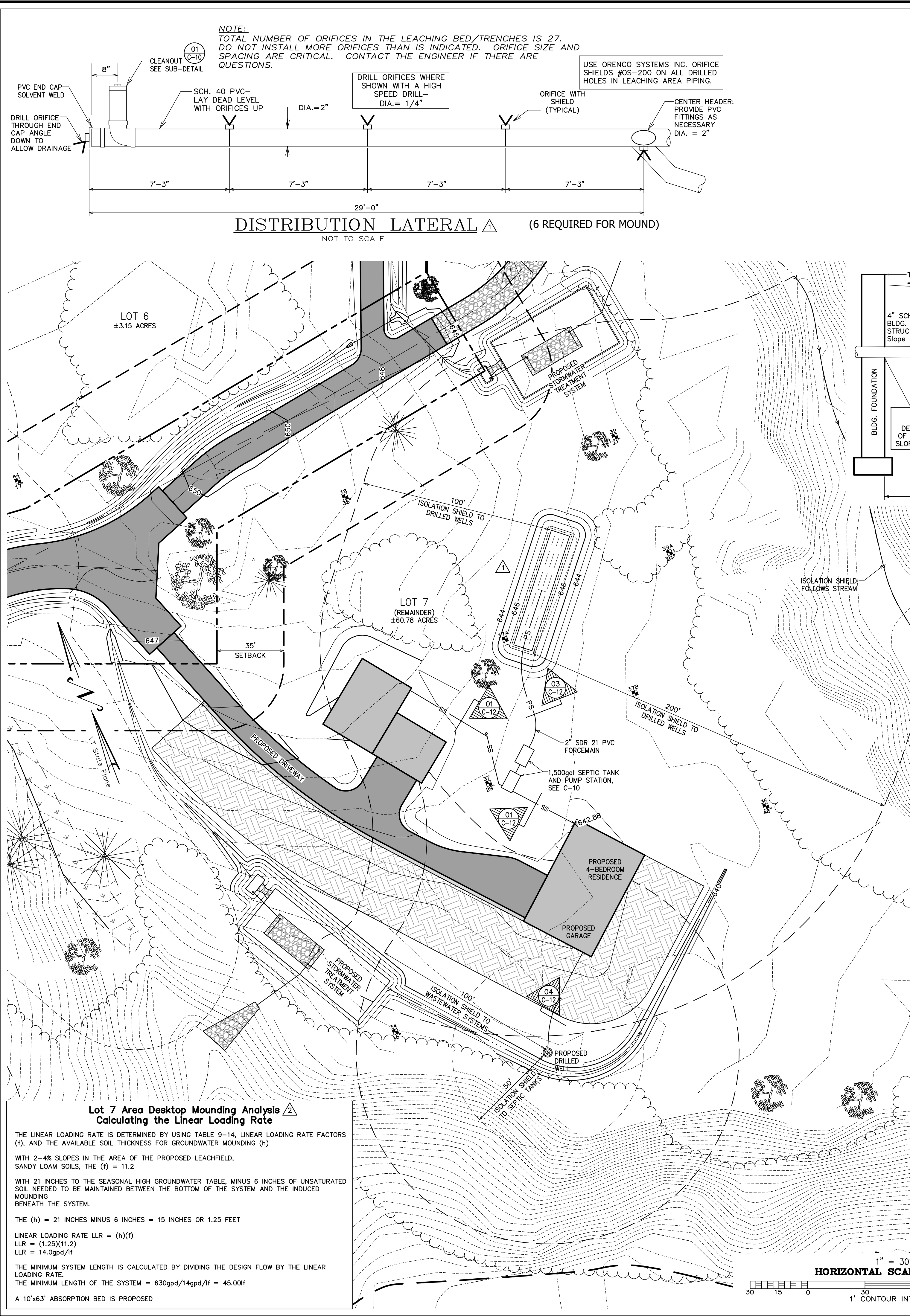
REVISIONS: 2022-04-07: UPDATED LOT NUMBERS, UPDATED DESIGN, ADDED A STATED SCALE PER ANK

Hillview Heights, LLC
 South Burlington, VT

Hillview Heights Subdivision
 Hillview Road
 Richmond, VT

CIVIL
C-8
 SHEET C-8 OF 20

PERMITTING



Lot 7 Area Desktop Mounding Analysis
Calculating the Linear Loading Rate

THE LINEAR LOADING RATE IS DETERMINED BY USING TABLE 9-14, LINEAR LOADING RATE FACTORS (L), AND THE AVAILABLE SOIL THICKNESS FOR GROUNDWATER MOUNDING (h)

WITH 2-4% SLOPES IN THE AREA OF THE PROPOSED LEACHFIELD, SANDY LOAM SOILS, THE (L) = 11.2

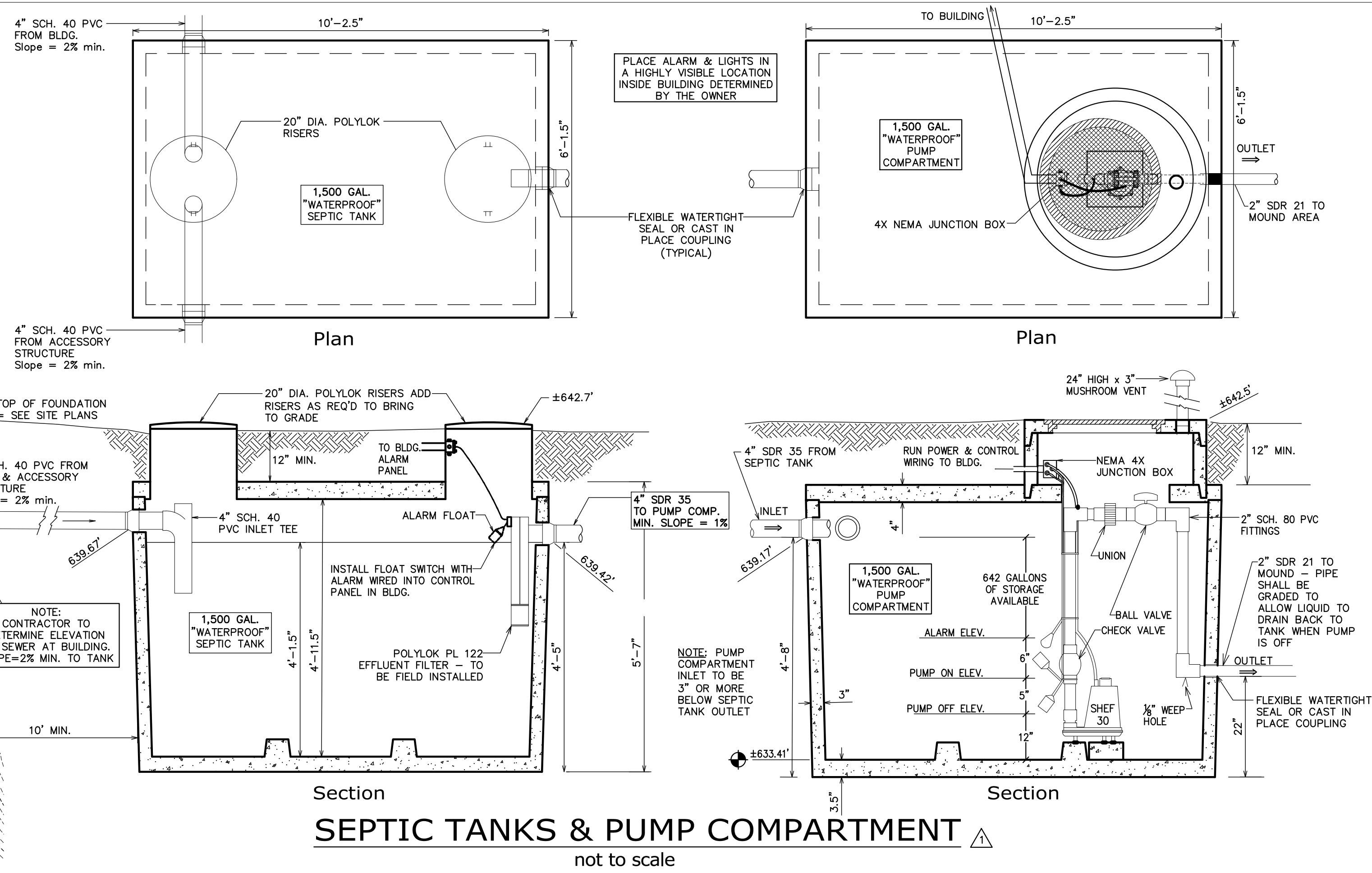
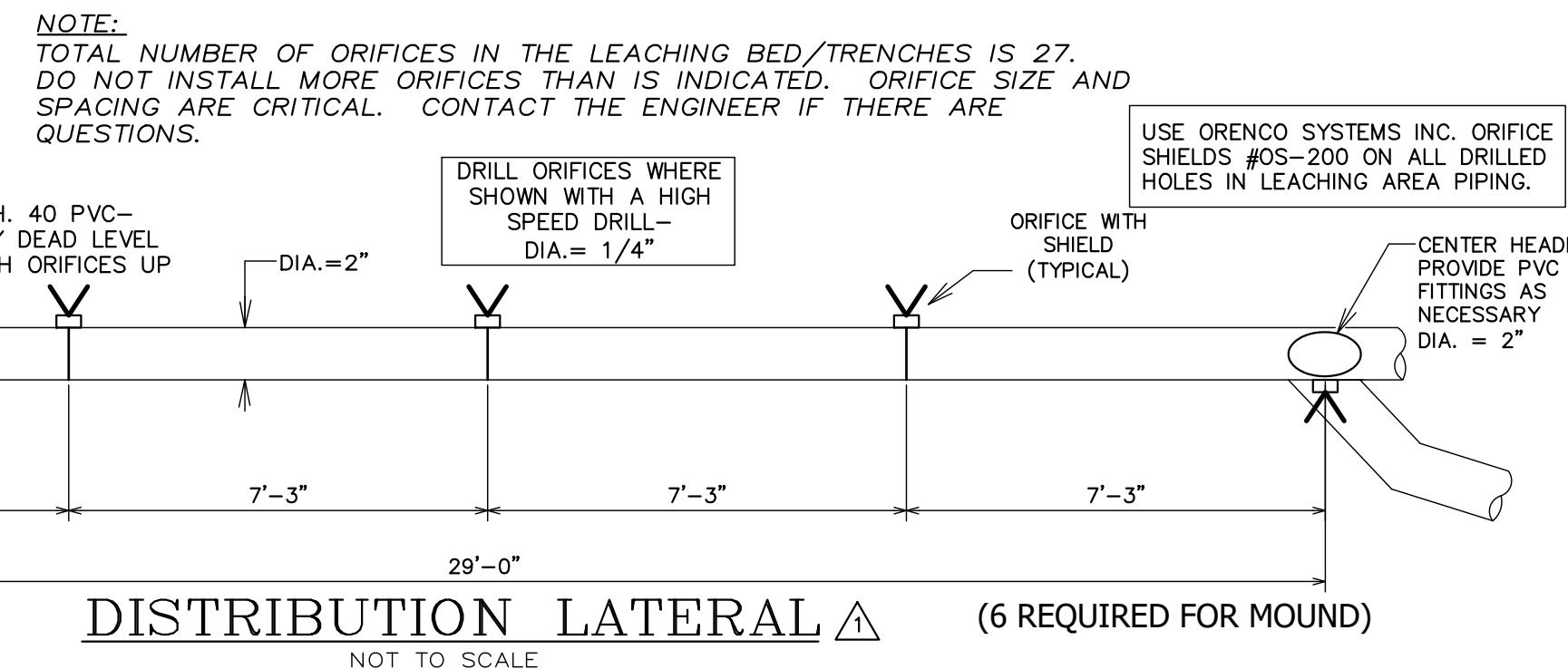
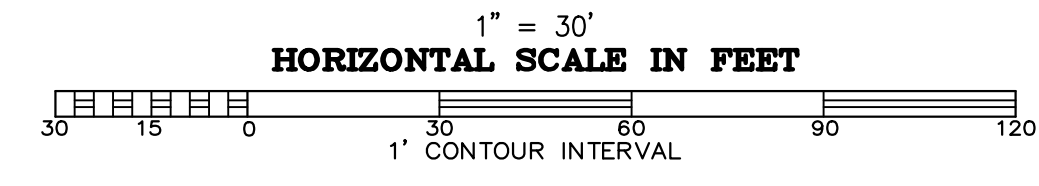
WITH 21 INCHES TO THE SEASONAL HIGH GROUNDWATER TABLE, MINUS 6 INCHES OF UNSATURATED SOIL NEEDED TO BE MAINTAINED BETWEEN THE BOTTOM OF THE INDUCED MOUNDING BENEATH THE SYSTEM.

THE (h) = 21 INCHES MINUS 6 INCHES = 15 INCHES OR 1.25 FEET

LINEAR LOADING RATE LLR = (h)(L)
 LLR = (1.25)(11.2)
 LLR = 14.0 gpd/lf

THE MINIMUM SYSTEM LENGTH IS CALCULATED BY DIVIDING THE DESIGN FLOW BY THE LINEAR LOADING RATE.
 THE MINIMUM LENGTH OF THE SYSTEM = 630 gpd / 14 gpd/lf = 45.001'

A 10' x 63' ABSORPTION BED IS PROPOSED



01 Observation Port
 C-10 NOT TO SCALE

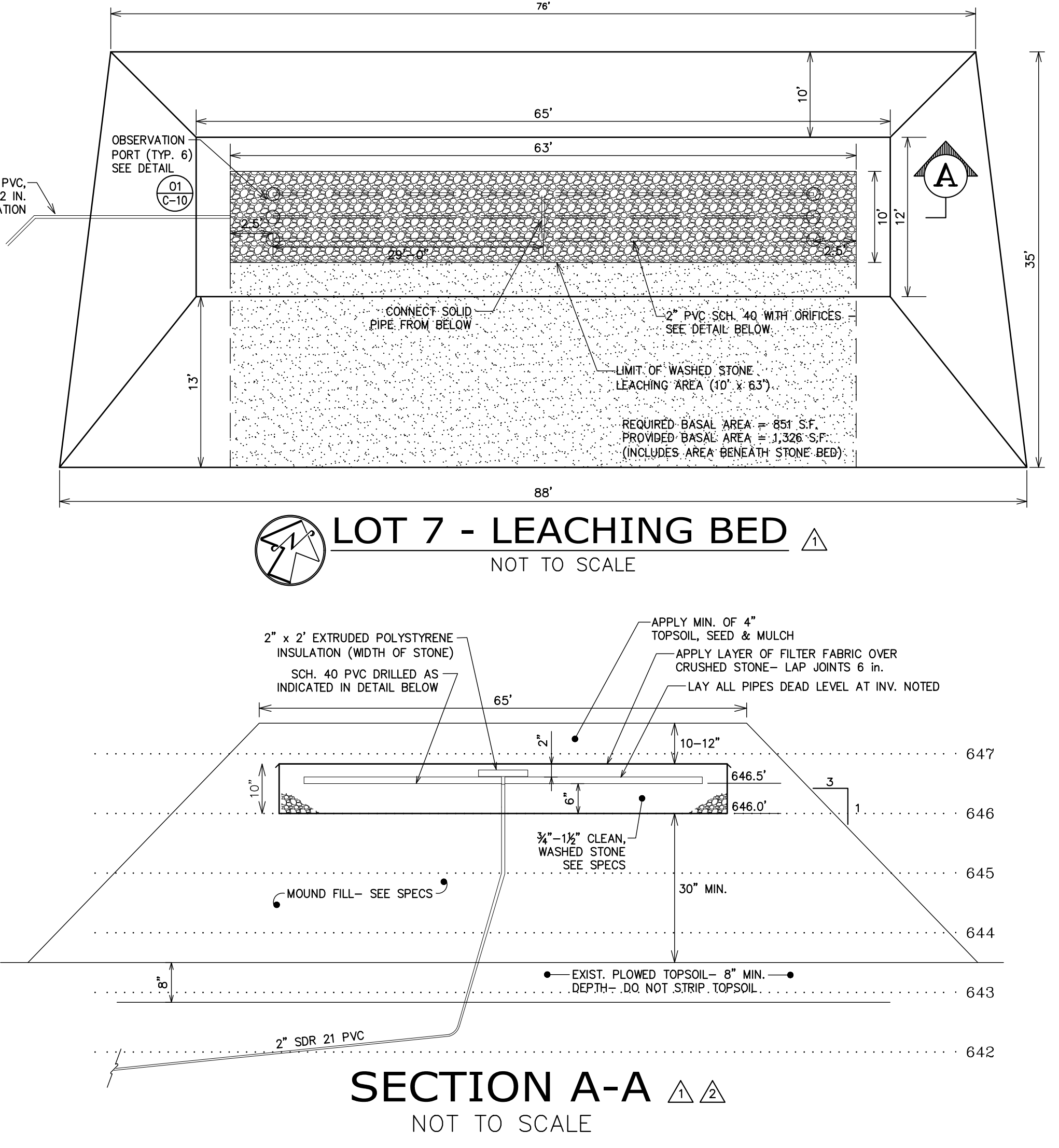
DESIGN CRITERIA - Lot 7
 FOR PROPOSED BUILDING

TYPE OF ESTABLISHMENT: 4 BEDROOM SINGLE FAMILY DWELLING + DETACHED 1 BEDROOM ACCESSORY STRUCTURE
 DESIGN FLOW: (140 GAL./BED/DAY)(3 BEDROOMS) + (70GAL./DAY) + (140GAL./BED/DAY) = 630 GAL./DAY
 GARBAGE GRINDER: NONE
 SEPTIC TANK PROPOSED: 1500 GALLON AS REQUIRED
 LEACHING AREA: PRESSURIZED MOUND
 MINIMUM BED SIZE BASED UPON MAXIMUM APPLICATION RATE OF 1.0 GAL./DAY/S.F.: (630 GAL./DAY) / (1.0 GAL./DAY/S.F.) = 630 S.F.
 ABSORPTION BED PROVIDED = 10' X 63' = 630 S.F.
 630 S.F. REQUIRED = 630 S.F. PROVIDED
 MINIMUM REQUIRED EFFECTIVE BASAL AREA USING MAXIMUM APPLICATION RATE OF 0.74 GAL./DAY/S.F. = 851 S.F.
 BASAL AREA PROVIDED = ±1,326 S.F.
 DOSE VOLUME TO FIELD = DAILY DESIGN FLOW / 4 DOSE PER DAY + DRAIN BACK TO PUMP STATION VOLUME = 630gpd / 4 DOSE + 14gal DRAIN BACK = 171.5gal / DOSE TO LEACHFIELD

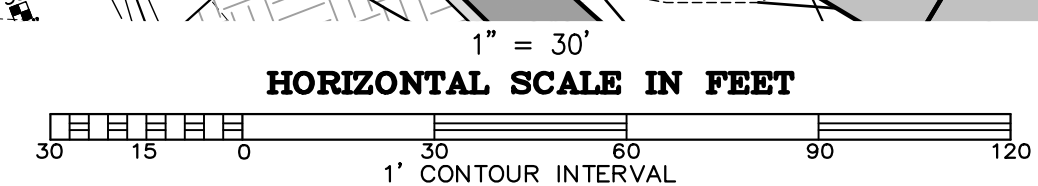
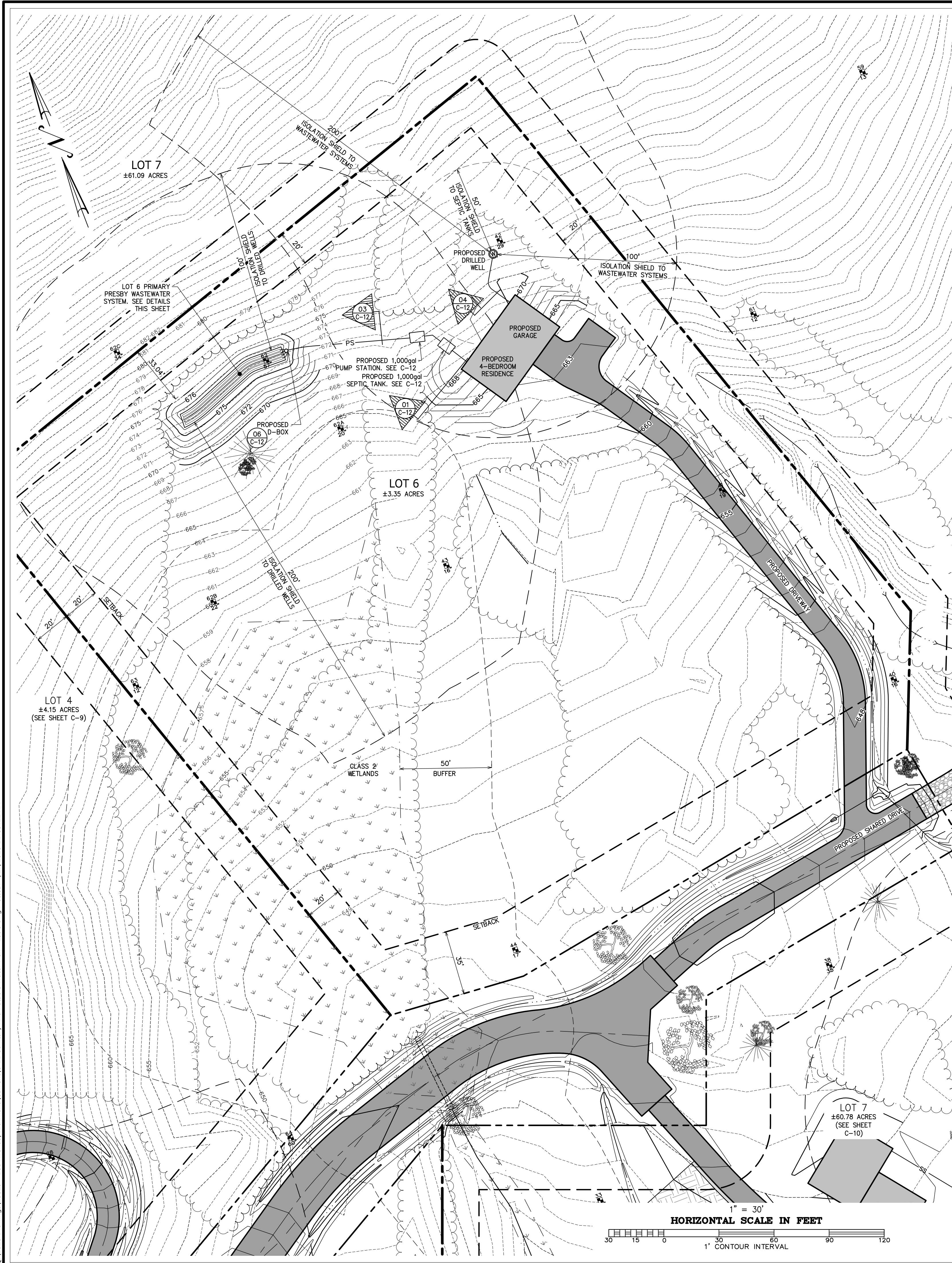
MOUND FILL SPECIFICATIONS

TABLE A

(1)		(2)		(3)	
Sieve Number	Percent Passing	Sieve Number	Percent Passing	Sieve Number	Percent Passing
10	85-100	4	95-100	10	85-100
40	25-75	8	80-100	40	30-50
60	0-30	16	50-85	200	0-10
100	0-10	30	25-60		
200	0-5	50	10-30		
		100	2-10		



Q:\2020 Drawings\20029 - Bob Avonds, Richmond\Current\C-11 Sanitary And Potable Water Plan - Lot 6.dwg Plotted: 4/27/2023 11:59:22 AM

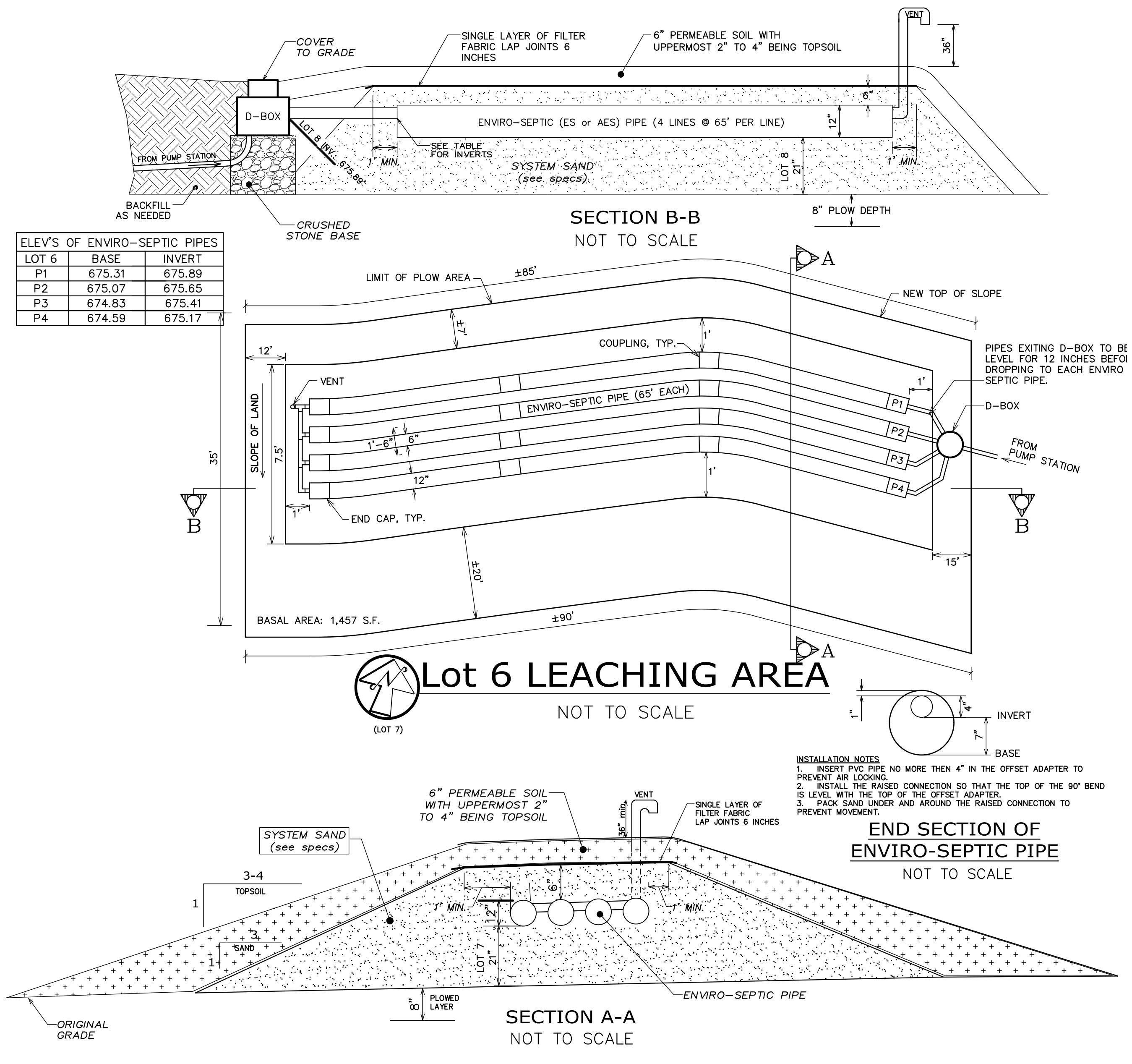


DESIGN CALCULATIONS FOR PRESBY SYSTEM		
STEP	LOT BEDROOMS	6
1	DETERMINE THE APPLICATION RATE & MINIMUM BED AREA REQUIRED CORRESPONDING TO SOIL TEXTURE AND STRUCTURE (TABLE B)	L = SBK APPLICATION RATE = 1.0gpd/sf & MINIMUM BED AREA = 490sf
2	DETERMINE MINIMUM LENGTH OF AES OR AE PIPE REQUIRED (TABLE A) USING NUMBER OF BEDROOMS AND APPLICATION RATE	4 BEDROOMS WITH A 1.0gpd/sf APPLICATION RATE = MINIMUM OF 245' OF PIPE
3	DETERMINE NUMBER OF ROWS OF PRESBY PIPE & SPACING USING MINIMUM PIPE LENGTH FROM TABLE A	4 ROWS @ 65' = 260', 7.5' TOTAL WIDTH
4	CALCULATE & CHECK SYSTEM LENGTH BY CALCULATING THE MOUNDING AND THE LONG TERM RATE	L @ 15-20% SLOPE f=19.6 490gpd/(65')(19.6) = 0.39' = 5" (5')(19.6) = 8.167 490gpd/8.167 = 59.99' MIN SYSTEM LENGTH (STAY WITH 67')
5	CALCULATE & CHECK SYSTEM WIDTH	490gpd/67' = 7.3' MINIMUM WIDTH (STAY WITH 7.5')
6	CALCULATE TOTAL SYSTEM SAND USING SEASONAL HIGH WATER TABLE AND CALCULATED MOUNDING	TP62A HAS FIRM SOIL AT 20" 36"-20"+5"(MOUND) = 21" MINIMUM OF SAND
5	TOTAL SYSTEM SIZE	67x7.5' = 502.5 S.F. > VT. REGS. REQ. OF 490 S.F. WITH 21" OF PRESBY SAND

Performance Based Design Criteria	
Design Basis	Lot 6 Performance
Available for mounding (inches)	20
Soil Texture	L
Natural Ground Slope (%)	16.0
Linear Loading Factor	19.6
Long Term Rate (Gpd/lf)	8.167
Length Calculated (feet)	59.99
Calculated Mounding (inches)	5
Mound sand needed (inches)	21
Pipe length to use (feet)	65
Bed length to use (feet)	67
Total system height (inches)	45

DESIGN CRITERIA -- Lot 6
FOR PROPOSED BUILDING:
TYPE OF ESTABLISHMENT: SINGLE FAMILY DWELLING.
NUMBER OF BEDROOMS: FOUR
DESIGN FLOW: (140 GAL./DAY/BEDROOM)(3 BEDROOMS) + (70 GAL./DAY) = 490 GAL./DAY
GARBAGE GRINDER: NONE
SEPTIC TANK PROPOSED: 1000 GALLON AS REQUIRED
LEACHING AREA DESIGN:
PRIMARY LEACHING AREA: ENVIRO-SEPTIC LEACHING COMPONENTS WITHIN A SAND BED. SEE DESIGN CALCULATIONS
MINIMUM REQUIRED EFFECTIVE BASAL AREA USING APPLICATION RATE OF 0.74 GAL./DAY/S.F. = 568 S.F. BASAL AREA PROVIDED = 1,457 S.F. > 568 S.F.

LOT 6 - PUMP DOSE NOTES
DOSE VOLUME TO FIELD = DAILY DESIGN FLOW / 4 DOSE PER DAY - DRAIN BACK TO PUMP STATION VOLUME
FORCEMAIN VOLUME: 70' OF 2" SDR 21 PVC = 10.5gal
DOSE = 490gpd / 4(dose) + 10.5gal = 133gal/DOSE TO LEACHFIELD



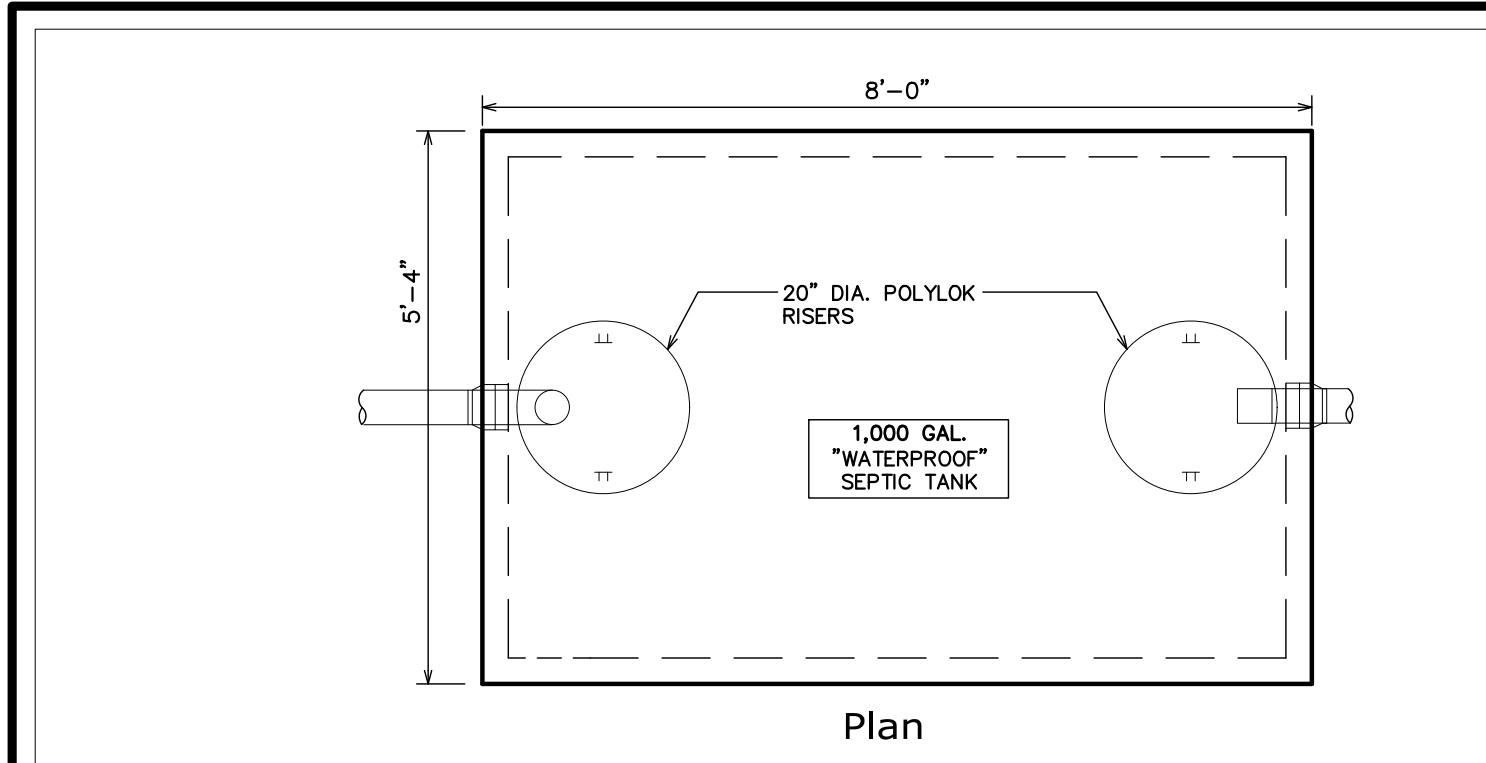
ELEV'S OF ENVIRO-SEPTIC PIPES		
LOT 6	BASE	INVERT
P1	675.31	675.89
P2	675.07	675.65
P3	674.83	675.41
P4	674.59	675.17

PROJECT: 20029 DATE: February 23, 2022
 Tel: 802-524-2113 Fax: 802-524-9681
 DESIGN: PJG DRAWN: RHW/NRB CHECKED: PJG APPROVED: PJG
CCE CROSS CONSULTING ENGINEERS, P.C.
 107 Fairfax Rd. St. Albans, Vermont 05478 © COPYRIGHT 2023 Cross Consulting Engineers, P.C.

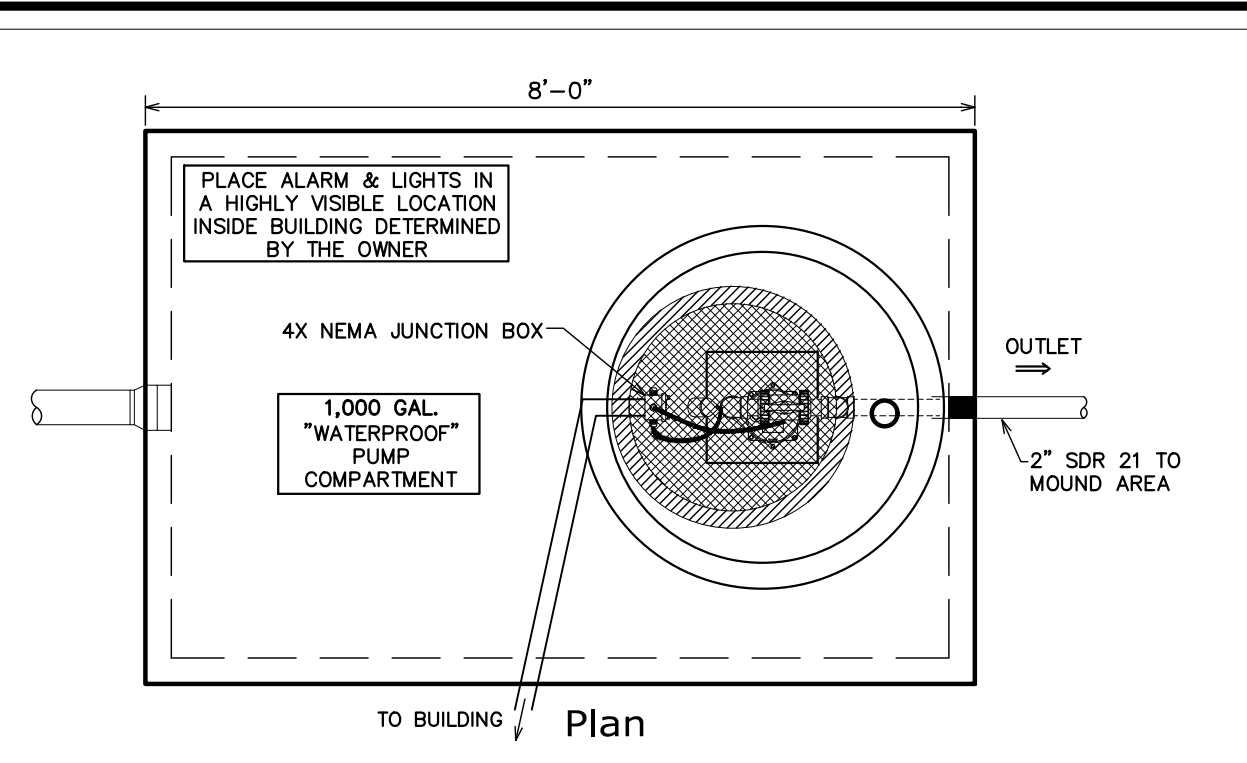
Sanitary And Potable Water Plan - Lot 6
 Hillview Heights, LLC South Burlington, VT
 Hillview Heights Subdivision Richmond, VT Hillview Road
 REVISIONS: 2022-04-07: UPDATED LOT NUMBERS, UPDATED DESIGN, ADDED A STATED SCALE PER ANR 2022-04-20: FIXED TYPO PER ANR COMMENTS

CIVIL
C-11
 SHEET C-11 OF 20

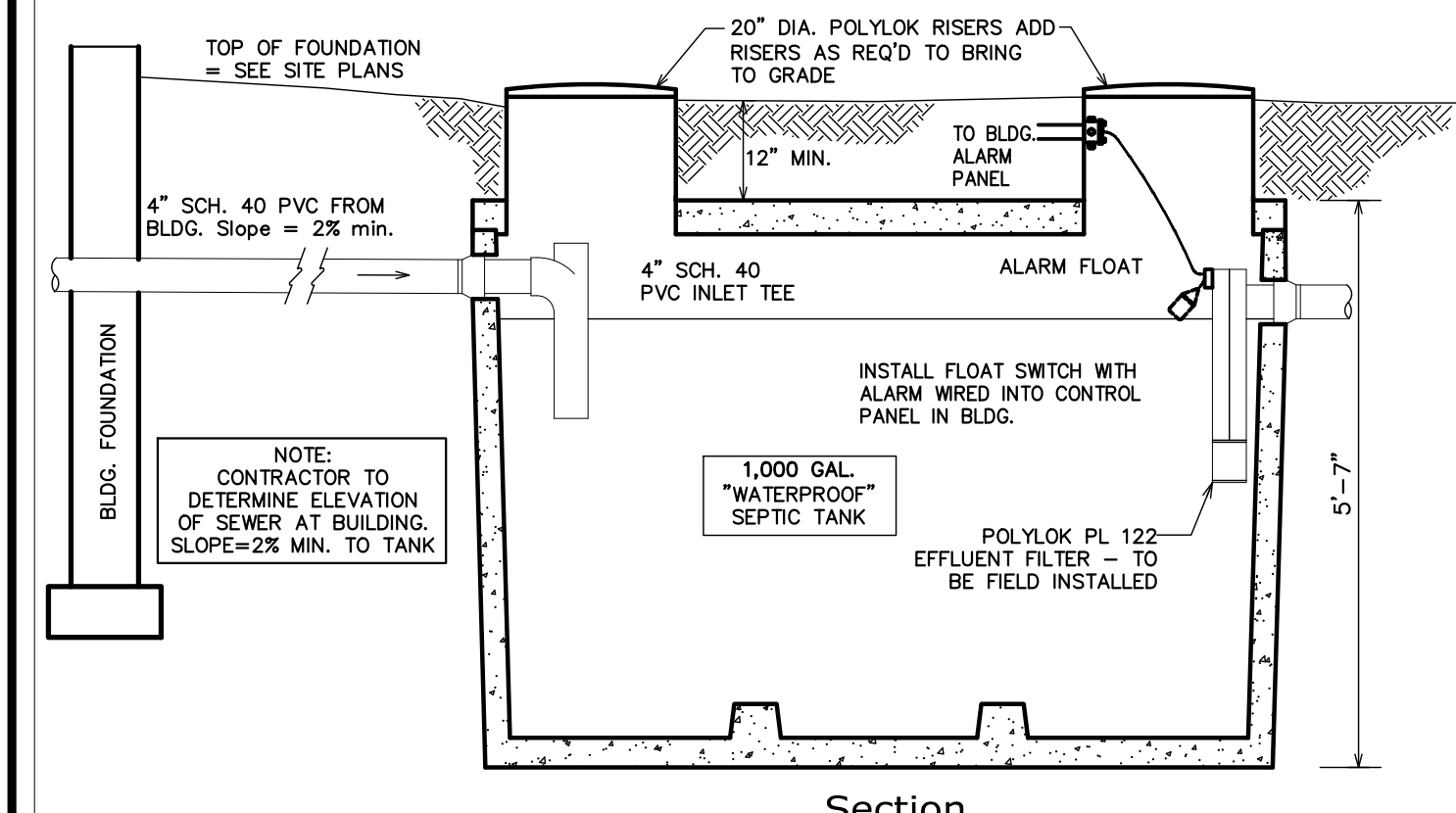
PERMITTING



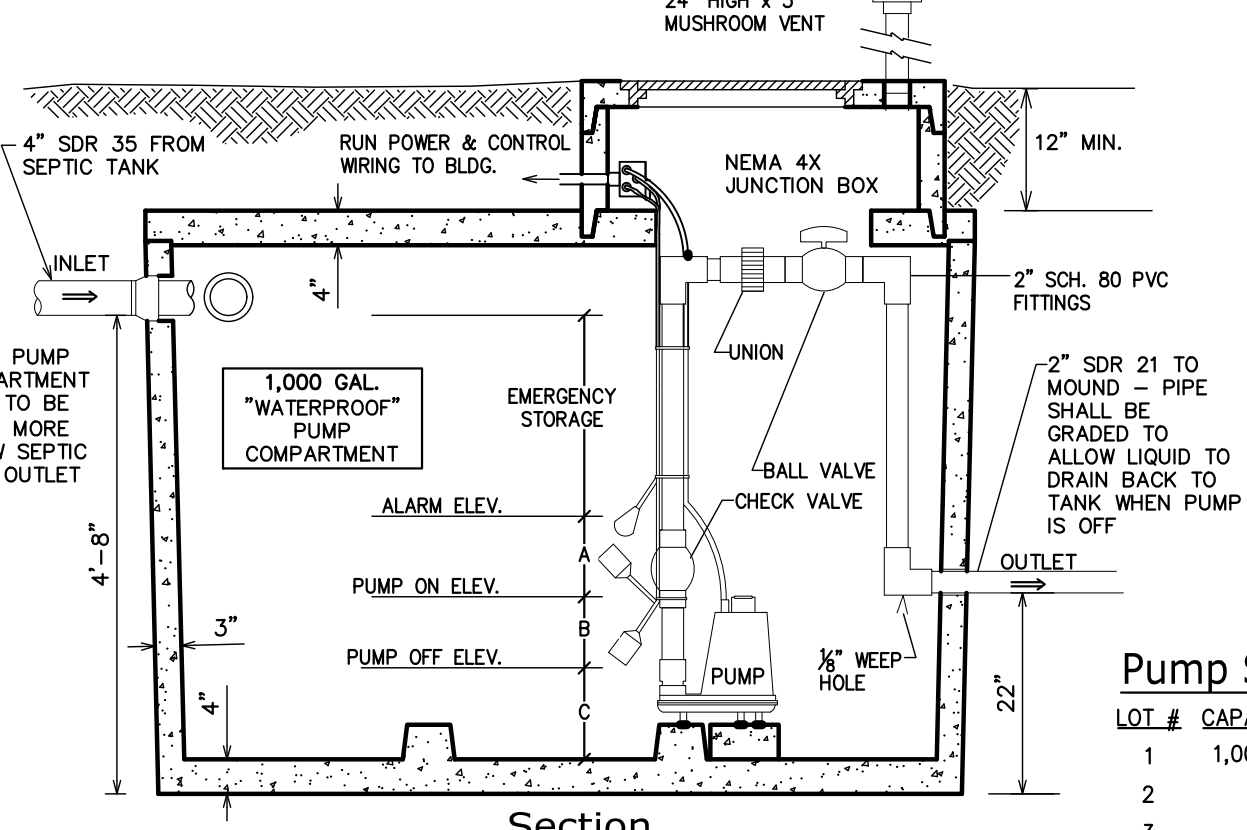
Plan



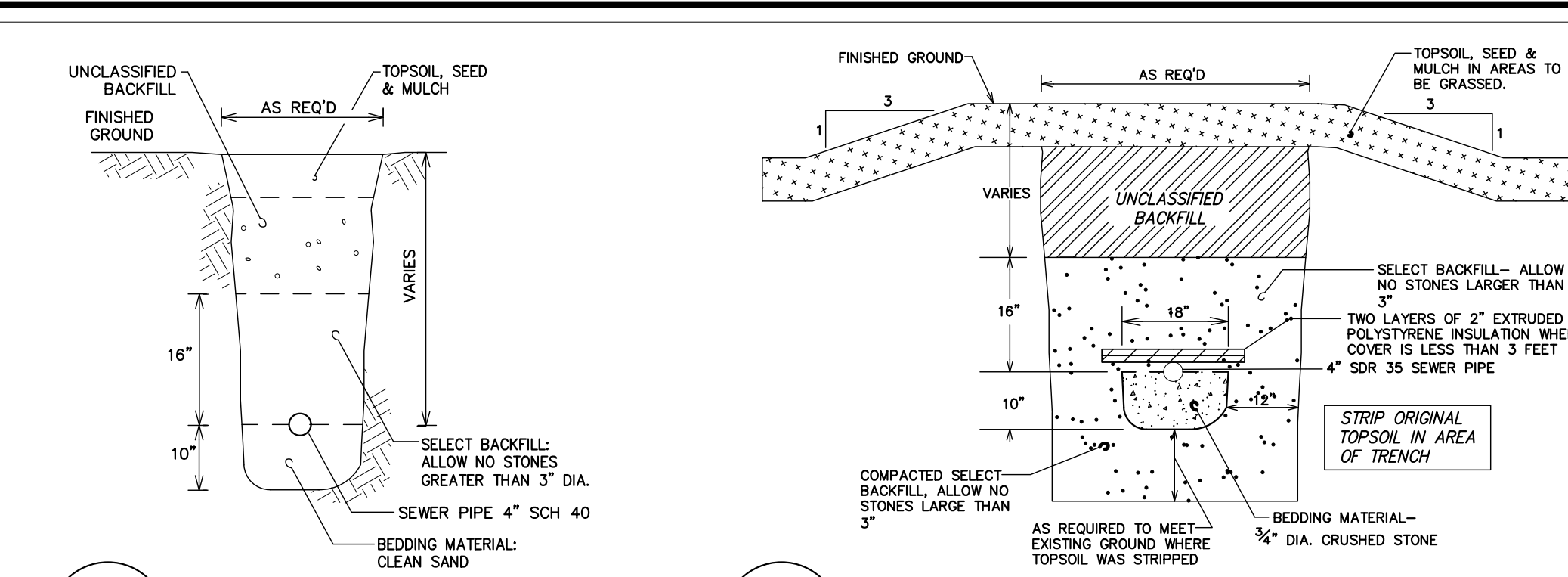
Plan



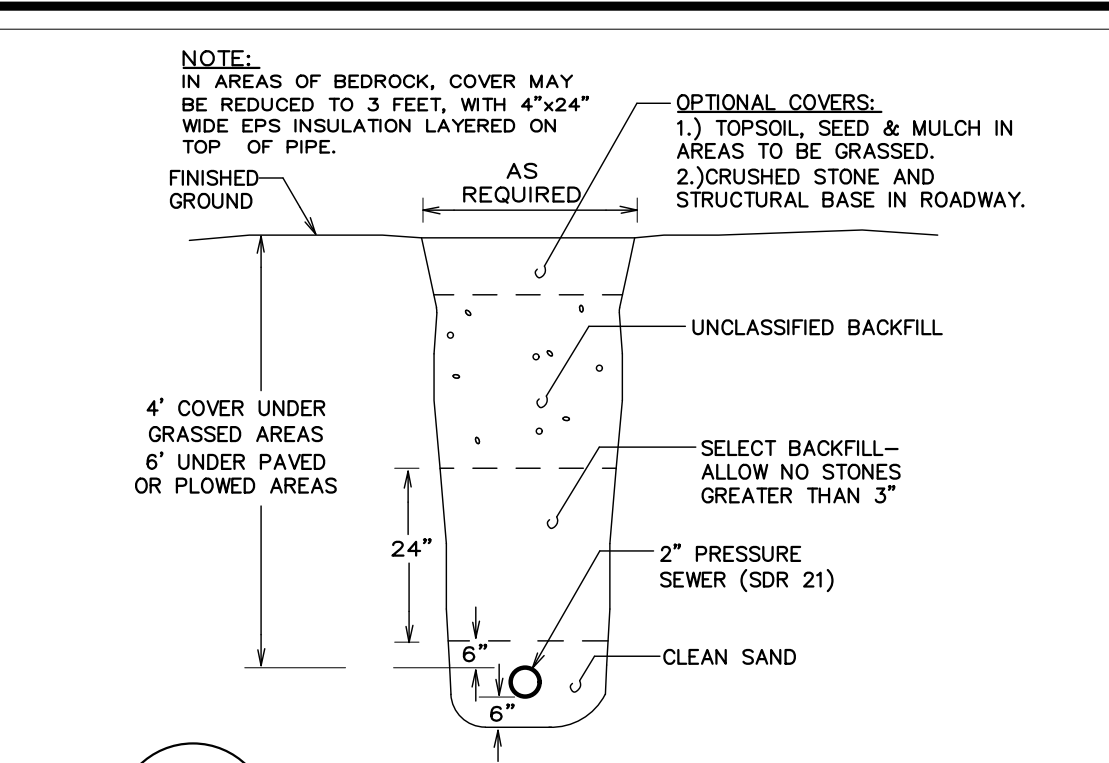
Section
SEPTIC TANKS
not to scale



Section
PUMP COMPARTMENT
not to scale



01 Gravity Sewer Trench
C-12 NOT TO SCALE



03 Pressure Sewer Trench
C-12 NOT TO SCALE

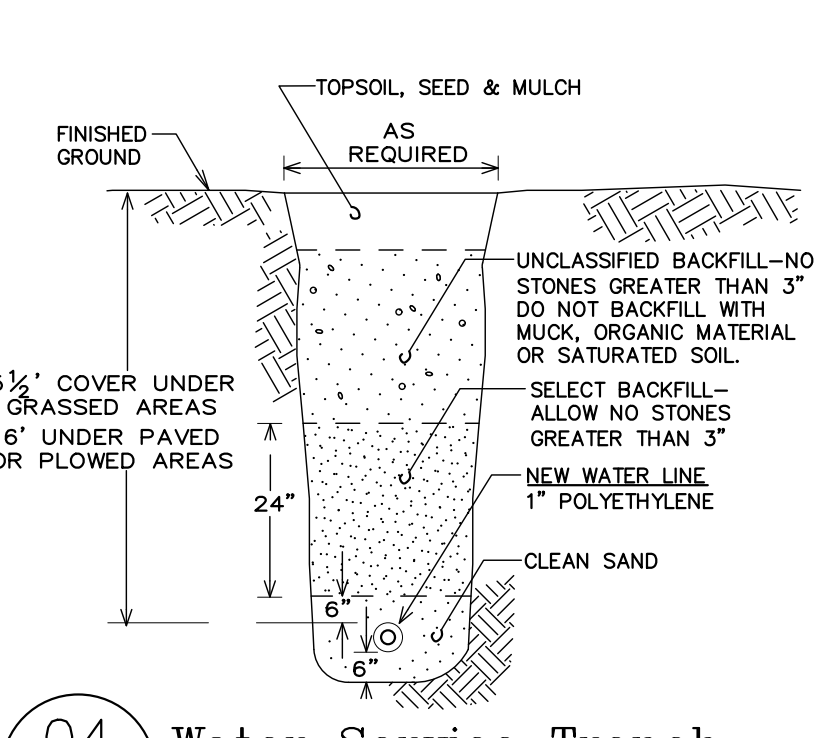
Septic Tank Design Information

LOT #	CAPACITY	INV. IN	INV. OUT	APPROX RIM
1	1,000gal	649.5'	649.25'	653.0'
2	1,000gal	676.5'	676.25'	680.0'
3	1,000gal	654.73'	654.48'	657.0'
4	1,000gal	675.16'	674.91'	677.5'
5	1,000gal	640.47'	640.22'	644.5'
6	1,000gal	664.75'	664.50'	668.0'
7	1,500gal	639.67'	639.42'	642.7'

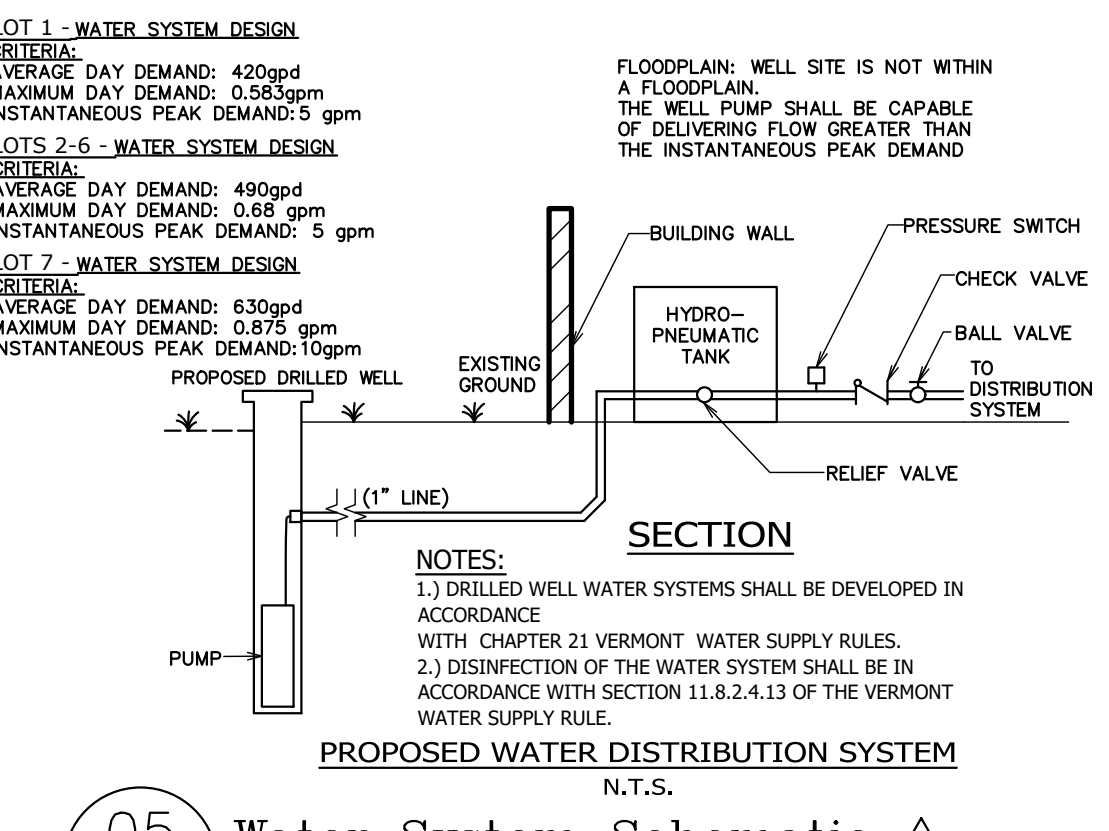
Pump Station Design Information

LOT #	CAPACITY	INV. IN	INV. OUT	APPROX RIM	PUMP	DM "A"	DM "B"	DM "C"	EMERGENCY STORAGE
1	1,000gal	649.0'	646.17'	653.6'	SHEF45	6"	6.6"	12"	±622 Gallons
2	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-
6	1,000gal	664.25'	661.42'	670.5'	SHEF40	6"	5.9"	12"	±641 Gallons
7	1,500gal	639.17'	636.34'	642.55'	SHEF30	6"	5"	12"	±1,001 Gallons

02 Gravity Sewer Trench (Fill Condition)
C-12 NOT TO SCALE



04 Water Service Trench
C-12 NOT TO SCALE



05 Water System Schematic
C-12 NOT TO SCALE

LOTS 1 & 6 SPECIFICATIONS

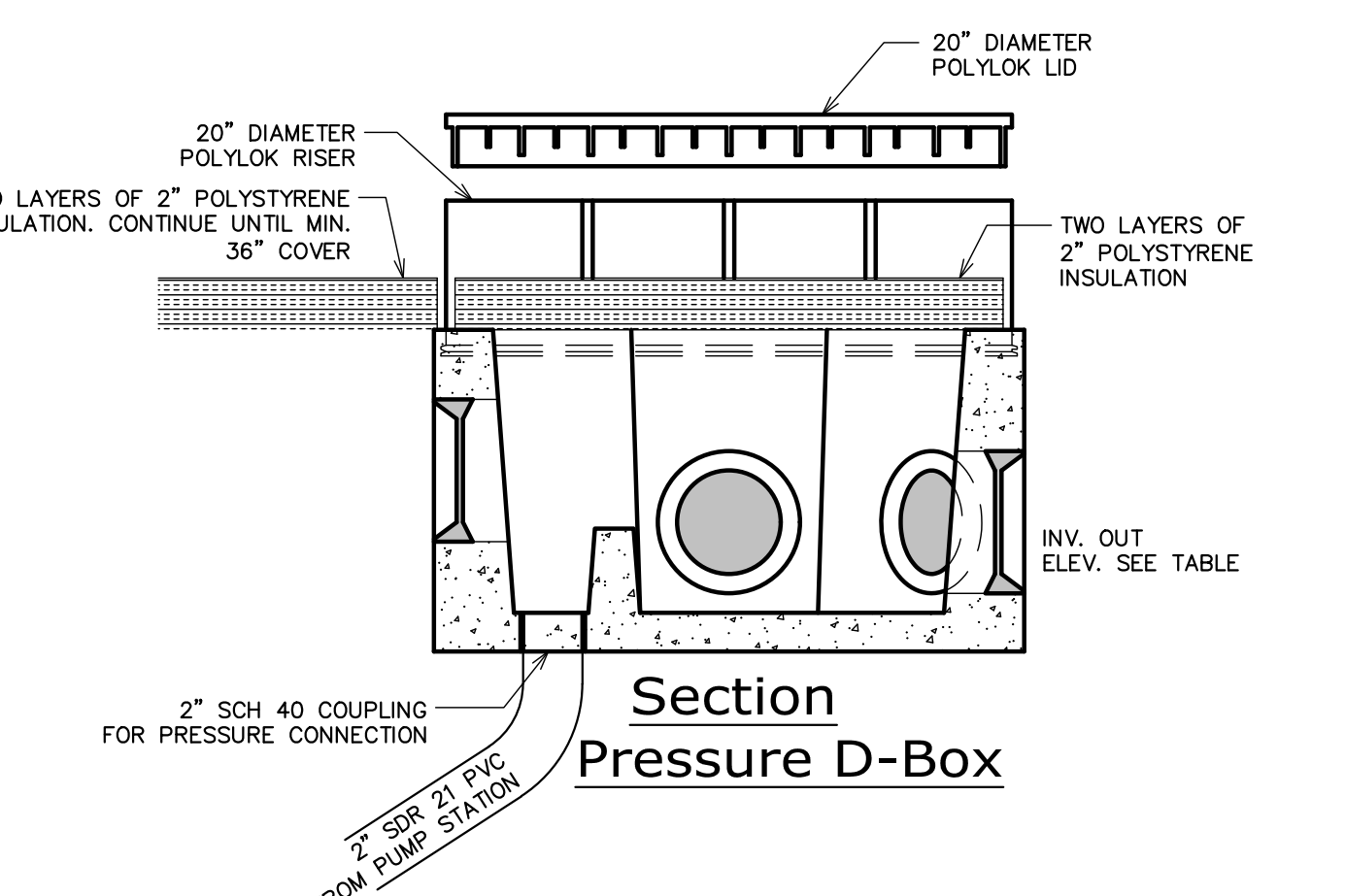
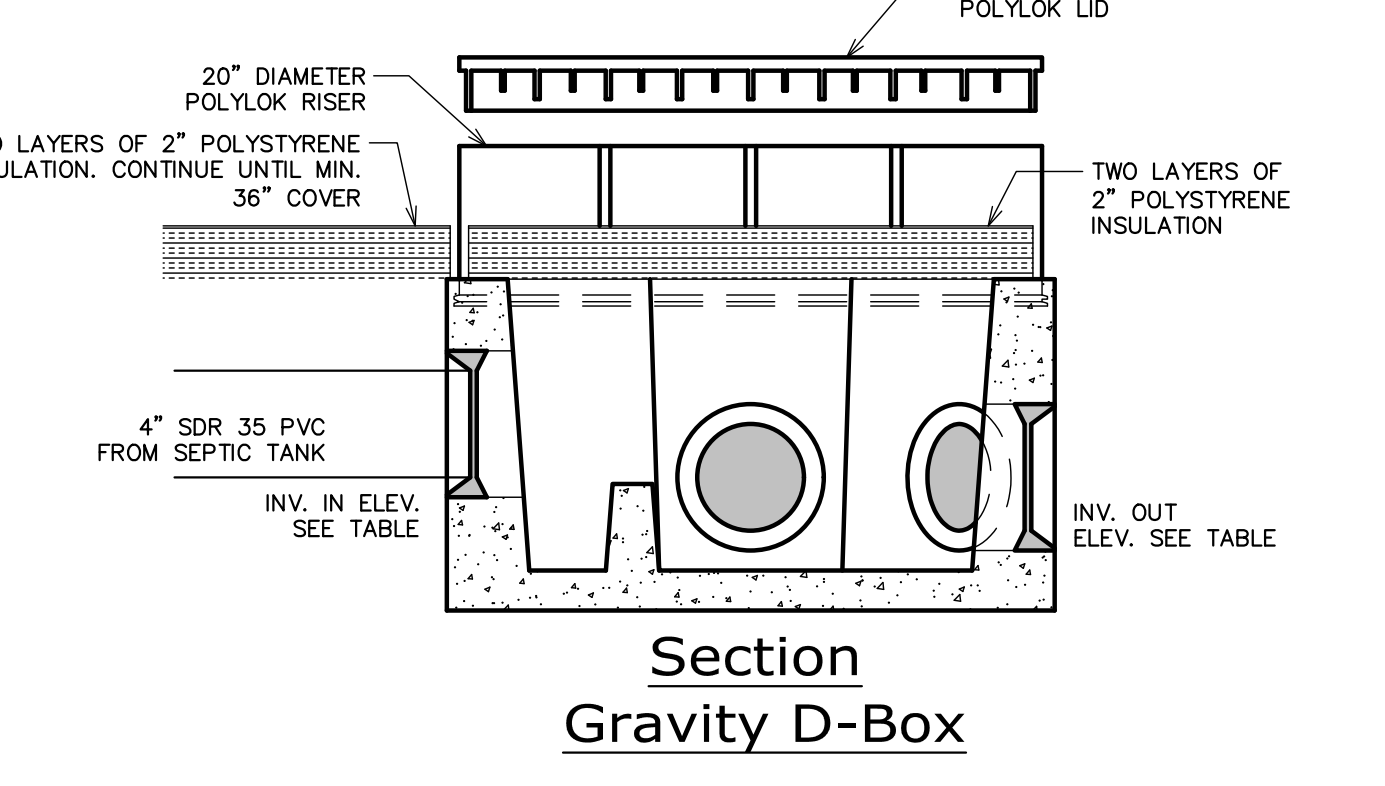
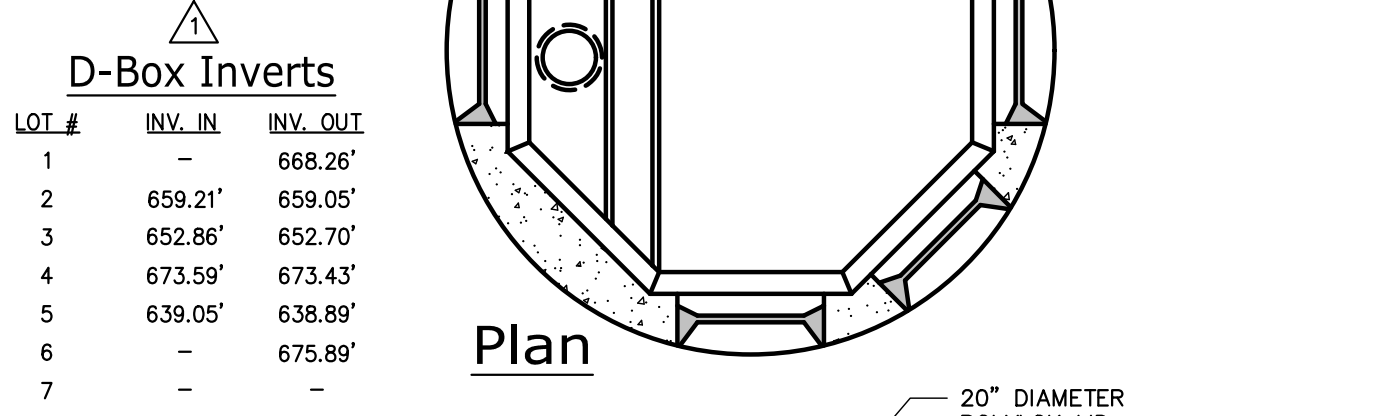
- 1.0 MATERIALS:**
- Septic Tank: 1000 gallon precast concrete septic tank as manufactured by Camp Precast, or engineer approved equivalent.
 - Pump Compartment: 1000 gallon concrete pump station tank manufactured by Camp Precast, or engineer approved equivalent.
 - Wastewater Pump: Furnish and install a Hydraulic submersible effluent pump, (Lot 1 SHEF 45, Lot 7 SHEF40).
 - Distribution Box (D-BOX): 5-outlet pressure distribution box as manufactured by Camp Precast, or engineer approved equivalent.
 - System piping material: From the building to the proposed septic tank use 4" SCH 40 PVC solid pipe. From the septic tank to the proposed pump station use 4" SDR 35 PVC solid pipe. From the pump station to the proposed distribution box (D-BOX) use 2" SDR 21 PVC solid pipe.
 - Leaching Area Piping Material: From the D-BOX to the leaching area use 4" SDR 35 PVC solid pipe.
 - Leaching Area: Utilize Enviro-Septic (ES or AES) leaching system components from Presby Environmental, Inc.
 - System Sand: The system sand material shall cover the entire plowed surface and shall extend from the plowed surface to 6" above the ENVIRO-SEPTIC pipes. The system sand material must meet the specifications of one of the sieve analyses provided in Table A to the right. Submit a sieve analysis representative of the system sand to the engineer prior to construction. Do not commence construction until written approval is issued by the engineer.
 - Topsoil: Clean fertile topsoil from on-site sources, if available. If not available on-site, procure from a suitable off-site source.
 - Grass Seed: Provide a mixture of Kentucky Bluegrass and White Clover. Mulch heavily and apply winter rye if seeded after October 1.
 - Filter Fabric: Mirafi 140 NT or approved equal.
- 2.0 INSTALLATION:**
- Septic Tank & Pump Compartment: Install septic tank and pump station dead level on undisturbed earth or bedrock. Set to grades indicated or as determined by the engineer in the field. Backfill with native soil and allow no stones larger than 3" in diameter.
 - Sewer Pipe: Where possible, lay sewer pipe at constant grade and alignment. Do not allow any low points in sewer that could collect effluent. Bed and cover sewer as indicated on the Drawings.
 - Leaching area: Do not strip original topsoil in area of new leaching system. Aboveground vegetation shall be closely cut and removed from the ground surface throughout the area to be used for the placement of the fill material. All trees within 10' of the leachfield site shall be removed. Tree stumps shall be cut flush with the surface of the ground and roots shall not be pulled. Plow the area to a depth of 8 inches, throwing the soil uphill. Soil shall be plowed parallel to the contour of the ground. Apply the approved sand material to depth indicated on drawings.
- Install ENVIRO-SEPTIC leaching system components. No rubber - tired equipment is permitted on the leaching area at any time. Where necessary, use small equipment on tracks. Do not perform construction during times of high soil moisture.
- Install distribution box as shown. Connect distribution box to ENVIRO-SEPTIC components as shown. Pipes exiting distribution box shall exit box level for at least 1 foot before dropping into corresponding trench.
- Connect new septic tank to new distribution box.
- After satisfactory inspections, cover the leaching area as shown in the drawings. Hand rake, seed and mulch all disturbed areas.
- 3.0 INSPECTIONS:**
- Note: Not the responsibility of the design engineer. Responsibility of the certifying engineer.
- 3.1 Staking of System: Engineer shall stake location of leaching area in field.
- 3.2 Notify the engineer for inspections at the following construction stages:
- When plowing is complete in leaching area.
 - After septic tank, pump station, and distribution piping is installed, but prior to backfilling. A minimum of two samples of the sand fill material will be collected by the engineer and analyzed for gradation. If the sand fill fails to meet the specifications indicated herein, the sand fill shall be removed and replaced by the contractor at no additional cost to the owner. The contractor shall demonstrate that the new septic tank and pump station is watertight by filling the septic tank with water and observing any drop in water level for 24 hours. Any drop in water level in excess of 1 inch is unacceptable and shall be remedied by the contractor. Seamless tanks do not need to be tested. During this inspection the pump station will need to be energized and an acceptable amount of water added to the pump station to pressurize the forcemain to ensure the pump supplies supplies enough pressure to the D-BOX.
 - Failure to notify the engineer at the stages identified above, or failure to construct the wastewater system in strict accordance with these plans and specifications may result in non-certification and non-approval of the system by the engineer. The site contractor is solely responsible for contacting the engineer designated by the owner, and for obtaining the proper certification. Failure to do so will affect the engineer's recommendation for payment to the contractor.

LOTS 2, 3, 4 & 5 SPECIFICATIONS

- 1.0 MATERIALS:**
- Septic Tank: 1000 gallon precast concrete septic tank as manufactured by Camp Precast, or engineer approved equivalent.
 - Distribution Box (D-BOX): 5-outlet distribution box as manufactured by Camp Precast, or engineer approved equivalent.
 - System piping material: From the building to the proposed septic tank use 4" SCH 40 PVC solid pipe. From the septic tank to the proposed distribution box (D-BOX) use 4" SDR 35 PVC solid pipe.
 - Leaching Area Piping Material: From the D-BOX to the leaching area use 4" SDR 35 PVC solid pipe.
 - Leaching Area: Utilize Enviro-Septic (ES or AES) leaching system components from Presby Environmental, Inc.
 - System Sand: The system sand material shall cover the entire plowed surface and shall extend from the plowed surface to 6" above the ENVIRO-SEPTIC pipes. The system sand material must meet the specifications of one of the sieve analyses provided in Table A to the right. Submit a sieve analysis representative of the system sand to the engineer prior to construction. Do not commence construction until written approval is issued by the engineer.
 - Topsoil: Clean fertile topsoil from on-site sources, if available. If not available on-site, procure from a suitable off-site source.
 - Grass Seed: Provide a mixture of Kentucky Bluegrass and White Clover. Mulch heavily and apply winter rye if seeded after October 1.
 - Filter Fabric: Mirafi 140 NT or approved equal.
- 2.0 INSTALLATION:**
- Septic Tank: Install septic tank dead level on undisturbed earth or bedrock. Set to grades indicated or as determined by the engineer in the field. Backfill with native soil and allow no stones larger than 3" in diameter.
 - Sewer Pipe: Where possible, lay sewer pipe at constant grade and alignment. Do not allow any low points in sewer that could collect effluent. Bed and cover sewer as indicated on the Drawings.
 - Leaching area: Do not strip original topsoil in area of new leaching system. Aboveground vegetation shall be closely cut and removed from the ground surface throughout the area to be used for the placement of the fill material. All trees within 10' of the leachfield site shall be removed. Tree stumps shall be cut flush with the surface of the ground and roots shall not be pulled. Plow the area to a depth of 8 inches, throwing the soil uphill. Soil shall be plowed parallel to the contour of the ground. Apply the approved sand material to depth indicated on drawings.
- Install ENVIRO-SEPTIC leaching system components. No rubber - tired equipment is permitted on the leaching area at any time. Where necessary, use small equipment on tracks. Do not perform construction during times of high soil moisture.
- Install distribution box as shown. Connect distribution box to ENVIRO-SEPTIC components as shown. Pipes exiting distribution box shall exit box level for at least 2 feet before dropping into corresponding trench.
- Connect new septic tank to new distribution box.
- After satisfactory inspections, cover the leaching area as shown in the drawings. Hand rake, seed and mulch all disturbed areas.
- 3.0 INSPECTIONS:**
- Note: Not the responsibility of the design engineer. Responsibility of the certifying engineer.
- 3.1 Staking of System: Engineer shall stake location of leaching area in field.
- 3.2 Notify the engineer for inspections at the following construction stages:
- When plowing is complete in leaching area.
 - After Septic tank is installed, and after distribution piping is installed, but prior to backfilling. A minimum of two samples of the sand fill material will be collected by the engineer and analyzed for gradation. If the sand fill fails to meet the specifications indicated herein, the sand fill shall be removed and replaced by the contractor at no additional cost to the owner. The Contractor shall demonstrate that the new septic tank is watertight by filling the septic tank with water and observing any drop in water level for 24 hours. Any drop in water level in excess of 1 inch is unacceptable and shall be remedied by the contractor. Seamless tanks do not need to be tested.
 - Failure to notify the engineer at the stages identified above, or failure to construct the wastewater system in strict accordance with these plans and specifications may result in non-certification and non-approval of the system by the engineer. The site contractor is solely responsible for contacting the engineer designated by the owner, and for obtaining the proper certification. Failure to do so will affect the engineer's recommendation for payment to the contractor.

LOT 7 SPECIFICATIONS

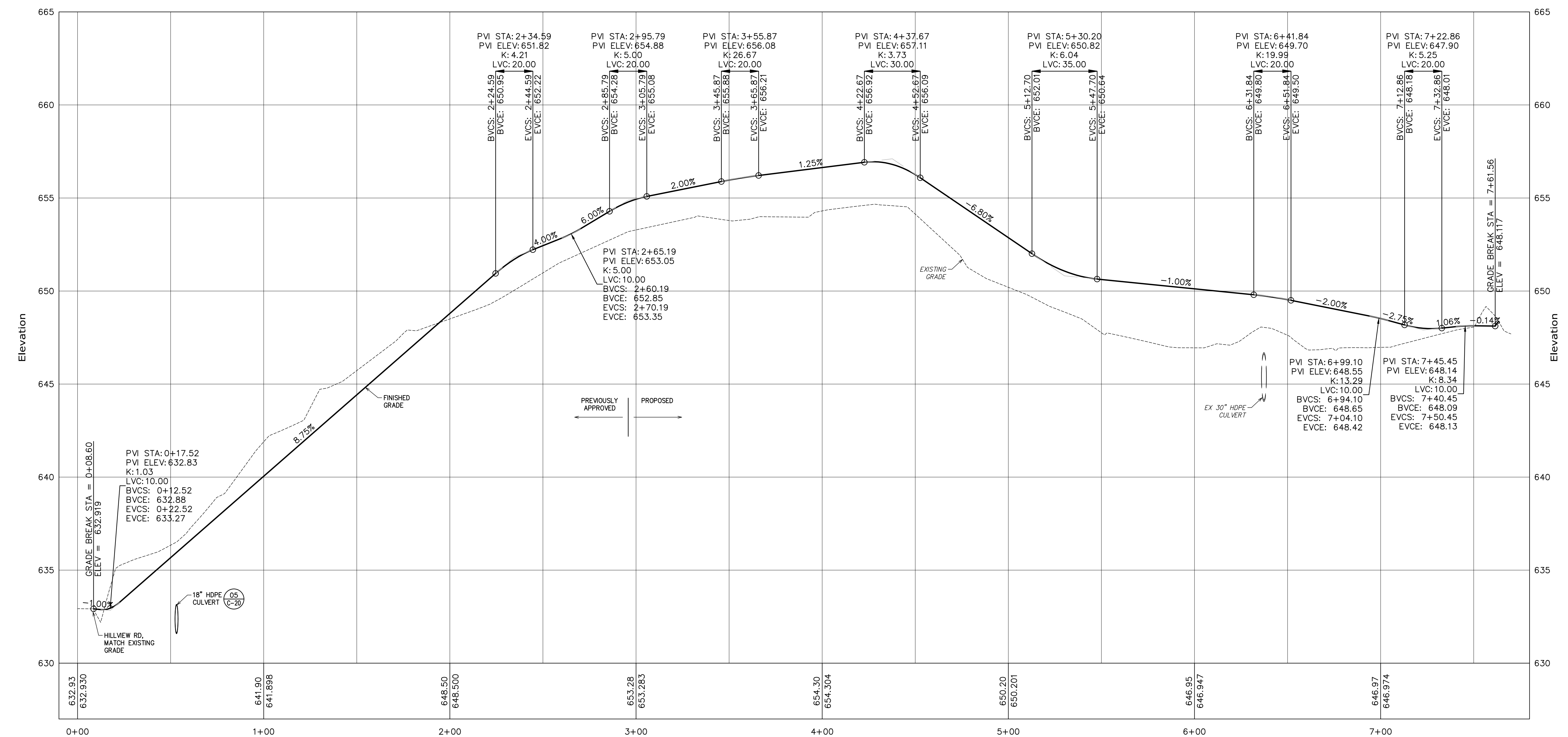
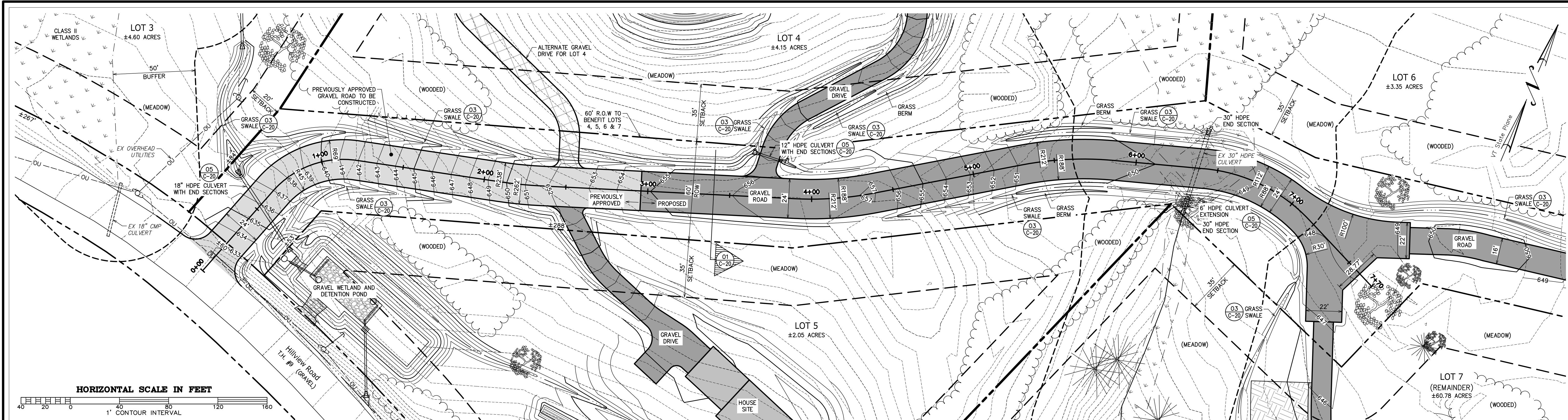
- 1.0 MATERIALS:**
- Septic Tank: 1500 gallon precast concrete septic tank as manufactured by Camp Precast, or engineer approved equivalent.
 - Pump Compartment: 1500 gallon concrete pump station tank manufactured by Camp Precast, or engineer approved equivalent.
 - Mound System Pipe Material: Utilized 2 inch diameter schedule 80 PVC pipe within the pump compartment. From the pump compartment to the mound system, utilize 2 inch diameter SDR 21 PVC. Within the mound system utilized 2 inch diameter schedule 40 PVC, drilled as shown on the drawings.
 - Wastewater Pump: Furnish and install a Hydraulic submersible effluent pump, Model SHEF30.
 - Mound Fill: The mound fill material shall cover the entire plowed surface and shall extend from the plowed surface to the top of the bed. The mound fill material must meet the specifications of one of the sieve analyses provided in Table A on Sheet 4. Submit a sieve analysis representative of the mound fill to the engineer prior to construction. Do not commence construction until written approval is issued by the engineer. The engineer has the right to obtain sand samples during the certifying and testing phase to ensure the material on site meets the state specifications.
 - Washed Stone: Utilize 3"-1 1/2" diameter stone, washed stone.
 - Topsoil: Clean fertile topsoil from on-site sources, if available. If not available on-site, procure from a suitable off-site source.
 - Grass Seed: Provide a mixture of Kentucky Bluegrass and White Clover. Mulch heavily and apply winter rye if seeded after October 1.
 - Filter Fabric: Mirafi 140 NT or approved equal.
- 2.0 INSTALLATION:**
- Septic Tank & Pump Compartment: Install septic tank and pump station dead level on undisturbed earth or bedrock. Set to grades indicated or as determined by the engineer in the field. Ensure the proper effluent filter is installed in the septic tank, and the pump station float switches are set per details. Backfill with native soil and allow no stones larger than 3" in diameter.
 - Sewer Pipe: Where possible, lay sewer pipe at constant grade and alignment. Do not allow any low points in sewer that could collect effluent. Bed and cover sewer as indicated on the Drawings.
 - Leaching area: Do not strip original topsoil in area of new leaching system. Aboveground vegetation shall be closely cut and removed from the ground surface throughout the area to be used for the placement of the fill material. All trees within 10' of the leachfield site shall be removed. Tree stumps shall be cut flush with the surface of the ground and roots shall not be pulled. Plow the area to a depth of 8 inches, throwing the soil uphill. Soil shall be plowed parallel to the contour of the ground. Apply the approved sand material to depth indicated on drawings. No rubber-tired equipment is permitted on the mound at any time. Where necessary, use small equipment on tracks. Do not perform construction during times of high soil moisture.
- Install piping as shown, and drill orifices where shown and ream out holes. Make sure interior of pipes are clean. Lay all distribution pipes dead level at the invert elevation shown. Connect pump compartment to distribution headed with pipe as shown. Pipe shall connect to header from below and shall be graded so that liquid shall drain back to the pump station when the pump is off to prevent freezing.
- After satisfactory inspections, cover the mound and piping as shown on the drawings. Install a layer of filter fabric over the stone, prior to backfill. Hand rake, seed and mulch all disturbed areas.
- 3.0 INSPECTIONS:**
- Note: Not the responsibility of the design engineer. Responsibility of the certifying engineer.
- 3.1 Staking of System: Engineer shall stake location of leaching area in field.
- 3.2 Notify the engineer for inspections at the following construction stages:
- When plowing is complete in leaching area.
 - After septic tank, pump station, and distribution piping is installed, but prior to backfilling. A minimum of two samples of the sand fill material will be collected by the engineer and analyzed for gradation. If the sand fill fails to meet the specifications indicated herein, the sand fill shall be removed and replaced by the contractor at no additional cost to the owner. The contractor shall demonstrate that the new septic tank and pump station is watertight by filling the septic tank with water and observing any drop in water level for 24 hours. Any drop in water level in excess of 1 inch is unacceptable and shall be remedied by the contractor. Seamless tanks do not need to be tested. During this inspection the pump station will need to be energized and an acceptable amount of water added to the pump station to pressurize the forcemain and leachfield to ensure the pump supplies supplies enough pressure to the leachfield.
 - Failure to notify the engineer at the stages identified above, or failure to construct the wastewater system in strict accordance with these plans and specifications may result in non-certification and non-approval of the system by the engineer. The site contractor is solely responsible for contacting the engineer designated by the owner, and for obtaining the proper certification. Failure to do so will affect the engineer's recommendation for payment to the contractor.



06 D-Box Detail
C-12 NOT TO SCALE

PROJECT: 20029 DATE: February 23, 2022
 Tel: 802-524-2113 Fax: 802-524-9681
 DESIGN: PJG DRAWN: RHW/NRB CHECKED: PJG APPROVED: PJG
 CCE CROSS CONSULTING ENGINEERS, P.C.
 107 Fairfax Rd. St. Albans, Vermont 05478
 © COPYRIGHT 2021 Cross Consulting Engineers, P.C.
 Sanitary And Potable Water Specifications & Details
 Hillview Heights, LLC South Burlington, VT
 Hillview Heights Subdivision Richmond, VT
 Hillview Road
 CIVIL
 C-12 SHEET C-12 OF 20
 PERMITTING

Q:\2020 Drawings\20029 - Bob Avondis, Richmond\Current\C-13 Road Plan And Profile.dwg, Plotted: 4/27/2023 12:03:34 PM



Proposed Gravel Road -0+10 to 7+80 Profile
Horizontal Scale: 1" = 30'
Vertical Scale: 1" = 3'

PERMITTING

PROJECT: 20029
DATE: February 23, 2022
DESIGN: PJG
DRAWN: RHW/NRB
CHECKED: PJG
APPROVED: PJG

CE CROSS
CONSULTING ENGINEERS, P.C.
103 Fairfax Rd.
St. Albans, Vermont 05478
© COPYRIGHT 2023
Cross Consulting Engineers, P.C.

Road Plan And Profile

Hillview Heights, LLC
South Burlington, VT

Hillview Heights Subdivision

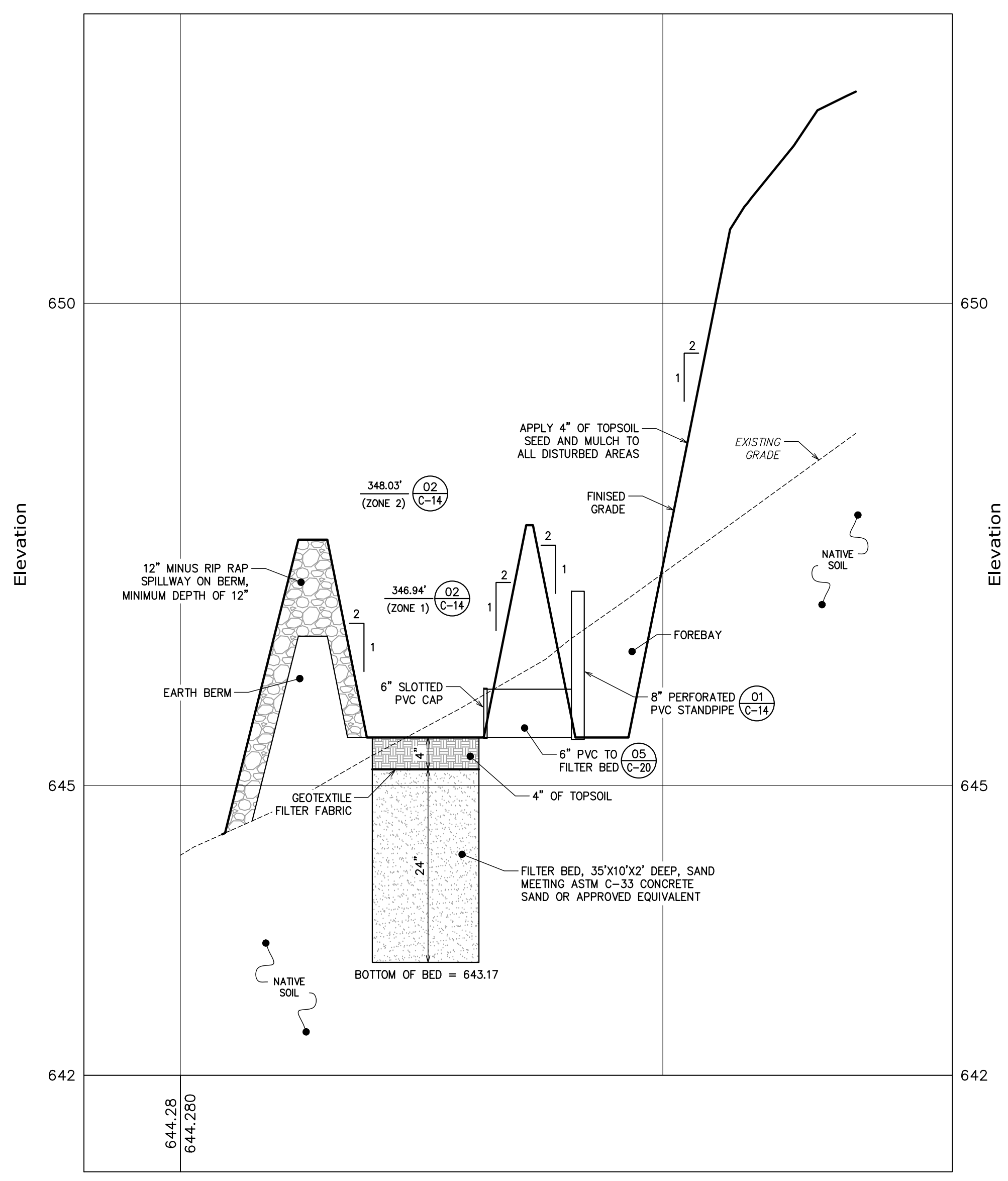
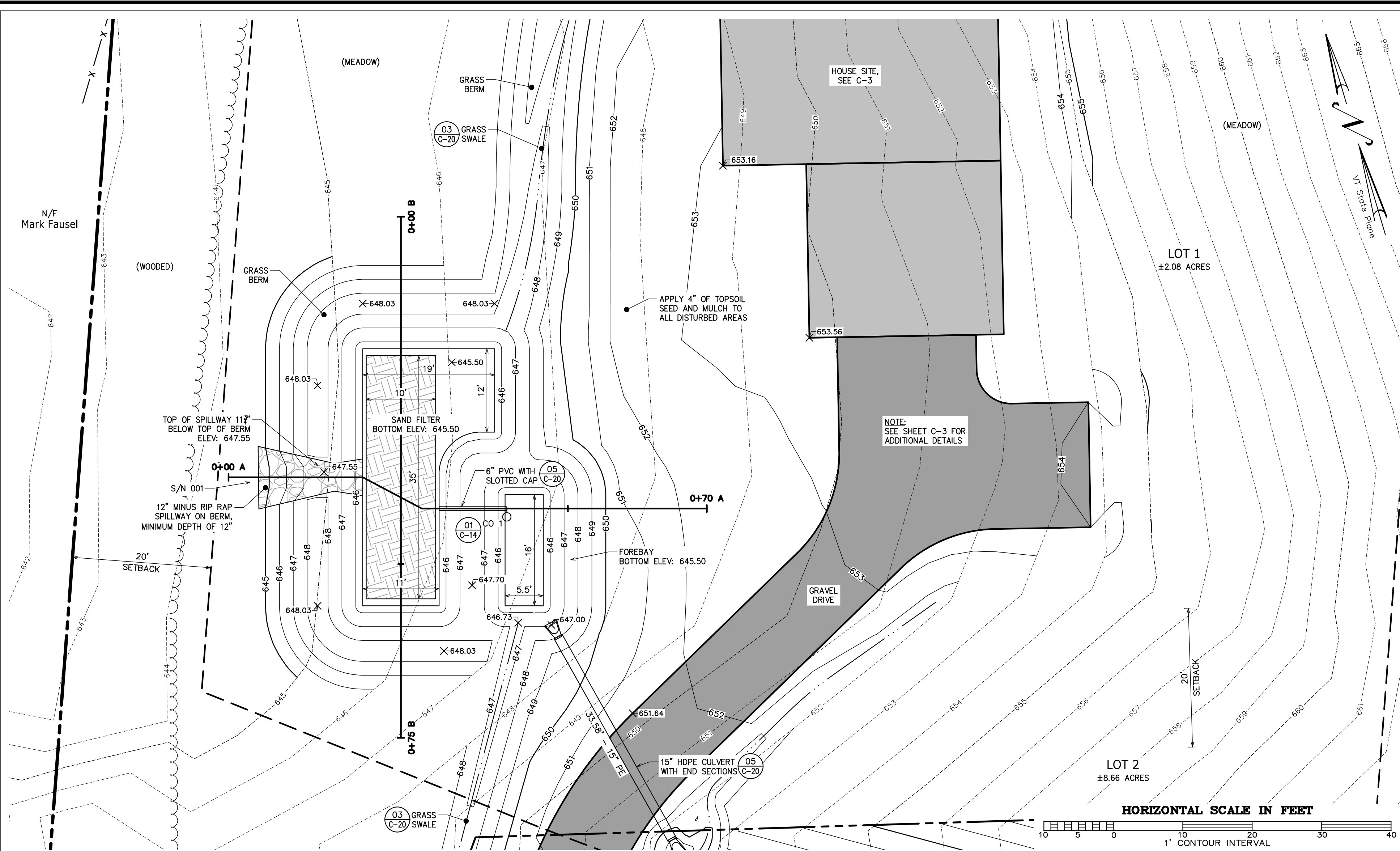
Richmond, VT

Hillview Road

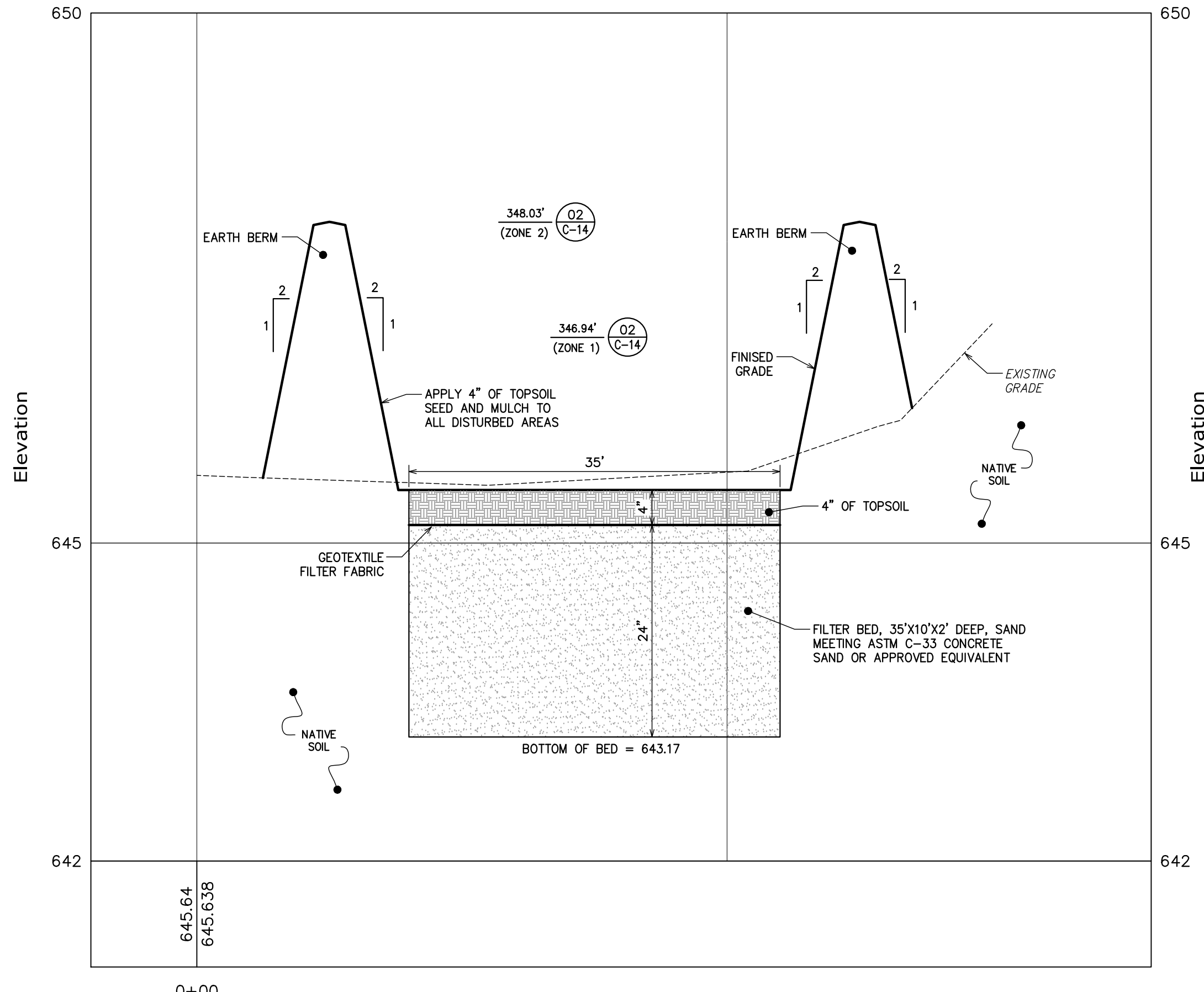
CIVIL

C-13

Q:\2020 Drawings\20029 - Bob Avondis, Richmond\Current\C-14 Filtering System Plan And Profile.dwg Plotted: 4/27/2023 12:02:45 PM



Section A-A -0+10 to 0+80 Profile
Horizontal Scale: 1" = 10'
Vertical Scale: 1" = 1'

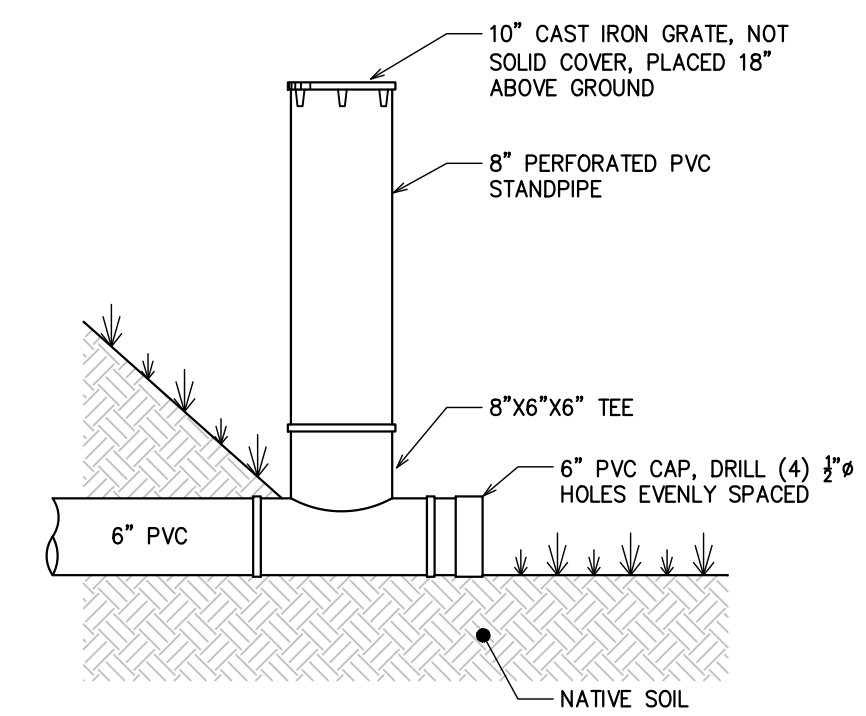


Section B-B -0+10 to 0+90 Profile
Horizontal Scale: 1" = 10'
Vertical Scale: 1" = 1'

01 Perforated Standpipe
C-14 NOT TO SCALE

02 Pond Planting
C-14 NOT TO SCALE

Zone #	Elevation Range (ft)	Area (sq ft)	Example Species	Planting/Seeding Rate	Total Quantity
1	645.5 - 646.94	1,092	Moist Seed Mix	25 lbs / acre	0.63 lbs of Seed
2	646.94 - 648.03	923	Upland Seed Mix	25 lbs / acre	0.53 lbs of Seed



PROJECT: 20029 DATE: February 23, 2022
 Tel: 802-524-2113 Fax: 802-524-9661
 DESIGN: PJG DRAWN: RHW/NRB CHECKED: PJG APPROVED: PJG
 CROSS CONSULTING ENGINEERS, P.C.
 103 Fairfax Rd, St. Albans, Vermont 05478
 © COPYRIGHT 2023 Cross Consulting Engineers, P.C.

Filtering System Plan
And Profile

Hillview Heights, LLC
South Burlington, VT

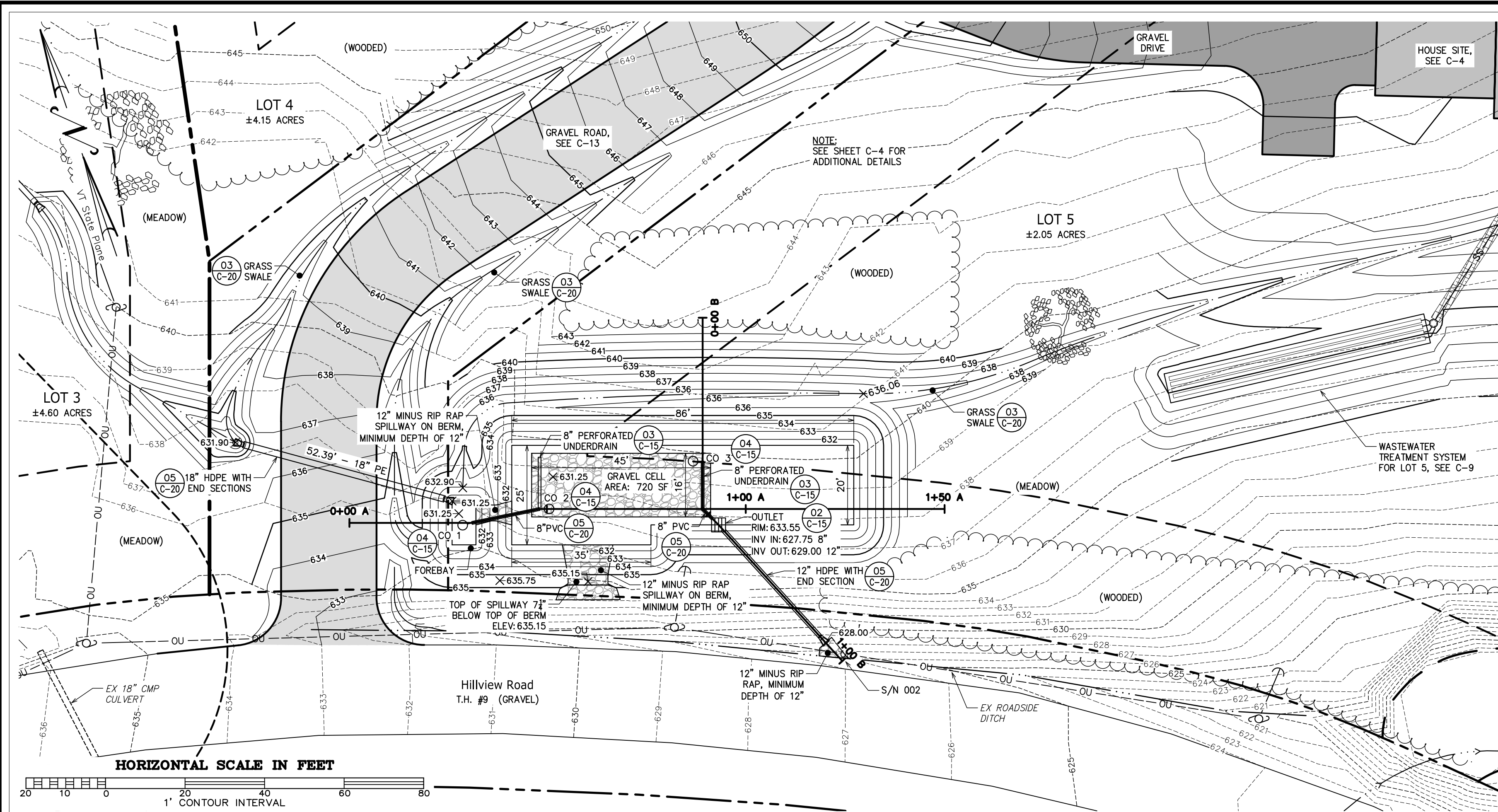
Hillview Heights Subdivision
Hillview Road
Richmond, VT

CIVIL

C-14

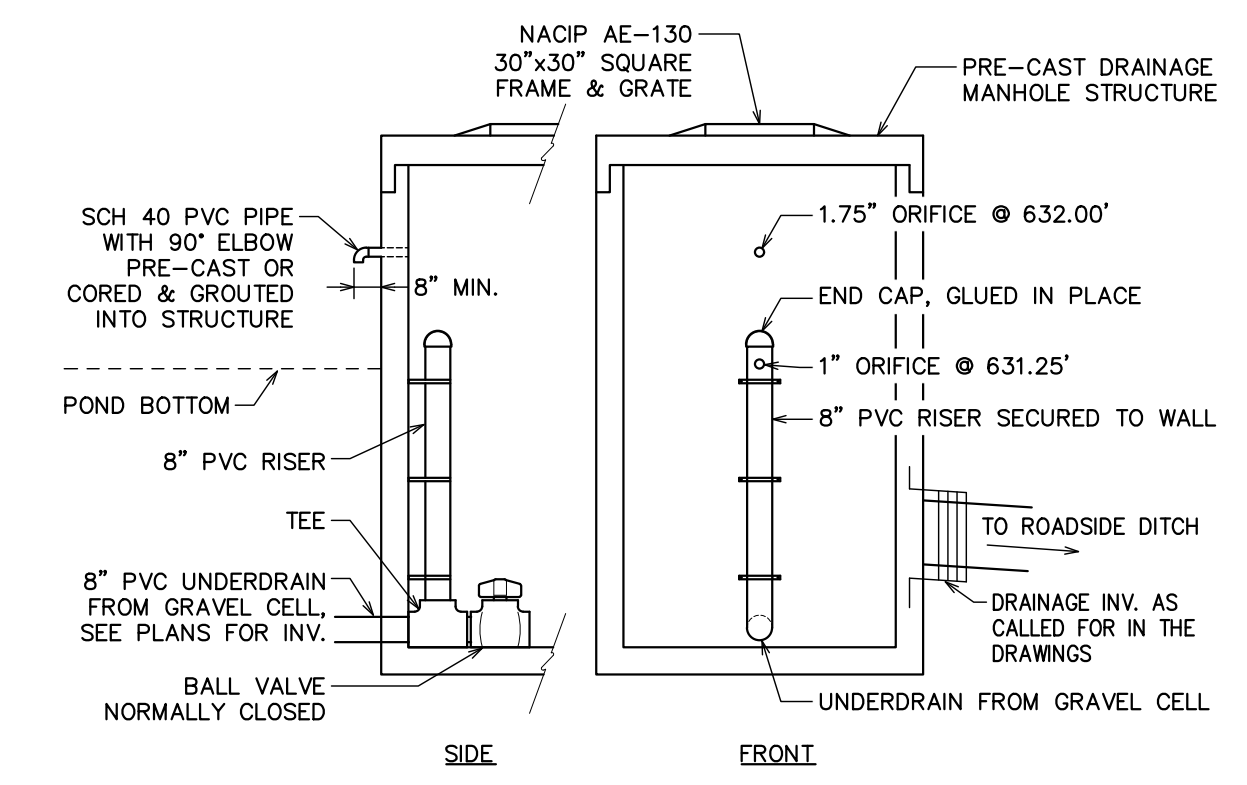
SHEET C-14 OF 20

PERMITTING

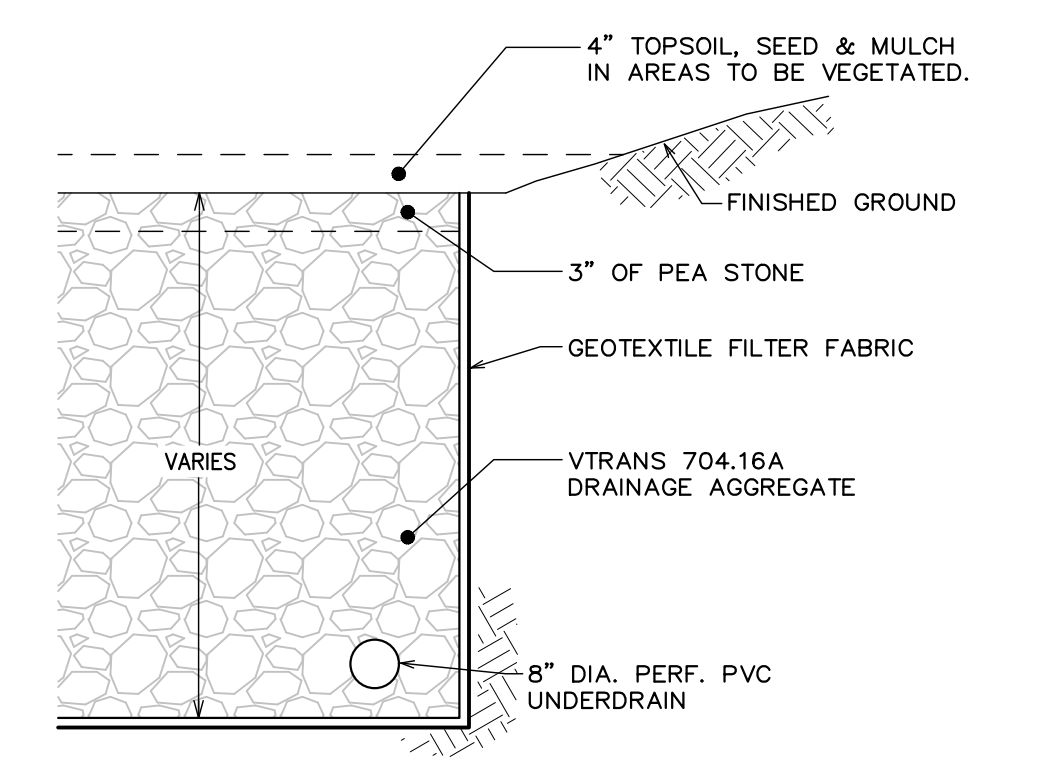


Zone #	Elevation Range (ft)	Area (sq ft)	Example Species	Planting/Seeding Rate	Total Quantity
1-2	631.25 (Gravel Wetland)	720	Water Lily, Water Celery, Pondweed, Northern Arrowhead, Softstem Bulrush	1 Plant / 4 sqft	180 Transplants
3	631.25 - 632.00	1,640	Moist Seed Mix	25 lbs / acre	0.94 lbs of Seed
4	632.00 - 635.75	2,190	Upland Seed Mix	25 lbs / acre	1.26 lbs of Seed

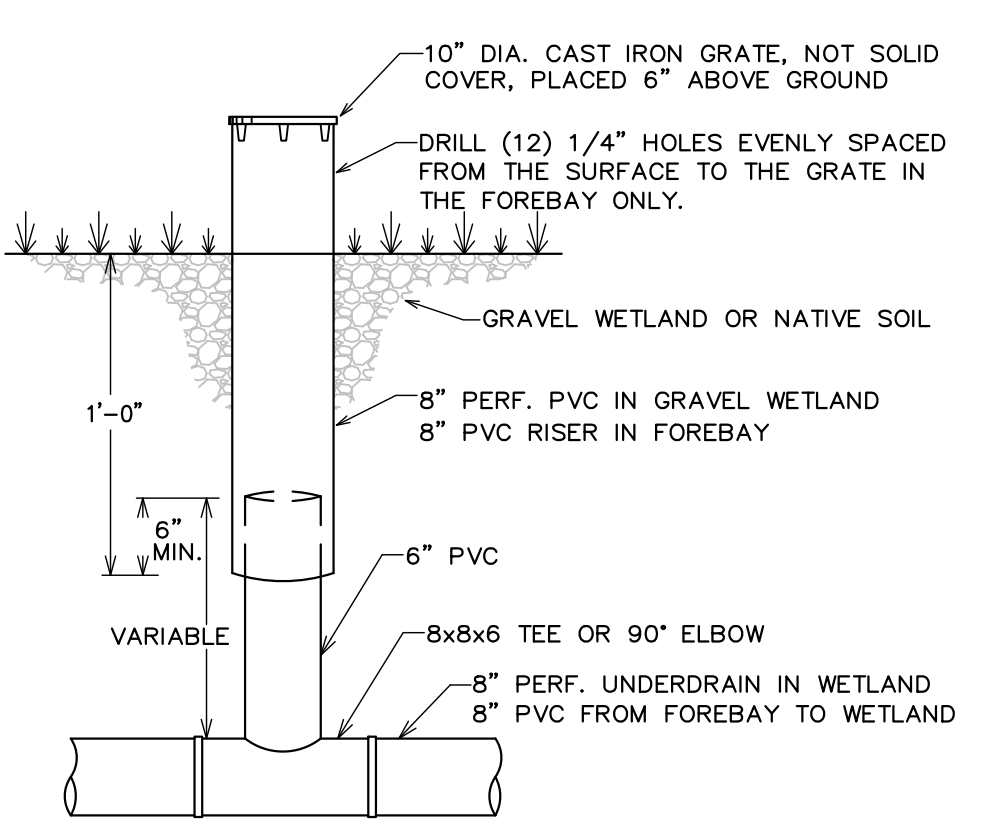
01 Pond Planting
C-15 NOT TO SCALE



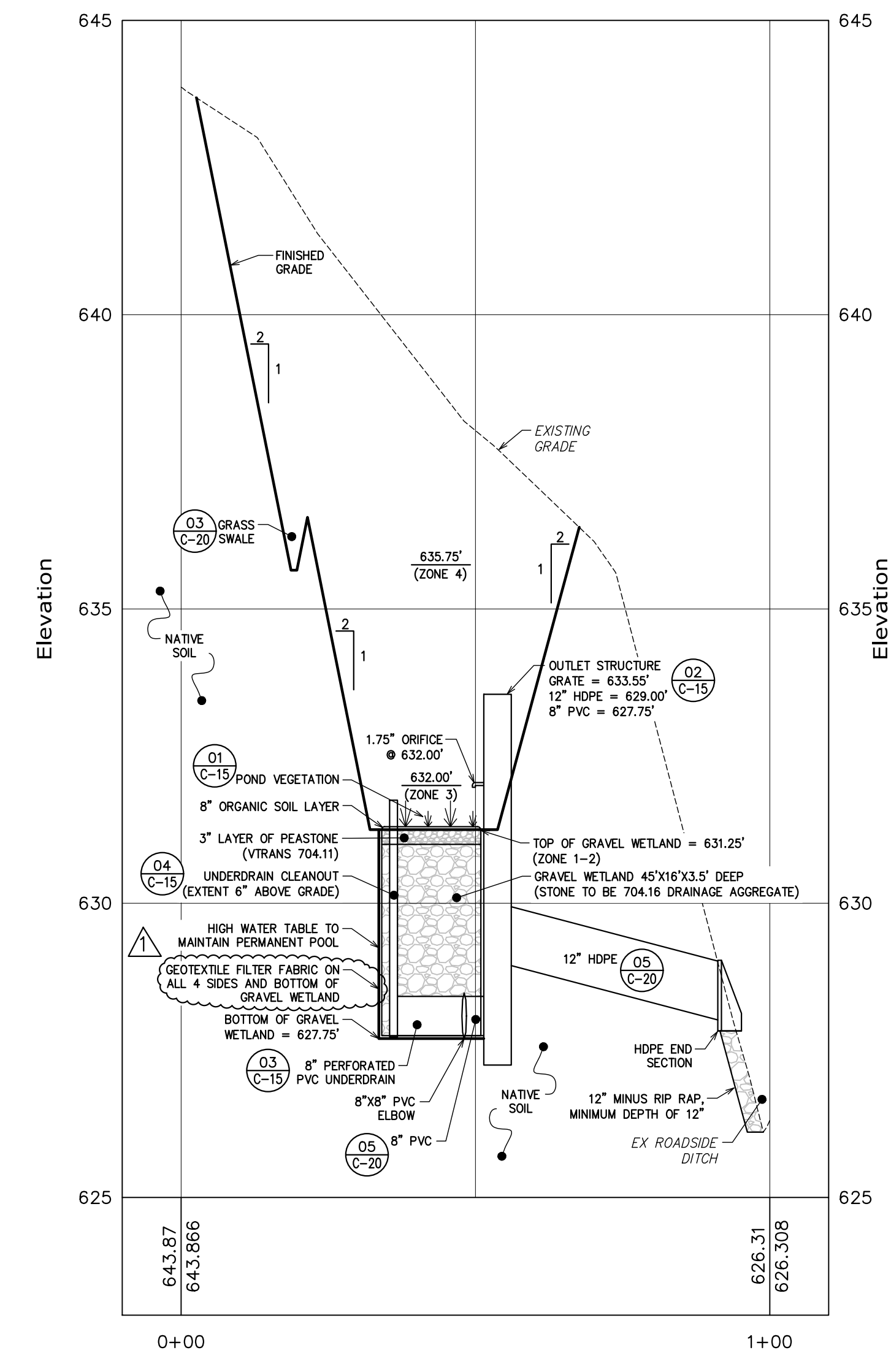
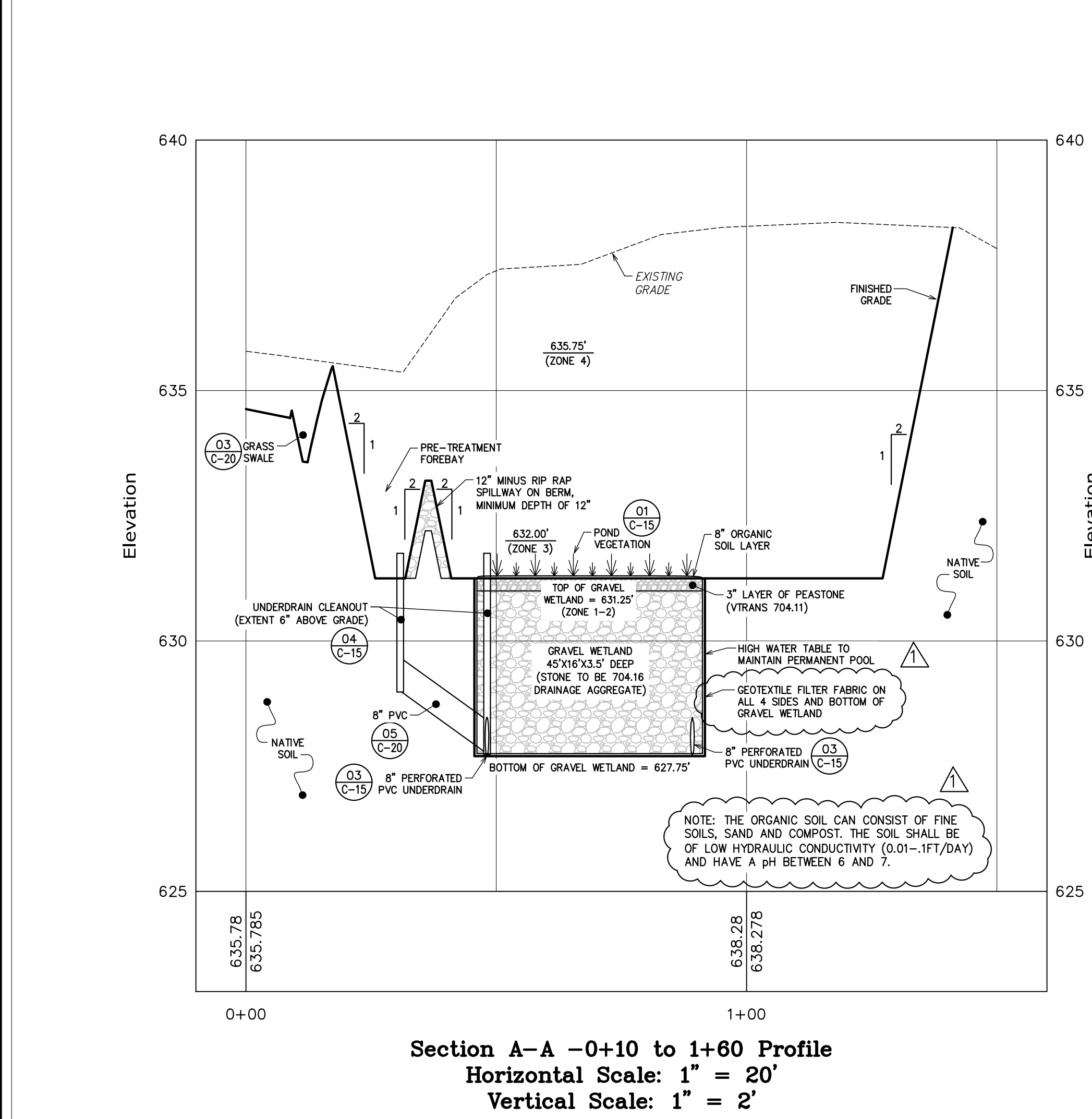
02 Outlet Structure
C-15 NOT TO SCALE



03 Perforated Underdrain
C-15 NOT TO SCALE



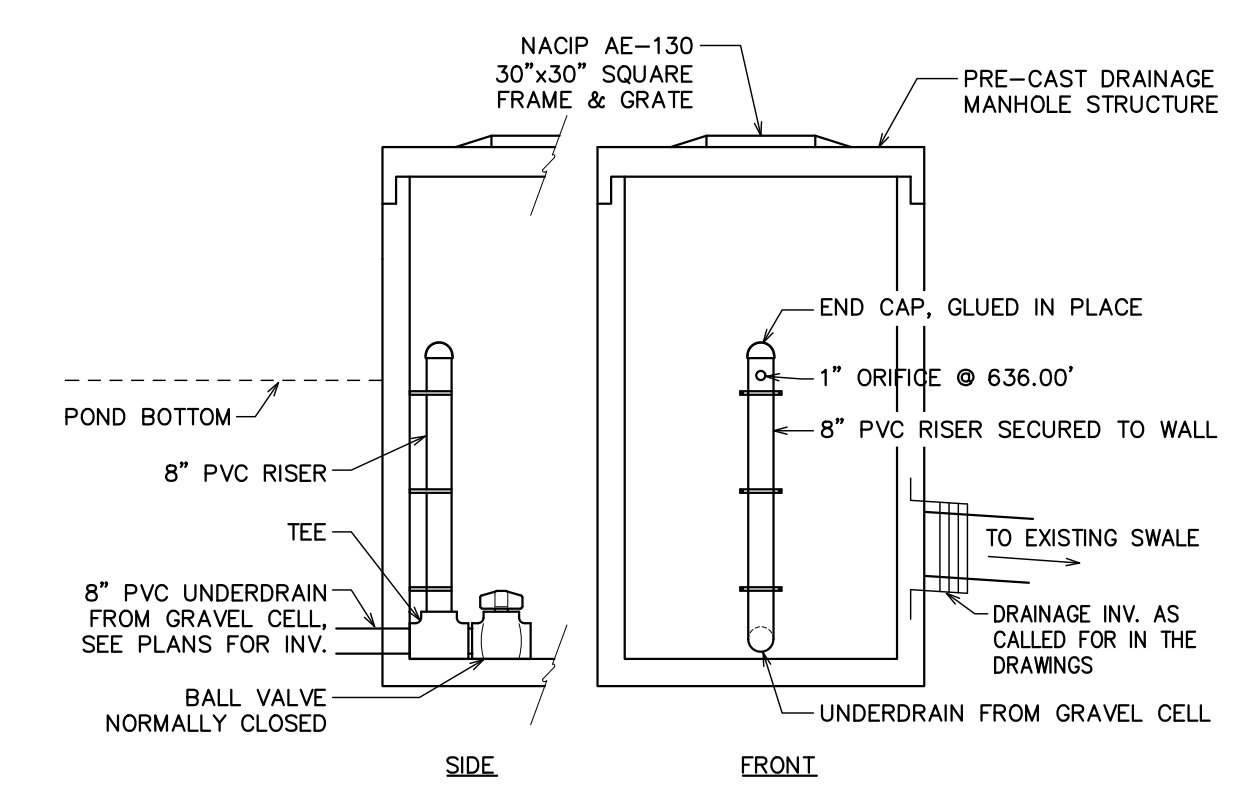
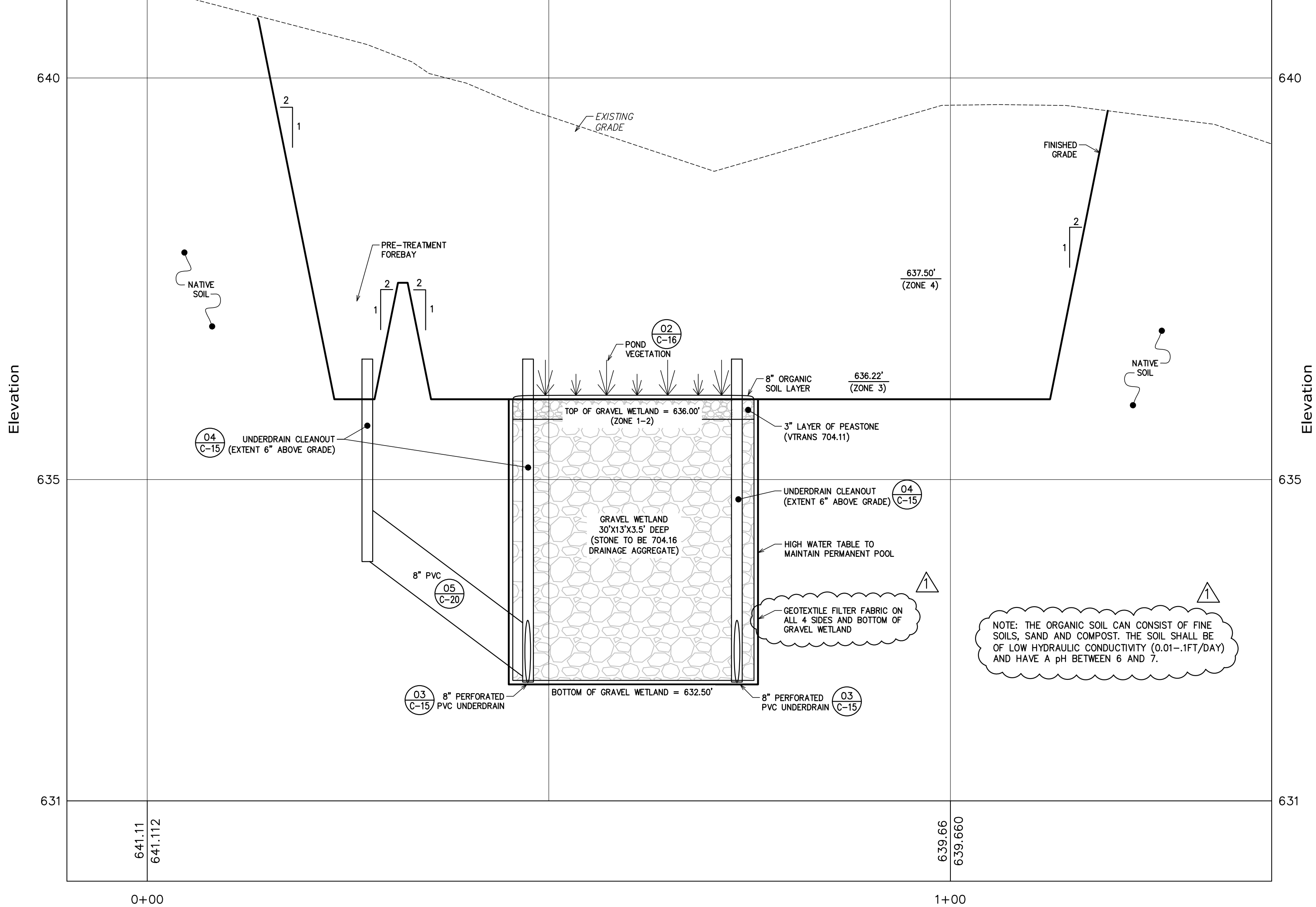
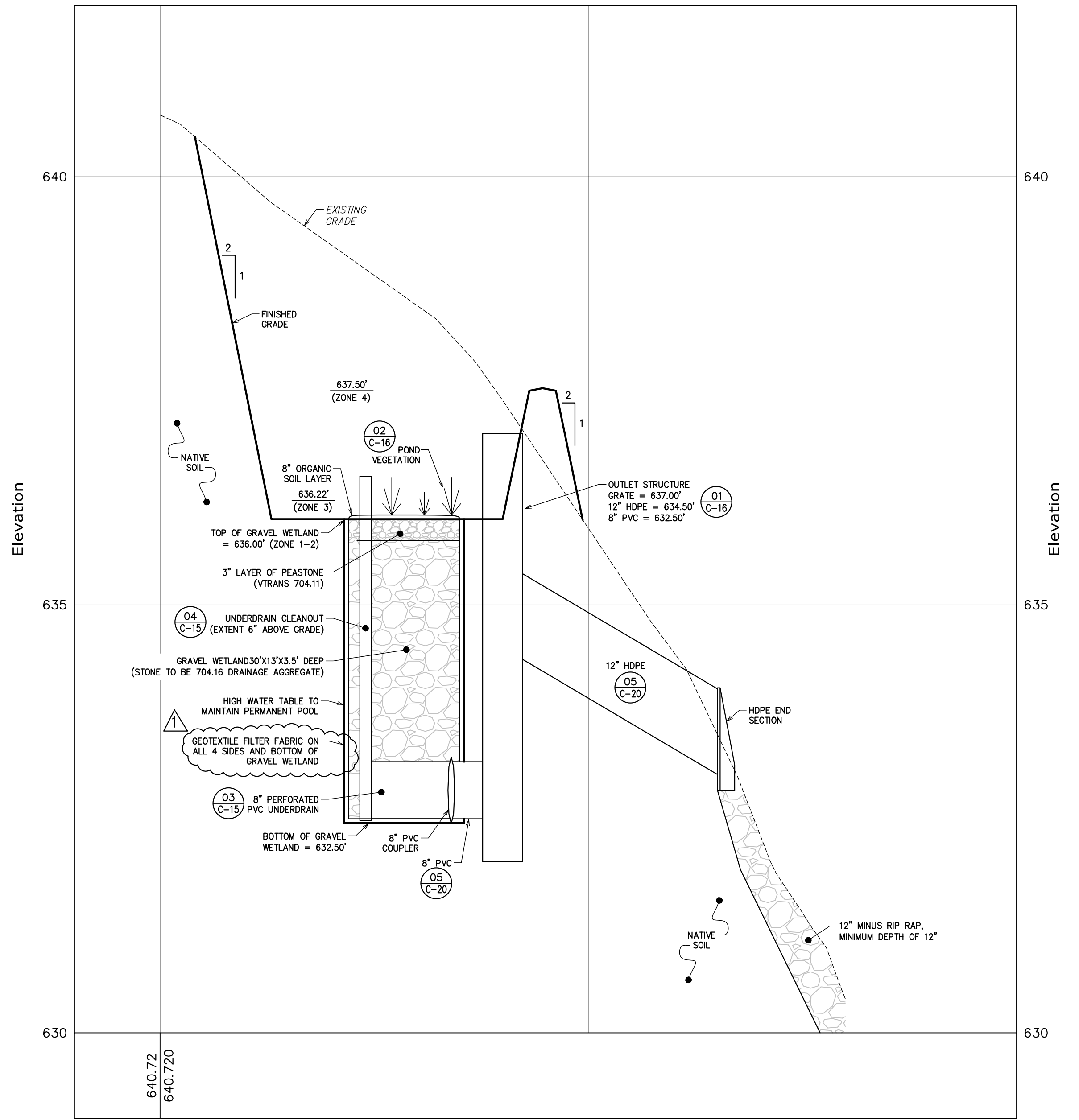
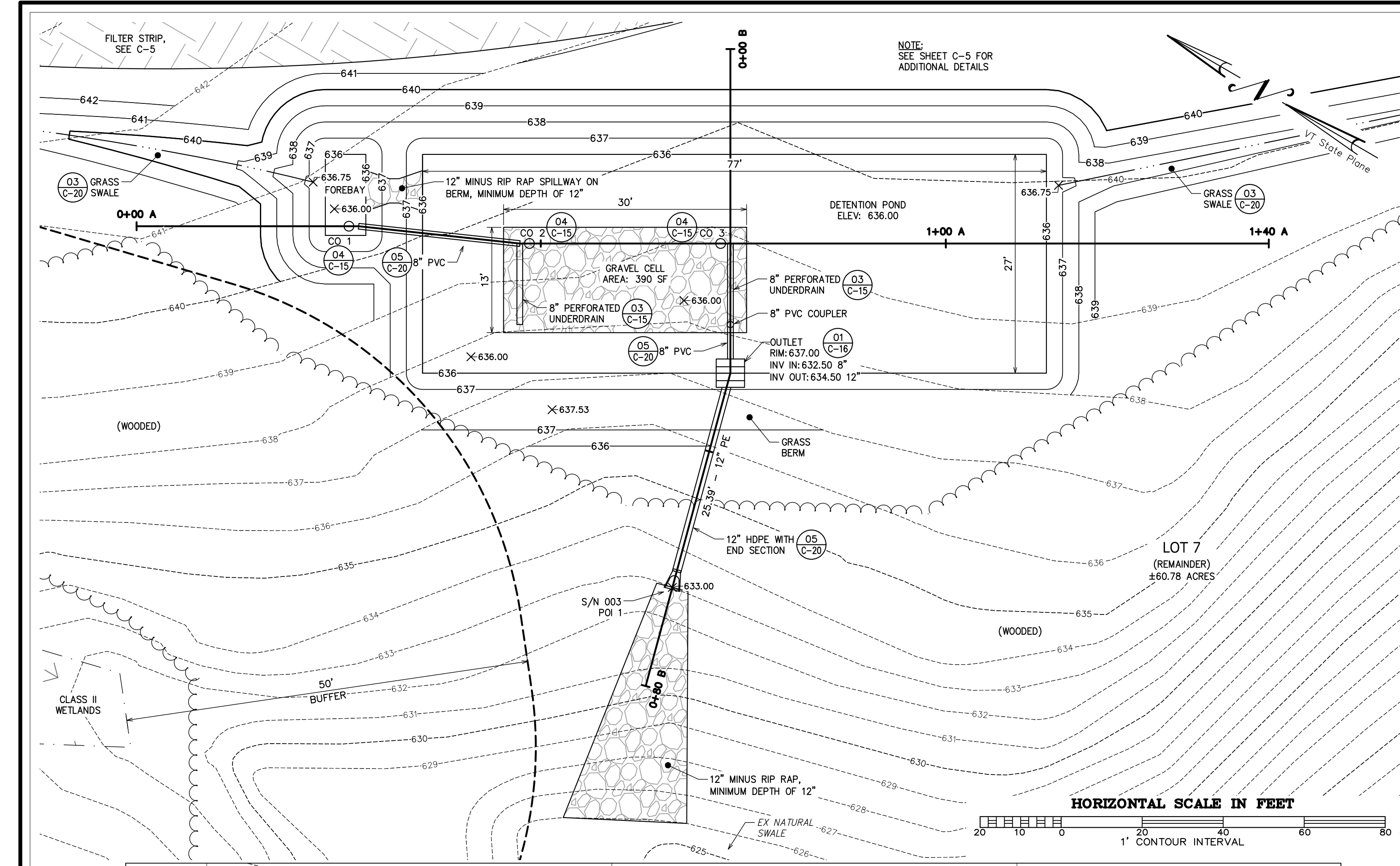
04 Underdrain Cleanout
C-15 NOT TO SCALE



Q:\2020 Drawings\20029 - Bob Avondis, Richmond\Current\C-15 Gravel Wetland 1 Plan And Profile.dwg Plotter: 4/27/2023 12:02:28 PM

PERMITTING

REVISION 05/21/2022: Added notes regarding organic soil composition and specifying where to install geotextile around the gravel cells.



Pond Planting Plan

Zone #	Elevation Range (ft)	Area (sq ft)	Example Species	Planting/Seeding Rate	Total Quantity
1-2	636.00 (Gravel Wetland)	390	Water Lily, Water Celery, Pondweed, Northern Arrowhead, Softstem Bulrush	1 Plant / 4 sqft	98 Transplants
3	636.00 - 636.22	1,876	Moist Seed Mix	25 lbs / acre	1.08 lbs of Seed
4	636.22 - 637.50	749	Upland Seed Mix	25 lbs / acre	0.43 lbs of Seed

02 Pond Planting

C-16 NOT TO SCALE

Q:\2020 Drawings\20029 - Bob Avondis, Richmond\Current\C-16 Gravel Wetland 2 Plan And Profile.dwg Plotter: 4/27/2023 12:02:14 PM

PROJECT: 20029 DATE: February 23, 2022
 Tel: 802-524-2113 Fax: 802-524-9681
CROSS CONSULTING ENGINEERS, P.C.
 103 Fairfax Rd. St. Albans, Vermont 05478
 © COPYRIGHT 2023 Cross Consulting Engineers, P.C.
 DESIGN: PJG DRAWN: RHW/NRB CHECKED: PJG APPROVED: PJG

Hillview Heights, LLC
 South Burlington, VT

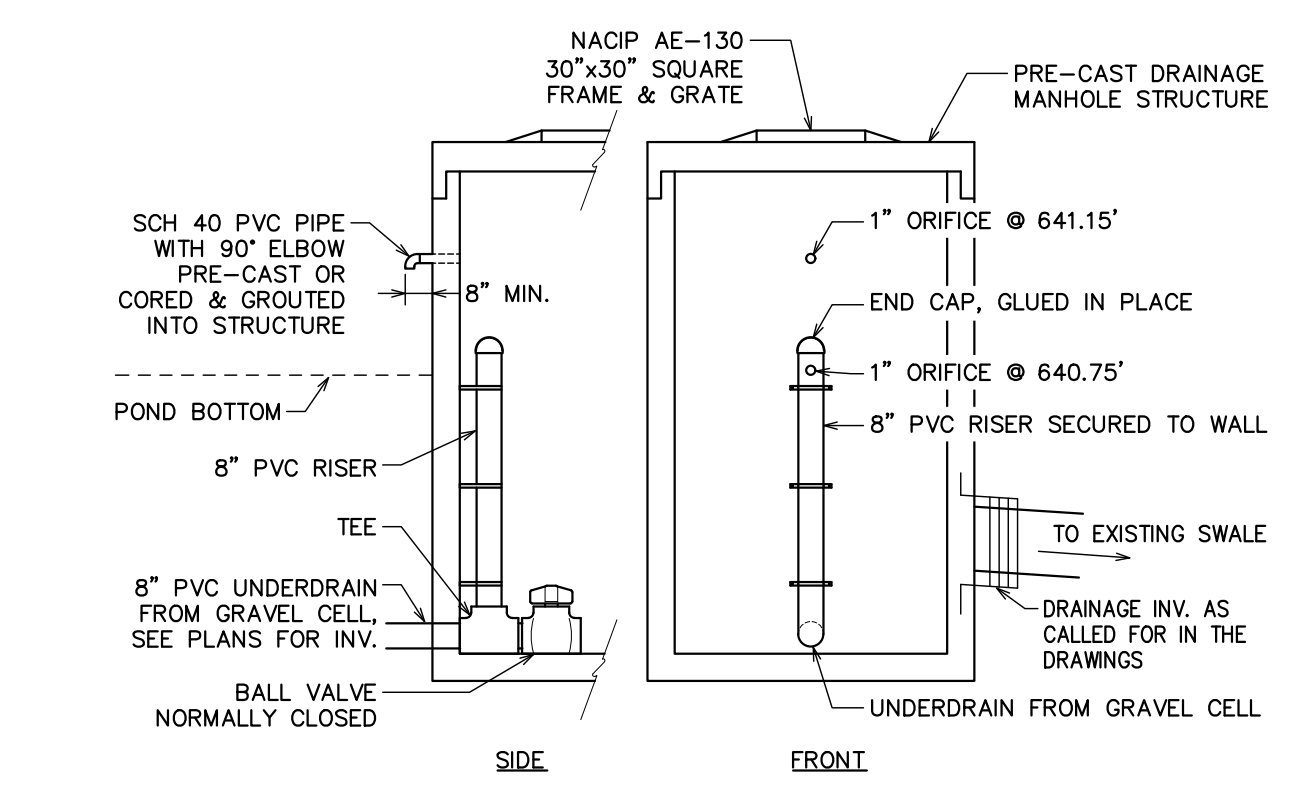
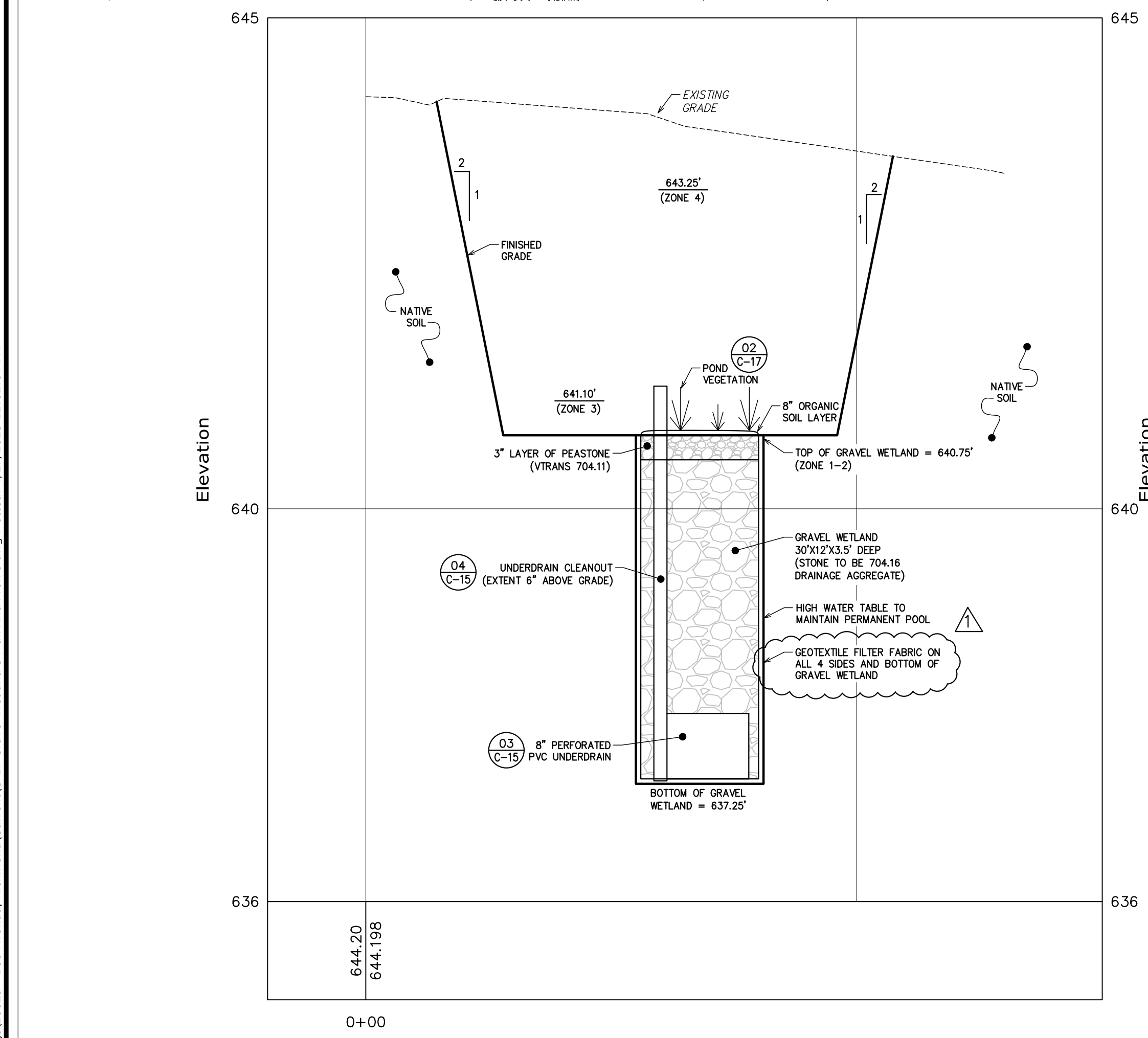
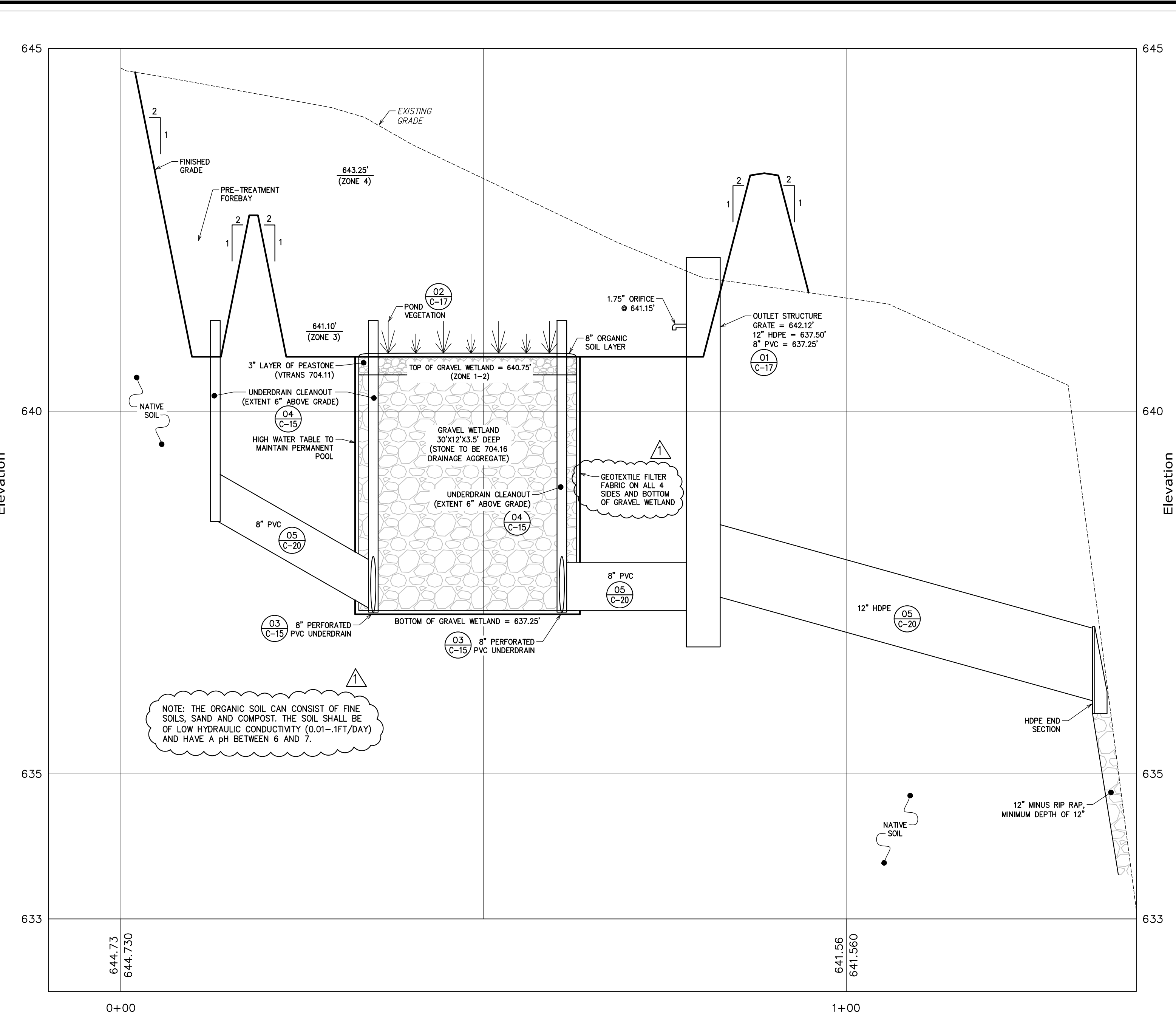
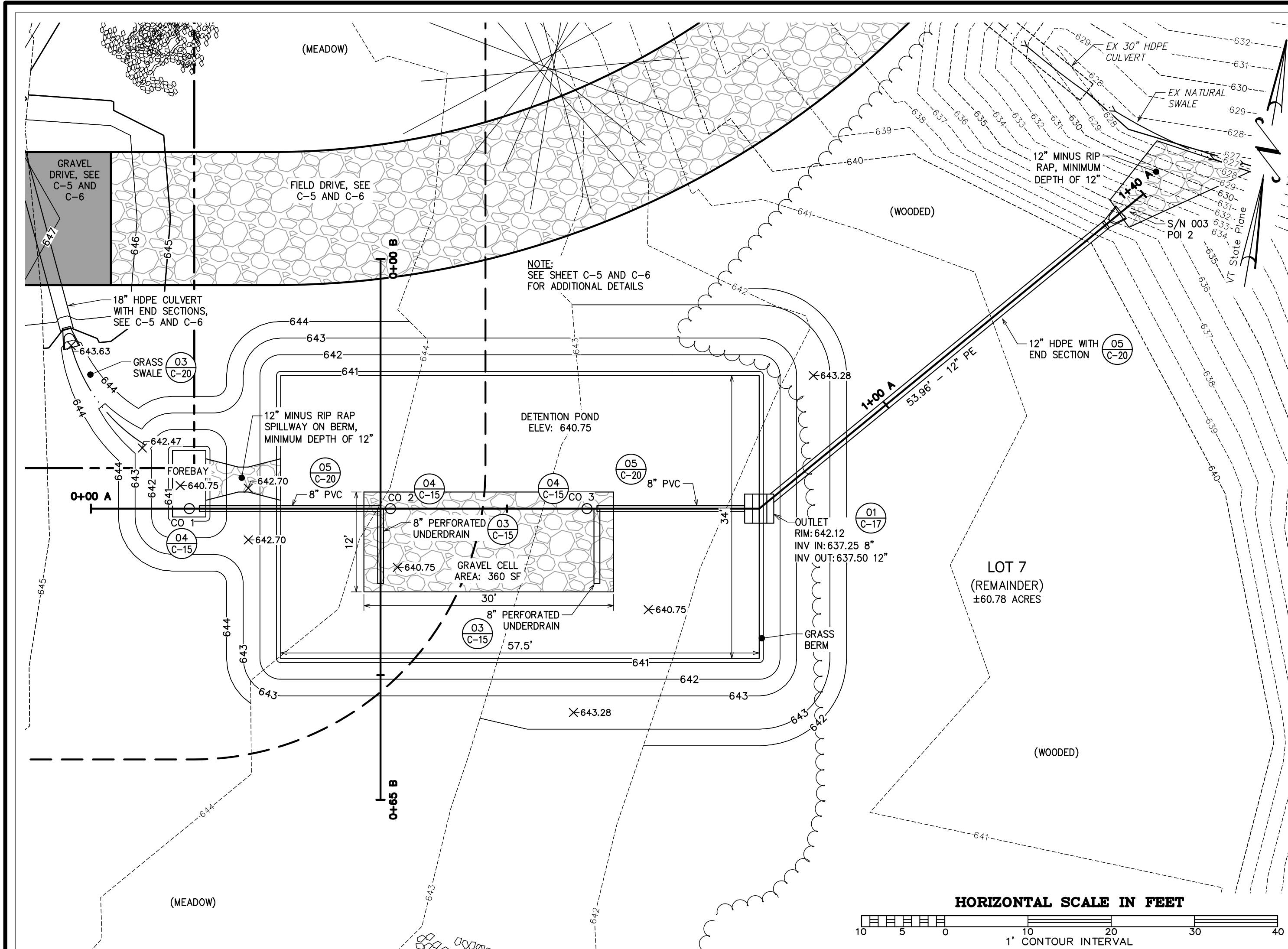
Hillview Heights Subdivision
 Hillview Road
 Richmond, VT

CIVIL

C-16

SHEET C-16 OF 20

PERMITTING



Pond Planting Plan

Zone #	Elevation Range (ft)	Area (sq ft)	Example Species	Planting/Seeding Rate	Total Quantity
1-2	640.75 (Gravel Wetland)	360	Water Lily, Water Celery, Pondweed, Northern Arrowhead, Softstem Bulrush	1 Plant / 4 sqft	90 Transplants
3	640.75 - 641.10	1,819	Moist Seed Mix	25 lbs / acre	1.04 lbs of Seed
4	641.10 - 643.25	1,030	Upland Seed Mix	25 lbs / acre	0.59 lbs of Seed

Q:\2020 Drawings\20029 - Bob Avondis, Richmond\Current\C-17 Gravel Wetland 3 Plan And Profile.dwg Plotter: 4/27/2023 12:02:04 PM

PROJECT: 20029 DATE: February 23, 2022
 Tel: 802-524-2113 Fax: 802-524-9681
 DESIGN: PJG DRAWN: RHW/NRB CHECKED: PJG APPROVED: PJG
CROSS CONSULTING ENGINEERS, P.C.
 103 Fairfax Rd., St. Albans, Vermont 05478
 © COPYRIGHT 2023 Cross Consulting Engineers, P.C.

Gravel Wetland 3 Plan And Profile

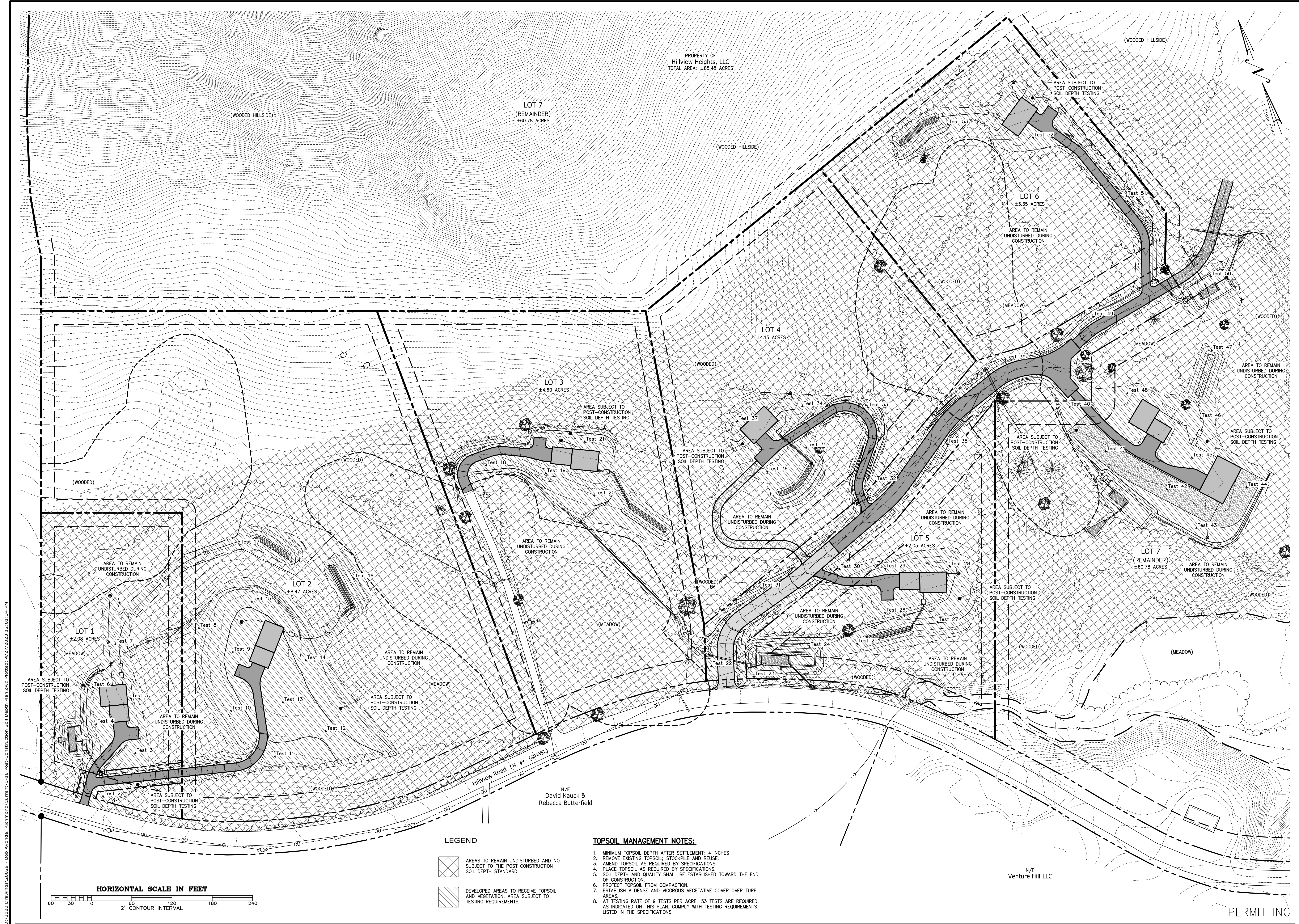
Hillview Heights, LLC
 South Burlington, VT

Hillview Heights Subdivision
 Hillview Road
 Richmond, VT

CIVIL
C-17

SHEET C-17 OF 20

PERMITTING



PROPERTY OF
Hillview Heights, LLC
TOTAL AREA: ±85.48 ACRES

LOT 7
(REMAINDER)
±60.78 ACRES

LOT 6
±3.35 ACRES

LOT 4
±4.15 ACRES

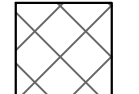

LOT 3
±4.60 ACRES

LOT 5
±2.05 ACRES

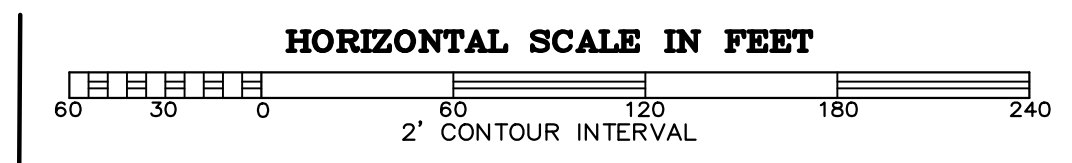
LOT 2
±8.47 ACRES

LOT 1
±2.08 ACRES

LEGEND

	AREAS TO REMAIN UNDISTURBED AND NOT SUBJECT TO THE POST CONSTRUCTION SOIL DEPTH STANDARD
	DEVELOPED AREAS TO RECEIVE TOPSOIL AND VEGETATION. AREA SUBJECT TO TESTING REQUIREMENTS.

- TOPSOIL MANAGEMENT NOTES:**
1. MINIMUM TOPSOIL DEPTH AFTER SETTLEMENT: 4 INCHES
 2. REMOVE EXISTING TOPSOIL: STOCKPILE AND REUSE.
 3. AMEND TOPSOIL AS REQUIRED BY SPECIFICATIONS.
 4. PLACE TOPSOIL AS REQUIRED BY SPECIFICATIONS.
 5. SOIL DEPTH AND QUALITY SHALL BE ESTABLISHED TOWARD THE END OF CONSTRUCTION.
 6. PROTECT TOPSOIL FROM COMPACTION.
 7. ESTABLISH A DENSE AND VIGOROUS VEGETATIVE COVER OVER TURF AREAS.
 8. AT TESTING RATE OF 9 TESTS PER ACRE; 53 TESTS ARE REQUIRED, AS INDICATED ON THIS PLAN. COMPLY WITH TESTING REQUIREMENTS LISTED IN THE SPECIFICATIONS.



Q:\2020 Drawings\20029 - Bob Avondale, Richmond\Current\C-18 Post-Construction Soil Depth Plan.dwg Plotter: 4/27/2023 12:01:34 PM

PROJECT: 20029
DATE: February 23, 2022
DESIGN: PJG
DRAWN: RHW/NRB
CHECKED: PJG
APPROVED: PJG

TEL: 802-524-2113
FAX: 802-524-9681
CROSS
CONSULTING ENGINEERS, P.C.
103 Fairfax Rd.
St. Albans, Vermont 05478
© COPYRIGHT 2023
Cross Consulting Engineers, P.C.

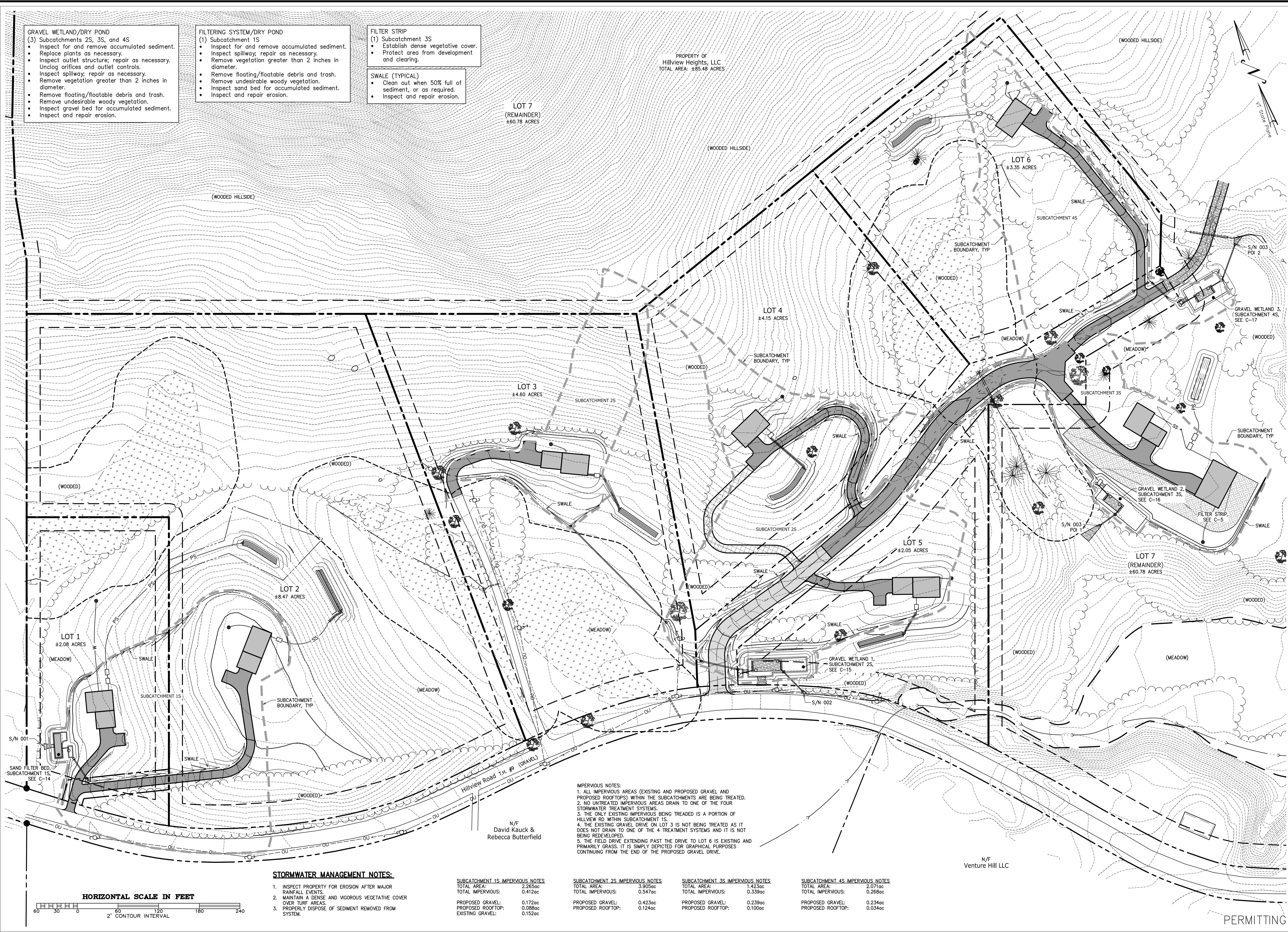
**Post-Construction Soil
Depth Plan**

Hillview Heights, LLC
South Burlington, VT
Hillview Heights Subdivision
Hillview Road
Richmond, VT

CIVIL
C-18
SHEET C-18 OF 20

PERMITTING

Q:\2020 Drawings\20029 - Bob Avondis, Richmond\Current\C-19 Stormwater Maintenance Plan.dwg Plotted: 4/27/2023 12:01:24 PM



GRAVEL WETLAND/DRY POND
 (3) Subcatchments 2S, 3S, and 4S
 • Inspect for and remove accumulated sediment.
 • Replace plants as necessary.
 • Inspect outlet structure; repair as necessary.
 • Unclog orifices and outlet controls.
 • Inspect spillway; repair as necessary.
 • Remove vegetation greater than 2 inches in diameter.
 • Remove floating/floatable debris and trash.
 • Remove undesirable woody vegetation.
 • Inspect gravel bed for accumulated sediment.
 • Inspect and repair erosion.

FILTERING SYSTEM/DRY POND
 (1) Subcatchment 1S
 • Inspect for and remove accumulated sediment.
 • Inspect spillway; repair as necessary.
 • Remove vegetation greater than 2 inches in diameter.
 • Remove floating/floatable debris and trash.
 • Remove undesirable woody vegetation.
 • Inspect sand bed for accumulated sediment.
 • Inspect and repair erosion.

FILTER STRIP
 (1) Subcatchment 3S
 • Establish dense vegetative cover.
 • Protect area from development and clearing.

SWALE (TYPICAL)
 • Clean out when 50% full of sediment, or as required.
 • Inspect and repair erosion.

LOT 7 (REMAINDER)
 ±60.78 ACRES

PROPERTY OF
 Hillview Heights, LLC
 TOTAL AREA: ±85.48 ACRES

LOT 3
 ±4.60 ACRES

LOT 4
 ±4.15 ACRES

LOT 6
 ±3.35 ACRES

LOT 5
 ±2.05 ACRES

LOT 7 (REMAINDER)
 ±60.78 ACRES

LOT 2
 ±8.47 ACRES

LOT 1
 ±2.08 ACRES

IMPERVIOUS NOTES:
 1. ALL IMPERVIOUS AREAS (EXISTING AND PROPOSED GRAVEL AND PROPOSED ROOFTOPS) WITHIN THE SUBCATCHMENTS ARE BEING TREATED.
 2. NO UNTREATED IMPERVIOUS AREAS DRAIN TO ONE OF THE FOUR STORMWATER TREATMENT SYSTEMS.
 3. THE ONLY EXISTING IMPERVIOUS BEING TREATED IS A PORTION OF HILLVIEW RD WITHIN SUBCATCHMENT 1S.
 4. THE EXISTING GRAVEL DRIVE ON LOT 3 IS NOT BEING TREATED AS IT DOES NOT DRAIN TO ONE OF THE 4 TREATMENT SYSTEMS AND IT IS NOT BEING REDEVELOPED.
 5. THE FIELD DRIVE EXTENDING PAST THE DRIVE TO LOT 6 IS EXISTING AND PRIMARILY GRASS. IT IS SIMPLY DEPICTED FOR GRAPHICAL PURPOSES CONTINUING FROM THE END OF THE PROPOSED GRAVEL DRIVE.

STORMWATER MANAGEMENT NOTES:

- INSPECT PROPERTY FOR EROSION AFTER MAJOR RAINFALL EVENTS.
- MAINTAIN A DENSE AND VIGOROUS VEGETATIVE COVER OVER TURF AREAS.
- PROPERLY DISPOSE OF SEDIMENT REMOVED FROM SYSTEM.

SUBCATCHMENT 1S IMPERVIOUS NOTES

TOTAL AREA:	2.285ac
TOTAL IMPERVIOUS:	0.412ac
PROPOSED GRAVEL:	0.172ac
PROPOSED ROOFTOP:	0.088ac
EXISTING GRAVEL:	0.152ac

SUBCATCHMENT 2S IMPERVIOUS NOTES

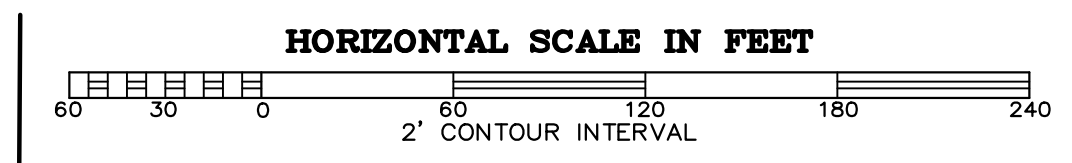
TOTAL AREA:	3.905ac
TOTAL IMPERVIOUS:	0.547ac
PROPOSED GRAVEL:	0.423ac
PROPOSED ROOFTOP:	0.124ac

SUBCATCHMENT 3S IMPERVIOUS NOTES

TOTAL AREA:	1.423ac
TOTAL IMPERVIOUS:	0.339ac
PROPOSED GRAVEL:	0.239ac
PROPOSED ROOFTOP:	0.100ac

SUBCATCHMENT 4S IMPERVIOUS NOTES

TOTAL AREA:	2.071ac
TOTAL IMPERVIOUS:	0.268ac
PROPOSED GRAVEL:	0.234ac
PROPOSED ROOFTOP:	0.034ac



PROJECT: 20029
 DATE: February 23, 2022
 DESIGN: PJG
 DRAWN: RHW/NRB
 CHECKED: PJG
 APPROVED: PJG

Tel: 802-524-2113
 Fax: 802-524-9661

Hillview Heights, LLC
 South Burlington, VT

Stormwater
 Maintenance Plan

REVISION 05/21/2022: Added subcatchment boundaries and impervious notes per stormwater technical review comments.

Hillview Heights, LLC
 South Burlington, VT

Hillview Heights Subdivision

Richmond, VT

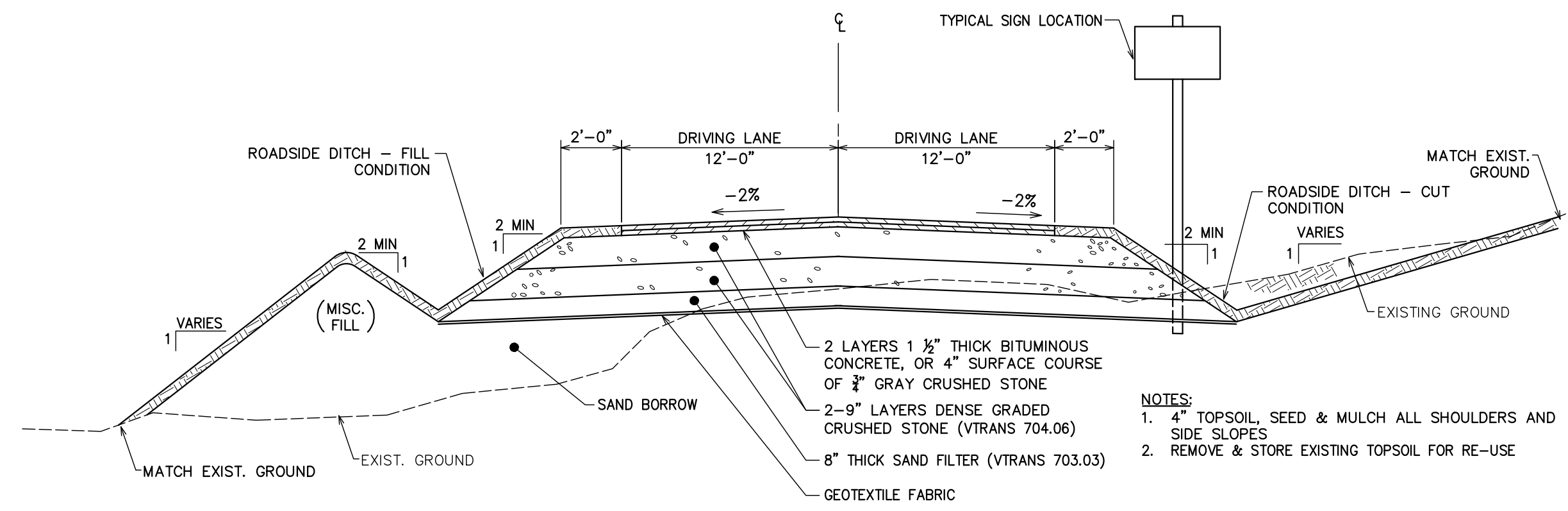
Hillview Road

Hillview Road

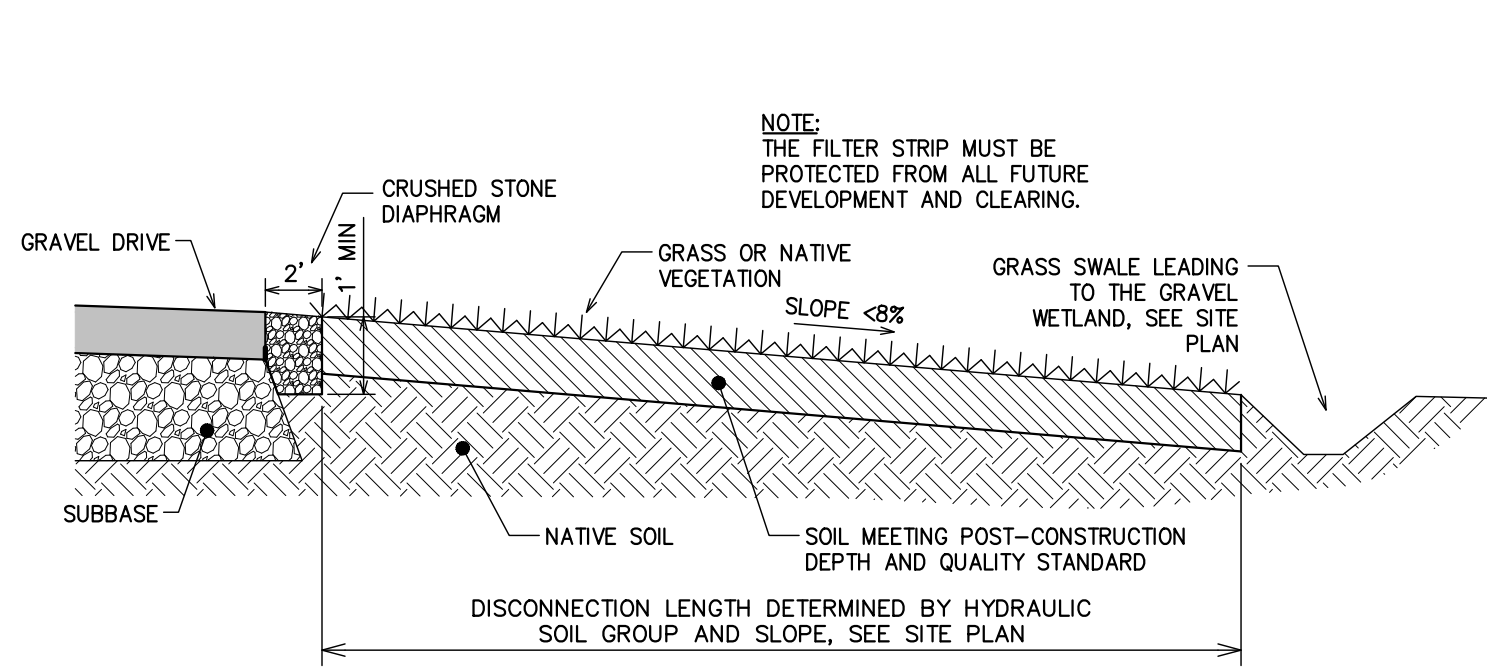
CIVIL

C-19

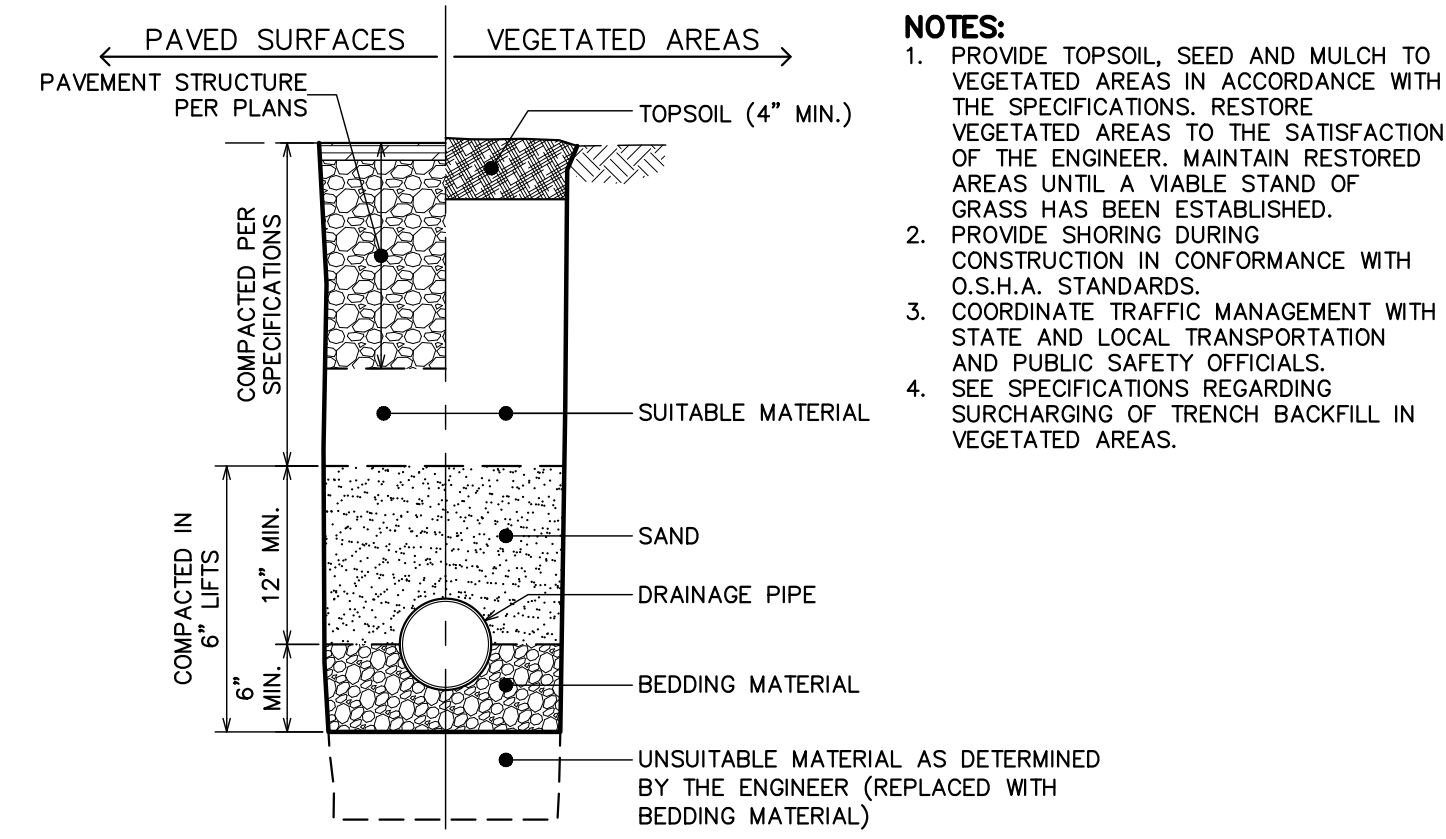
SHEET C-19 OF 20



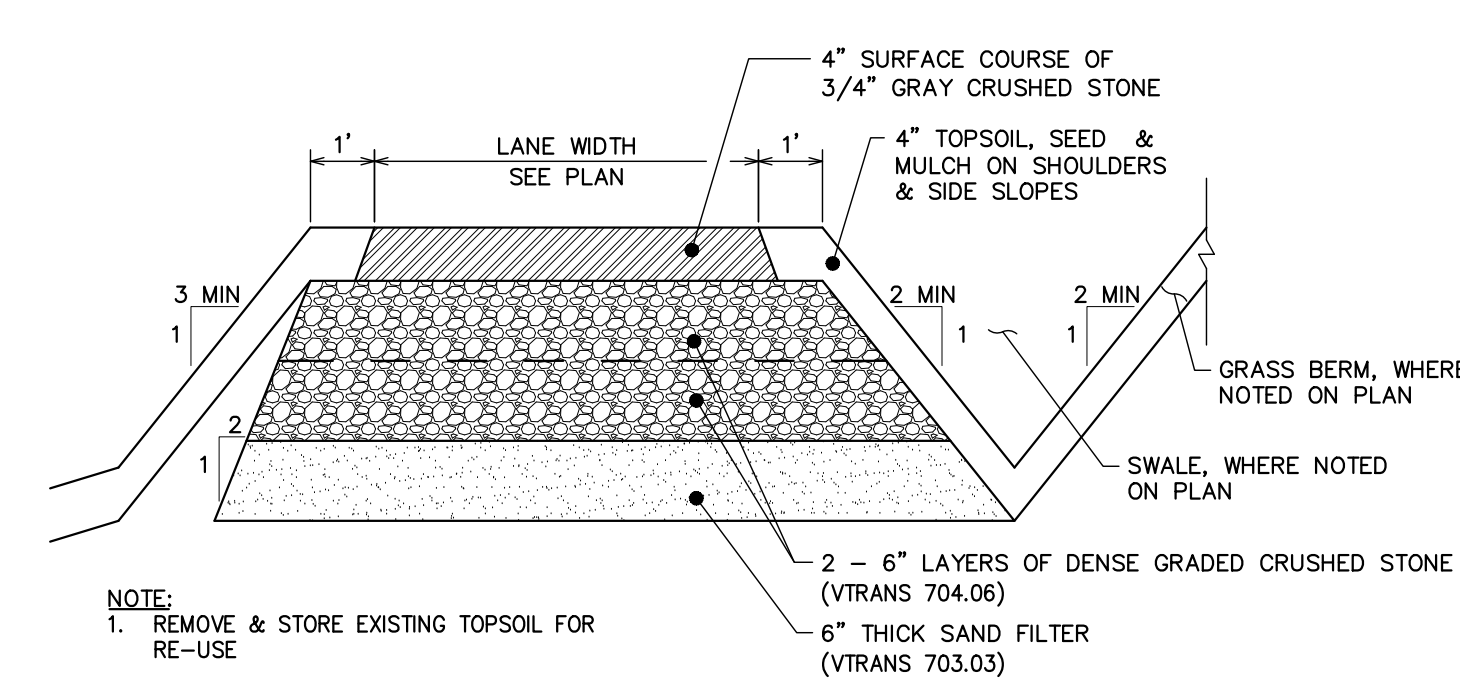
01 Typical Road Section
C-20 NOT TO SCALE



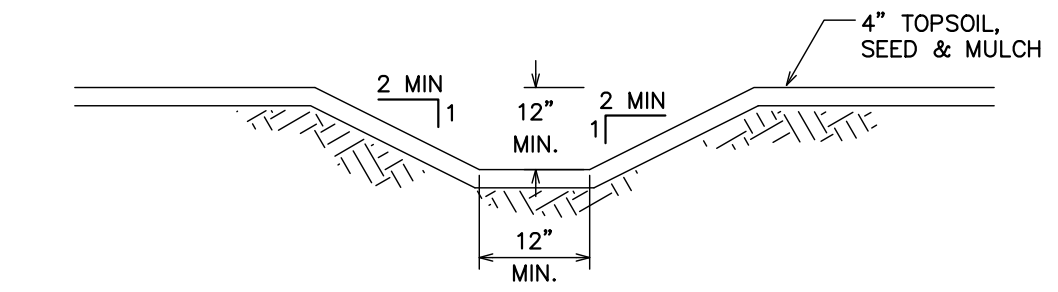
04 Filter Strip
C-20 NOT TO SCALE



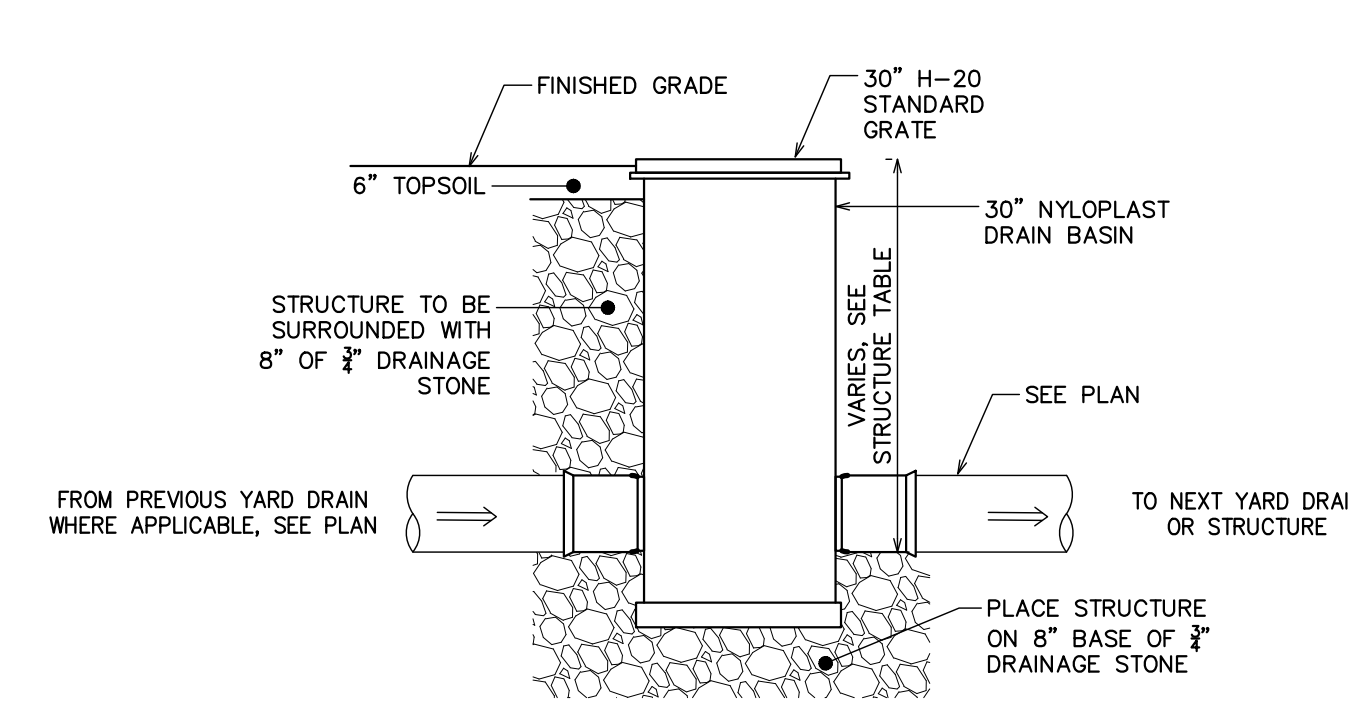
05 Stormdrain Trench
C-20 NOT TO SCALE



02 Typical Driveway Section
C-20 NOT TO SCALE



03 Typical Swale Section
C-20 NOT TO SCALE



06 Yard Drain
C-20 NOT TO SCALE

Q:\2020 Drawings\20029 - Bob Avondis, Richmond\Current\C-20 Details.dwg Plotted: 4/27/2023 12:04:54 PM

PROJECT: 20029
DATE: February 23, 2022
DESIGN: PJG
DRAWN: RHW/NRB
CHECKED: PJG
APPROVED: PJG

TEL: 802-524-2113
FAX: 802-524-9661

CROSS
CONSULTING ENGINEERS, P.C.
103 Fairfax Rd.
St. Albans, Vermont 05478
© COPYRIGHT 2023
Cross Consulting Engineers, P.C.

Details

Hillview Heights, LLC
South Burlington, VT
Hillview Heights Subdivision
Hillview Road
Richmond, VT

CIVIL
C-20
SHEET C-20 OF 20

PERMITTING