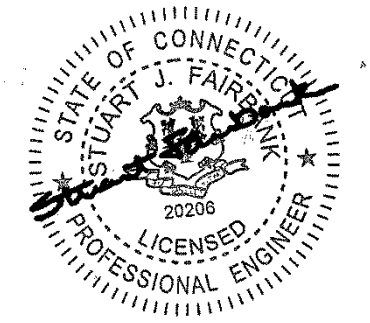
ANGUS McDONALD
GARY SHARPE
& ASSOCIATES, INC.
SINCE 1966

Avery Brook Homes

Septic System Effluent Renovation Analysis

96-100 Stoddards Wharf Road
Ledyard, Connecticut



June 20, 2024

Table of Contents

Overview

The proposed Avery Brook Homes project is an 18 lot, single family residential subdivision submitted to the Ledyard Planning & Zoning Commission for consideration under the Affordable Housing Appeals Act (8-30g). The property is approximately 6.38 acres, located on the North side of Stoddards Wharf Road -CT Route 214. Each lot will be served by a drilled bedrock cased well and subsurface sewage disposal system (SSDS), to be reviewed and approved prior to construction by Ledge Light Health District (LLHD). Conceptual well and SSDS locations are depicted on the subdivision plan prepared by Dieter and Gardner, Inc. and last revised March 25, 2024, which have been approved for subdivision purposes by LLHD based on 3 bedroom homes.

The property is currently undeveloped, with surface cover consisting of partially overgrown agricultural fields with hardwood forest around the perimeter. The general slope of the land is from Northwest to Southeast, the lowest point being along the easterly boundary. We are unable to ascertain original slopes or drainage patterns northerly, easterly or westerly of the site because it appears that a significant volume of earth materials were removed 50 or more years ago, in some places to a depth of approximately 25'. It is likely that the excavation was a sand and gravel operation, since much of the subject site is underlain by sand and gravel.

Soils on the site mapped by the USDA Soil Conservation Service consist primarily of Agawam fine sandy loams and Hinckley gravelly sandy loams, with small areas of other soils mapped around the perimeter. Agawam fine sandy loam is a stratified drift sandy soil, typically exhibiting moderate-high soil permeabilities and deep depth to groundwater. Hinckley gravelly sandy loams are glacial outwash soils with high soil permeabilities and deep depth to groundwater.

The site lies within the public water supply watershed of the City of Groton. The city owns Billings Avery Pond, located to the Northwest of the subject site. Billings Avery Pond is connected to the City of Groton reservoir system by a canal (Stoddards Brook) constructed by the city. This canal diverts water on demand from the pond, which would otherwise discharge to the Thames River via Billings Avery Brook.

Scope of report

The Avery Brook Homes 18 lot Affordable Housing subdivision application is currently being reviewed by the Ledyard Planning & Zoning Commission. In late 2022-early 2023, the Ledyard Inland Wetland Commission requested an effluent renovation analysis of proposed Subsurface Sewage Disposal Systems (SSDS) for what was then proposed as a 26 lot subdivision proposal on 9.21 acres. At that time, three specific renovation parameters evaluated were Nitrogenous compound concentrations, effluent plume travel time and exposure from viruses. The analysis focused on these parameters, but of necessity touched on other aspects of effluent movement and renovation in soil and groundwater. The methodology presented was based on the Connecticut Department of Energy and

Environmental Protection (DEEP) publication "Guidance for Large-Scale on-site wastewater Renovation Systems" dated February 2006. This report did and will refer to this publication as the *Manual.* All single-family residential SSDS on the site are subject to permitting for construction and discharge by the local Health District (Ledge Light Health District) under Connecticut Public Health Code regulations. There are no discharge permits required by DEEP for single-family residential SSDS design and construction on any proposed lot on the site. Evaluating the development wastewater discharges by use of DEEP criteria is intended to provide additional assurance that the proposal is reasonable, beyond meeting all applicable Connecticut Public Health Code regulations.

During the 2022-2023 Public Hearing process, the City of Groton filed as an intervener. The Commission and City asked questions of the applicant regarding various aspects of this report, and requesting additional analysis for constituents not included in the original report.

The questions raised in 2022-2023 and considered here in addition to already evaluated parameters, are as follows:

1. Phosphorous- analysis of potential impacts from Phosphorous compounds in domestic sewage. We have included an analysis in this report, conducted as recommended in the *Manual.*
2. Groundwater contour mapping-additional groundwater monitoring wells were installed by the applicant's surveyor and groundwater depths measured during the spring of 2024. New groundwater contour mapping was generated and is included herein, which clarifies groundwater flow direction and gradient. Bacterial renovation travel time calculations have been revised and updated based on the new groundwater mapping.
3. Residential discharge as used for Nitrogen analysis- in 2023 this report had estimated water use from 3 bedroom homes at 135 gallons per day (GPD), or 45 GPD/bedroom. Water use data from Groton Public Utilities covering the time period July 2023-April 2024, submitted to the hearing record by the Applicant, indicates an average of 145 GPD/ home (or 48 GPD/bedroom assuming an average of 3 bedrooms per home). This data covers all residential properties in the Town of Ledyard served by public water during that time period, with over 15,000 meter readings covering approximately 1,500 residences. We have revised the Nitrogen calculations to correspond with the metered water use.

Soil Testing

Soil testing for subdivision approval was performed by Dieter & Gardner in cooperation with the Ledge Light Health District (LLHD). Subsequent soil testing (Test holes 100-115) was performed under the supervision of Angus McDonald/Gary Sharpe and Assoc. for the purpose of gathering soil samples for permeability determination, and installing groundwater level observation wells. Test hole locations for test hole number 100-115 and 200-209 are depicted on the ground water contour maps in **Appendix C** of this report. The soil logs for test holes 100-109 can be found in **Appendix**

D of this report, from which soil samples were gathered for permeability determination. Dieter & Gardner supervised installation of groundwater monitor wells #200-209 in March 2024, which were located and monitored by them. The groundwater elevations recorded are depicted on groundwater contour mapping in **Appendix C.**

Soil Permeability

The permeability of the soil on the site was determined using core tubes and washed sieve analysis from bag samples that were collected during each of the rounds of testing. The core tubes were analyzed using falling head permeability tests, and the bag samples were examined using grain size analysis. The results from all of the soil tests were compiled into the following tables that show the permeability average and geometric mean.

For reference, the majority of the site is mapped as either Agawam Fine sandy loam or Hinckley gravelly sandy loam by the United States Department of Agriculture, Soil Conservation Service. Udorthent soils mapped by SCS to the North, West and East of the site, on the adjacent property of City of Groton, appear to be the result of historical gravel mining, and are assumed to have been Agawam or Hinckley soils. The permeability range given for Agawam soils is 12-40 ft/day, for Hinckley >40 ft/day.

Test Hole	Description	Depth, in	Tube, in (T)	T-L	L in	H1 in	H2 in	H1-H2 in	T min	H1+H2/2	K ft/min	K ft/day
100	C-Horizon	47	12	9.75	2.25	11.875	8.25	3.625	90	10.1	0.0008	1.1
101	D-Horizon	38	11.75	8.75	3	11.625	11.25	0.375	90	11.4	0.0001	0.1
102	C-Horizon	46	11.875	9	2.875	11.75	5.625	6.125	11	8.7	0.0154	22.1
103	C-Horizon	48	11.75	9.5	2.25	11.625	6.5	5.125	0.33	9.1	0.3213	462.7
104	C-Horizon	48	12	8.75	3.25	11.875	4.875	7	1	8.4	0.2264	326.0
105	C-Horizon	48	12	7.875	4.125	11.875	6.625	5.25	2	9.3	0.0976	140.5
106	C-Horizon	57	11.375	9.25	2.125	11.75	4.5	7.25	1	8.1	0.2	227.5
108	C-Horizon	48	12	9.5	2.5	11.875	6.875	5	1.5	9.4	0.1	106.7
109	C-Horizon	52	12	9.5	2.5	11.875	7.75	4.125	3	9.8	0.0	42.0
Recompacted Samples (1/10/23)												
102*	recompacted	172	12	8.25	3.75	11.87	7.25	4.62	3	9.6	0.0503	72.5
103*	recompacted	168	12	7.12	4.88	11.75	7	4.75	1.5	9.4	0.1374	197.8
111*	recompacted	190	12	6.38	5.62	11.87	7.495	4.375	1.5	9.7	0.1411	203.2
	*All three samples recompacted in tubes from bag samples											

NOTE: Samples 100 & 101 removed from analysis as outliers

Overall Arithmetic Mean =	180	ft/day
Overall Geometric Mean =	130	ft/day
In Situ Arithmetic Mean =	190	ft/day
In Situ Geometric Mean =	125	ft/day
Recompacted Arithmetic Mean =	158	ft/day
Recompacted Geometric Mean =	143	ft/day

Table 1 – Falling Head Permeability Calculations

The grain size sieve analysis results can be found in **Appendix B**.

Test Hole	Split	Depth	Permeability Range		
100	1	42-48"	Dense	2	ft/day
			Loose	7	ft/day
100	2	42-48"	Dense	3	ft/day
			Loose	10	ft/day
101	1	30-36"	Dense	125	ft/day
			Loose	374	ft/day
101	2	30-36"	Dense	184	ft/day
			Loose	552	ft/day
102	1	42-48"	Dense	329	ft/day
			Loose	986	ft/day
102	2	42-48"	Dense	199	ft/day
			Loose	596	ft/day
102	1	180-186"	Dense	119	ft/day
			Loose	356	ft/day
102	2	180-186"	Dense	123	ft/day
			Loose	368	ft/day
103	1	42-48"	Dense	227	ft/day
			Loose	831	ft/day
103	2	42-48"	Dense	218	ft/day
			Loose	655	ft/day
103	1	165-171"	Dense	242	ft/day
			Loose	726	ft/day
103	2	165-171"	Dense	214	ft/day
			Loose	642	ft/day
104	1	42-48"	Dense	510	ft/day
			Loose	1531	ft/day
104	2	42-48"	Dense	371	ft/day
			Loose	1114	ft/day
105	1	42-48"	Dense	130	ft/day
			Loose	389	ft/day
105	2	42-48"	Dense	145	ft/day
			Loose	436	ft/day
106	1	55-60"	Dense	374	ft/day
			Loose	1123	ft/day
106	2	55-60"	Dense	258	ft/day
			Loose	775	ft/day
108	1	46-50"	Dense	162	ft/day
			Loose	485	ft/day
108	2	46-50"	Dense	155	ft/day
			Loose	465	ft/day
109	1	46-52"	Dense	260	ft/day
			Loose	779	ft/day
109	2	46-52"	Dense	196	ft/day
			Loose	588	ft/day
		Overall Arithmetic Mean		417	ft/day
		Overall Geometric Mean		244	ft/day
		Dense Arithmetic Mean		207	ft/day
		Dense Geometric Mean		139	ft/day
		Loose Arithmetic Mean		627	ft/day
		Loose Geometric Mean		427	ft/day

Table 2 – Washed Sieve Analysis Summary

For the purposes of effluent renovation calculations, core tube values will be utilized because they represent more closely in-situ soil conditions. In reviewing the various

average values of core tube permeabilities and grain size permeability estimates, there is a close correlation between the core tube values and the dense grain size analysis (dense soil values most closely represent in-situ soil conditions). This provides a cross-check to insure that the values utilized in the analysis are reasonable.

Ground Water Monitoring and Ground Water Contours

The groundwater observation wells #100-115 were installed on two dates in December, 2022 and January, 2023 and monitored on five dates. Wells # 100-109 and the existing dug well on the property were monitored on December 20th and 27th, 2022 and January 3, 2023. Because some of those wells did not penetrate the groundwater table, wells #110-115 were installed on January 3rd, then all wells were monitored on January 5th and 12th, 2023. Additional monitoring wells #200-209 were installed by Dieter and Gardner in March 2024 and monitored on several dates into May 2024.

Groundwater contours mapped as a result of the groundwater elevations measured in the monitoring wells on those dates indicate that the gradient across the entire site is toward the west-northwest. The updated 2024 groundwater contour maps confirm that groundwater flows primarily in a westerly direction, turning to the north as it approaches Billings Avery Brook.

Based on the 2023 groundwater mapping, it appeared that a groundwater boundary condition exists in the southeast portion of the site as evidenced by warped groundwater contours between wells 100-101 and down gradient wells to the west. Based on the observation of bedrock in test holes in the southerly and easterly portion of the site, we believed it likely that groundwater is perched on bedrock in those areas, resulting in the warping.

In response to questions raised during the 2022-2023 hearing, the applicant installed groundwater monitoring wells 200-209 around the perimeter of the site. Subsequent groundwater monitoring confirmed that groundwater gradients slope into the site from the perimeter, with the gradient reducing in deep sandy soils in the center and northern portion of the site. We note that the highest groundwater conditions observed in any 2023 -2024 monitoring occurred on April 19, 2024, so applicable calculations have been revised based on those observations.

Ground water contour maps and groundwater monitoring measurements can be found in **Appendix C** of this report, based on January 5th & 12th, 2023, April 8th, 19th, and May 2nd, 2024 monitoring.

Hydraulic Gradients

The hydraulic gradient of the water table across the site was determined using the ground water contour maps. The gradient on various monitoring dates varies from about 0.4% to 1.3% in down gradient (northwest) areas of the site. Because this report is concerned with potential impacts to Billings Avery Pond, the groundwater gradient

under lots closest to the pond was selected. It is the area of lots 13, 15, & 17 where the groundwater gradient varies from 0.4-1.3% depending on the date of the monitoring. Utilizing the highest gradients on site will yield the most conservative values for travel time. Travel time is determined because the *Manual* requires a minimum travel time of 21 days to a point of concern, the objective being to provide time for bacteria in SSDS effluent to die. The 21 day travel time is the standard DEEP model used to estimate bacterial die off, so we are presenting it here keeping in mind that the closest SSDS to Billings Avery Pond is more than 200' away (double the distance required by the Connecticut Public Health Code). In this report, we are considering Billings Avery Pond, and tributaries, as the point of concern. The *Manual* suggests that up to a 56 day travel time may be appropriate to a public water supply, however, the DEEP models were developed for DEEP permitting of large septic systems of over 5,000 GPD design flow (DEEP regulatory authority is now 7,500 GPD design flow and above). The Connecticut Public Health Code has regulatory authority over SSDS design in this development, and therefore the local Health District reviews and approves septic system design and installation. For small septic systems, such as are proposed by Avery Brook Homes, LLC, the Connecticut Public Health Code requires a 100' separating distance from a Public Water Supply Reservoir. For the following reasons we believe the 21 day travel time to be sufficient on this site:

- The Connecticut Public Health Code requires a 100' separating distance between a small SSDS and a Public Water Supply Reservoir. The 21 day travel time distance demonstrates a distance based on site specific conditions rather than a 100' cookbook distance. All proposed SSDS meet both the 100' separating distance and the 21 day travel time distance.
- The DEEP methodology presented in the *Manual* is intended for use on SSDS design for large discharges regulated by DEEP (currently defined as over 7,500 GPD). As such, a large SSDS would be in a central location where the discharge would be concentrated. This site has numerous small SSDS dispersed throughout the 18 proposed lots, so most SSDS far exceed any minimum standards for travel time to the reservoir.
- Note that three of the existing four building lots owned by Avery Brook Homes could potentially have an SSDS installed as close of closer to the Reservoir or its tributaries than are proposed in the current application.

Unsaturated Soil Thickness

The observed unsaturated soil thickness of the soil horizon was estimated by comparing the calculated ground water contours to the ground surface contours and test hole logs. With the exception of lots 1, 2, 7 & 9 the unsaturated soil thickness exceeds 10 feet somewhere on the lot. Most of the remaining lots on the site enjoy exceptionally deep, well drained soils with a water table as deep as 25' below grade in the central and westerly portion of the site. These deep unsaturated soils provide considerably more separation distance than recommended by the *Manual* between the bottom of leachfields and the mounded water table. (mounded water table calculated at 1.8', see mound calculation in Travel Time Analysis) The purpose of the separation, recommended at 3', is to insure the removal of viruses from the effluent prior to it

contacting groundwater. The deep soils provide adequate depth to groundwater from the bottom of the leachfields to meet or exceed the recommended separation.

The groundwater monitoring results can be found in **Appendix C** of this report.
Test hole logs can be found in **Appendix D** of this Report.

Leaching Field Sizing and Type

The proposed septic tank/leaching systems (SSDS) for each lot were sized by Dieter and Gardner for three bedroom houses based on percolation rates as described in the *Connecticut Public Health Code, On-site Sewage Disposal Regulations and Technical Standards for Subsurface Sewage Disposal Systems*.

The leachfields proposed consist of Geomatrix GST 6236. The Geomatrix GST products consist of a crushed stone core with alternating fingers of crushed stone and ASTM C-33 sand extending horizontally for a total unit width of 5.17'.

This report is concerned with the renovation of wastewater within and after it leaves the leachfield. The leachfield type may affect the quality of effluent treatment in the biomat at the stone/soil interface, as well as in the select fill directly below the crushed stone leachfield. (See Massachusetts Alternative Septic System Test Center report on Geomatrix GST products in **Appendix E** and discussion page 21.)

Effluent Travel Time to Billings Avery Pond

The equation V=Ki/n can be utilized to determine the velocity of the effluent plume down gradient of the leachfield. The objective of this calculation is to determine the elapsed time between the discharge of effluent from the leachfield and its arrival at any specified point of concern (POC). For purposes of this analysis, the POC is the nearest down gradient point of the Reservoir or its tributaries. The minimum travel time recommended by the *Manual,* and normally required by DEEP, is 21 days. The 21 day minimum is intended to provide time to remove pathogenic bacteria in the effluent to acceptable levels. It should again be noted that on a site with sandy soils such as this development, the 21 day travel time distance far exceeds the requirements of the Connecticut Public Health Code Technical Standards for a septic system serving a single family dwelling to the Reservoir: i.e. 100' between any component of the septic system and the Reservoir.

V = effluent plume movement in groundwater, ft/day
K = Soil permeability as determined by sample analysis, ft/day
i = hydraulic gradient, ft/ft
n= effective porosity, dimensionless

For the travel time analysis we have utilized the following values:

K = 180 ft/day. This value represents the arithmetic mean of permeability core tube values, minus very low outliers. Removing the outliers increases the permeability, providing a more conservative analysis.
i = .013 (1.3%) Maximum value in January, 2023 monitoring (Example **Figure 1a & 1b**)
i = .010 (1.0%) Average value in April, 2024 monitoring (**Figure 1b**)
n = .25 (value from *Manual*)

Based on the groundwater contours mapped for April 8, 2024, it appears that the gradient increases closer to the wetland areas. The average gradient from the leachfield on lot #16 to the nearest downgradient point at the edge of wetlands would be 2.7'/270' = 1%. For a comparison of travel times from SSDS on Lots 16, 17 and 18 to Billings Avery Reservoir and it's tributaries, on groundwater monitoring dates January 12, 2013 and April 8, 2024 mapping, we demonstrate travel times 1.3% and 1.0% hydraulic gradients respectively because they are conservative values representing conditions during differing groundwater levels.

Calculated horizontal plume velocity in the groundwater at i = 1.3%
V=(180(.013)/.25) = 9.4 ft/day
21 day travel time distance = 197'

Calculated horizontal plume velocity in the groundwater at i = 1.0%
V=(180(.010)/.25) = 7.2 ft/day
21 day travel time distance = 151'

Figure 1 - Travel Time flow paths superimposed on a portion of April 8, 2024 Groundwater Contour Map Lots 16, 17, & 18

3 Bedroom House	450	gal/day	60	ft^3/day

Hydraulic Conductivity (K)	130	ft/day	(Overall Geometric Mean of core tubes)
Hydraulic Gradient (i)	1.3%		(TH 114-112, 1/12/22) 1.8'/140'
Leaching Bed Length	20	ft	
Leaching Bed Width	5.17	ft	

Cross-Sectional Area A=Q/ki	36	ft^2	Mound height = 36'/20' = 1.8'
Area of Proposed Leaching Bed	103.4	ft^2	

21 Day Bacteria Travel Time

$$V = \frac{Ki}{n}$$

Hydraulic Conductivity (K)	180	ft/day	(Overall Arithmetic Mean of core tubes)
Hydraulic Gradient (i)	1.3%		
Porosity (n)	0.25		(Effective Porosity of Sand per *Manual)*

Velocity (V)	9.36	ft/day
21 Travel Time (T_{21})	196.56	ft

Figure 1a – Example of Hydraulic Analysis and 21 Day Travel Time based on January 12, 2023

Travel times from proposed SSDS serving lots 16, 17 and 18 were calculated since they are the closest to Billings Avery Reservoir. Travel times vary based on fluctuating water table observations. The most complete groundwater contour coverage was obtained in spring 2024, at which time groundwater levels were higher, but gradients were lower than during the January 2023 observations. We have included estimates of travel times for both groundwater observation periods to provide a range of estimated travel times for comparison. (Max GW = April 8, 2024 mapping, Min GW = January 12, 2023 mapping) All estimated travel times from those SSDS proposed closest to Billings Avery Reservoir and tributaries exceed 21 days travel time. SSDS proposed at greater distance will have greater travel times to the same points.

Lot Number	Distance to Billings Avery Reservoir and/or tributaries		Travel time Max GW (Velocity = 7.2 ft/day)		Travel time Min GW (Velocity = 9.4 ft/day)	
16	270	ft	38	days	29	days
17	343	ft	48	days	36	days
18	352	ft	49	days	37	days

Figure 1b – Travel Times to Nearest Point of Billings Avery Reservoir or Tributary

In contrast to **Figure 1b**, note that observed hydraulic gradients across much of the site are reduced to 0.4%-.6% (see April 2024 groundwater contour maps) at certain times. At a gradient of 0.4%, the 21 day travel time distance is reduced as follows: Calculated horizontal plume velocity in the groundwater = V=(180(.004)/.25) = 2.9 ft/day
21 day travel time distance = 61'

Therefore, the 21 day travel time distance is met at a distance of 61' from the leachfield in those locations, with groundwater conditions as observed on those dates. It is our opinion that actual travel times are greater than those calculated in Figure 1b, but we present Figure 1b as being a conservative estimate.

Mound Calculations and Leachfield Elevation above Groundwater for Virus Removal

In the **Figure 1a** calculations, an estimate of mounded water table under a leachfield is provided. The estimated mound is calculated based on Darcy's Law (Q = KiA).

Q = discharge, cubic ft/day
K = 130 ft/day
i = .013 (1.3%)
A = hydraulic window, L x H

In the example, the value of K has been reduced to 130 ft/day, corresponding to the Geometric mean of the permeability core tubes. The reduced value provides a conservative estimate of the hydraulics under the leachfield. The Manual recommends a minimum separating distance of 3' above mounded water table, primarily for virus removal. The mounded water table is estimated to be 1.8', which means that the bottom of the leachfields on all lots should be at least 4.8' above the observed water table in their respective location. (3' separation + 1.8' mound height) The depth from the bottom of the leachfields to mounded groundwater exceeds this recommendation, (see separating distances in Phosphorous removal spreadsheets) thereby maximizing virus removal prior to effluent contacting the water table.

Nitrogen Analysis

The objective of this analysis is to determine the concentration of Nitrogenous compounds in the groundwater as a result of the proposed SSDS construction. The

target concentration is 10 mg/l, which is the EPA drinking water standard for Total Nitrogen (TN).

The methodology recommended by DEEP in the *Manual*, has remained essentially the same since the original DEEP (then DEP) design manual was introduced in 1982. Certain updates to input variables have been made, but the basic concept is that the TN concentration is governed by the volume of effluent + infiltrating rainwater.

On most sites where a large central leachfield is proposed, the rainfall contributing area is limited to the area of the site directly up gradient and down gradient from the proposed leachfield. Gradient in this context refers to groundwater gradient, not necessarily surface topography. On the Avery Brook site, residential lots and their corresponding SSDS are spread relatively uniformly around the property. It is our opinion that the entire area of the subject site and 94 Stoddard Wharf Road can be considered as contributing to infiltrated rainfall for dilution. The applicant has proposed development restrictions on the adjacent lot at 94 Stoddard's Wharf Road, providing an easement such that infiltrating groundwater on that site can be considered as part of the dilution calculations for the development. Use of such an easement has been acceptable to DEEP in this situation, since the applicant thus controls the site upon which the easement is proposed. In sum total, the Nitrogen calculations will consider 19, 3-bedroom homes including one 3-bedroom, single family home on 94 Stoddard's Wharf Road.

As part of our review of the site we have recommended that gutter outlets be collected and infiltrated on each lot. A detail of the proposed infiltration structure is depicted on Sheet 7 of the Site Development Plan Set in **Appendix A**. The applicant has adopted this proposal and incorporated it into the design of the project.

The applicant's road design engineer has incorporated stormwater infiltration basins into the design of the subdivision. Refer to the project drainage report for details on that design. For the purpose of calculating infiltrating stormwater for Nitrogen dilution, we have chosen to use a 70% infiltration rate. This assumes that some stormwater is lost when a major event occurs, beyond the capacity of the infiltration basin.

Figures 2-5 below depict the steps in determining infiltrated rainfall and the resulting TN concentration.

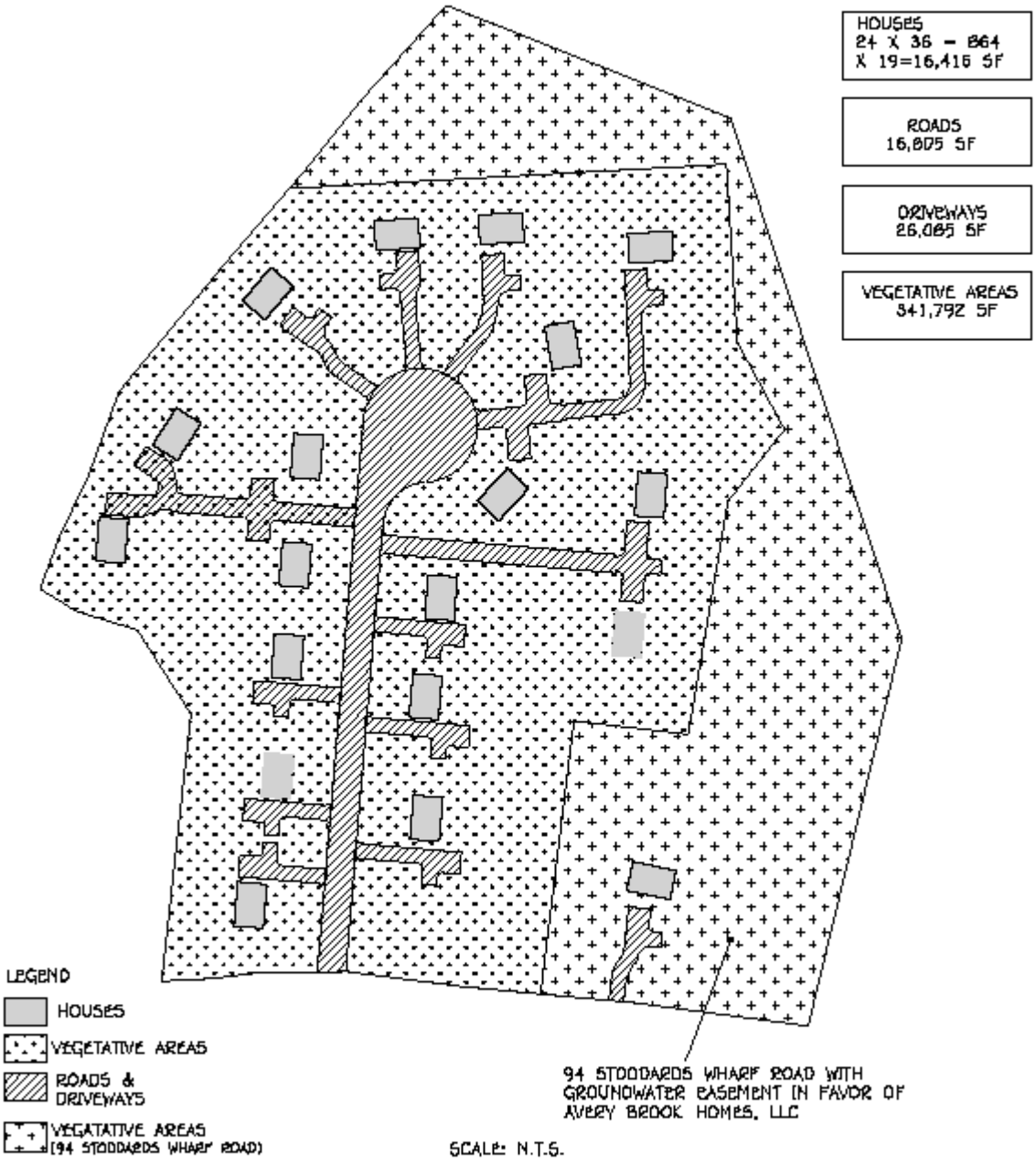


Figure 2 – Site Coverage Map

Figure 2 breaks out the various ground cover features. It is similar to a drainage area map commonly used for runoff calculations as a result of development, as it will be used to calculate a TR-55 composite curve number (CN). We have elected to calculate all vegetated areas at the same CN because doing so is conservative, assigning the wooded areas the same higher CN that lawns are assigned. Note that only rainwater infiltrating (+ effluent) on the subject site is considered for TN dilution.

Avery Brook Homes	Total (ft^2)	Total (Acres)	% of Total Area	Hydraulic Soil Group	Cover Type	Curve Number	Product CN x Area
Roads	16,805	0.39	4.19%	A	Impervious (Paved)	98	37.8
Roofs	16,416	0.38	4.09%	A	Roofs	95	35.8
Vegetated Areas	341,792	7.85	85.21%	A	Grass (Good)	39	306.0
Driveways	26,085	0.60	6.50%	A	Impervious (Gravel)	76	45.5
	401,098	9.21	1.00				425
					CN *(Weighted)* =	425 / 9	**46**

Figure 3 – Average Runoff Coefficient Calculation

Figure 3 calculates the composite CN, note that roof areas and roads have been assigned a CN of 95 even though they will ultimately be infiltrated at a rate of 90% and 70% respectively. This is conservative in that it elevates the CN somewhat, which would typically reduce the infiltrated rainwater volume. The composite CN is calculated as 46.

Section X, Page 42 of 82

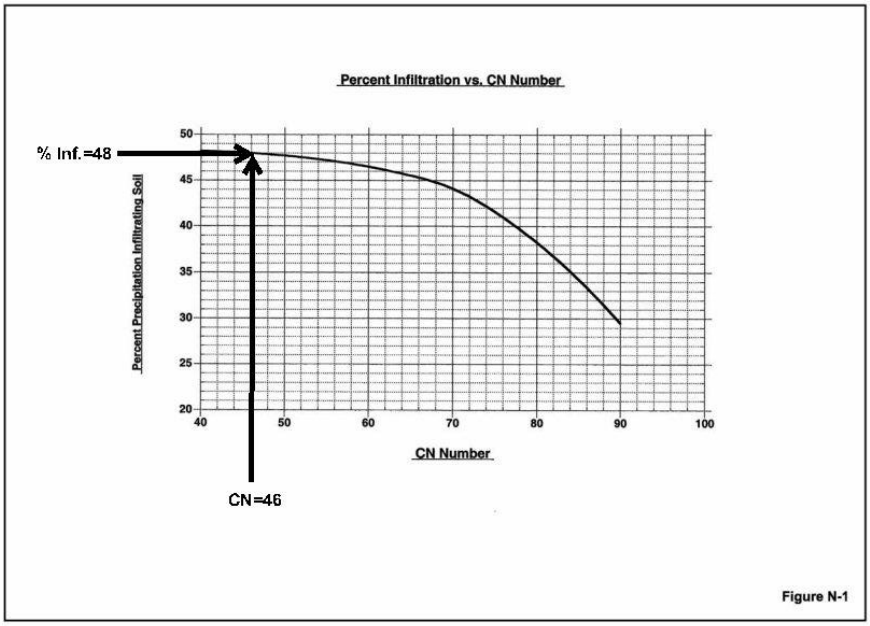


Figure 4 – Infiltration Rate Determination

Figure 4 is copied from the *Manual;* the graph yields an infiltration rate of 48%. In the calculation of infiltrated rainwater for dilution in **Figure 5** below, the yards and drives are calculated at 48%, the roofs are calculated at 90% (See detail of gutter downspout collection and infiltration structure on plans) and the roads at 70% (see infiltration basin details on subdivision plans).

Lot Size:	401,098	ft^2			9.21	Acres					
House Size: 3 beds, 24' x 36'			Number of Bedrooms:		57						
CALCULATE NITROGEN LOAD											
Discharge per bedroom/day (DPB) =			48	gal/day		Approximates 145 GPD/home as shown in					
Design Flow = *# Bedrooms x DPB x 3.8 l/g* =				10397	L/day	Ledyard use data 7/2023-4/2024					
Raw Total Nitrogen from house			90	mg/L		90 mg/l is concentration submitted to DEEP in					
Nitrogen Concentration discharge to ground			54	mg/L		most recent 2023 & 2024 applications					
Daily Nitrogen Concentration = *Design Flow x Nitrogen Concentration*											
Nitrogen Load in Effluent =	561427.2	mg/Day									
CALCULATE DILUTION WATER VOLUME											
Daily Effluent Volume	10396.8	L/day									
Rain to the Site	0.01 ft/Day x Lot Area =		4010.98	ft^3/day	=	114008	L/day				
	% Precipitation Infiltrating		***Area ft^2***								
Impervious Area	0.70		16,805								
Roofs	0.9		16,416		19 houses x 864						
Grass Area	0.48		341,792		includes 94 SWR						
Driveways	0.48		26,085		19 lots						
			401,098								
Infiltration Rate =	0.51										
Rain Infiltrating =	57,735	L/Day									
Notes :	CN_{AVE} of Impervious, Grass and Driveways = **46**										
	% Precipitation Infiltrating = **48%** taken from *Manual Fig. N-1*										
	70% infiltration of road runoff captured in infiltration system										
	90% infiltration due to use of roof runoff infiltration structure										
TOTAL DILUTION WATER											
Rain Infiltrating + Effluent =	68131	L/Day									
NITROGEN CONCENTRATION =	*561427.2*	*mg/Day*	÷	*68131*	*L/Day*	=	***8.24***	*mg/L*			
ALLOWABLE DISCHARGE =	10	mg/L									
DISCHARGE IS ACCEPTABLE											

Figure 5 – Nitrogen Concentration Analysis (48 gpd)

For estimating the TN load to the groundwater in **Figure 5** above, the following discharge and TN concentrations are utilized:

In 2023 this report had estimated water use from 3 bedroom homes at 135 gallons per day (GPD), or 45 GPD/bedroom. Water use data from Groton Public Utilities covering

the time period July 2023-April 2024, submitted to the 2024 Ledyard Planning and Zoning Commission Public Hearing record by the Applicant, indicates an average of 145 GPD/ home (or 48 GPD/bedroom assuming an average of 3 bedrooms per home).

WOR018-1	18	WOODRIDGE CIRCLE	5/8 METER"	10/31/2023	RESID	APT	147.00	$30.78				
WOR018-1	18	WOODRIDGE CIRCLE	5/8 METER"	11/30/2023	RESID	APT	156.00	$30.78				
WOR018-1	18	WOODRIDGE CIRCLE	5/8 METER"	12/31/2023	RESID	APT	157.00	$30.78				
WOR018-1	18	WOODRIDGE CIRCLE	5/8 METER"	1/31/2024	RESID	APT	175.00	$30.78				
WOR018-1	18	WOODRIDGE CIRCLE	5/8 METER"	2/29/2024	RESID	APT	170.00	$30.78				
WOR018-1	18	WOODRIDGE CIRCLE	5/8 METER"	3/31/2024	RESID	APT	159.00	$30.78				
WOR018-1	18	WOODRIDGE CIRCLE	5/8 METER"	4/30/2024	RESID	APT	168.00	$30.78				
							65692522.00	$768,909.17				
					Average daily water use per a			gpd				
					(65692522 gallons / (15,043 Readings x 30 Days per Month) = 145.5 gpd							

Table 3 - Potion of Groton Public Utilities Metered Water Usage of all Residential Properties on Public Water in Ledyard

This data covers all residential properties in the Town of Ledyard served by public water during that time period, with over 15,000 meter readings covering approximately 1,500 residences. We have revised the Nitrogen calculations to correspond with the metered water use.

Effluent TN concentration: 90 mg/l from house, 54 mg/l to leachfield. Recent applications to DEEP in 2023-2024 prepared by our office have utilized this concentration.

The 54 mg/l figure is a standard 60% of the raw sewage concentration, as used in the *Manual.* In the *Manual*, it is accepted that approximately 40% of the raw sewage TN is removed in the septic tank/leachfield system.

Based on the above, the calculated TN concentration exiting the site is below the EPA drinking water standard of 10 mg/l. There are no water bodies or inland wetlands mapped within the effluent plume on-site.

In **Figure 6** below, we present an analysis of TN based on the methodology used by DEEP prior to 2006. We have included it because at the 2023 Inland Wetland Commission hearing, commissioners questioned whether using 150 gpd/bedroom was the more conservative approach. The following spreadsheet uses a discharge of 150 gpd/bedroom, with a discharge concentration of 40 mg/l (as was standard practice for residential development prior to 2006). Note that the estimated site TN concentration is approximately the same using this method vs. the current method presented in **Figure 5**.

Lot Size:	401,098	ft^2		9.21	Acres					
House Size: 3 beds, 24' x 36'		Number of Bedrooms:		57						
CALCULATE NITROGEN LOAD										
Discharge per bedroom/day (DPB) =			150	gal/day		Standard analysis prior to 2006 Manual				
Design Flow = *# Bedrooms x DPB x 3.8 l/g* =				32490	L/day					
Raw Total Nitrogen from house			40	mg/L						
Nitrogen Concentration discharge to ground			24	mg/L						
Daily Nitrogen Concentration = *Design Flow x Nitrogen Concentration*										
Nitrogen Load in Effluent =	779760	mg/Day								
CALCULATE DILUTION WATER VOLUME										
Daily Effluent Volume	32490	L/day								
Rain to the Site	0.01 ft/Day x Lot Area =		4010.98	ft^3/day	=	114008	L/day			
	% Precipitation Infiltrating		***Area ft^2***							
Impervious Area	0.70		16,805							
Roofs	0.9		16,416		19 houses x 864 SF roof each					
Grass Area	0.48		341,792		includes conceptual lawn for 94 SWR					
Driveways	0.48		26,085		19 lots					
			401,098							
Infiltration Rate =	0.51									
Rain Infiltrating =	57,735	L/Day								
Notes :	CN_{AVE} of Impervious, Grass and Driveways = **46**									
	% Precipitation Infiltrating = **48%** taken from *Manual Fig. N-1*									
	70% infiltration of road runoff captured by infiltration system									
	90% infiltration due to use of roof runoff infiltration structure									
TOTAL DILUTION WATER										
Rain Infiltrating + Effluent =	90225	L/Day								
NITROGEN CONCENTRATION =	*779760*	*mg/Day*	÷	*90225*	*L/Day*	=	**8.64**	*mg/L*		
ALLOWABLE DISCHARGE =	10	mg/L								
DISCHARGE IS ACCEPTABLE										

Figure 6 – Nitrogen Concentration Analysis (Pre-2006 model @ 150 gpd/bedroom)

Massachusetts Alternative Septic System Test Center report on Geomatrix GST

The MASSTC report conducted on Geomatrix GST units is included herein because Geomatrix GST units are proposed as leachfields serving dwellings on the site. It is our opinion that this is a sound engineering choice, in part because GST units are constructed using a specific sand mix as part of the leachfield cross section (ASTM C-33 sand). Installation quality control is managed by the use of forms, rented from the manufacturer for each installation. The advantage to the GST cross section is that the crushed stone-soil interface, where the biological mat forms, is uniform as compared to other crushed stone leachfields where the crushed stone is in direct contact with potentially variable site soils. The biological mat, which is the primary area of the septic system where effluent treatment occurs, responds to differences in soil grain size at the crushed stone-soil interface. The mat will tend to be more or less vigorous as natural soil variations occur across the leachfield, possibly resulting in areas of saturated flow. In contrast, the C-33 sand provides a relatively uniform surface for the mat, resulting in a more evenly distributed discharge through the mat. This maximizes unsaturated percolation of the effluent through the sand, which in turn provides the time and environment for effective nitrification of the effluent, as well as virus removal.

The reason nitrification is important is that in the nitrogen cycle, the preferred nitrogen compound in ground or surface water is nitrate (NO_3). The very basic progression of nitrification in wastewater treatment is as follows:

$$\text{Organic N} + NH_3/NH_4 \rightarrow NO_2 \rightarrow NO_3$$

In general, the primary constituent in the household waste stream is Organic N plus NH_3/NH_4 (ammonia/ammonium respectively), sometimes referred to as Total Kjeldahl Nitrogen (TKN). As treatment progresses through the septic tank/leachfield system, autotrophic bacteria convert (oxidize) the N compounds first to NO_2 and then NO_3 (nitrification). When a leachfield is first installed, it takes some time (3-6 months) for the biological mat to fully develop. During that time, treatment efficiency in the system increases, the results of which can be determined through effluent sampling under the leachfield.

In the MASSTC report (found in **Appendix E**), one can visualize the increase in treatment, and accompanying nitrification, by reviewing the raw sample data in the TKN, TN, NO_2 & NO_3 columns. Refer to the data appendices in the MASSTC report for definitions.

As mentioned above the objective in nitrification is to get the value of NO_3 to be as close to 100% of the TN value as possible. Reviewing the sampling data columns starting from day 1, 1-31-2019, through 8-14-2019, there is a progressive increase in nitrification efficiency. By the 8-14-2019 date, the nitrification rate is as high as 94%. This rate may be expected to vary over time as seen in the continuing test data, but demonstrates the potential performance of the GST in nitrification. Additional nitrification can still be expected below the leachfield, for N compounds not yet converted to NO_3.

Phosphorous Analysis

The objective of this analysis is to calculate the capacity of soils under the proposed leachfield to remove Phosphorous (P) from the wastewater. The DEEP *Manual* outlines a procedure which estimates the capability of unsaturated soil under the leachfield to remove P.

Phosphorous (P), normally in the form of a phosphate (PO_4) is removed by chemically binding with other elements in the soil, primarily Iron, Aluminum and Calcium. The estimated ability of the soil to absorb the P varies by soil type, from typical published low values of 8 milligrams/100 grams soil to high values of 30 milligrams/100 grams soil. For this analysis we have chosen a sorption capacity of 6 milligrams/100 grams soil.

The model considers the unsaturated soil directly under a leachfield, defined as the "unfolded" plan area of the leachfield. Therefore, a 20 foot run of Geomatrix GST6236 would have a plan area of 224 square feet. Effluent percolating downward beneath the leachfield contacts unsaturated soil resulting in adsorption of the P to Fe, Al, and Ca in the soil. The model views the removal capacity on a 6 month regenerative basis, and only considers one half (50%) of the available unsaturated soil mass as being available.

We have prepared spreadsheets for each lot which estimate the P sorption capacity on that lot, which can be found in **Appendix F** of this report. The spreadsheets utilize a depth to seasonal high water table based on April 8, 2024 monitoring, a 36" deep leachfield, one foot of ground cover and a mounded water table of 1.8' to estimate unsaturated soil conditions beneath the respective leachfields.

The spreadsheets depict the Geomatrix GST 6236 leachfield length necessary to meet or exceed the estimated 6 month P sorption capacity on that lot. The subdivision plan depicts conceptual leachfields of 20 linear feet in length. We recommend that when final SSDS design is submitted to Ledge Light Health District, as required in their subdivision approval letter of May 22, 2024, that the designs provide the following minimum length GST6236 leachfield (or equivalent unfolded area based on leachfield type if an alternate leachfield is used):

	Lot #	Recommended length GST 6236 for Phosphorous removal (FT)
	1	30
	2	40
	3	20
	4	30
	5	20
	6	22
	7	20
	8	20
	9	20
	10	30
	11	20
	12	25
	13	20
	14	20
	15	20
	16	24
	17	20
	18	20

Table 4 – Recommended System Lengths

Conclusion

It is our opinion that the development of the proposed 18 single family, 3 bedroom homes, utilizing onsite septic systems, is reasonable and will not adversely impact groundwater or surface water on or adjacent to the site, based upon the pollutant renovation analysis conducted in this study. In particular, and for the reasons stated herein, it is our opinion that there is sufficient travel time between the SSDS proposed on the site and the nearest hydraulically down gradient point of Billing Avery Reservoir or its tributaries to remove bacteria based upon the guidance contained in the *Manual*, and there is sufficient dilution available based on the project design to reduce total nitrogen concentration from the site to a level which meets the standard for drinking water prior to encountering those same points. Vertical separation above the mounded groundwater exceeds the recommended separation in the *Manual*, and should therefore provide virus removal to the standards described therein. The Geomatrix GST leachfields proposed on the subdivision plan are effective at nitrifying TN in the effluent, converting a high percentage of the TN to NO_3 prior to effluent leaving the leachfield package. Sufficient unsaturated soil beneath the leachfields is provided to permit adsorption of Phosphorous in accordance with DEEP models.

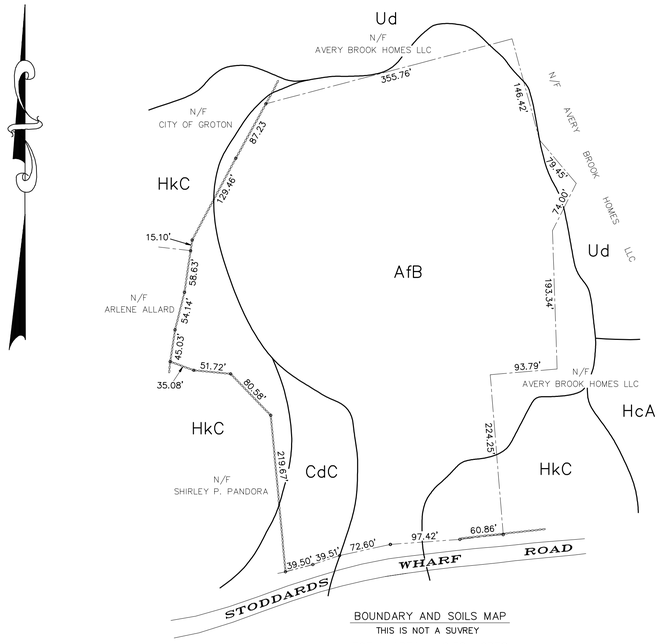
ANGUS McDONALD
GARY SHARPE
& ASSOCIATES, INC.
SINCE 1966

Appendicies

ANGUS McDONALD
GARY SHARPE
& ASSOCIATES, INC.
SINCE 1966

Appendix A

Site Development Plan Set



BOUNDARY AND SOILS MAP

THIS IS NOT A SUVREY

TOTAL AREA = 6.38 ACRES

GRAPHIC SCALE

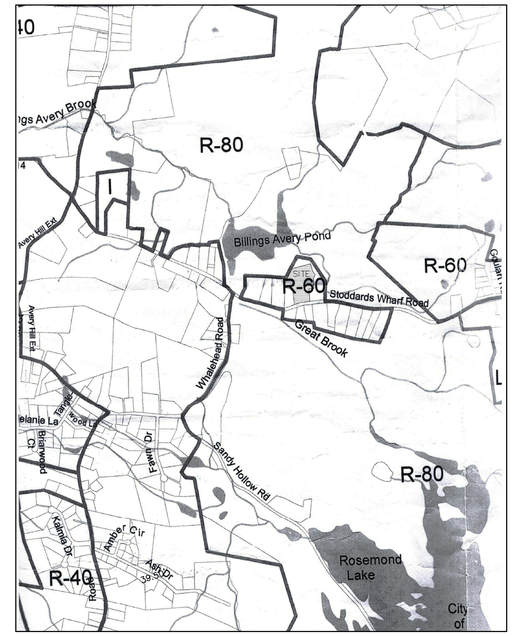
100 0 50 100 200 400

(IN FEET)

1 inch = 100 ft.

GENERAL NOTES:

1. MAP REFERENCES:
   - A) SUBDIVISION PLAN PREPARED FOR AMER JAVAD 98 STODDARDS WHARF ROAD – (CONN. RTE #214) LEDYARD, CONNECTICUT BOUNDARY SURVEY MAP DATE: 9/12/11 SCALE: 1"=40' SHEET 1 OF 4 ADVANCED SURVEYS, LLC.
   - B) LOT DIVISION PLAN PROPERTY OF PANDE HOLDINGS, LLC 98 STODDARDS WHARF (CONNECTICUT ROUTE 214) LEDYARD, CONNECTICUT DATE: MAY 10, 2007 SCALE: 1"=40' SHEET NO. 1 OF 2. REVISIONS DATE 5/23/07 STREET ADDRESS, LOCATION MAP & NOTE 12 ADDED.
   - C) BOUNDARY LINE ADJUSTMENT PLAN PROPERTY OF AVERY BROOK HOMES LLC 94, 96, 98 AND 100 STODDARDS WHARF ROAD A.K.A. CONNECTICUT ROUTE 214 LEDYARD, CONNECTICUT SCALES AS SHOWN FEBRUARY 2024.
2. CALL BEFORE YOU DIG AT 1–800–922–4455 BEFORE ANY CONSTRUCTION ACTIVITY.
3. ELEVATIONS SHOWN HEREON ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM.
4. THIS SUBDIVISION WILL BE SERVED BY ON SITE WELLS ON SITE SEWAGE SYSTEMS AND OVERHEAD UTILITIES.
5. HOUSES, WELLS, DRIVEWAYS, SEWAGE DISPOSAL SYSTEMS AND EROSION/SEDIMENT SEDIMENT CONTROL MEASURES ARE SHOWN CONCEPTUALLY ONLY.
6. ZONING SETBACKS: LOTS SUBMITTED AS A SET–ASIDE DEVELOPMENT AS DEFINED IN CONNECTICUT GENERAL STATUTES SECTION 8–30g.
   MINIMUM FRONT YARD SETBACK 12'
   MINIMUM SIDE YARD SETBACK 6'
   MINIMUM REAR YARD SETBACK 15'
7. PASSIVE SOLAR TECHNIQUES AS PRESCRIBED BY LAW HAVE BEEN CONSIDERED IN THE DESIGN OF THIS SUBDIVISION.
8. ACTUAL CONDITIONS THAT DEVELOP OR ARE MORE CLEARLY ASSESSED DURING CONSTRUCTION MAY DICTATE THAT FIELD ADJUSTMENTS, INCLUDING ADDITIONAL DRAINAGE AND SIGHTLINE MEASURES, MAY BE NECESSARY FOR ADEQUATE STORMWATER MANAGEMENT. ADDITIONAL DESIGN EFFORT FOR INSTALLATION OF SUCH MEASURES SHALL BE UNDERTAKEN IN ACCORDANCE WITH DIRECTION FROM THE TOWN.
9. THE TOWN WILL INSTALL THE REQUIRED ROAD SIGNAGE AND MARKINGS, THE COST OF WHICH WILL BE BACKCHARGED TO THE APPLICANT/OWNER.
10. THIS SITE IS LOCATED IN FLOOD ZONE C AS SHOWN ON FIRM FLOOD MAP 09011C0359G.



LOCATION MAP

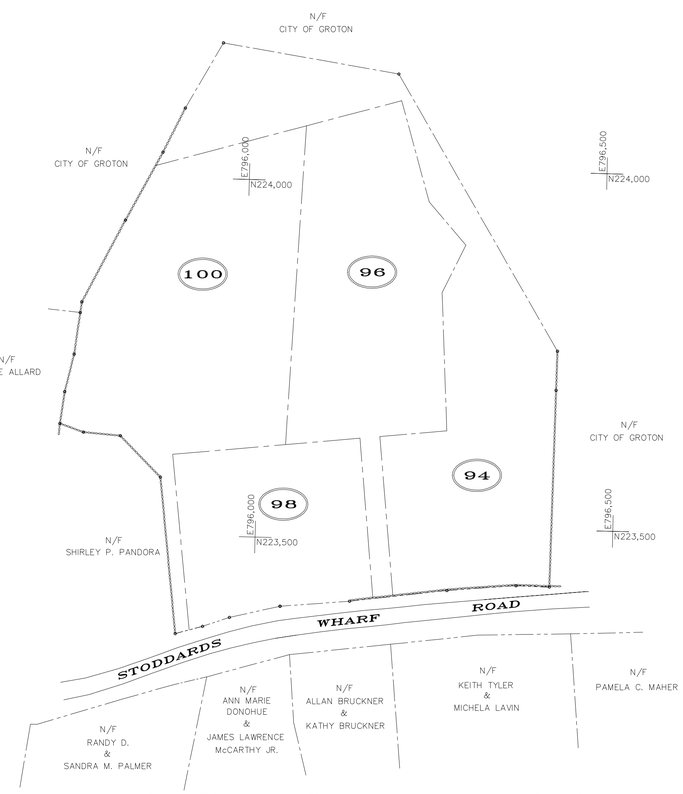
ZONING DISTRICT: R–60

GRAPHIC SCALE

1000 0 500 1000 2000 4000

(IN FEET)

1 inch = 1000 ft.



PARCEL HISTORY MAP & BOUNDARY LINE ADJUSTMENT INFORMATION

THIS IS NOT A SUVREY

PARCEL HISTORY

TOTAL AREA ON MARCH 22, 1962 = 9.21 ACRES

TOTAL NUMBER OF LOTS CREATED FROM ORIGINAL TRACT = 4

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)

1 inch = 100 ft.

SHEET INDEX

PLAN SHOWING AFFORDABLE HOUSING DEVELOPMENT PER C.G.S §8–30g RESUBDIVISION PROPERTY OF AVERY BROOK HOMES LLC 96, 98 & 100 STODDARDS WHARF ROAD A.K.A. CONNECTICUT ROUTE 214

PARCEL ID: 65–2360–96/98/100

LEDYARD, CONNECTICUT

SCALES AS SHOWN

MARCH 2024

REVISED: MAY 13, 2024 SHEETS 3 & 6 TO ADDRESS LLHD COMMENTS

THIS SURVEY AND MAP HAS BEEN PREPARED IN ACCORDANCE WITH SECTIONS 20–300b–1 THRU 20–300b–20 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES – "MINIMUM STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ENDORSED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. IT IS A BOUNDARY SURVEY BASED ON AN RESURVEY CONFORMING TO HORIZONTAL ACCURACY CLASS "D" TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

TITLE: LAND SURVEYOR CT No. 14208

DATE: MARCH 25, 2024

LEGEND

- STONE WALL
- PROPERTY LINE
- STREET LINE
- 98 — STREET NUMBER

SOILS LEGEND

- AfB – AGAWAM FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES
- CdC – CANTON AND CHARLTON EXTREMELY STONY FINE SANDY LOAMS, 3 TO 15 PERCENT SLOPES
- HcA – HAVEN SILT LOAM, 0 TO 3 PERCENT SLOPES
- HkC – HINCKLEY GRAVELLY SANDY LOAM, 3 TO 15 PERCENT SLOPES
- Rn – RIDGEBURY, LEICESTER AND WHITMAN EXTREMELY STONY FINE SANDY LOAM
- Ud – UDORTHENTS–URBAN LAND COMPLEX

APPROVED BY THE LEDYARD PLANNING AND ZONING COMMISSION AS TO THE COMPLIANCE WITH THE REGULATIONS GOVERNING THE SUBDIVISION OF LAND.

ALL IMPROVEMENTS SHALL BE COMPLETED BY _____ DATE

_____ CHAIRMAN OR SECRETARY _____ DATE

EROSION AND SEDIMENT CONTROL PLAN CERTIFIED BY THE AFFIRMATIVE VOTE OF THE LEDYARD PLANNING AND ZONING COMMISSION ON _____ DATE

LOT NUMBERS ASSIGNED BY THE ASSESSOR

_____ ASSESSOR _____ DATE

THE WORD "CERTIFY" IS UNDERSTOOD TO BE AN EXPRESSION OF THE PROFESSIONAL OPINION BY THE LAND SURVEYOR WHICH IS BASED ON HIS OR HER BEST KNOWLEDGE, INFORMATION AND BELIEF. AS SUCH IT CONSTITUTES NEITHER GUARANTEE OR WARRANTY.

THE STONE WALLS AND/OR FENCES SHOWN AS BOUNDARIES MAY HAVE IRREGULARITIES OF COURSE BETWEEN PRINCIPAL POINTS OF COURSE INDICATED.

JOB# 22–0071BLOT.DWG FBK#327

NOTE: BOUNDARY LINES OF ADJOINING PROPERTIES ARE SHOWN FOR GENERAL INFORMATIONAL PURPOSES ONLY AND ARE NOT TO BE CONSTRUED AS BEING ACCURATELY LOCATED OR DEPICTED.

DIETER & GARDNER

LAND SURVEYORS • PLANNERS

P.O. BOX 335

1641 CONNECTICUT ROUTE 12

GALES FERRY, CT. 06335

(860) 464–7455

EMAIL: DIETER.GARDNER@YAHOO.COM

APPROVED BY THE LEDYARD PLANNING AND ZONING COMMISSION AS TO THE COMPLIANCE WITH THE REGULATIONS GOVERNING THE SUBDIVISION OF LAND.

ALL IMPROVEMENTS SHALL BE COMPLETED BY _____ DATE

_____ CHAIRMAN OR SECRETARY _____ DATE

EROSION AND SEDIMENT CONTROL PLAN CERTIFIED BY THE AFFIRMATIVE VOTE OF THE LEDYARD PLANNING AND ZONING COMMISSION ON _____ DATE

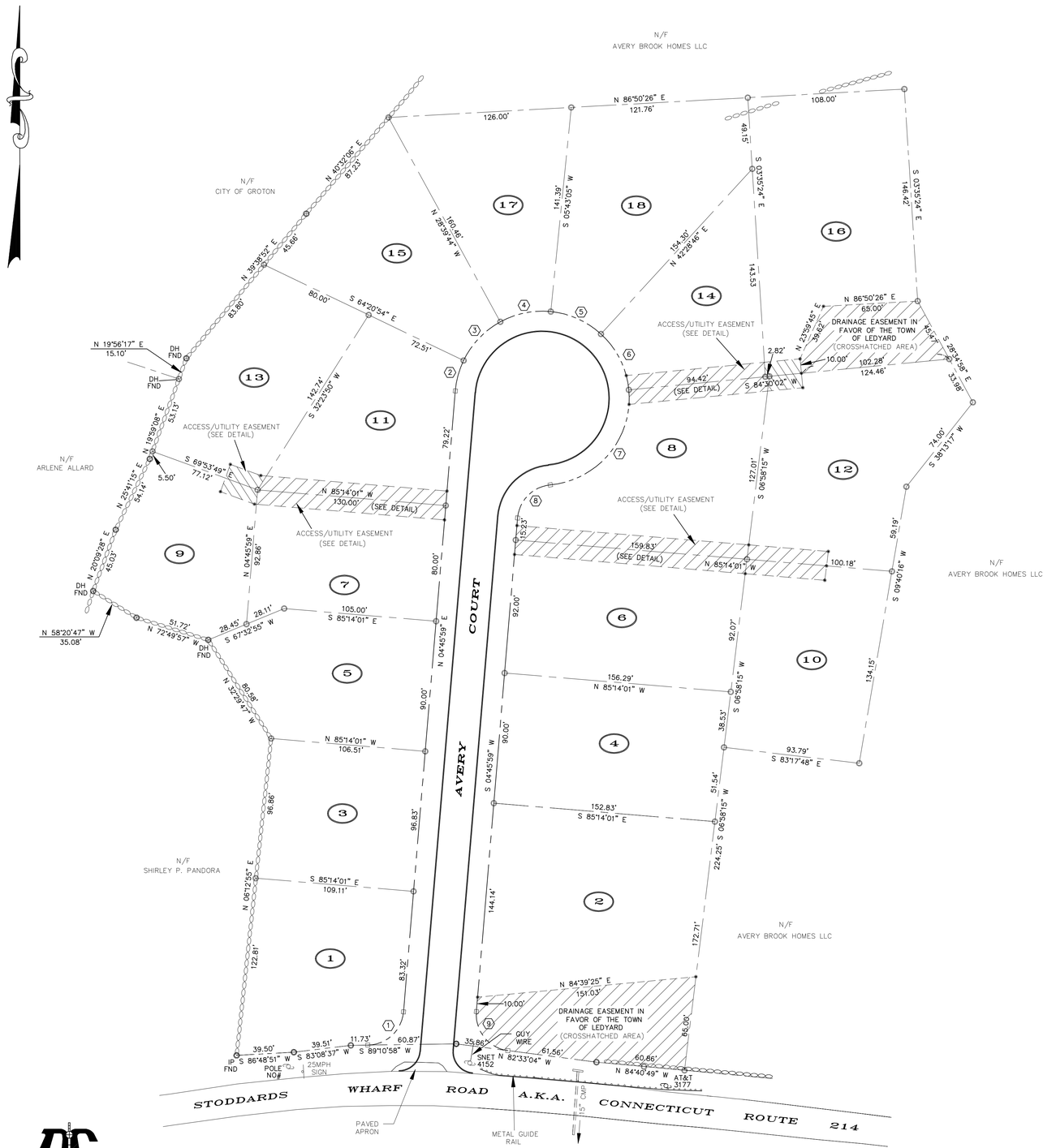
LOT NUMBERS ASSIGNED BY THE ASSESSOR

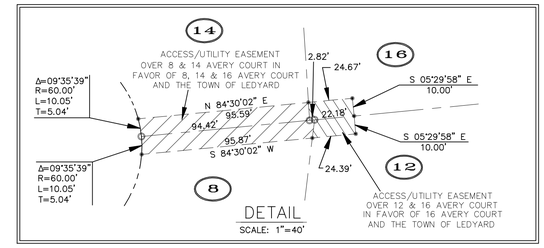
_____ ASSESSOR _____ DATE

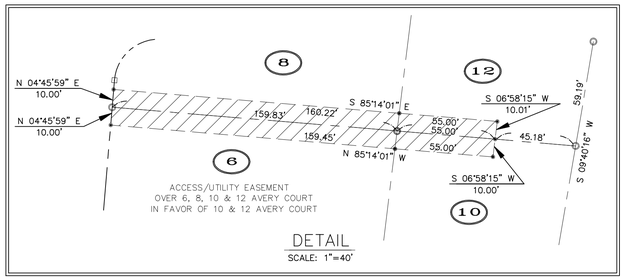
STREET ADDRESS	TOTAL AREA
1	12,481 Sq. Ft. 0.29 ACRES
2	24,444 Sq. Ft. 0.58 ACRES
3	10,439 Sq. Ft. 0.24 ACRES
4	13,910 Sq. Ft. 0.32 ACRES
5	11,762 Sq. Ft. 0.27 ACRES
6	14,542 Sq. Ft. 0.33 ACRES
7	10,561 Sq. Ft. 0.24 ACRES
8	14,287 Sq. Ft. 0.33 ACRES
9	10,201 Sq. Ft. 0.23 ACRES
10	12,819 Sq. Ft. 0.29 ACRES
11	11,508 Sq. Ft. 0.26 ACRES
12	15,917 Sq. Ft. 0.37 ACRES
13	12,308 Sq. Ft. 0.28 ACRES
14	9,756 Sq. Ft. 0.22 ACRES
15	12,575 Sq. Ft. 0.29 ACRES
16	20,973 Sq. Ft. 0.48 ACRES
17	11,456 Sq. Ft. 0.26 ACRES
18	14,752 Sq. Ft. 0.34 ACRES

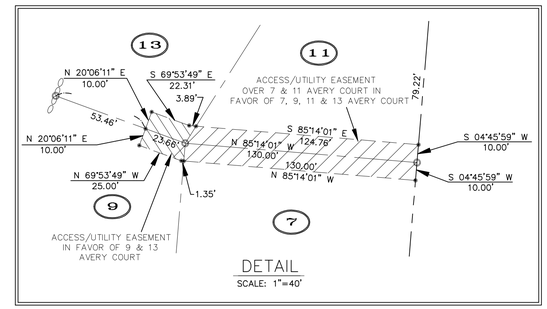
LEGEND

- STONE WALL
- PROPERTY LINE
- STREET LINE
- DH FND — DRILL HOLE FOUND
- IP FND — IRON PIPE FOUND
- DRILL HOLE OR REBAR TO BE SET
- MONUMNET OR DRILL HOLE TO BE SET
- ⟨7⟩ — CURVE TABLE NUMBER
- UTILITY POLE
- ACCESS/UTILITY EASEMENT
- (8) — STREET ADDRESS









LOTS CURVE TABLE				
CURVE #	Δ	R	L	T
1	84°24'59"	25.00'	36.83'	22.68'
2	20°53'07"	60.00'	21.87'	11.06'
3	35°41'10"	60.00'	37.37'	19.31'
4	34°22'48"	60.00'	36.00'	18.56'
5	36°45'41"	60.00'	38.50'	19.94'
6	42°01'16"	60.00'	44.00'	23.04'
7	90°06'06"	60.00'	94.35'	60.11'
8	79°50'09"	25.00'	34.83'	20.92'
9	87°19'03"	25.00'	38.10'	23.86'

PLAN SHOWING AFFORDABLE HOUSING DEVELOPMENT PER C.G.S §8-30g RESUBDIVISION PROPERTY OF AVERY BROOK HOMES LLC 96, 98 & 100 STODDARDS WHARF ROAD A.K.A. CONNECTICUT ROUTE 214

PARCEL ID: 65-2360-96/98/100

LEDYARD, CONNECTICUT

SCALE: 1"=40'

MARCH 2024

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)

1 inch = 40 ft.

THE STONE WALLS AND/OR FENCES SHOWN AS BOUNDARIES MAY HAVE IRREGULARITIES OF COURSE BETWEEN PRINCIPAL POINTS OF COURSE INDICATED.

THE WORD "CERTIFY" IS UNDERSTOOD TO BE AN EXPRESSION OF THE PROFESSIONAL OPINION BY THE LAND SURVEYOR WHICH IS BASED ON HIS OR HER BEST KNOWLEDGE, INFORMATION AND BELIEF. AS SUCH IT CONSTITUTES NEITHER GUARANTEE OR WARRANTY.

NOTE: BOUNDARY LINES OF ADJOINING PROPERTIES ARE SHOWN FOR GENERAL INFORMATIONAL PURPOSES ONLY AND ARE NOT TO BE CONSTRUED AS BEING ACCURATELY LOCATED OR DEPICTED.

JOB# 22-00718LOT.DWG FBK#327

DIETER & GARDNER
LAND SURVEYORS • PLANNERS
1641 CONNECTICUT ROUTE 12
P.O. BOX 335
GALES FERRY, CT. 06335
(860) 464-7455
EMAIL: DIETER.GARDNER@YAHOO.COM

THIS MAP AND SURVEY HAS BEEN PREPARED IN ACCORDANCE WITH SECTIONS 20-300B-1 THROUGH 20-300B-20 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES-"MINIMUM STANDARDS OF ACCURACY, CONTENT AND CERTIFICATION FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT", ADOPTED EFFECTIVE JUNE 21, 1996, REVISED OCTOBER 26, 2018. IT IS A BOUNDARY SURVEY BASED ON A DEPENDENT RESURVEY CONFORMING TO HORIZONTAL ACCURACY CLASS A-2.
TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

TITLE: LAND SURVEYOR CT No. 14208

DATE: MARCH 25, 2024

APPROVED BY THE LEDYARD PLANNING AND ZONING COMMISSION AS TO THE COMPLIANCE WITH THE REGULATIONS GOVERNING THE SUBDIVISION OF LAND.

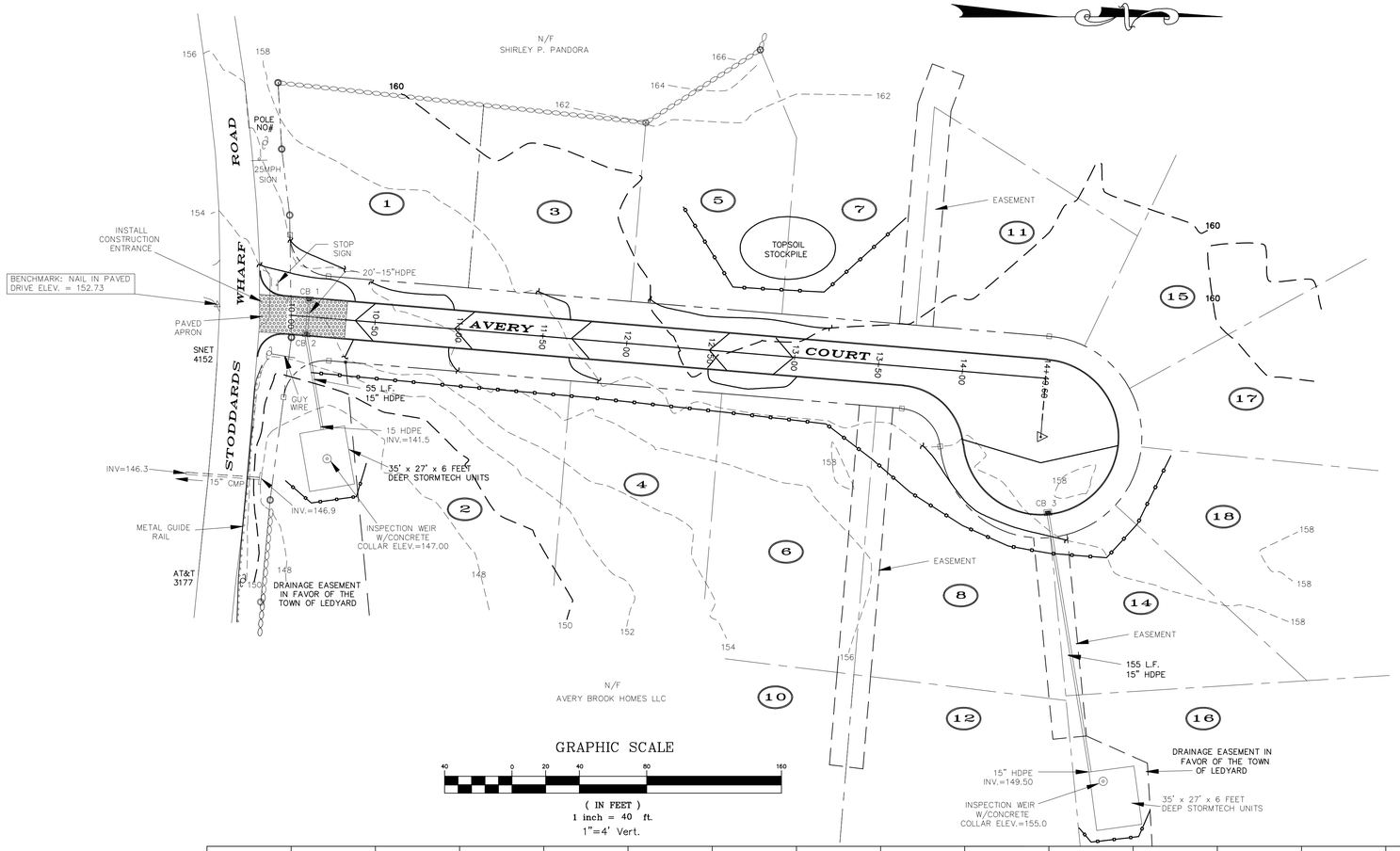
ALL IMPROVEMENTS SHALL BE COMPLETED BY _____ DATE

_____ CHAIRMAN OR SECRETARY _____ DATE

EROSION AND SEDIMENT CONTROL PLAN CERTIFIED BY THE AFFIRMATIVE VOTE OF THE LEDYARD PLANNING AND ZONING COMMISSION ON DATE

LOT NUMBERS ASSIGNED BY THE ASSESSOR

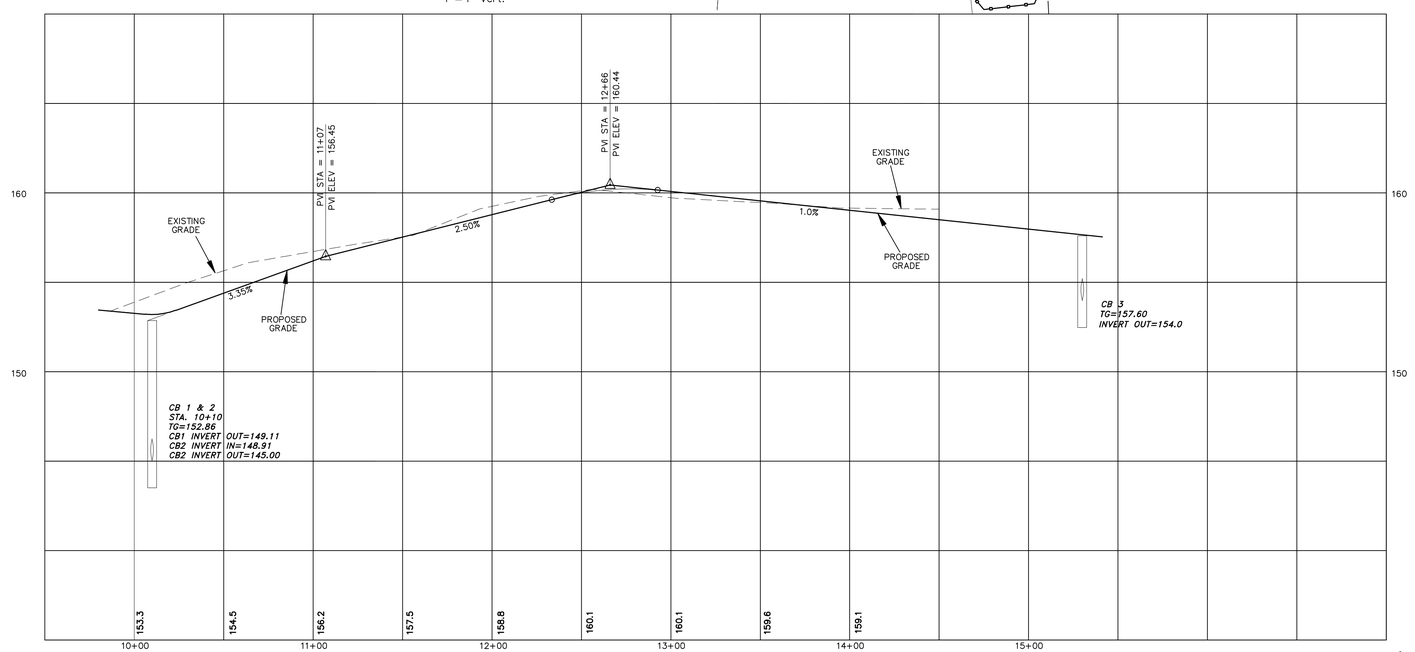
_____ ASSESSOR _____ DATE



GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.
1"=4' Vert.



LEGEND

- STONE WALL
- PROPERTY LINE
- STREET LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- UTILITY POLE
- (8) STREET ADDRESS
- PROPOSED CATCH BASIN
- SILT FENCE

DIETER & GARDNER
LAND SURVEYORS • PLANNERS
P.O. BOX 335
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GALES FERRY, CT. 06335
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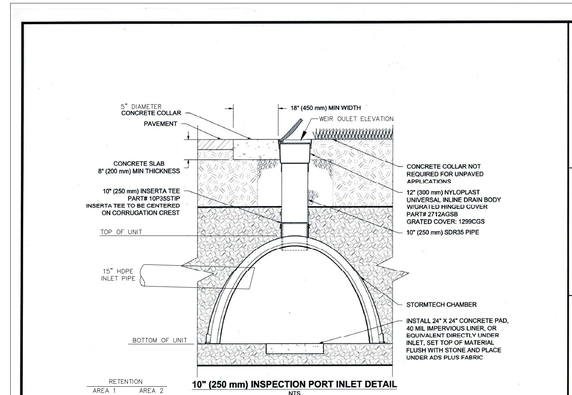
EMAIL: DIETER.GARDNER@YAHOO.COM



10" (250 mm) INSPECTION PORT INLET DETAIL
NTS

RETENTION	AREA 1	AREA 2
OUTLET ELEV.	147.0	155.0
INLET ELEV.	141.5	149.5
TOP	144.0	152.0
BOTTOM	139.0	147.0

INSPECTION PORT INLET
STORMTECH CHAMBER SYSTEM
DATE: 11/14/23 DRAWN: JLM CHECKED: GDG
PROJECT #:

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1

PLAN / PROFILE
RESUBDIVISION
AFFORDABLE HOUSING
DEVELOPMENT PER C.G.S §8-30g
PROPERTY OF
AVERY BROOK HOMES LLC
96, 98 & 100 STODDARDS WHARF ROAD
A.K.A.
CONNECTICUT ROUTE 214
PARCEL ID: 65-2360-96/98/100
LEDYARD, CONNECTICUT
SCALE: 1"=40' HORIZ.
1"=4' VERT.
MARCH 2024

STATE OF CONNECTICUT
JOHN R. MARTUCCI
19494
LICENSED PROFESSIONAL ENGINEER

DEEP TEST PIT DATA

WITNESSED AND RECORDED BY WENDY BROWN–ARNOLD RS,/REHS AND ALEX WILBOUR LEDGE LIGHT HEALTH DISTRICT ON 5/2/22, 5/5/22 AND 5/23/2022 AND WENDY BROWN–ARNOLD RS,/REHS ON JUNE 14, 2022.

TP 13
0–13" TOPSOIL
13–25" BROWN FINE TO MED. SANDY LOAM
25–91" TAN TO BROWN MED. TO COARSE SAND AND GRAVEL, SOME COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 14
0–8" TOPSOIL
8–26" BROWN FINE TO MED. SANDY LOAM
26–91" TAN MED. TO FINE SAND/GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 17
0–11" TOPSOIL
11–37" BROWN FINE TO MED. SANDY LOAM
37–89" TAN TO GRAY MED. TO FINE SAND W/GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 18
0–9" TOPSOIL
9–29" YELLOW TO BROWN FINE SANDY LOAM
29–103" TAN TO OLIVE MED. TO COARSE SAND W/GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 29
0–12" TOPSOIL
12–32" BROWN FINE TO MED. SANDY LOAM
32–99" TAN TO GRAY MED. TO FINE SAND W/ GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 30
0–12" TOPSOIL
12–34" BROWN FINE SANDY LOAM (DEPTH VARIES)
34–98" TAN TO MED. TO FINE SAND W/GRAVEL AND GRAVEL, STRATIFIED

NO MOTTLING
NO WATER
NO LEDGE

TP 31
0–7" TOPSOIL
7–31" YELLOW TO BROWN FINE TO VERY FINE SANDY LOAM
31–100" TAN FINE TO MED. SAND W/GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 32
0–8" TOPSOIL
8–34" BROWN FINE SANDY LOAM
34–82" TAN TO GRAY MED. TO FINE SAND W/GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 33
0–10" TOPSOIL
10–34" BROWN FINE SANDY LOAM
34–75" TAN TO GRAY MED. TO FINE SAND W/GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 34
0–12" TOPSOIL
12–44" YELLOW TO BROWN FINE TO VERY FINE SANDY LOAM
44–89" TAN TO BROWN MED. SAND W/GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 35
0–9" TOPSOIL
9–21" BROWN FINE SANDY LOAM
21–47" TAN TO BROWN MED. SAND W/GRAVEL, FEW COBBLES
47–110" TAN TO BROWN, MED. SAND W/GRAVEL, FEW COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 36
0–8" TOPSOIL
8–34" BROWN FINE SANDY LOAM
34–94" TAN TO GRAY MED. TO FINE SAND W/GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 37
0–9" TOPSOIL
9–39" LIGHT BROWN TO TAN, FINE TO VERY FINE, SANDY LOAM
39–100" LIGHT TAN FINE TO MED. SAND W/GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 38
0–8" TOPSOIL
8–34" BROWN FINE SANDY LOAM

34–90" TAN TO GRAY MED. TO FINE SAND W/GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 39
0–5" TOPSOIL
5–41" LIGHT BROWN FINE SANDY LOAM
41–83" TAN TO MED. SAND W/ GRAVEL AND COBBLES
83"–104" OLIVE TO BROWN FINE SAND,SOME GRAVEL

NO MOTTLING
NO WATER
NO LEDGE

TP 40
0–8" TOPSOIL
8–32" BROWN FINE TO MED. SANDY LOAM
32–58" TAN TO GRAY SILT WITH PATCHY ORANGE REDOX INCONSISTENT AROUND
58–99" TAN TO GRAY MED, TO FINE SAND
NO MOTTLING W/GRAVEL AND COBBLES
NO WATER
NO LEDGE

TP 41
0–9" TOPSOIL
9–29" BROWN FINE TO MED. SANDY LOAM
29–52" TAN TO GRAY SILT FINE SAND, STAINED
52–101" TAN TO GRAY, FINE TO MED. SAND
NO MOTTLING W/GRAVEL AND COBBLES
NO WATER
NO LEDGE

TP 42
0–5" TOPSOIL
5–14" LIGHT BROWN FINE TO VERY FINE SANDY LOAM
14–50" ORANGE TO GRAY SILT, STAINED
50–105" TAN TO BROWN FINE TO MED. SAND W/GRAVEL AND COBBLES
NO MOTTLING
NO WATER
NO LEDGE

TP 43
0–8" TOPSOIL
8–33" BROWN FINE SANDY LOAM
33–45" TAN TO GRAY SILT INCONSISTENT AROUND HOLE
45–83" TAN TO MED. TO FINE SAND W/GRAVEL AND COBBLES
NO MOTTLING
NO WATER
NO LEDGE

TP 44
0–6" TOPSOIL
6–14" BROWN FINE TO MED. SANDY LOAM
14–42" TAN TO GRAY SILT INCONSISTENT AROUND HOLE
42–102" TAN TO GRAY MED. TO FINE SAND W/GRAVEL AND COBBLES
NO MOTTLING
NO WATER
NO LEDGE

TP 45
0–13" TOPSOIL
13"–23 BROWN FINE TO VERY FINE SANDY LOAM
23–37" GRAY TO TAN VERY FINE SAND W/SILT
37–93" BROWN TO GRAY COARSE SAND W/ GRAVEL AND SOME COBBLES
MOTTLING @ 37"
NO WATER
NO LEDGE

TP 46
0–15" TOPSOIL
15–39" GRAY TO TAN VERY FINE SANDY W/SILT
39–51" GRAY FINE TO MED. SAND W/SILT & HEAVILY MOTTLED THROUGHOUT
51–108" BROWN TO TAN COARSE SAND W/ GRAVEL AND SOME COBBLES
OLD FILTER FABRIC AND GRAVEL @ 20"
MOTTLING @ 39"
WATER @ 96"
NO LEDGE

TP 47
0–10" TOPSOIL
10–22" BROWN FINE TO MED. SANDY LOAM W/SILT
22–41" LIGHT BROWN TO ORANGE SILTY LOAM, TRACE FINE SAND
41–98" BROWN TO GRAY COARSE SAND W/GRAVEL AND SOME COBBLES
NO MOTTLING
WATER @ 96"
NO LEDGE

TP 48
0–10" TOPSOIL
10–28" BROWN FINE TO VERY FINE SANDY LOAM TO SILT
28–106" BROWN TO GRAY MED. TO COARSE SAND W/GRAVEL AND COBBLES
NO MOTTLING
NO WATER–WET AT BOTTOM
NO LEDGE

TP 49
0–10" TOPSOIL
10–24" BROWN FINE TO VERY FINE SANDY LOAM
24–52" LIGHT YELLOW TO BROWN VERY FINE SAND W/SILT
52–99" BROWN TO GRAY COARSE SAND WITH GRAVEL, FEW COBBLES
POSSIBLE MOTTLING @ 52"
WATER @ 90"
NO LEDGE

TP 50
0–10" TOPSOIL
10–24" BROWN FINE TO VERY FINE SANDY LOAM
24–41" LIGHT YELLOW TO TAN VERY FINE SAND, W/SILT
41–111" TAN TO BROWN COARSE SAND W/GRAVEL AND SOME COBBLES
NO MOTTLING
WATER @ 106"
NO LEDGE

TP 51
0–10" TOPSOIL
10–20" LIGHT BROWN FINE TO VERY FINE SANDY LOAM
20–42" LIGHT YELLOW TO BROWN VERY FINE SAND W/TRACE SILT
42–101" BROWN TO TAN COARSE SAND WITH GRAVEL, SOME COBBLES
NO MOTTLING
NO WATER
NO LEDGE

TP 52
0–13" TOPSOIL
13–38" BROWN FINE TO VERY FINE SANDY LOAM
38–90" BROWN TO TAN COARSE TO MED. SAND WITH SOME GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 53
0–13" TOPSOIL
13–32" BROWN FINE TO MED. SANDY LOAM W/GRAVEL AND COBBLES
32–92" BROWN TO TAN COARSE TO MED. SAND W/GRAVEL AND MANY COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 54
0–11" TOPSOIL
11–32" BROWN FINE TO VERY FINE SANDY LOAM
32–95" BROWN TO TAN COARSE TO MED. SAND W/GRAVEL AND SOME COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 55
0–14" TOPSOIL
14–22" BROWN FINE TO VERY FINE SANDY LOAM
22–37" LIGHT BROWN FINE TO VERY FINE SAND W/SILT
37–110" TAN MED. SAND W/GRAVEL, FEW COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 56
0–15" TOPSOIL
15–43" LIGHT BROWN SILT LOAM ,SOME FINE SAND
43–110" TAN MED. SAND SOME GRAVEL FEW COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 57
0–8" TOPSOIL
8–27" LIGHT BROWN FINE TO VERY FINE SANDY LOAM
27–104" TAN TO BROWN MED. TO COARSE SAND W/GRAVEL, SOME COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 58
0–12" TOPSOIL
12"–32" LIGHT BROWN FINE TO VERY FINE SANDY LOAM
32–98" TAN TO BROWN MED. TO COARSE SAND WITH GRAVEL, SOME COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 59
0–11" TOPSOIL
11–23" BROWN FINE TO VERY FINE SANDY LOAM
23–93" BROWN TO TAN COARSE TO MED. SAND W/GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 60
0–10" TOPSOIL
10–23" BROWN FINE TO VERY FINE SANDY LOAM
23–97" BROWN TO TAN COARSE TO MED. SAND WITH GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 61
0–8" TOPSOIL
8–28" BROWN VERY FINE SANDY LOAM
28–99" TAN TO BROWN COARSE SAND W/GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 62
0–9" TOPSOIL
9–24" LIGHT BROWN VERY FINE SANDY LOAM
24–96" BROWN TO TAN COARSE TO MED. SAND W/GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 63
0–8" TOPSOIL
8–26" BROWN FINE TO MED. SANDY LOAM
26–91" BROWN TO TAN COARSE TO MED. SAND, W/GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 64
0–10" TOPSOIL
10–31" BROWN FINE SANDY LOAM
31–91" BROWN TO TAN COARSE TO MED. SAND W/SOME SILT GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 65
0–13" TOPSOIL
13–30" LIGHT BROWN FINE TO VERY FINE SANDY LOAM
30–100" TAN TO BROWN COARSE SAND WITH GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 66
0–10" TOPSOIL
10–28" BROWN FINE SANDY LOAM
28–90" TAN TO GRAY MED. TO COARSE SAND W/SOME GRAVEL

NO MOTTLING
NO WATER
NO LEDGE

TP 67
0–14" TOPSOIL
14–25" LIGHT BROWN FINE TO VERY FINE SANDY LOAM
25–108" TAN TO BROWN MED. TO COARSE SAND W/GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 68
0–11" TOPSOIL
11–29" BROWN FINE TO MED. SANDY LOAM
29–80" TAN TO GRAY MED. TO COARSE SAND W/GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 69
0–12" TOPSOIL
12–36" YELLOW TAN FINE TO VERY FINE SANDY LOAM
36–93" TAN TO BROWN MED. TO FINE SAND W/GRAVEL, SOME COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 70
0–14" TOPSOIL
14–36" BROWN FINE TO MED. SANDY LOAM
36–91" TAN MED. TO FINE SAND W/GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 71
0–8" TOPSOIL
8–36" BROWN FINE TO MED. SANDY LOAM
36–96" TAN TO GRAY MED. TO FINE SAND W/ GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 72
0–8" TOPSOIL
8–32" BROWN FINE TO MED. SANDY LOAM
32–91" TAN TO GRAY MED. TO FINE SAND W/GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 73
0–13" TOPSOIL
13–28" BROWN FINE SANDY LOAM
28–37" YELLOW TAN FINE TO VERY FINE SANDY LOAM
37–90" TAN TO BROWN FINE TO MED. SAND W/GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 74
0–6" TOPSOIL
6–39" BROWN FINE SANDY LOAM
39–99" TAN TO BROWN FINE TO MED. SAND W/GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 75
0–10" TOPSOIL
10–29" LIGHT BROWN FINE SANDY LOAM
29–96" TAN TO OLIVE/BROWN FINE TO MED. SAND W/GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 76
0–10" TOPSOIL
10–34" LIGHT BROWN FINE SANDY LOAM
34–96" TAN TO OLIVE/BROWN FINE TO MED. SAND W/GRAVEL AND COBBLES STRATIFIED

NO MOTTLING
NO WATER
NO LEDGE

TP 77
0–11" TOPSOIL
11–36" BROWN FINE TO MED. SANDY LOAM
36–101" BROWN TO TAN MED. TO FINE SAND WITH GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 78
0–15" TOPSOIL
15–46" BROWN FINE TO MED. SANDY LOAM
46–106" BROWN TO TAN MED. FINE SAND W/ SOME GRAVEL

NO MOTTLING
NO WATER
NO LEDGE

TP 79
0–11" TOPSOIL
11–38" BROWN FINE TO MED. SANDY LOAM
38–90" TAN TO GRAY MED. TO FINE SAND WITH GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 80
0–12" TOPSOIL
12–33" BROWN FINE TO MED. SANDY LOAM
33–95" TAN TO GRAY MED. TO FINE SAND W/GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 81
0–13" TOPSOIL
13–40" BROWN FINE TO MED. SANDY LOAM
40–96" TAN TO GRAY MED. SAND W/GRAVEL AND COBBLES

NO MOTTLING
NO WATER
NO LEDGE

TP 82
0–9" SAND AND GRAVEL FILL
9–18" TOPSOIL
18–52" LIGHT BROWN FINE TO VERY FINE SANDY LOAM, SOME SILT
52–101" TAN TO BROWN FINE TO MED. SAND, SOME GRAVEL

NO MOTTLING
NO WATER
NO LEDGE

ADDITIONAL DEEP TEST PIT DATA

WITNESSED AND RECORDED BY WENDY BROWN–ARNOLD RS,/REHS LEDGE LIGHT HEALTH DISTRICT ON APRIL 10, 2024.

TP 300
0–12" TOPSOIL
12–29" LIGHT BROWN FINE SANDY LOAM
29–119" BROWN MED–COARSE SAND WITH GRAVEL & COBBLES

NO MOTTLING
NO WATER
NO LEDGE
RESTRICTIVE: 119"

TP 301
0–10" TOPSOIL
10–27" LIGHT BROWN FINE SANDY LOAM
27–103" BROWN MED–COARSE SAND WITH GRAVEL & COBBLES
103–120" TAN MED. SAND
NO MOTTLING
NO WATER
NO LEDGE
RESTRICTIVE: 120"

TP 302
0–11" TOPSOIL
11–32" LIGHT BROWN VERY FINE SANDY LOAM
32–120" BROWN MED–COARSE SAND WITH GRAVEL & COBBLES, STRATIFIED

NO MOTTLING
NO WATER
NO LEDGE
RESTRICTIVE: 120"

TP 303
0–9" TOPSOIL
9–33" LIGHT BROWN FINE SANDY LOAM
33–108" BROWN MED–COARSE SAND WITH GRAVEL & COBBLES

NO MOTTLING
NO WATER
NO LEDGE
RESTRICTIVE: 108"

TP 304
0–12" TOPSOIL
12–32" LIGHT BROWN VERY FINE SANDY LOAM
32–117" BROWN MED. SAND WITH GRAVEL & SOME COBBLES

NO MOTTLING
NO WATER
NO LEDGE
RESTRICTIVE: 117"

TP 305
0–9" TOPSOIL
9–32" LIGHT BROWN VERY FINE SANDY LOAM
32–121" BROWN MED–COARSE SAND WITH GRAVEL & SOME COBBLES

NO MOTTLING
NO WATER
NO LEDGE
RESTRICTIVE: 121"

TP 306
0–13" TOPSOIL
13–35" LIGHT BROWN VERY FINE SANDY LOAM
35–115" BROWN MED–COARSE SAND WITH GRAVEL & COBBLES

NO MOTTLING
NO WATER
NO LEDGE
RESTRICTIVE: 115"

TP 307
0–10" TOPSOIL
10–27" LIGHT BROWN FINE SANDY LOAM
27–121" BROWN COARSE SAND WITH GRAVEL & COBBLES

NO MOTTLING
NO WATER
NO LEDGE
RESTRICTIVE: 121"

TP 308
0–11" TOPSOIL
11–28" ORANGE BROWN FINE SANDY LOAM
28–34" YELLOW BROWN FINE MED. SAND
34–128" GRAY–DARK BROWN MED. SAND WITH GRAVEL & COBBLES
NO MOTTLING
NO WATER
NO LEDGE
ROOTS TO 34"
RESTRICTIVE: 138"

TP 309
0–9" TOPSOIL
9–25" ORANGE BROWN FINE SANDY LOAM
25–48" TAN YELLOW–BROWN FINE MED. SAND
48–135" GRAY–DARK BROWN MED. SAND WITH GRAVEL & COBBLES

NO MOTTLING
NO WATER
NO LEDGE
ROOTS TO 53"
RESTRICTIVE: 135"

TP 310
0–10" TOPSOIL
10–34" ORANGE BROWN FINE SANDY LOAM
34–113" GRAY–DARK BROWN MED. SAND WITH GRAVEL & COBBLES

NO MOTTLING
NO WATER
NO LEDGE
ROOTS TO 53"
RESTRICTIVE: 135"

TP 311
0–10" TOPSOIL
10–33" ORANGE BROWN FINE SANDY LOAM
33–51" DARK BROWN–GRAY MED. SAND, SOME COBBLES
51–135" GRAY–DARK BROWN MED. SAND WITH GRAVEL & COBBLES

NO MOTTLING
NO WATER
NO LEDGE
ROOTS TO 32"
RESTRICTIVE: 135"

TP 312
0–9" TOPSOIL
9–34" ORANGE BROWN FINE SANDY LOAM
34–138" DARK BROWN–GRAY MED. SAND WITH COBBLES

NO MOTTLING
NO WATER
NO LEDGE
ROOTS TO 36"
RESTRICTIVE: 138"

TP 313
0–8" TOPSOIL
8–37" ORANGE BROWN FINE SANDY LOAM
37–72" GRAY–DARK BROWN MED. SAND, WITH GRAVEL & COBBLES
72–80" GRAY–DARK BROWN MED. SAND
80–125" GRAY–DARK BROWN MED. SAND WITH GRAVEL & COBBLES

NO MOTTLING
NO WATER
NO LEDGE
ROOTS TO 37"
RESTRICTIVE: 125"

TP 314
0–12" TOPSOIL
12–31" ORANGE BROWN FINE SANDY LOAM
31–109" GRAY–DARK BROWN MED. SAND, WITH GRAVEL & COBBLES
109–125" GRAY–DARK BROWN MED. SAND WITH GRAVEL

NO MOTTLING
NO WATER
NO LEDGE
ROOTS TO;
RESTRICTIVE: 125"

TP 315
0–8" TOPSOIL
8–36" ORANGE BROWN FINE SANDY LOAM
36–122" GRAY–DARK BROWN MED. SAND WITH GRAVEL & COBBLES

NO MOTTLING
NO WATER
NO LEDGE
ROOTS TO 34"
RESTRICTIVE: 122"

TP 316
0–10" TOPSOIL
10–40" ORANGE BROWN FINE SANDY LOAM
40–52" YELLOW BROWN FINE–MED. SAND, SOME SILT
52–61" YELLOW–BROWN FINE SAND
61–120" GRAY–DARK BROWN MED. SAND WITH GRAVEL & COBBLES

NO MOTTLING
NO WATER
NO LEDGE
ROOTS TO 35"
RESTRICTIVE: 120"

TP 317
0–11" TOPSOIL
11–29" ORANGE BROWN FINE SANDY LOAM
29–39" ORANGE BROWN FINE SANDY LOAM WITH COBBLES
39–116 GRAY–DARK BROWN MED. SAND WITH GRAVEL & COBBLES

NO MOTTLING
NO WATER
NO LEDGE
ROOTS TO 45"
RESTRICTIVE: 116"

APPROVED BY THE LEDYARD PLANNING AND ZONING COMMISSION AS TO THE COMPLIANCE WITH THE REGULATIONS GOVERNING THE SUBDIVISION OF LAND.

ALL IMPROVEMENTS SHALL BE COMPLETED BY _____ DATE

_____ CHAIRMAN OR SECRETARY _____ DATE

EROSION AND SEDIMENT CONTROL PLAN CERTIFIED BY THE AFFIRMATIVE VOTE OF THE LEDYARD PLANNING AND ZONING COMMISSION ON DATE

LOT NUMBERS ASSIGNED BY THE ASSESSOR

_____ ASSESSOR _____ DATE

DIETER & GARDNER
LAND SURVEYORS • PLANNERS
1641 CONNECTICUT ROUTE 12
P.O. BOX 335
GALES FERRY, CT. 06335
(860) 464–7455
EMAIL: DIETER.GARDNER@YAHOO.COM

PLAN SHOWING
AFFORDABLE HOUSING
DEVELOPMENT PER C.G.S §8–30g
DEEP TEST PIT DATA
RESUBDIVISION
PROPERTY OF
AVERY BROOK HOMES LLC
96, 98 & 100 STODDARDS WHARF ROAD
A.K.A.
CONNECTICUT ROUTE 214
PARCEL ID: 65–2360–96/98/100
LEDYARD, CONNECTICUT
MARCH 2024
REVISED: APRIL 19, 2024

PERCOLATION TESTS PERFORMED ON MAY 26 & 27, JUNE 3 AND JUNE 10, 2022 BY DIETER & GARDNER, INC. (JODY TERRY AND MATT EMILYTA)

1 AVERY COURT AT PIT 41/42
29" DEEP

TIME	READING
8:43	5"
8:48	10 3/4"
8:53	15"
8:58	17 1/2"
9:03	19 1/2"
9:08	21"
9:13	22"
9:18	23"
9:23	23 3/4"
9:28	24 1/2"
9:33	25 1/2"

PERC RATE: 1"/5 MINS.

1 AVERY COURT AT PIT 43/44
26" DEEP

TIME	READING
8:40	5 1/2"
8:45	9 1/2"
8:50	11 1/2"
8:55	14"
9:00	15 1/2"
9:05	16 1/2"
9:10	17 3/4"
9:15	18 1/2"
9:20	19 1/2"
9:25	20 1/2"
9:30	21 1/2"

PERC RATE: 1"/5 MINS.

2 AVERY COURT AT PIT 47/48
28" DEEP

TIME	READING
1:38	5"
1:43	11"
1:48	13 1/2"
1:53	16"
1:58	18"
2:03	19"
2:08	20 1/8"
2:13	21 1/2"
2:18	22 1/2"
2:23	23 1/2"
2:28	24 1/2"

PERC RATE: 1"/5 MINS.

2 AVERY COURT AT PIT 51/52
29" DEEP

TIME	READING
1:50	4 1/4"
1:55	11 7/8"
2:00	15 1/2"
2:05	18"
2:10	21"
2:15	23"
2:20	25"
2:25	27"
2:30	28 7/8"
2:35	DRY

PERC RATE: 1"/2.7 MINS.

2 AVERY COURT AT PIT 55/56
30" DEEP

TIME	READING
1:30	2 1/2"
1:35	9 1/2"
1:40	13 1/2"
1:45	15"
1:50	17 1/2"
1:55	20"
2:00	21 1/2"
2:05	22 1/2"
2:10	23 1/2"
2:15	24 1/2"

PERC RATE: 1"/5 MINS.

3 AVERY COURT AT PIT 39/40
30" DEEP

TIME	READING
8:41	4"
8:46	8 1/4"
8:51	10 1/4"
8:56	12 1/2"
9:01	15"
9:06	17"
9:11	18"
9:16	19"
9:21	20"
9:26	21"
9:31	22"

PERC RATE: 1"/5 MINS.

4 AVERY COURT AT PIT 59/60
29" DEEP

TIME	READING
10:49	3"
10:54	11"
10:59	15"
11:04	18 1/2"
11:09	20 1/2"
11:14	22"
11:19	23 1/2"
11:24	25"
11:29	26 1/2"

PERC RATE: 1"/3.3 MINS.

4 AVERY COURT AT PIT 57/58
30" DEEP

TIME	READING
1:27	2 1/2"
1:32	8 1/4"
1:37	13"
1:42	15 1/2"
1:47	18"
1:52	19 1/2"
1:57	21 1/2"
2:02	23"
2:07	24 1/2"
2:12	26"

PERC RATE: 1"/3.3 MINS.

5 AVERY COURT AT PIT 37/38
28" DEEP

TIME	READING
10:37	3"
10:42	6 3/4"
10:47	9 1/4"
10:52	12 1/2"
10:57	15"
11:02	17"
11:07	19"
11:12	20"
11:17	21"
11:22	22 1/8"
11:27	23 1/8"

PERC RATE: 1"/5 MINS.

5 AVERY COURT AT PIT 81/82
27" DEEP

TIME	READING
8:48	2"
8:53	9"
8:58	14"
9:03	18"
9:08	20"
9:13	22"
9:18	23"
9:23	24"
9:28	25"
9:33	26"
9:38	DRY

PERC RATE: 1"/5 MINS.

6 AVERY COURT AT PIT 61/62
30" DEEP

TIME	READING
10:18	2 1/2"
10:23	12"
10:28	15 1/2"
10:33	19 1/2"
10:38	21"
10:43	22 1/2"
10:48	24"
10:53	25"
10:58	25 3/4"
11:03	26 3/4"

PERC RATE: 1"/6 MINS.

6 AVERY COURT AT PIT 63/64
29" DEEP

TIME	READING
11:46	3"
11:51	6 1/2"
11:56	9"
12:01	12"
12:06	13 1/2"
12:11	14 1/2"
12:16	16"
12:21	17 1/2"
12:26	18 1/2"
12:31	19 1/2"
12:36	20 1/2"

PERC RATE: 1"/5 MINS.

8 AVERY COURT AT PIT 69/70
28" DEEP

TIME	READING
10:15	3"
10:20	11 1/2"
10:25	16 1/2"
10:30	21"
10:35	24"
10:40	25 1/2"
10:45	27"
10:50	DRY

PERC RATE: 1"/3.3 MINS.

8 AVERY COURT AT PIT 67/68
29" DEEP

TIME	READING
11:46	3"
11:51	6 1/2"
11:56	9"
12:01	12"
12:06	13 1/2"
12:11	14 1/2"
12:16	16"
12:21	17 1/2"
12:26	18 1/2"
12:31	19 1/2"
12:36	20 1/2"

PERC RATE: 1"/5 MINS.

8 AVERY COURT AT PIT 65/66
29" DEEP

TIME	READING
12:30	3"
12:35	12"
12:40	17 1/2"
12:45	20"
12:50	23"
12:55	25"
1:00	26 1/2"
1:05	28"
1:10	DRY

PERC RATE: 1"/3.3 MINS.

9 AVERY COURT AT PIT 35/36
28" DEEP

TIME	READING
10:45	3"
10:50	12"
10:55	14 1/4"
11:00	15 1/4"
11:05	17 1/4"
11:10	19 1/4"
11:15	21"
11:20	22 1/4"
11:25	23 1/4"
11:30	24 1/2"
11:35	25 3/4"

PERC RATE: 1"/4 MINS.

13 AVERY COURT AT PIT 31/32
30" DEEP

TIME	READING
10:41	9"
10:46	12 1/2"
10:51	15"
10:56	17"
11:01	19"
11:06	19 1/2"
11:11	20 1/2"
11:16	21 1/2"
11:21	22 1/2"
11:26	23 1/2"

PERC RATE: 1"/5 MINS.

13 AVERY COURT AT PIT 33/34
30" DEEP

TIME	READING
10:39	7"
10:44	11"
10:49	15"
10:54	19 1/2"
10:59	20 1/2"
11:04	22"
11:09	23"
11:14	24"
11:19	25"
11:24	25 3/4"

PERC RATE: 1"/6.7 MINS.

14 AVERY COURT AT PIT 79/80
29" DEEP

TIME	READING
11:45	3"
11:50	7 3/4"
11:55	11 1/2"
12:00	13 3/4"
12:05	16"
12:10	18"
12:15	20"
12:20	21"
12:25	22 1/4"
12:30	23 1/2"
12:35	25"

PERC RATE: 1"/4 MINS.

15 AVERY COURT AT PIT 29/30
32" DEEP

TIME	READING
11:24	3 1/2"
11:29	17 1/2"
11:34	21"
11:39	23 1/2"
11:44	25 1/2"
11:49	27 1/2"
11:54	29"
11:59	30 1/2"
12:04	DRY

PERC RATE: 1"/3.3 MINS.

16 AVERY COURT AT PIT 17/18
29" DEEP

TIME	READING
1:41	4"
1:46	10"
1:51	13"
1:56	15 1/2"
2:01	17 1/2"
2:06	19"
2:11	20 1/2"
2:16	22"
12:25	22 1/4"
12:30	23 1/2"
12:35	25"

PERC RATE: 1"/4 MINS.

18 AVERY COURT AT PIT 77/78
29" DEEP

TIME	READING
11:45	3"
11:50	7 3/4"
11:55	11 1/2"
12:00	13 3/4"
12:05	16"
12:10	18"
12:15	20"
12:20	21"
12:25	22 1/4"
12:30	23 1/2"
12:35	25"

PERC RATE: 1"/4 MINS.

PERCOLATION TESTS PERFORMED ON APRIL 22, 2024 BY DIETER & GARDNER, INC.

7 AVERY COURT AT PIT 316/317
30" DEEP

TIME	READING
11:47	4"
11:52	11"
11:57	15"
12:02	18 3/4"
12:07	21 1/4"
12:12	23"
12:17	24 1/2"
12:22	26"
12:27	27 1/4"

PERC RATE: 1"/4 MINS.

8 AVERY COURT AT PIT 302/303
30" DEEP

TIME	READING
8:00	3"
8:05	11"
8:10	13 1/2"
8:15	15 1/2"
8:20	17 1/2"
8:25	19"
8:30	20 3/4"
8:35	22"
8:40	23 1/4"

PERC RATE: 1"/4 MINS.

10 AVERY COURT AT PIT 300/301
32" DEEP

TIME	READING
7:58	3 1/2"
8:03	8 1/2"
8:08	13"
8:13	15"
8:18	17"
8:23	19 1/2"
8:28	21"
8:33	22"
8:38	23"

PERC RATE: 1"/5 MINS.

11 AVERY COURT AT PIT 312/313
29" DEEP

TIME	READING
10:19	3"
10:24	10 1/2"
10:29	15 1/4"
10:34	17 1/4"
10:39	19"
10:44	20 1/2"
10:49	22"
10:54	23 1/2"
10:59	25"

PERC RATE: 1"/3.33 MINS.

12 AVERY COURT AT PIT 304/305
32" DEEP

TIME	READING
8:45	4"
8:50	10 1/2"
8:55	13 1/2"
9:00	15 1/2"
9:05	17 1/2"
9:10	18 3/4"
9:15	19 1/2"
9:20	20 1/2"
9:25	21 1/2"

PERC RATE: 1"/5 MINS.

13 AVERY COURT AT PIT 314/315
28" DEEP

TIME	READING
11:45	5"
11:50	9"
11:55	11 1/2"
12:00	13 1/2"
12:05	15 1/4"
12:10	16 3/4"
12:15	18"
12:20	19"
12:25	20"

PERC RATE: 1"/5 MINS.

15 AVERY COURT AT PIT 310/311
30" DEEP

TIME	READING
9:34	5"
9:39	11"
9:44	13 1/2"
9:49	15 1/2"
9:54	17 1/4"
9:59	19"
10:04	20 1/2"
10:09	21 3/4"
10:14	22 3/4"

PERC RATE: 1"/5 MINS.

16 AVERY COURT AT PIT 306/307
31" DEEP

TIME	READING
8:47	5"
8:52	9 1/4"
8:57	12 1/4"
9:02	14"
9:07	15 1/2"
9:12	16 3/4"
9:17	18"
9:22	19"
9:27	20"

PERC RATE: 1"/5 MINS.

17 AVERY COURT AT PIT 308/309
29" DEEP

TIME	READING
9:32	4"
9:37	10 1/2"
9:42	15 1/4"
9:47	19 1/4"
9:52	21"
9:57	22 1/2"
10:02	23 3/4"
10:07	24 3/4"
10:12	25 3/4"

PERC RATE: 1"/5 MINS.

APPROVED BY THE LEDYARD PLANNING AND ZONING COMMISSION AS TO THE COMPLIANCE WITH THE REGULATIONS GOVERNING THE SUBDIVISION OF LAND.

ALL IMPROVEMENTS SHALL BE COMPLETED BY _____ DATE

_____ CHAIRMAN OR SECRETARY

_____ DATE

EROSION AND SEDIMENT CONTROL PLAN CERTIFIED BY THE AFFIRMATIVE VOTE OF THE LEDYARD PLANNING AND ZONING COMMISSION ON _____ DATE

LOT NUMBERS ASSIGNED BY THE ASSESSOR

_____ ASSESSOR

_____ DATE

DIETER & GARDNER
LAND SURVEYORS • PLANNERS
1641 CONNECTICUT ROUTE 12
P.O. BOX 335
GALES FERRY, CT. 06335
(860) 464-7455
EMAIL: DIETER.GARDNER@YAHOO.COM

SANITARY DESIGN CRITERIA

A. ALL PRIMARY AND SEPTIC SYSTEM DESIGNS ARE LAYED OUT FOR THREE-BEDROOM HOMES. NO TUBS OVER 100 GALLONS IN SIZE OR GARBAGE DISPOSAL INTO SEPTIC SYSTEM PLANNED.

B. THREE BEDROOM HOMES AT A PERC RATE OF 10.0 MIN/INCH OR LESS REQUIRES 495 S.F. OF EFFECTIVE LEACHING AREA.

C. GST 6236 LEACHING SYSTEM SELECTED FOR LEACHING SYSTEM DESIGN.
MINIMUM REQUIRED AREA IS 495 S.F.

6236 SYSTEM REQUIRES 20 L.F.

HF = HYDRAULIC FACTOR BASED ON GRADIENT AND DEPTH TO RESTRICTION
FF = FLOW FACTOR, 1.5 FOR THREE BEDROOM HOME DESIGN
PF = PERC FACTOR, 1.0 PERCOLATION RATE UP TO 10.0 MIN/INCH.

MLSS TABLE (NOT APPLICABLE)

STREET ADDRESS	GRADIENT	RESTRICTION	HF	FF	PF	SYSTEM
1	MLSS	NOT	APPLICABLE	1.5	1.0	20 L.F. GST 6236
2	MLSS	NOT	APPLICABLE	1.5	1.0	20 L.F. GST 6236
3	MLSS	NOT	APPLICABLE	1.5	1.0	20 L.F. GST 6236
4	MLSS	NOT	APPLICABLE	1.5	1.0	20 L.F. GST 6236
5	MLSS	NOT	APPLICABLE	1.5	1.0	20 L.F. GST 6236
6	MLSS	NOT	APPLICABLE	1.5	1.0	20 L.F. GST 6236
7	MLSS	NOT	APPLICABLE	1.5	1.0	20 L.F. GST 6236
8	MLSS	NOT	APPLICABLE	1.5	1.0	20 L.F. GST 6236
9	MLSS	NOT	APPLICABLE	1.5	1.0	20 L.F. GST 6236
10	MLSS	NOT	APPLICABLE	1.5	1.0	20 L.F. GST 6236
11	MLSS	NOT	APPLICABLE	1.5	1.0	40 L.F. GST 6236
12	MLSS	NOT	APPLICABLE	1.5	1.0	20 L.F. GST 6236
13	MLSS	NOT	APPLICABLE	1.5	1.0	20 L.F. GST 6236
14	MLSS	NOT	APPLICABLE	1.5	1.0	20 L.F. GST 6236
15	MLSS	NOT	APPLICABLE	1.5	1.0	20 L.F. GST 6236
16	MLSS	NOT	APPLICABLE	1.5	1.0	20 L.F. GST 6236
17	MLSS	NOT	APPLICABLE	1.5	1.0	20 L.F. GST 6236
18	MLSS	NOT	APPLICABLE	1.5	1.0	20 L.F. GST 6236

PLAN SHOWING
AFFORDABLE HOUSING
DEVELOPMENT PER C.G.S §8-30g
PERCOLATION TEST DATA
AND
SEPTIC SYSTEM DESIGN CRITERIA
RESUBDIVISION
PROPERTY OF
AVERY BROOK HOMES LLC
96, 98 & 100 STODDARDS WHARF ROAD
A.K.A.
CONNECTICUT ROUTE 214
PARCEL ID: 65-2360-96/98/100
LEDYARD, CONNECTICUT
MARCH 2024

REVISED: APRIL 24, 2024
REVISED: MAY 13, 2024 TO ADDRESS LLHD COMMENTS

EROSION & SEDIMENT CONTROL PLAN

SHALL BE IN ACCORDANCE WITH THE STATE OF CONNECTICUT GUIDELINES FOR EROSION AND SEDIMENT CONTROL DATED MARCH 2024.

NARRATIVE:

PURPOSE AND DESCRIPTION OF PROJECT:

THE PURPOSE OF THIS PROJECT IS TO SUBDIVIDE 6.38 ACRES OF LAND TO CREATE 18 RESIDENTIAL BUILDING LOTS. EACH LOT WILL BE SERVICED BY ON SITE WELL AND SEPTIC SYSTEM.
APPROXIMATELY 510 LINEAR FEET OF ROAD WILL BE CONSTRUCTED. THE PAVEMENT WIDTH IS 22 FEET.
THE TOTAL AREA OF NEW PAVEMENT ASSOCIATED WITH THE ROAD CONSTRUCTION WILL BE APPROXIMATELY 16,100 SQUARE FEET.
ROAD DRAINAGE HAS BEEN DESIGNED BY A PROFESSIONAL ENGINEER, AND INCLUDES CURBED PAVEMENT AND CATCH BASINS WITH 2 FOOT SUMP DEPTHS. THE UPLANDS ARE GENTLY SLOPING AND MOSTLY OLD PASTURE.
THE UPLAND SOILS ON THE PROJECT SITE INCLUDE WELL DRAINED CANTON HINCKLEY AND AGAWAM SOILS.

IT IS ANTICIPATED THAT ONCE WORK ON THE PUBLIC IMPROVEMENTS BEGINS, IT WILL CONTINUE UNTIL THE PROJECT IS COMPLETED. IT IS ANTICIPATED THAT THE ROAD CONSTRUCTION WILL BE COMPLETED WITHIN ONE YEAR OF COMMENCEMENT.

PETER GARDNER 860-464-7455 (OR OWNER AT TIME OF CONSTRUCTION) SHALL BE RESPONSIBLE FOR OVERSEEING THE INSTALLATION AND PROPER MAINTENANCE OF ANY EROSION & SEDIMENT CONTROL MEASURES EMPLOYED IN IMPLEMENTING THIS PLAN.

TOTAL AREA OF THE PROJECT SITE AND THE TOTAL AREA OF THE SITE THAT IS EXPECTED TO BE DISTURBED BY ROAD AND DRAINAGE CONSTRUCTION ACTIVITIES.

THE TOTAL PROJECT AREA IS 6.38 ACRES OF WHICH APPROXIMATELY 0.5± ACRES WILL BE DISTURBED TO FACILITATE THE CONSTRUCTION OF THE ROAD AND DRAINAGE.
ESTIMATE OF TOTAL AREA TO BE DISTURBED APPROXIMATELY 2.5± ACRES FOR HOME/DRIVE AND SEPTIC CONSTRUCTION.

PLANNED START AND COMPLETION DATES FOR THE PROJECT.

IT IS ANTICIPATED THAT THE PROJECT WILL COMMENCE DURING FALL OF 2024 AND BE COMPLETED IN THE FALL OF 2028.

DESIGN CRITERIA, CONSTRUCTION DETAILS AND MAINTENANCE PROGRAM FOR THE EROSION & SEDIMENT CONTROL MEASURES TO BE USED.

SILT FENCE AND SILT FENCE BACKED WITH HAY BALES FOR STRUCTURAL SUPPORT WILL BE USED. ALL SILT FENCE SEDIMENT BARRIERS SHALL BE MAINTAINED SUCH THAT SEDIMENTS WILL BE REMOVED WHEN REACHING A HEIGHT OF 0.5 FEET. BREACHES IN SILT FENCE SHALL BE REPAIRED IMMEDIATELY. THE SILT FENCE SHALL BE INSPECTED AT LEAST WEEKLY AND AFTER EACH RAINFALL OF 0.5 INCH IN A 24 HOUR PERIOD.

CONSTRUCTION ENTRANCE DESIGN AND MAINTENANCE CRITERIA FROM 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL. ENTRANCE. THE CONSTRUCTION ENTRANCES WILL BE CONSTRUCTED OF ANGULAR STONE IN A SIZE AND GRADATION CORRESPONDING TO ASTM C-33, SIZE NO. 2 OR 3, OR DOT STANDARD SPECIFICATIONS SECTION M.01.01 SIZE #3. THE CONSTRUCTION ENTRANCE WILL BE 12 FEET WIDE AND 50 FEET LONG.

CONSTRUCTION: CONSTRUCTION ENTRANCE AREA WILL BE CLEARED AND GRUBBED. AREAS WILL THEN BE ROUGH GRADED. A 4-INCH LAYER OF CRUSHED STONE WILL BE SPREAD AS DEPICTED IN THE DETAILS.

MAINTENANCE: THE CONSTRUCTION ENTRANCE WILL BE MAINTAINED IN A CONDITION THAT WILL MITIGATE TRACKING AND WASHING OF SEDIMENT ONTO PAVED SURFACES. THE CONSTRUCTION ENTRANCE WILL BE TOP DRESSED AS NEEDED TO PROVIDE FUNCTIONALITY. ADDITIONAL LENGTH MAY BE ADDED IF ON-SITE CONDITIONS WARRANT SUCH EXTENSION. ANY ACCUMULATED OR SPILLED SEDIMENTS WILL BE CLEANED IMMEDIATELY, AND DISPOSED OF IN A MANNER WHICH IS CONSISTENT WITH THE INTENT OF THIS EROSION & SEDIMENT CONTROL PLAN.

STOCKPILE MANAGEMENT WILL BE DONE IN ACCORDANCE WITH THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL (CHAPTER 4). TOPSOIL STOCKPILES WILL BE LOCATED AS DEPICTED ON THE PLANS, AND WILL BE TREATED AS DISTURBED GROUND, I.E.: SURROUNDED BY SILT FENCE, AND SEEDED TO GRASS AFTER ALL THE TOPSOIL TO BE STRIPPED IS PLACED IN THE STOCKPILE. STOCKPILE SLOPES SHALL NOT EXCEED 2:1.

TOPSOILING SHALL TAKE PLACE AS AREAS ARE BROUGHT TO GRADE. THE TOPSOIL THAT SHALL BE SPREAD IS OF NATURAL ORIGIN AND WILL BE TAKEN FROM THE TOPSOIL STOCKPILE(S) REFERRED TO ABOVE. STONES LARGER THAN 2 INCHES IN DIAMETER AND OTHER DEBRIS WILL BE REMOVED FROM THE TOPSOIL WITH A RAKE. TOPSOIL SHALL BE SPREAD AT A MINIMUM DEPTH OF 4 INCHES OVER ALL DISTURBED AREAS. IN ORDER TO "BOND" THE TOPSOIL TO THE SUBSOIL, THE SUBGRADE WILL BE LOOSENED BY "TRACKING" WITH A BULLDOZER IMMEDIATELY BEFORE APPLYING TOPSOIL. TOPSOIL WILL NOT BE PLACED IF THE SUBGRADE OR THE TOPSOIL IS FROZEN OR TOO WET. HEAVY RUBBER-TIRED VEHICLES WILL BE EXCLUDED FROM THE NEWLY TOPSOILED AREAS TO PREVENT EXCESSIVE COMPACTION WHICH COULD HINDER SEED GERMINATION AND SEEDLING GROWTH.

PERMANENT SEEDING WILL BE DONE AS DISTURBED AREAS ARE BROUGHT TO GRADE AND TOPSOILED AS LONG AS SUCH SEEDING IS DONE BETWEEN APRIL 1 AND JULY OR AUGUST 15 THROUGH OCTOBER 31. WITHIN 7 DAYS AFTER TOPSOIL IS APPLIED THE APPROPRIATE SEED MIX WILL BE BROADCAST AT THE PRESCRIBED RATE FOR THAT PARTICULAR MIX. THE SELECTED SEED MIX WILL BE FROM THE 2002 CONNECTICUT GUIDELINES FOR EROSION AND SEDIMENT CONTROL, FIGURE PS-3. PRIOR TO SEEDING, FERTILIZER WILL BE APPLIED AT THE RATE OF 7.5 PER 1,000 SQUARE FEET (10-10-10 OR EQUIVALENT), AND GROUND LIMESTONE WILL BE APPLIED AT THE RATE OF 200 POUNDS PER 1,000 SQUARE FEET. THE LIME AND FERTILIZER WILL BE LIGHTLY WORKED TO A DEPTH OF 3 TO 4 INCHES. SEED SHALL BE APPLIED UNIFORMLY USING A CYCLONE SEEDER (HYDROSEEDING MAY BE USED IN LIEU OF CONVENTIONAL SEEDING METHODS.) HAY MULCH WILL BE APPLIED AT THE RATE OF 100 POUNDS (APPROXIMATELY 2 BALES) PER 1,000 SQUARE FEET. WHERE SLOPES EXCEED 10 PERCENT, JUTE NETTING SHALL BE USED TO ANCHOR THE HAY MULCH IN PLACE. ANY SUCH NETTING WILL BE INSTALLED TO MANUFACTURER'S RECOMMENDATIONS.

MAINTENANCE: THE SEEDBED WILL BE INSPECTED AT LEAST ONCE PER WEEK, AND WITHIN 24 HOURS OF A RAINFALL IN AN AMOUNT EXCEEDING 0.5 INCHES IN 24 HOURS. IN ANY AREAS THAT SUSTAIN DAMAGE, THE TOPSOIL WILL BE REAPPLIED AND SMOOTHED, AND RESEEDED AS DESCRIBED ABOVE. THE NEWLY ESTABLISHED GRASS WILL NOT BE MOWN UNTIL IT REACHES A HEIGHT OF 6 INCHES. MOWING WILL NOT TAKE PLACE WHEN THE GROUND SURFACE IS WET. THE FIRST MOWING WILL TAKE 33 TO 50 PERCENT OF THE GRASS HEIGHT (I.E.: NOT BELOW 3 INCHES). MULCH MATERIALS WILL NOT BE REMOVED, BUT WILL BE ALLOWED TO DISINTEGRATE OVER TIME.

WHERE BARE GROUND NEEDS TO BE PROTECTED FOR RELATIVELY SHORT PERIODS, OR WHERE THE SEEDING SEASONS FOR PERMANENT SEEDINGS CAN NOT BE ADHERED TO, TEMPORARY SEEDING MAY BE USED. THE RECOMMENDED SEED MIX WILL VARY UPON CIRCUMSTANCES, BUT SHALL BE IN COMPLIANCE WITH THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, FIGURE TS-2, TEMPORARY SEEDING RATES AND DATES. WHERE THE SEASON PRECLUDES ANY TYPE OF SEEDING, AN ANCHORED MULCH WILL BE EMPLOYED TO PROTECT BARE SOIL AREAS.

CONSTRUCTION SEQUENCE. PRIOR TO THE COMMENCEMENT OF ANY EARTH DISTURBANCES, THE DEVELOPER AND HIS CONTRACTOR SHALL MEET WITH TOWN STAFF FOR A PRECONSTRUCTION CONFERENCE.

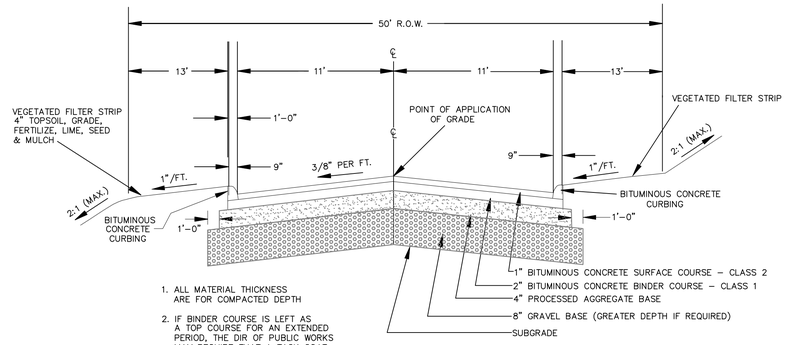
1) INSTALL CONSTRUCTION ENTRANCE AS SHOWN ON PLAN.
2) INSTALL EROSION AND SEDIMENT CONTROL.
3) STRIP TOPSOIL FROM THE ROADWAY AND STOCKPILE TOPSOIL ACCORDING TO THE PLAN. SEED STRIPPED AREAS THAT ARE NOT TO BE WORKED FOR 30 DAYS IMMEDIATELY WITH PERENNIAL RYEGRASS AT THE RATE OF 40 LBS./ACRE.
4) GRADE THE ROAD TO ATTAIN THE PLANNED SUBGRADE PROFILE AND GRADE SIDESLOPES TO PLAN.
5) APPLY TOPSOIL AND PERMANENT SEED MIX AND APPLY AND ANCHOR MULCH TO ALL FINISHED SLOPES.
6) INSTALL ALL DRAINAGE STARTING AT OUTFALLS AND PROCEEDING UPGRADIENT. THE CONTRACTOR WILL ENSURE THAT ADEQUATE PROTECTION IS PROVIDED AT THE OUTLETS OF THE DRAINAGE SYSTEM SO THAT SEDIMENTS WILL BE PREVENTED FROM MIGRATING OFF THE SITE. NO WATER WILL BE ALLOWED TO ENTER THE DRAINAGE SYSTEM UNTIL THE OUTLETS ARE PROTECTED. ALL DRAINAGE COMPONENTS WILL BE CHECKED ON A REGULAR BASIS AND CLEANED AS NEEDED TO MAINTAIN PROPER FUNCTION.
7) PLACE, GRADE AND COMPACT THE SUBGRADE AGGREGATE TO ESTABLISH THE ROADWAY BASE. TOPSOIL AND GRADE ALL SLOPES/DISTURBED AREAS WITHIN 2 FEET OF THE OUTSIDE OF THE PROPOSED CURBS.
8) LAY DOWN FIRST COURSE OF BITUMINOUS PAVEMENT.
9) INSTALL CURBING.
10) APPLY TOP COURSE OF BITUMINOUS PAVEMENT.
11) REMOVE SILT FENCE AFTER TOPSOIL STABILIZED.

DISPOSAL OF SEDIMENTS – ANY SEDIMENT REMOVED FROM ANY EROSION AND SEDIMENT CONTROL MEASURE AS PART OF SITE MAINTENANCE SHALL BE DISPOSED OF IN A MANNER CONSISTENT WITH THE INTENT OF THIS PLAN. NO SEDIMENT SHALL BE DEPOSITED IN ANY WETLAND AREA.

FIELD CHANGES – IF FIELD MODIFICATIONS OF PLANNED MEASURES ARE NEEDED TO PROPERLY ADDRESS ANY EROSION OR SEDIMENTATION SITUATION, SUCH CHANGES MAY BE MADE ONLY AFTER NOTIFYING TOWN STAFF. ADDITIONAL NON-STRUCTURAL MEASURES MAY BE ADDED WITHOUT PRIOR NOTIFICATION.

STORMWATER SYSTEM OPERATION AND MAINTENANCE NOTES:

-PROVIDE ANNUAL STREET SWEEPING, PREFERABLY AFTER FINAL SNOW MELT TO ALLEVIATE SEDIMENT BUILDUP IN CATCH BASIN SUMPS AND TO INSURE EFFICIENT TSS REMOVAL FROM STORMWATER
– REMOVE SEDIMENT FROM CATCH BASIN SUMPS WHEN SEDIMENT REACHES HALF THE DEPTH OF THE SUMP.
-INSPECT CATCH BASINS FOR TRASH AND DEBRIS BI-ANNUALLY. REMOVE ACCUMULATED SEDIMENT AND DEBRIS FROM PIPE INLETS AND OUTLETS TO PREVENT CLOGGING.
– REMOVE ACCUMULATED TRASH AND LEAVES FROM CATCH BASIN GRATES TO INSURE ADEQUATE GRATE INFLOW CAPACITIES.



1. ALL MATERIAL THICKNESS ARE FOR COMPACTED DEPTH
2. IF BINDER COURSE IS LEFT AS A TOP COURSE FOR AN EXTENDED PERIOD, THE DIR OF PUBLIC WORKS MAY REQUIRE THAT A TACK COAT OF BITUMINOUS MATERIAL MAY BE APPLIED BEFORE LAYING THE BITUMINOUS CONCRETE SURFACE COURSE.
3. SUBBASE DEPTH SHALL BE INCREASED TO 18" WHERE LEDGE ROCK IS ENCOUNTERED.
4. FOR CONSTRUCTION MATERIAL STANDARDS, REFER TO STATE OF CONNECTICUT, STANDARD SPECIFICATIONS FOR ROADS, BRIDGES AND INCIDENTAL CONSTRUCTION, FORM 813, AS AMENDED.

AVERY COURT CROSS SECTION

(N.T.S.)

APPROVED BY THE LEDYARD PLANNING AND ZONING COMMISSION AS TO THE COMPLIANCE WITH THE REGULATIONS GOVERNING THE SUBDIVISION OF LAND.

ALL IMPROVEMENTS SHALL BE COMPLETED BY _____ DATE

_____ CHAIRMAN OR SECRETARY _____ DATE

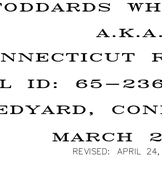
EROSION AND SEDIMENT CONTROL PLAN CERTIFIED BY THE AFFIRMATIVE VOTE OF THE LEDYARD PLANNING AND ZONING COMMISSION ON _____ DATE

LOT NUMBERS ASSIGNED BY THE ASSESSOR

_____ ASSESSOR _____ DATE

TYPICAL COMMON DRIVEWAY CROSS-SECTION

NOT TO SCALE



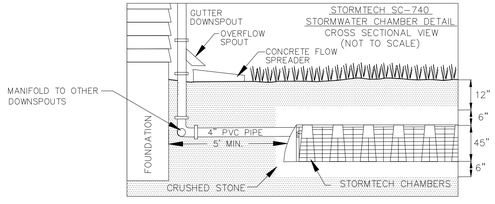
SECURE TO 1 1/2" GALVANIZED STEEL POST WITH (2) 1/4" GALVANIZED BOLTS (1 TOP, 1 BOTTOM)

NOTE:
SIGN TO BE INSTALLED IN ACCORDANCE WITH STATE OF CONNECTICUT D.O.T. STANDARDS

STOP SIGN

NOT TO SCALE

HOMES WILL HAVE ROOF DRAINAGE TIE INTO STORMTECH SC-740 CHAMBER TO INFILTRATE 1" STORM

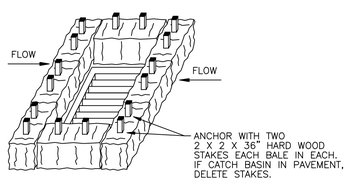


NOTES:

1. PROVIDE STORMTECH CHAMBERS TO CAPTURE 1" RAINFALL FROM THE ROOF OF THE HOME.
2. KEEP ALL TRAFFIC OFF UNITS AFTER CONSTRUCTION.
3. INSTALL CHAMBERS IN ACCORDANCE WITH STORMTECH DESIGN MANUAL.

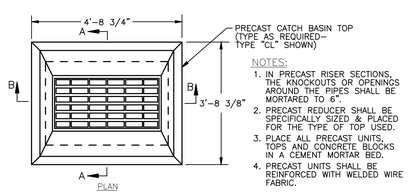
ROOF = 36' X 24' = 864 S.F.
864 S.F. X 0.083 = 71.71 C.F.
18 HOUSES X 864 = 15,552 S.F
15,552 S.F. X 0.083 = 1,290 C.F.

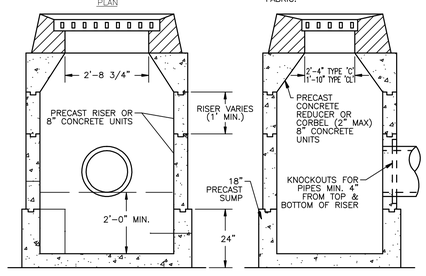
4. PROVIDE LEAF SCREENS AT ALL GUTTERS.



CATCH BASIN INLET PROTECTION

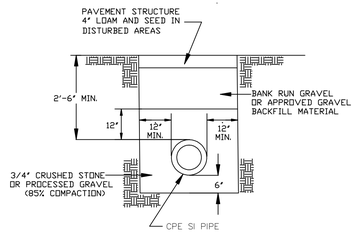
NOT TO SCALE





PRECAST CATCH BASIN

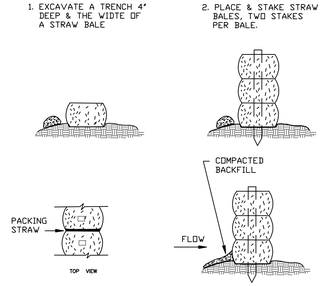
NOT TO SCALE



NOTE:
1. IF PIPE IS PLACED IN OR ON LEDGE, ALL LEDGE WITHIN 12" OF PIPE SHALL BE REMOVED AND REPLACED WITH PIPE BEDDING.

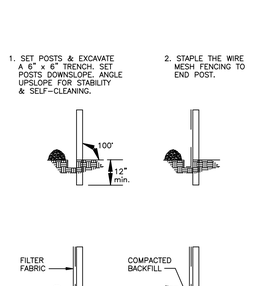
DRAINAGE PIPE TRENCH

NOT TO SCALE



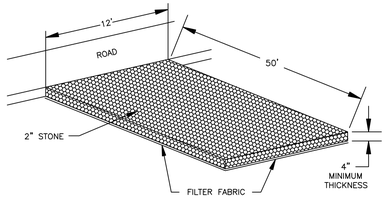
CONSTRUCTION OF A STRAW BALE BARRIER

NOT TO SCALE



FILTER FABRIC SEDIMENT BARRIER

NOT TO SCALE



TEMPORARY CONSTRUCTION ENTRANCE

NOT TO SCALE

DIETER & GARDNER
LAND SURVEYORS • PLANNERS
P.O. BOX 335
1641 CONNECTICUT ROUTE 12
GALES FERRY, CT. 06335
(860) 464-7455
EMAIL: DIETER.GARDNER@YAHOO.COM

PLAN SHOWING
AFFORDABLE HOUSING
DEVELOPMENT PER C.G.S §8-30g
EROSION AND SEDIMENT CONTROL
NARRATIVE AND DETAILS
AND
CONSTRUCTION DETAILS
RESUBDIVISION
PROPERTY OF
AVERY BROOK HOMES LLC
96, 98 AND 100
STODDARDS WHARF ROAD
A.K.A.
CONNECTICUT ROUTE 214
PARCEL ID: 65-2360-96/98/100
LEDYARD, CONNECTICUT
MARCH 2024
REVISED: APRIL 24, 2024

APPROVED BY THE LEDYARD PLANNING AND ZONING COMMISSION AS TO THE COMPLIANCE WITH THE REGULATIONS GOVERNING THE SUBDIVISION OF LAND.

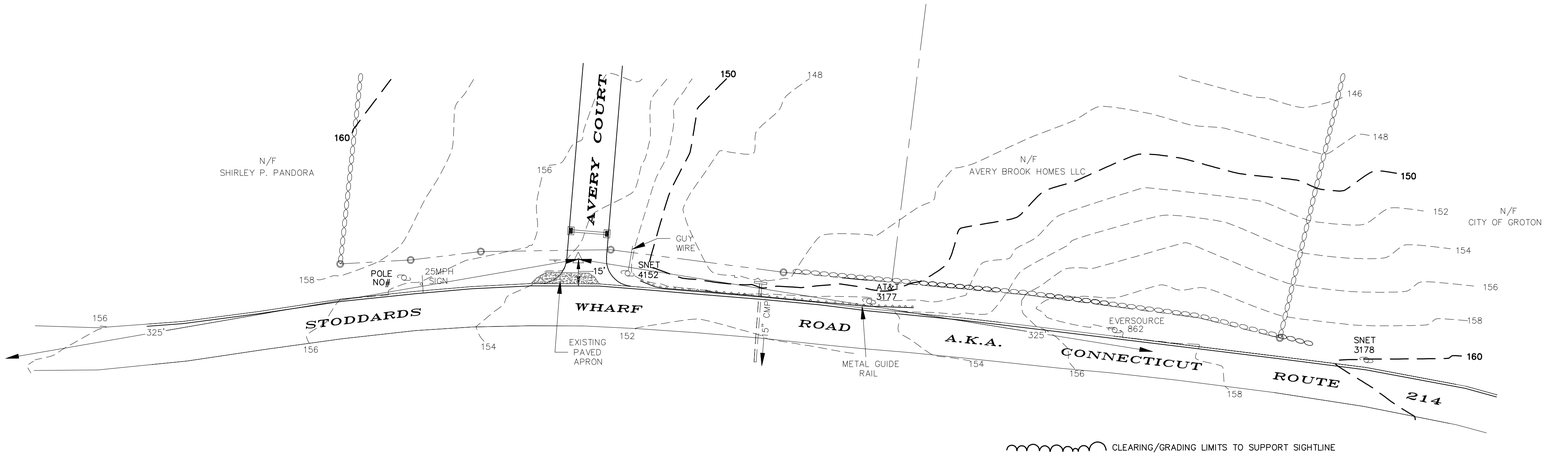
ALL IMPROVEMENTS SHALL BE COMPLETED BY _____ DATE

_____ CHAIRMAN OR SECRETARY _____ DATE

EROSION AND SEDIMENT CONTROL PLAN CERTIFIED BY THE AFFIRMATIVE VOTE OF THE LEDYARD PLANNING AND ZONING COMMISSION ON DATE

LOT NUMBERS ASSIGNED BY THE ASSESSOR

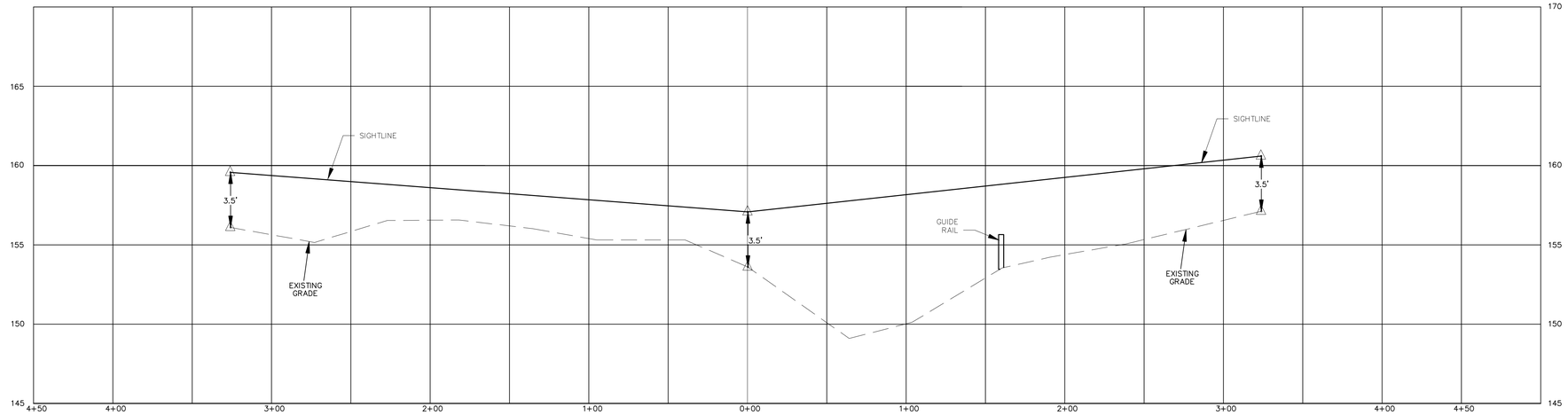
_____ ASSESSOR _____ DATE



GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.
1"=4' Vert.



LEGEND

- STONE WALL
- PROPERTY LINE
- STREET LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- UTILITY POLE

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GALES FERRY, CT. 06335
(860) 464-7455
EMAIL: DIETER.GARDNER@YAHOO.COM

SIGHTLINE DEMONSTRATION PLAN AFFORDABLE HOUSING DEVELOPMENT PER C.G.S §8-30g

PROPERTY OF
AVERY BROOK HOMES LLC
STODDARDS WHARF ROAD
A.K.A.
CONNECTICUT ROUTE 214
PARCEL ID: 65-2360-96/98/100
LEDYARD, CONNECTICUT
SCALE: 1"=40' HORIZ.
1"=4' VERT.
MARCH 2024

APPROVED BY THE LEDYARD PLANNING AND ZONING COMMISSION AS TO THE COMPLIANCE WITH THE REGULATIONS GOVERNING THE SUBDIVISION OF LAND.

ALL IMPROVEMENTS SHALL BE COMPLETED BY ______________
DATE

______________ CHAIRMAN OR SECRETARY ______________ DATE

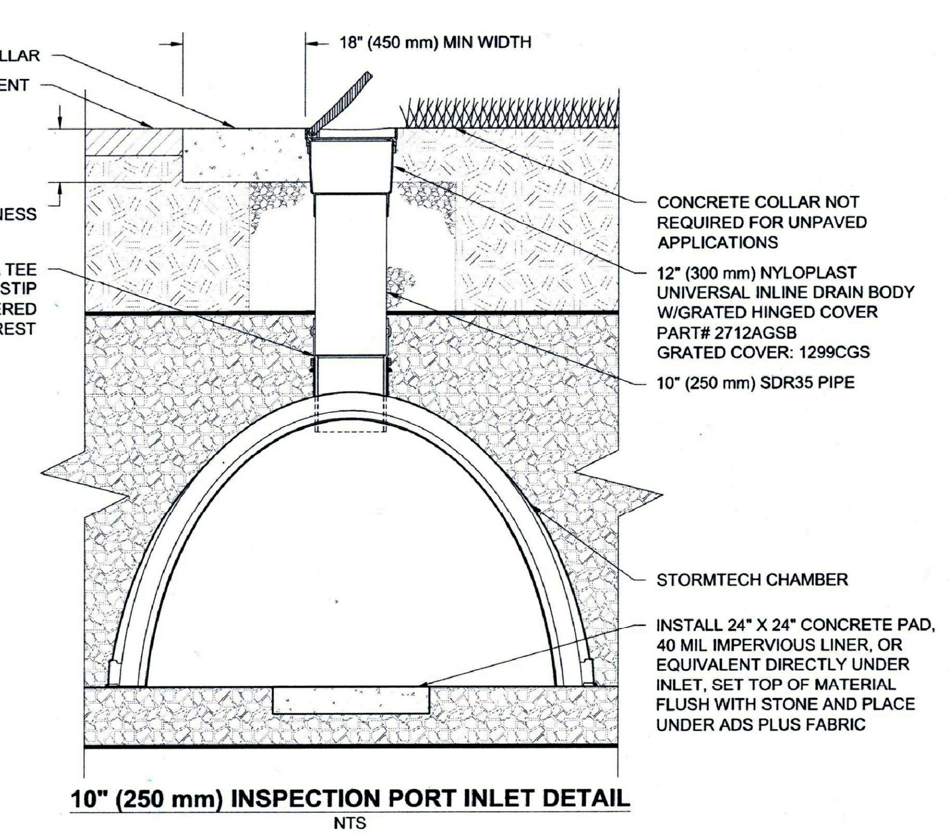
EROSION AND SEDIMENT CONTROL PLAN CERTIFIED BY THE AFFIRMATIVE VOTE OF THE LEDYARD PLANNING AND ZONING COMMISSION ON ______________ DATE

LOT NUMBERS ASSIGNED BY THE ASSESSOR

______________ ASSESSOR ______________ DATE

LEGEND

- STONE WALL
- PROPERTY LINE
- STREET LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- BUILDING SETBACK LINE
- APPROXIMATE DEEP TEST PIT
- APPROXIMATE PERC TEST LOCATION
- UTILITY POLE
- H — CONCEPTUAL HOME
- P — CONCEPTUAL PRIMARY SEPTIC
- R — CONCEPTUAL RESERVE AREA
- W — CONCEPTUAL WELL
- TS — TOPSOIL STOCKPILE
- 8 — STREET ADDRESS
- PROPOSED CATCH BASIN
- D — STORMTECH SC-740
- EASEMENT AREAS (SEE SHEET 2 FOR DETAILS)
- HAYBALES/SILT FENCE/WOODCHIPS
- LIMITS OF DISTURBANCE



10" (250 mm) INSPECTION PORT INLET DETAIL
NTS

STORMTECH CHAMBER MAINTENANCE SCHEDULE:
TWICE YEARLY, END OF MAY AND END OF NOVEMBER, INSPECT AND CLEAN GUTTERS, CHECK STORMTECH UNITS FOR STANDING WATER OR DEBRIS. IF DEBRIS IS IN UNIT, REMOVE WITH A VACUUM TRUCK.

INSPECTION PORT INLET
STORMTECH CHAMBER SYSTEM
DATE: 11/14/23 | DRAWN: JLM
PROJECT #: | CHECKED: CJD

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

ADS StormTech® Chamber System
4640 TRUEMAN BLVD
HILLIARD, OH 43026
888-892-2694
WWW.STORMTECH.COM

1

PLAN SHOWING AFFORDABLE HOUSING DEVELOPMENT PER C.G.S §8-30g RESUBDIVISION PROPERTY OF AVERY BROOK HOMES LLC 96, 98 & 100 STODDARDS WHARF ROAD A.K.A. CONNECTICUT ROUTE 214 PARCEL ID: 65-2360-96/98/100 LEDYARD, CONNECTICUT

SCALE: 1"=40'

MARCH 2024

REVISED: APRIL 24, 2024
REVISED: MAY 13, 2024 TO ADDRESS LLHD COMMENTS

THE STONE WALLS AND/OR FENCES SHOWN AS BOUNDARIES MAY HAVE IRREGULARITIES OF COURSE BETWEEN PRINCIPAL POINTS OF COURSE INDICATED.

THE WORD "CERTIFY" IS UNDERSTOOD TO BE AN EXPRESSION OF THE PROFESSIONAL OPINION BY THE LAND SURVEYOR WHICH IS BASED ON HIS OR HER BEST KNOWLEDGE, INFORMATION AND BELIEF. AS SUCH IT CONSTITUTES NEITHER GUARANTEE OR WARRANTY.

NOTE: BOUNDARY LINES OF ADJOINING PROPERTIES ARE SHOWN FOR GENERAL INFORMATIONAL PURPOSES ONLY AND ARE NOT TO BE CONSTRUED AS BEING ACCURATELY LOCATED OR DEPICTED.

JOB# 22-00718LOT.DWG FBK#327

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

DIETER & GARDNER
LAND SURVEYORS • PLANNERS
1641 CONNECTICUT ROUTE 12
P.O. BOX 335
GALES FERRY, CT. 06335
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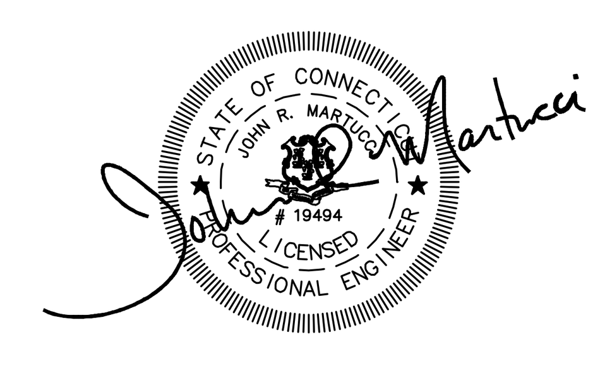
EMAIL: DIETER.GARDNER@YAHOO.COM



SHEET 3 OF 8

THIS MAP AND SURVEY HAS BEEN PREPARED IN ACCORDANCE WITH SECTIONS 20-300B-1 THROUGH 20-300B-20 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES-"MINIMUM STANDARDS OF ACCURACY, CONTENT AND CERTIFICATION FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT", ADOPTED EFFECTIVE JUNE 21, 1996, REVISED OCTOBER 26, 2018. IT IS A BOUNDARY SURVEY BASED ON A DEPENDENT RESURVEY CONFORMING TO HORIZONTAL ACCURACY CLASS "D" AND TOPOGRAPHIC ACCURACY T-2. TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

TITLE: LAND SURVEYOR CT No. 14208

DATE: MARCH 25, 2024

LAND & MARINE
ENGINEERING
SURVEYING
PLANNING

ANGUS McDONALD
GARY SHARPE
& ASSOCIATES, INC.
SINCE 1966

Appendix B

Washed Sieve Analysis Results

WASHED SIEVE ANALYSIS

CLIENT: Avery Brook LLC
DATE: 12/14/2022
SAMPLE: TH 100 42-48", Split 1 of 2

MOIST WEIGHT	=	**0.764 Kg**
TOTAL DRY WEIGHT	=	**0.728 Kg**
DRY WEIGHT AFTER WASH	=	**0.610 Kg**

Sieve Size	(mm)	Weight Retained	% Retained	% Passing
3"	75.0	0.000	0.0%	100.0%
1 1/2"	37.5	0.000	0.0%	100.0%
1"	25.0	0.096	13.2%	86.8%
3/4"	19.0	0.040	5.5%	81.3%
1/2"	12.5	0.028	3.8%	77.5%
#4	4.75	0.060	8.2%	69.2%
#10	2.00	0.048	6.6%	62.6%
#20	0.850	0.054	7.4%	55.2%
#40	0.425	0.058	8.0%	47.3%
#60	0.250	0.078	10.7%	36.5%
#80	0.180	0.056	7.7%	28.8%
#100	0.150	0.020	2.7%	26.1%
#140	0.106	0.042	5.8%	20.3%
#200	0.075	0.030	4.1%	16.2%
Passing #200		0.118	16.2%	

Weight of Material Passing #200 Sieve = Total Dry Weight - Dry Weight After Wash

Water Content **4.95%**

Unified Soil Classification System

Grain Size Comparison

Cobbles	**0.0%**
Coarse Gravel	**18.7%**
Fine Gravel	**12.1%**
Coarse Sand	**6.6%**
Medium Sand	**15.4%**
Fine Sand	**31.0%**
Silt & Clay	**16.2%**
Uniformity Coeff.	**34.39**

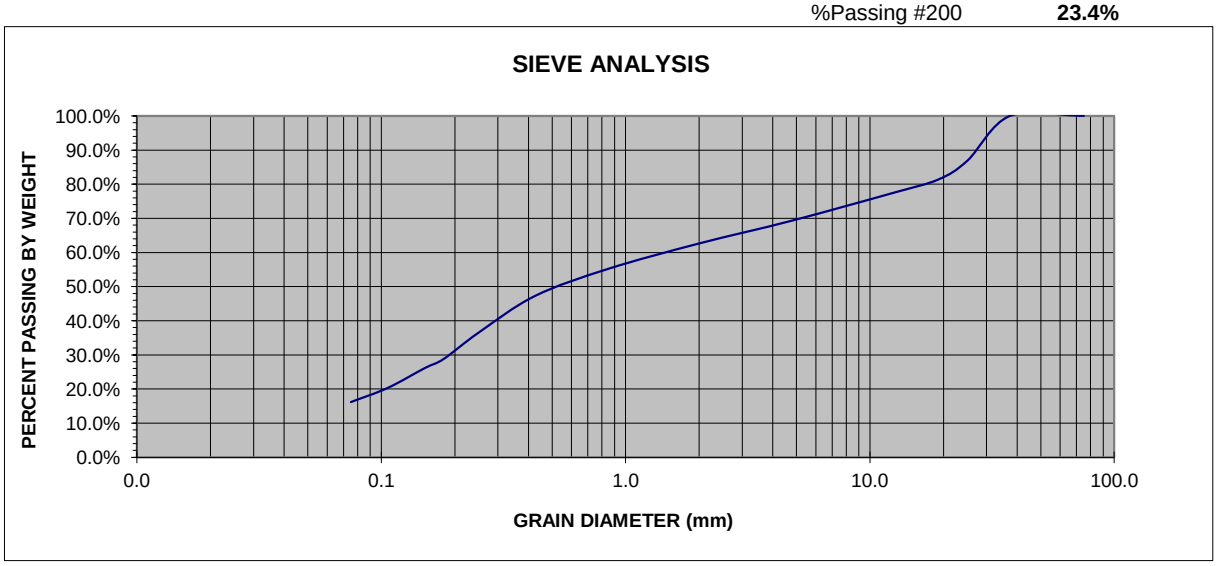
Permeability Range **

Dense	2 ft/day
Loose	7 ft/day

2000 CT. Health Code Septic Fill Specs

%Retained on #4 **30.8%**

% Passing #4-#200 (Fill less Gravel)		**Permitted**
%Passing #4	**100.0%**	**100%**
%Passing #10	**90.5%**	**70%-100%**
%Passing #40	**68.3%**	***10%-50%**
%Passing #100	**37.7%**	**0%-20%**
%Passing #200	**23.4%**	**0%-5%**



* Percent Passing the #40 sieve can be increased to no greater than 75% if the percent passing the #100 sieve does not exceed 10% and the #200 does not exceed 5%.

** Based on empirical relationship by Hazen (1911) relating permeability to the D_{10} grain size.
Accuracy diminishes with >5% passing the #200 Sieve or permeability values <.3 ft/day.
Relationship invalid when D_{10} < .1mm or D_{10} > 3mm

WASHED SIEVE ANALYSIS

CLIENT: Avery Brook LLC
DATE: 12/14/2022
SAMPLE: TH 100 42-48", Split 2 of 2

MOIST WEIGHT	=	**0.858 Kg**
TOTAL DRY WEIGHT	=	**0.82 Kg**
DRY WEIGHT AFTER WASH	=	**0.706 Kg**

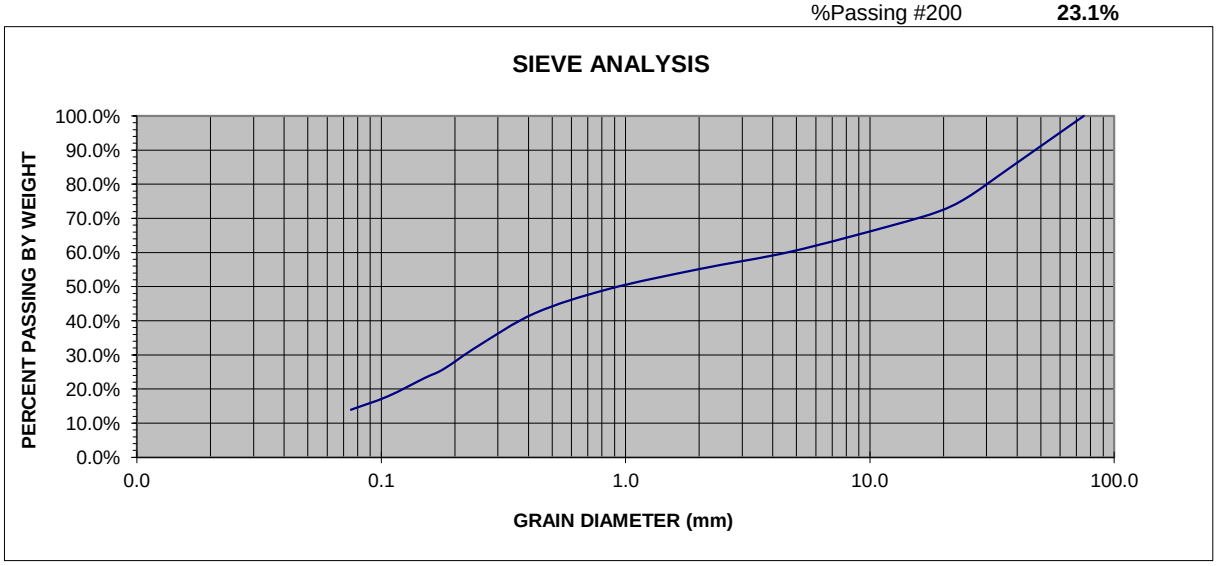
Sieve Size	(mm)	Weight Retained	% Retained	% Passing
3"	75.0	0.000	0.0%	100.0%
1 1/2"	37.5	0.124	15.1%	84.9%
1"	25.0	0.072	8.8%	76.1%
3/4"	19.0	0.034	4.1%	72.0%
1/2"	12.5	0.032	3.9%	68.0%
#4	4.75	0.064	7.8%	60.2%
#10	2.00	0.042	5.1%	55.1%
#20	0.850	0.048	5.9%	49.3%
#40	0.425	0.058	7.1%	42.2%
#60	0.250	0.078	9.5%	32.7%
#80	0.180	0.056	6.8%	25.9%
#100	0.150	0.022	2.7%	23.2%
#140	0.106	0.044	5.4%	17.8%
#200	0.075	0.032	3.9%	13.9%
Passing #200		0.114	13.9%	

Weight of Material Passing #200 Sieve = Total Dry Weight - Dry Weight After Wash

Water Content	**4.63%**
Unified Soil Classification System	
Grain Size Comparison	
Cobbles	**0.0%**
Coarse Gravel	**28.0%**
Fine Gravel	**11.7%**
Coarse Sand	**5.1%**
Medium Sand	**12.9%**
Fine Sand	**28.3%**
Silt & Clay	**13.9%**
Uniformity Coeff.	**85.62**
Permeability Range **	
Dense	3 ft/day
Loose	10 ft/day

2000 CT. Health Code Septic Fill Specs

%Retained on #4	**39.8%**	
% Passing #4-#200 (Fill less Gravel)		**Permitted**
%Passing #4	**100.0%**	**100%**
%Passing #10	**91.5%**	**70%-100%**
%Passing #40	**70.0%**	***10%-50%**
%Passing #100	**38.5%**	**0%-20%**
%Passing #200	**23.1%**	**0%-5%**



* Percent Passing the #40 sieve can be increased to no greater than 75% if the percent passing the #100 sieve does not exceed 10% and the #200 does not exceed 5%.

** Based on empirical relationship by Hazen (1911) relating permeability to the D_{10} grain size.
Accuracy diminishes with >5% passing the #200 Sieve or permeability values <.3 ft/day.
Relationship invalid when D_{10} < .1mm or D_{10} > 3mm

WASHED SIEVE ANALYSIS

CLIENT: Avery Brook LLC
DATE: 12/14/2022
SAMPLE: TH 101 30-36", Split 1 of 2

MOIST WEIGHT	=	**0.594**	**Kg**
TOTAL DRY WEIGHT	=	**0.536**	**Kg**
DRY WEIGHT AFTER WASH	=	**0.522**	**Kg**

Sieve Size	(mm)	Weight Retained	% Retained	% Passing
3"	75.0	0.000	0.0%	100.0%
1 1/2"	37.5	0.000	0.0%	100.0%
1"	25.0	0.000	0.0%	100.0%
3/4"	19.0	0.108	20.1%	79.9%
1/2"	12.5	0.092	17.2%	62.7%
#4	4.75	0.106	19.8%	42.9%
#10	2.00	0.054	10.1%	32.8%
#20	0.850	0.050	9.3%	23.5%
#40	0.425	0.050	9.3%	14.2%
#60	0.250	0.042	7.8%	6.3%
#80	0.180	0.012	2.2%	4.1%
#100	0.150	0.002	0.4%	3.7%
#140	0.106	0.004	0.7%	3.0%
#200	0.075	0.002	0.4%	2.6%
Passing #200		0.014	2.6%	

Weight of Material Passing #200 Sieve = Total Dry Weight - Dry Weight After Wash

Water Content **10.82%**

Unified Soil Classification System

Grain Size Comparison

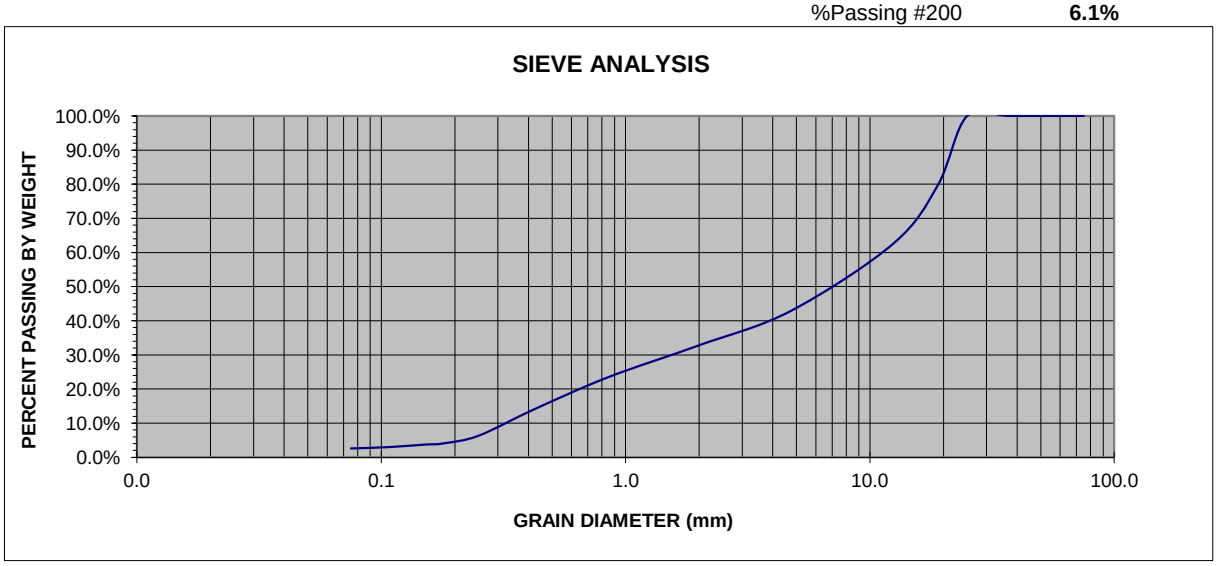
Cobbles	**0.0%**
Coarse Gravel	**20.1%**
Fine Gravel	**36.9%**
Coarse Sand	**10.1%**
Medium Sand	**18.7%**
Fine Sand	**11.6%**
Silt & Clay	**2.6%**
Uniformity Coeff.	**34.51**

Permeability Range **

Dense	125	ft/day
Loose	374	ft/day

2000 CT. Health Code Septic Fill Specs

%Retained on #4	**57.1%**	
% Passing #4-#200 (Fill less Gravel)		**Permitted**
%Passing #4	**100.0%**	**100%**
%Passing #10	**76.5%**	**70%-100%**
%Passing #40	**33.0%**	***10%-50%**
%Passing #100	**8.7%**	**0%-20%**
%Passing #200	**6.1%**	**0%-5%**



* Percent Passing the #40 sieve can be increased to no greater than 75% if the percent passing the #100 sieve does not exceed 10% and the #200 does not exceed 5%.

** Based on empirical relationship by Hazen (1911) relating permeability to the D_{10} grain size.
Accuracy diminishes with >5% passing the #200 Sieve or permeability values <.3 ft/day.
Relationship invalid when D_{10} < .1mm or D_{10} > 3mm

WASHED SIEVE ANALYSIS

CLIENT: Avery Brook LLC
DATE: 12/14/2022
SAMPLE: TH 101 30-36", Split 2 of 2

MOIST WEIGHT	=	**0.648 Kg**
TOTAL DRY WEIGHT	=	**0.594 Kg**
DRY WEIGHT AFTER WASH	=	**0.584 Kg**

Sieve Size	(mm)	Weight Retained	% Retained	% Passing
3"	**75.0**	0.000	0.0%	100.0%
1 1/2"	**37.5**	0.074	12.5%	87.5%
1"	**25.0**	0.100	16.8%	70.7%
3/4"	**19.0**	0.000	0.0%	70.7%
1/2"	**12.5**	0.106	17.8%	52.9%
#4	**4.75**	0.100	16.8%	36.0%
#10	**2.00**	0.062	10.4%	25.6%
#20	**0.850**	0.044	7.4%	18.2%
#40	**0.425**	0.044	7.4%	10.8%
#60	**0.250**	0.036	6.1%	4.7%
#80	**0.180**	0.010	1.7%	3.0%
#100	**0.150**	0.002	0.3%	2.7%
#140	**0.106**	0.004	0.7%	2.0%
#200	**0.075**	0.002	0.3%	1.7%
Passing #200		0.010	1.7%	

Weight of Material Passing #200 Sieve = Total Dry Weight - Dry Weight After Wash

Water Content **9.09%**

Unified Soil Classification System

Grain Size Comparison

Cobbles	**0.0%**
Coarse Gravel	**29.3%**
Fine Gravel	**34.7%**
Coarse Sand	**10.4%**
Medium Sand	**14.8%**
Fine Sand	**9.1%**
Silt & Clay	**1.7%**
Uniformity Coeff.	**37.50**

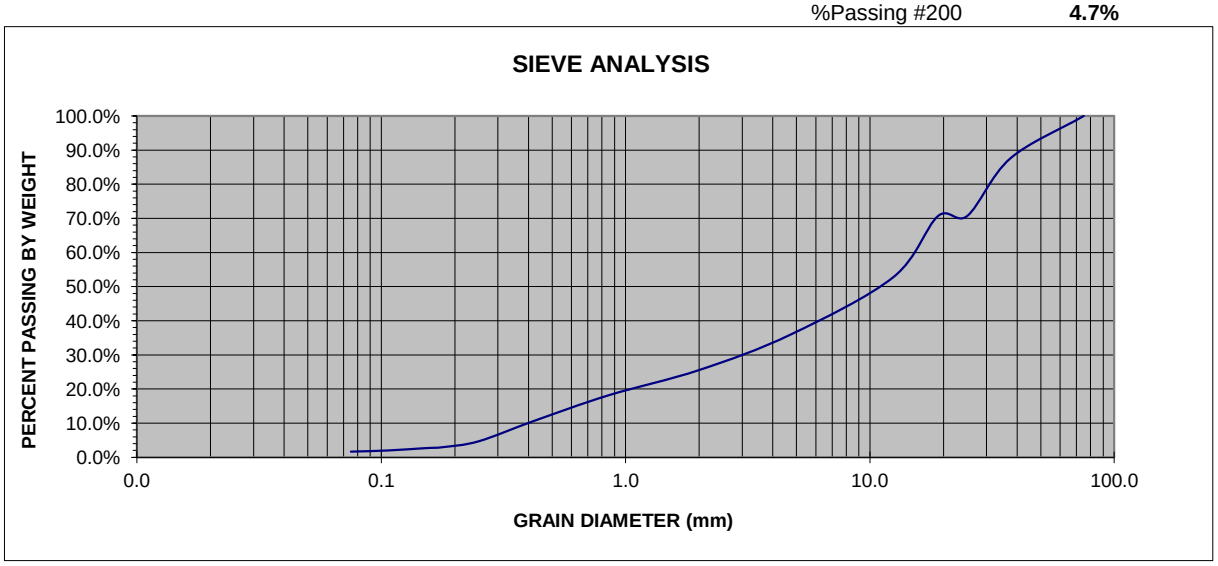
Permeability Range **

Dense	184	ft/day
Loose	552	ft/day

2000 CT. Health Code Septic Fill Specs

%Retained on #4 **64.0%**

% Passing #4-#200 (Fill less Gravel)		**Permitted**
%Passing #4	**100.0%**	**100%**
%Passing #10	**71.0%**	**70%-100%**
%Passing #40	**29.9%**	***10%-50%**
%Passing #100	**7.5%**	**0%-20%**
%Passing #200	**4.7%**	**0%-5%**



* Percent Passing the #40 sieve can be increased to no greater than 75% if the percent passing the #100 sieve does not exceed 10% and the #200 does not exceed 5%.

** Based on empirical relationship by Hazen (1911) relating permeability to the D_{10} grain size.
Accuracy diminishes with >5% passing the #200 Sieve or permeability values <.3 ft/day.
Relationship invalid when D_{10} < .1mm or D_{10} > 3mm

WASHED SIEVE ANALYSIS

CLIENT: Avery Brook LLC
DATE: 12/14/2022
SAMPLE: TH 102 42-48", Split 1 of 2

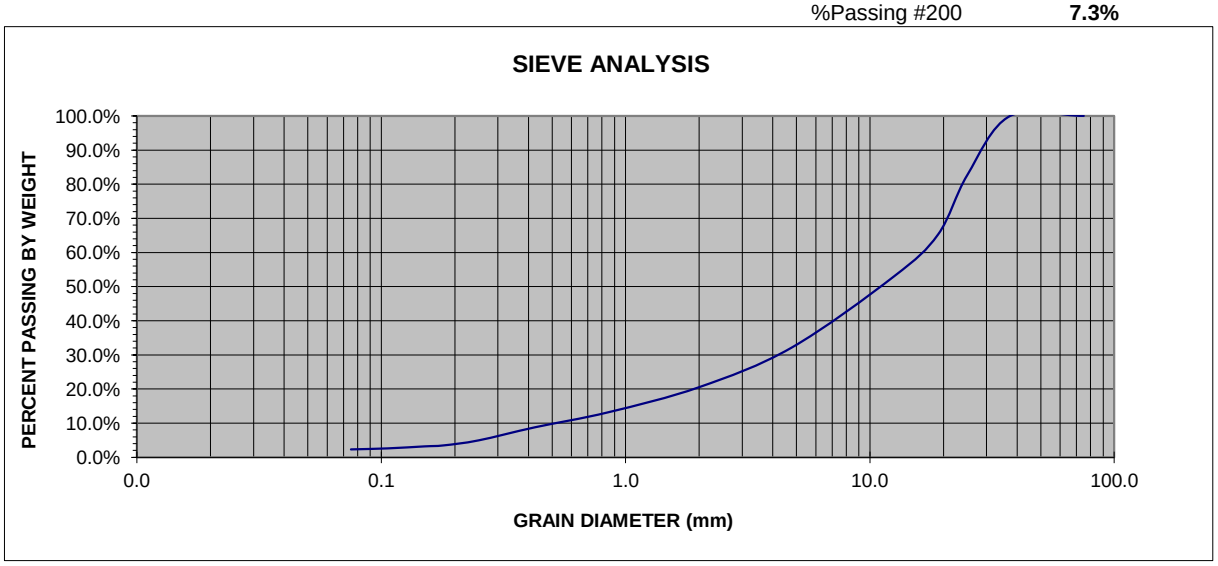
MOIST WEIGHT	=	**0.7 Kg**
TOTAL DRY WEIGHT	=	**0.68 Kg**
DRY WEIGHT AFTER WASH	=	**0.664 Kg**

Sieve Size	(mm)	Weight Retained	% Retained	% Passing
3"	75.0	0.000	0.0%	100.0%
1 1/2"	37.5	0.000	0.0%	100.0%
1"	25.0	0.118	17.4%	82.6%
3/4"	19.0	0.118	17.4%	65.3%
1/2"	12.5	0.084	12.4%	52.9%
#4	4.75	0.142	20.9%	32.1%
#10	2.00	0.078	11.5%	20.6%
#20	0.850	0.050	7.4%	13.2%
#40	0.425	0.030	4.4%	8.8%
#60	0.250	0.026	3.8%	5.0%
#80	0.180	0.010	1.5%	3.5%
#100	0.150	0.002	0.3%	3.2%
#140	0.106	0.004	0.6%	2.6%
#200	0.075	0.002	0.3%	2.4%
Passing #200		0.016	2.4%	

Weight of Material Passing #200 Sieve = Total Dry Weight - Dry Weight After Wash

Water Content	**2.94%**
Unified Soil Classification System	
Grain Size Comparison	
Cobbles	**0.0%**
Coarse Gravel	**34.7%**
Fine Gravel	**33.2%**
Coarse Sand	**11.5%**
Medium Sand	**11.8%**
Fine Sand	**6.5%**
Silt & Clay	**2.4%**
Uniformity Coeff.	**30.12**
Permeability Range **	
Dense	329 ft/day
Loose	986 ft/day

2000 CT. Health Code Septic Fill Specs		
%Retained on #4	**67.9%**	
% Passing #4-#200 (Fill less Gravel)		**Permitted**
%Passing #4	**100.0%**	**100%**
%Passing #10	**64.2%**	**70%-100%**
%Passing #40	**27.5%**	***10%-50%**
%Passing #100	**10.1%**	**0%-20%**
%Passing #200	**7.3%**	**0%-5%**



* Percent Passing the #40 sieve can be increased to no greater than 75% if the percent passing the #100 sieve does not exceed 10% and the #200 does not exceed 5%.

** Based on empirical relationship by Hazen (1911) relating permeability to the D_{10} grain size.
Accuracy diminishes with >5% passing the #200 Sieve or permeability values <.3 ft/day.
Relationship invalid when D_{10} < .1mm or D_{10} > 3mm

WASHED SIEVE ANALYSIS

CLIENT: Avery Brook LLC
DATE: 12/14/2022
SAMPLE: TH 102 42-48", Split 2 of 2

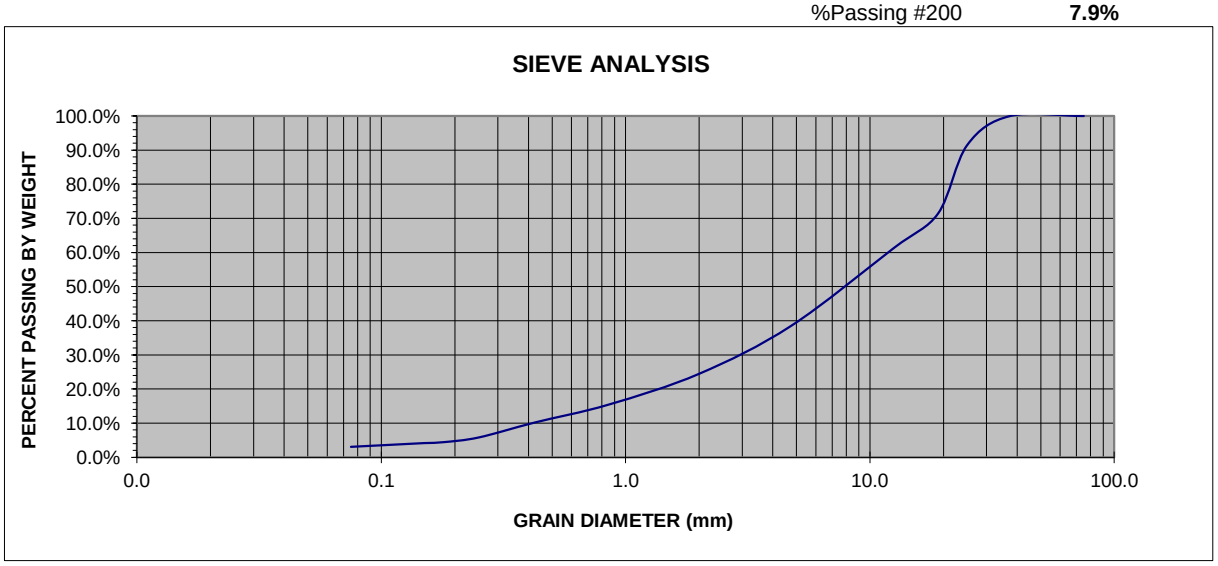
MOIST WEIGHT	=	**0.75 Kg**
TOTAL DRY WEIGHT	=	**0.728 Kg**
DRY WEIGHT AFTER WASH	=	**0.706 Kg**

Sieve Size	(mm)	Weight Retained	% Retained	% Passing
3"	75.0	0.000	0.0%	100.0%
1 1/2"	37.5	0.000	0.0%	100.0%
1"	25.0	0.062	8.5%	91.5%
3/4"	19.0	0.146	20.1%	71.4%
1/2"	12.5	0.074	10.2%	61.3%
#4	4.75	0.166	22.8%	38.5%
#10	2.00	0.102	14.0%	24.5%
#20	0.850	0.066	9.1%	15.4%
#40	0.425	0.038	5.2%	10.2%
#60	0.250	0.032	4.4%	5.8%
#80	0.180	0.010	1.4%	4.4%
#100	0.150	0.002	0.3%	4.1%
#140	0.106	0.004	0.5%	3.6%
#200	0.075	0.004	0.5%	3.0%
Passing #200		0.022	3.0%	

Weight of Material Passing #200 Sieve = Total Dry Weight - Dry Weight After Wash

Water Content	**3.02%**
Unified Soil Classification System	
Grain Size Comparison	
Cobbles	**0.0%**
Coarse Gravel	**28.6%**
Fine Gravel	**33.0%**
Coarse Sand	**14.0%**
Medium Sand	**14.3%**
Fine Sand	**7.1%**
Silt & Clay	**3.0%**
Uniformity Coeff.	**28.85**
Permeability Range **	
Dense	199 ft/day
Loose	596 ft/day

2000 CT. Health Code Septic Fill Specs		
%Retained on #4	**61.5%**	
% Passing #4-#200 (Fill less Gravel)		**Permitted**
%Passing #4	**100.0%**	**100%**
%Passing #10	**63.6%**	**70%-100%**
%Passing #40	**26.4%**	***10%-50%**
%Passing #100	**10.7%**	**0%-20%**
%Passing #200	**7.9%**	**0%-5%**



* Percent Passing the #40 sieve can be increased to no greater than 75% if the percent passing the #100 sieve does not exceed 10% and the #200 does not exceed 5%.

** Based on empirical relationship by Hazen (1911) relating permeability to the D_{10} grain size.
Accuracy diminishes with >5% passing the #200 Sieve or permeability values <.3 ft/day.
Relationship invalid when D_{10} < .1mm or D_{10} > 3mm

WASHED SIEVE ANALYSIS

CLIENT: Avery Brook LLC
DATE: 12/14/2022
SAMPLE: TH 102 180-186", Split 1 of 2

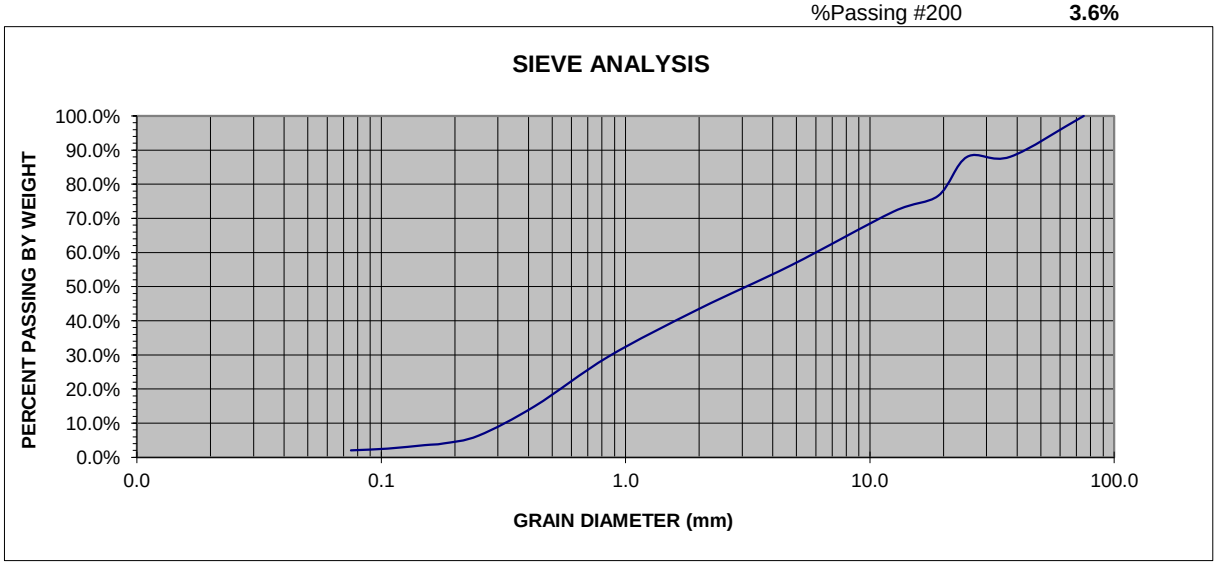
MOIST WEIGHT	=	**0.802 Kg**
TOTAL DRY WEIGHT	=	**0.786 Kg**
DRY WEIGHT AFTER WASH	=	**0.770 Kg**

Sieve Size	(mm)	Weight Retained	% Retained	% Passing
3"	75.0	0.000	0.0%	100.0%
1 1/2"	37.5	0.094	12.0%	88.0%
1"	25.0	0.000	0.0%	88.0%
3/4"	19.0	0.090	11.5%	76.6%
1/2"	12.5	0.036	4.6%	72.0%
#4	4.75	0.124	15.8%	56.2%
#10	2.00	0.100	12.7%	43.5%
#20	0.850	0.110	14.0%	29.5%
#40	0.425	0.114	14.5%	15.0%
#60	0.250	0.068	8.7%	6.4%
#80	0.180	0.018	2.3%	4.1%
#100	0.150	0.004	0.5%	3.6%
#140	0.106	0.008	1.0%	2.5%
#200	0.075	0.004	0.5%	2.0%
Passing #200		0.016	2.0%	

Weight of Material Passing #200 Sieve = Total Dry Weight - Dry Weight After Wash

Water Content	**2.04%**	
Unified Soil Classification System		
Grain Size Comparison		
Cobbles	**0.0%**	
Coarse Gravel	**23.4%**	
Fine Gravel	**20.4%**	
Coarse Sand	**12.7%**	
Medium Sand	**28.5%**	
Fine Sand	**13.0%**	
Silt & Clay	**2.0%**	
Uniformity Coeff.	**20.40**	
Permeability Range **		
Dense	119 ft/day	
Loose	356 ft/day	

2000 CT. Health Code Septic Fill Specs		
%Retained on #4	**43.8%**	
% Passing #4-#200 (Fill less Gravel)		**Permitted**
%Passing #4	**100.0%**	**100%**
%Passing #10	**77.4%**	**70%-100%**
%Passing #40	**26.7%**	***10%-50%**
%Passing #100	**6.3%**	**0%-20%**
%Passing #200	**3.6%**	**0%-5%**



* Percent Passing the #40 sieve can be increased to no greater than 75% if the percent passing the #100 sieve does not exceed 10% and the #200 does not exceed 5%.

** Based on empirical relationship by Hazen (1911) relating permeability to the D_{10} grain size.
Accuracy diminishes with >5% passing the #200 Sieve or permeability values <.3 ft/day.
Relationship invalid when D_{10} < .1mm or D_{10} > 3mm

WASHED SIEVE ANALYSIS

CLIENT: Avery Brook LLC
DATE: 12/14/2022
SAMPLE: TH 102 180-186", Split 2 of 2

MOIST WEIGHT	=	**0.832**	**Kg**
TOTAL DRY WEIGHT	=	**0.818**	**Kg**
DRY WEIGHT AFTER WASH	=	**0.804**	**Kg**

Sieve Size	(mm)	Weight Retained	% Retained	% Passing
3"	**75.0**	0.000	0.0%	100.0%
1 1/2"	**37.5**	0.122	14.9%	85.1%
1"	**25.0**	0.000	0.0%	85.1%
3/4"	**19.0**	0.088	10.8%	74.3%
1/2"	**12.5**	0.076	9.3%	65.0%
#4	**4.75**	0.106	13.0%	52.1%
#10	**2.00**	0.094	11.5%	40.6%
#20	**0.850**	0.104	12.7%	27.9%
#40	**0.425**	0.110	13.4%	14.4%
#60	**0.250**	0.066	8.1%	6.4%
#80	**0.180**	0.018	2.2%	4.2%
#100	**0.150**	0.006	0.7%	3.4%
#140	**0.106**	0.008	1.0%	2.4%
#200	**0.075**	0.006	0.7%	1.7%
Passing #200		0.014	1.7%	

Weight of Material Passing #200 Sieve = Total Dry Weight - Dry Weight After Wash

Water Content **1.71%**

Unified Soil Classification System

Grain Size Comparison

Cobbles	**0.0%**
Coarse Gravel	**25.7%**
Fine Gravel	**22.2%**
Coarse Sand	**11.5%**
Medium Sand	**26.2%**
Fine Sand	**12.7%**
Silt & Clay	**1.7%**
Uniformity Coeff.	**28.84**

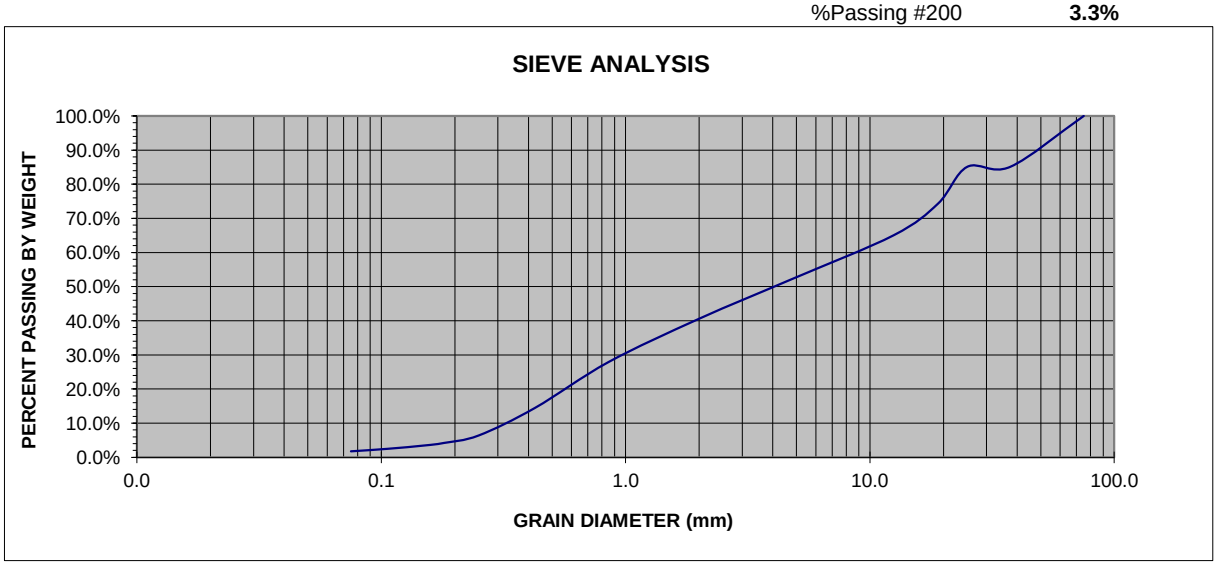
Permeability Range **

Dense	123	ft/day
Loose	368	ft/day

2000 CT. Health Code Septic Fill Specs

%Retained on #4 **47.9%**

% Passing #4-#200 (Fill less Gravel)		**Permitted**
%Passing #4	**100.0%**	**100%**
%Passing #10	**77.9%**	**70%-100%**
%Passing #40	**27.7%**	***10%-50%**
%Passing #100	**6.6%**	**0%-20%**
%Passing #200	**3.3%**	**0%-5%**



* Percent Passing the #40 sieve can be increased to no greater than 75% if the percent passing the #100 sieve does not exceed 10% and the #200 does not exceed 5%.

** Based on empirical relationship by Hazen (1911) relating permeability to the D_{10} grain size.
Accuracy diminishes with >5% passing the #200 Sieve or permeability values <.3 ft/day.
Relationship invalid when D_{10} < .1mm or D_{10} > 3mm

WASHED SIEVE ANALYSIS

CLIENT: Avery Brook LLC
DATE: 12/14/2022
SAMPLE: TH 103 42-48", Split 1 of 2

MOIST WEIGHT	=	**0.958 Kg**
TOTAL DRY WEIGHT	=	**0.932 Kg**
DRY WEIGHT AFTER WASH	=	**0.926 Kg**

Sieve Size	(mm)	Weight Retained	% Retained	% Passing
3"	75.0	0.000	0.0%	100.0%
1 1/2"	37.5	0.000	0.0%	100.0%
1"	25.0	0.136	14.6%	85.4%
3/4"	19.0	0.058	6.2%	79.2%
1/2"	12.5	0.060	6.4%	72.7%
#4	4.75	0.116	12.4%	60.3%
#10	2.00	0.098	10.5%	49.8%
#20	0.850	0.190	20.4%	29.4%
#40	0.425	0.216	23.2%	6.2%
#60	0.250	0.044	4.7%	1.5%
#80	0.180	0.004	0.4%	1.1%
#100	0.150	0.000	0.0%	1.1%
#140	0.106	0.002	0.2%	0.9%
#200	0.075	0.002	0.2%	0.6%
Passing #200		0.006	0.6%	

Weight of Material Passing #200 Sieve = Total Dry Weight - Dry Weight After Wash

Water Content **2.79%**

Unified Soil Classification System

Grain Size Comparison

Cobbles	**0.0%**
Coarse Gravel	**20.8%**
Fine Gravel	**18.9%**
Coarse Sand	**10.5%**
Medium Sand	**43.6%**
Fine Sand	**5.6%**
Silt & Clay	**0.6%**
Uniformity Coeff.	**9.45**

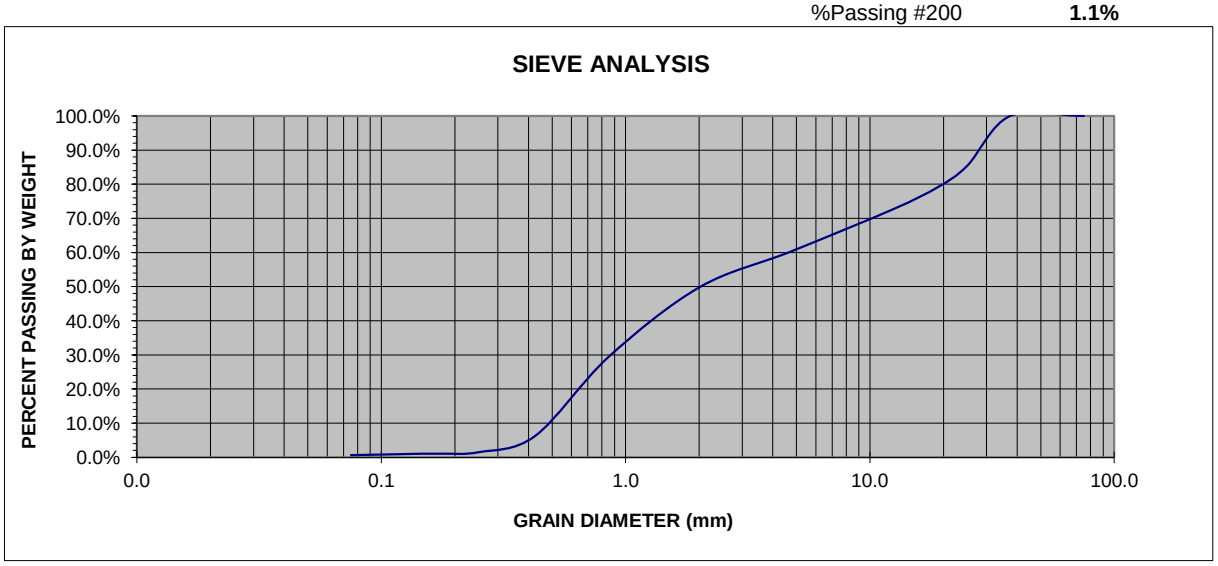
Permeability Range **

Dense	277	ft/day
Loose	831	ft/day

2000 CT. Health Code Septic Fill Specs

%Retained on #4 **39.7%**

% Passing #4-#200 (Fill less Gravel)		**Permitted**
%Passing #4	**100.0%**	**100%**
%Passing #10	**82.6%**	**70%-100%**
%Passing #40	**10.3%**	***10%-50%**
%Passing #100	**1.8%**	**0%-20%**
%Passing #200	**1.1%**	**0%-5%**



* Percent Passing the #40 sieve can be increased to no greater than 75% if the percent passing the #100 sieve does not exceed 10% and the #200 does not exceed 5%.

** Based on empirical relationship by Hazen (1911) relating permeability to the D_{10} grain size.
Accuracy diminishes with >5% passing the #200 Sieve or permeability values <.3 ft/day.
Relationship invalid when D_{10} < .1mm or D_{10} > 3mm

WASHED SIEVE ANALYSIS

CLIENT: Avery Brook LLC
DATE: 12/14/2022
SAMPLE: TH 103 42-48", Split 2 of 2

MOIST WEIGHT	=	**0.79 Kg**
TOTAL DRY WEIGHT	=	**0.764 Kg**
DRY WEIGHT AFTER WASH	=	**0.742 Kg**

Sieve Size	(mm)	Weight Retained	% Retained	% Passing
3"	75.0	0.000	0.0%	100.0%
1 1/2"	37.5	0.000	0.0%	100.0%
1"	25.0	0.000	0.0%	100.0%
3/4"	19.0	0.052	6.8%	93.2%
1/2"	12.5	0.074	9.7%	83.5%
#4	4.75	0.118	15.4%	68.1%
#10	2.00	0.076	9.9%	58.1%
#20	0.850	0.176	23.0%	35.1%
#40	0.425	0.198	25.9%	9.2%
#60	0.250	0.040	5.2%	3.9%
#80	0.180	0.004	0.5%	3.4%
#100	0.150	0.000	0.0%	3.4%
#140	0.106	0.002	0.3%	3.1%
#200	0.075	0.002	0.3%	2.9%
Passing #200		0.022	2.9%	

Weight of Material Passing #200 Sieve = Total Dry Weight - Dry Weight After Wash

Water Content **3.40%**

Unified Soil Classification System

Grain Size Comparison

Cobbles	**0.0%**
Coarse Gravel	**6.8%**
Fine Gravel	**25.1%**
Coarse Sand	**9.9%**
Medium Sand	**49.0%**
Fine Sand	**6.3%**
Silt & Clay	**2.9%**
Uniformity Coeff.	**5.75**

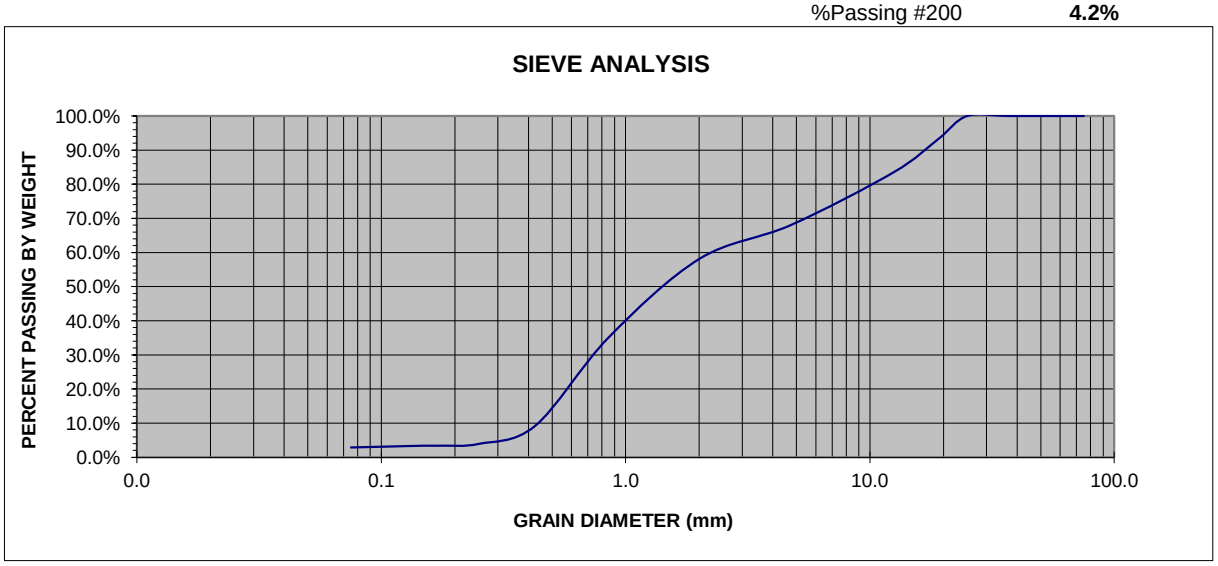
Permeability Range **

Dense	218	ft/day
Loose	655	ft/day

2000 CT. Health Code Septic Fill Specs

%Retained on #4 **31.9%**

% Passing #4-#200 (Fill less Gravel)		**Permitted**
%Passing #4	**100.0%**	**100%**
%Passing #10	**85.4%**	**70%-100%**
%Passing #40	**13.5%**	***10%-50%**
%Passing #100	**5.0%**	**0%-20%**
%Passing #200	**4.2%**	**0%-5%**



* Percent Passing the #40 sieve can be increased to no greater than 75% if the percent passing the #100 sieve does not exceed 10% and the #200 does not exceed 5%.

** Based on empirical relationship by Hazen (1911) relating permeability to the D_{10} grain size.
Accuracy diminishes with >5% passing the #200 Sieve or permeability values <.3 ft/day.
Relationship invalid when D_{10} < .1mm or D_{10} > 3mm

WASHED SIEVE ANALYSIS

CLIENT: Avery Brook LLC
DATE: 12/14/2022
SAMPLE: TH 103 165-171", Split 1 of 2

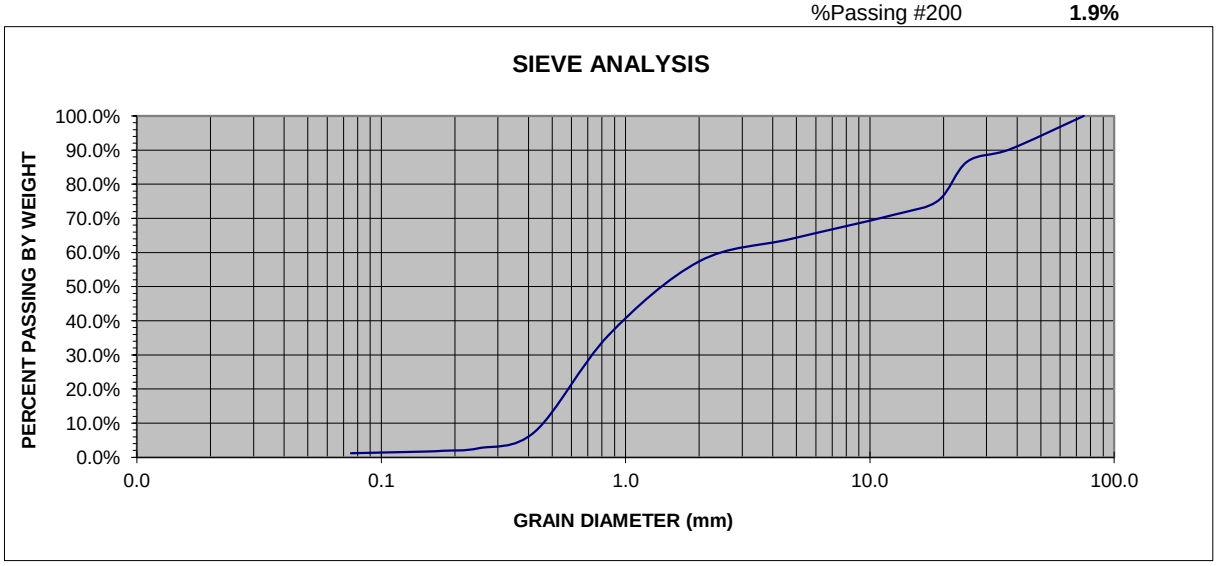
MOIST WEIGHT	=	**0.85 Kg**
TOTAL DRY WEIGHT	=	**0.822 Kg**
DRY WEIGHT AFTER WASH	=	**0.812 Kg**

Sieve Size	(mm)	Weight Retained	% Retained	% Passing
3"	75.0	0.000	0.0%	100.0%
1 1/2"	37.5	0.080	9.7%	90.3%
1"	25.0	0.030	3.6%	86.6%
3/4"	19.0	0.094	11.4%	75.2%
1/2"	12.5	0.034	4.1%	71.0%
#4	4.75	0.058	7.1%	64.0%
#10	2.00	0.054	6.6%	57.4%
#20	0.850	0.178	21.7%	35.8%
#40	0.425	0.232	28.2%	7.5%
#60	0.250	0.040	4.9%	2.7%
#80	0.180	0.006	0.7%	1.9%
#100	0.150	0.002	0.2%	1.7%
#140	0.106	0.002	0.2%	1.5%
#200	0.075	0.002	0.2%	1.2%
Passing #200		0.010	1.2%	

Weight of Material Passing #200 Sieve = Total Dry Weight - Dry Weight After Wash

Water Content	**3.41%**
Unified Soil Classification System	
Grain Size Comparison	
Cobbles	**0.0%**
Coarse Gravel	**24.8%**
Fine Gravel	**11.2%**
Coarse Sand	**6.6%**
Medium Sand	**49.9%**
Fine Sand	**6.3%**
Silt & Clay	**1.2%**
Uniformity Coeff.	**6.67**
Permeability Range **	
Dense	242 ft/day
Loose	726 ft/day

2000 CT. Health Code Septic Fill Specs		
%Retained on #4	**36.0%**	
% Passing #4-#200 (Fill less Gravel)		**Permitted**
%Passing #4	**100.0%**	**100%**
%Passing #10	**89.7%**	**70%-100%**
%Passing #40	**11.8%**	***10%-50%**
%Passing #100	**2.7%**	**0%-20%**
%Passing #200	**1.9%**	**0%-5%**



* Percent Passing the #40 sieve can be increased to no greater than 75% if the percent passing the #100 sieve does not exceed 10% and the #200 does not exceed 5%.

** Based on empirical relationship by Hazen (1911) relating permeability to the D_{10} grain size.
Accuracy diminishes with >5% passing the #200 Sieve or permeability values <.3 ft/day.
Relationship invalid when D_{10} < .1mm or D_{10} > 3mm

WASHED SIEVE ANALYSIS

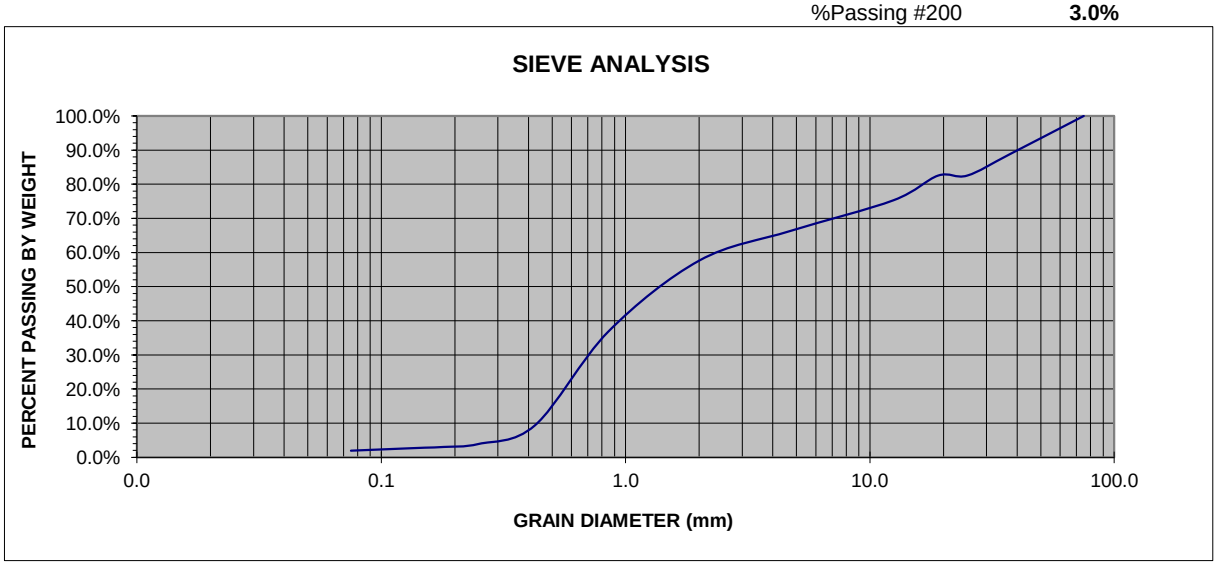
CLIENT: Avery Brook LLC
DATE: 12/14/2022
SAMPLE: TH 103 165-171", Split 2 of 2

MOIST WEIGHT	=	**0.948 Kg**
TOTAL DRY WEIGHT	=	**0.916 Kg**
DRY WEIGHT AFTER WASH	=	**0.898 Kg**

Sieve Size	(mm)	Weight Retained	% Retained	% Passing
3"	**75.0**	0.000	0.0%	100.0%
1 1/2"	**37.5**	0.102	11.1%	88.9%
1"	**25.0**	0.058	6.3%	82.5%
3/4"	**19.0**	0.000	0.0%	82.5%
1/2"	**12.5**	0.066	7.2%	75.3%
#4	**4.75**	0.082	9.0%	66.4%
#10	**2.00**	0.080	8.7%	57.6%
#20	**0.850**	0.190	20.7%	36.9%
#40	**0.425**	0.252	27.5%	9.4%
#60	**0.250**	0.050	5.5%	3.9%
#80	**0.180**	0.008	0.9%	3.1%
#100	**0.150**	0.002	0.2%	2.8%
#140	**0.106**	0.004	0.4%	2.4%
#200	**0.075**	0.004	0.4%	2.0%
Passing #200		0.018	2.0%	

Weight of Material Passing #200 Sieve = Total Dry Weight - Dry Weight After Wash

Water Content	**3.49%**	
Unified Soil Classification System		
Grain Size Comparison		
Cobbles	**0.0%**	
Coarse Gravel	**17.5%**	
Fine Gravel	**16.2%**	
Coarse Sand	**8.7%**	
Medium Sand	**48.3%**	
Fine Sand	**7.4%**	
Silt & Clay	**2.0%**	
Uniformity Coeff.	**6.31**	
Permeability Range **		
Dense	214 ft/day	
Loose	642 ft/day	
2000 CT. Health Code Septic Fill Specs		
%Retained on #4	**33.6%**	
% Passing #4-#200 (Fill less Gravel)		**Permitted**
%Passing #4	**100.0%**	**100%**
%Passing #10	**86.8%**	**70%-100%**
%Passing #40	**14.1%**	***10%-50%**
%Passing #100	**4.3%**	**0%-20%**
%Passing #200	**3.0%**	**0%-5%**



* Percent Passing the #40 sieve can be increased to no greater than 75% if the percent passing the #100 sieve does not exceed 10% and the #200 does not exceed 5%.

** Based on empirical relationship by Hazen (1911) relating permeability to the D_{10} grain size.
Accuracy diminishes with >5% passing the #200 Sieve or permeability values <.3 ft/day.
Relationship invalid when D_{10} < .1mm or D_{10} > 3mm

WASHED SIEVE ANALYSIS

CLIENT: Avery Brook LLC
DATE: 12/14/2022
SAMPLE: TH 104 42-48", Split 1 of 2

MOIST WEIGHT	=	**0.918 Kg**
TOTAL DRY WEIGHT	=	**0.904 Kg**
DRY WEIGHT AFTER WASH	=	**0.888 Kg**

Sieve Size	(mm)	Weight Retained	% Retained	% Passing
3"	75.0	0.000	0.0%	100.0%
1 1/2"	37.5	0.156	17.3%	82.7%
1"	25.0	0.108	11.9%	70.8%
3/4"	19.0	0.052	5.8%	65.0%
1/2"	12.5	0.082	9.1%	56.0%
#4	4.75	0.236	26.1%	29.9%
#10	2.00	0.112	12.4%	17.5%
#20	0.850	0.044	4.9%	12.6%
#40	0.425	0.056	6.2%	6.4%
#60	0.250	0.030	3.3%	3.1%
#80	0.180	0.006	0.7%	2.4%
#100	0.150	0.002	0.2%	2.2%
#140	0.106	0.002	0.2%	2.0%
#200	0.075	0.002	0.2%	1.8%
Passing #200		0.016	1.8%	

Weight of Material Passing #200 Sieve = Total Dry Weight - Dry Weight After Wash

Water Content **1.55%**

Unified Soil Classification System

Grain Size Comparison

Cobbles	**0.0%**
Coarse Gravel	**35.0%**
Fine Gravel	**35.2%**
Coarse Sand	**12.4%**
Medium Sand	**11.1%**
Fine Sand	**4.6%**
Silt & Clay	**1.8%**
Uniformity Coeff.	**22.93**

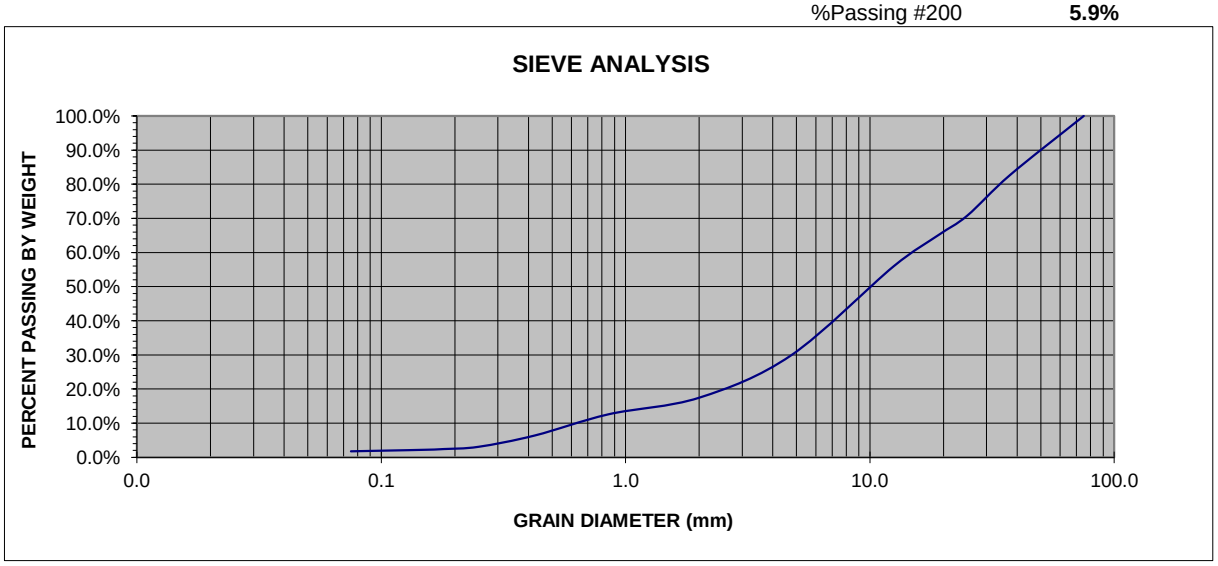
Permeability Range **

Dense	510	ft/day
Loose	1531	ft/day

2000 CT. Health Code Septic Fill Specs

%Retained on #4 **70.1%**

% Passing #4-#200 (Fill less Gravel)		**Permitted**
%Passing #4	**100.0%**	**100%**
%Passing #10	**58.5%**	**70%-100%**
%Passing #40	**21.5%**	***10%-50%**
%Passing #100	**7.4%**	**0%-20%**
%Passing #200	**5.9%**	**0%-5%**



* Percent Passing the #40 sieve can be increased to no greater than 75% if the percent passing the #100 sieve does not exceed 10% and the #200 does not exceed 5%.

** Based on empirical relationship by Hazen (1911) relating permeability to the D_{10} grain size.
Accuracy diminishes with >5% passing the #200 Sieve or permeability values <.3 ft/day.
Relationship invalid when D_{10} < .1mm or D_{10} > 3mm

WASHED SIEVE ANALYSIS

CLIENT: Avery Brook LLC
DATE: 12/14/2022
SAMPLE: TH 104 42-48", Split 2 of 2

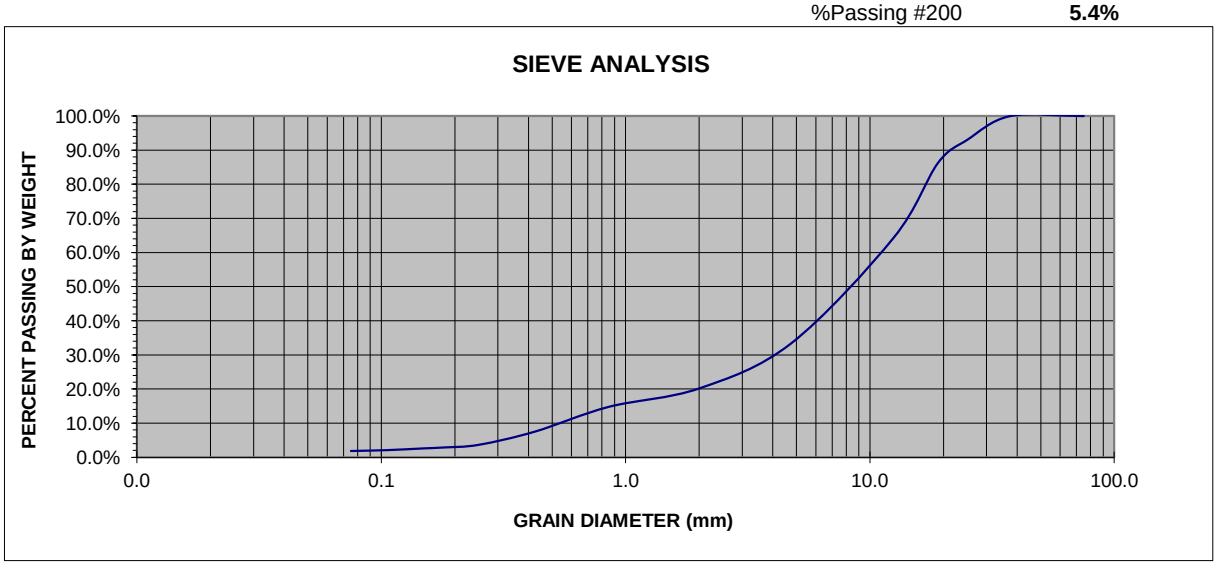
MOIST WEIGHT	=	**0.786 Kg**
TOTAL DRY WEIGHT	=	**0.774 Kg**
DRY WEIGHT AFTER WASH	=	**0.760 Kg**

Sieve Size	(mm)	Weight Retained	% Retained	% Passing
3"	75.0	0.000	0.0%	100.0%
1 1/2"	37.5	0.000	0.0%	100.0%
1"	25.0	0.054	7.0%	93.0%
3/4"	19.0	0.052	6.7%	86.3%
1/2"	12.5	0.170	22.0%	64.3%
#4	4.75	0.240	31.0%	33.3%
#10	2.00	0.102	13.2%	20.2%
#20	0.850	0.042	5.4%	14.7%
#40	0.425	0.056	7.2%	7.5%
#60	0.250	0.030	3.9%	3.6%
#80	0.180	0.006	0.8%	2.8%
#100	0.150	0.002	0.3%	2.6%
#140	0.106	0.004	0.5%	2.1%
#200	0.075	0.002	0.3%	1.8%
Passing #200		0.014	1.8%	

Weight of Material Passing #200 Sieve = Total Dry Weight - Dry Weight After Wash

Water Content	**1.55%**
Unified Soil Classification System	
Grain Size Comparison	
Cobbles	**0.0%**
Coarse Gravel	**13.7%**
Fine Gravel	**53.0%**
Coarse Sand	**13.2%**
Medium Sand	**12.7%**
Fine Sand	**5.7%**
Silt & Clay	**1.8%**
Uniformity Coeff.	**19.95**
Permeability Range **	
Dense	371 ft/day
Loose	1114 ft/day

2000 CT. Health Code Septic Fill Specs		
%Retained on #4	**66.7%**	
% Passing #4-#200 (Fill less Gravel)		**Permitted**
%Passing #4	**100.0%**	**100%**
%Passing #10	**60.5%**	**70%-100%**
%Passing #40	**22.5%**	***10%-50%**
%Passing #100	**7.8%**	**0%-20%**
%Passing #200	**5.4%**	**0%-5%**



* Percent Passing the #40 sieve can be increased to no greater than 75% if the percent passing the #100 sieve does not exceed 10% and the #200 does not exceed 5%.

** Based on empirical relationship by Hazen (1911) relating permeability to the D_{10} grain size.
Accuracy diminishes with >5% passing the #200 Sieve or permeability values <.3 ft/day.
Relationship invalid when D_{10} < .1mm or D_{10} > 3mm

WASHED SIEVE ANALYSIS

CLIENT: Avery Brook LLC
DATE: 12/14/2022
SAMPLE: TH 105 42-48", Split 1 of 2

MOIST WEIGHT	=	**0.728 Kg**
TOTAL DRY WEIGHT	=	**0.712 Kg**
DRY WEIGHT AFTER WASH	=	**0.700 Kg**

Sieve Size	(mm)	Weight Retained	% Retained	% Passing
3"	**75.0**	0.000	0.0%	100.0%
1 1/2"	**37.5**	0.000	0.0%	100.0%
1"	**25.0**	0.058	8.1%	91.9%
3/4"	**19.0**	0.082	11.5%	80.3%
1/2"	**12.5**	0.064	9.0%	71.3%
#4	**4.75**	0.144	20.2%	51.1%
#10	**2.00**	0.084	11.8%	39.3%
#20	**0.850**	0.066	9.3%	30.1%
#40	**0.425**	0.112	15.7%	14.3%
#60	**0.250**	0.062	8.7%	5.6%
#80	**0.180**	0.016	2.2%	3.4%
#100	**0.150**	0.004	0.6%	2.8%
#140	**0.106**	0.006	0.8%	2.0%
#200	**0.075**	0.002	0.3%	1.7%
Passing #200		0.012	1.7%	

Weight of Material Passing #200 Sieve = Total Dry Weight - Dry Weight After Wash

Water Content **2.25%**

Unified Soil Classification System

Grain Size Comparison

Cobbles	**0.0%**
Coarse Gravel	**19.7%**
Fine Gravel	**29.2%**
Coarse Sand	**11.8%**
Medium Sand	**25.0%**
Fine Sand	**12.6%**
Silt & Clay	**1.7%**
Uniformity Coeff.	**24.11**

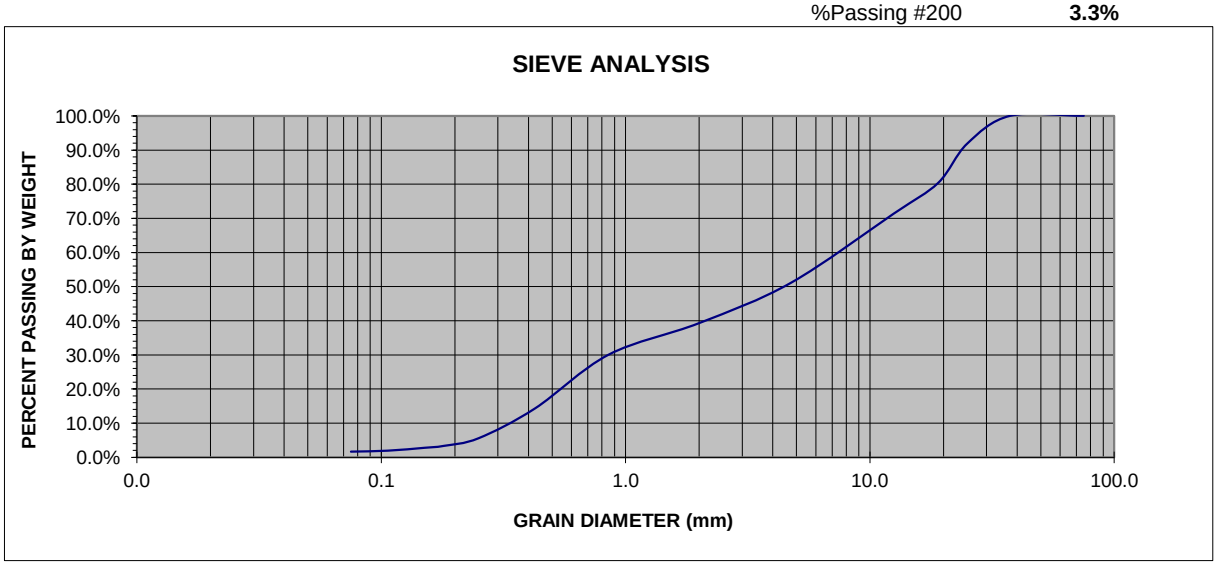
Permeability Range **

Dense	130	ft/day
Loose	389	ft/day

2000 CT. Health Code Septic Fill Specs

%Retained on #4 **48.9%**

% Passing #4-#200 (Fill less Gravel)		**Permitted**
%Passing #4	**100.0%**	**100%**
%Passing #10	**76.9%**	**70%-100%**
%Passing #40	**28.0%**	***10%-50%**
%Passing #100	**5.5%**	**0%-20%**
%Passing #200	**3.3%**	**0%-5%**



* Percent Passing the #40 sieve can be increased to no greater than 75% if the percent passing the #100 sieve does not exceed 10% and the #200 does not exceed 5%.

** Based on empirical relationship by Hazen (1911) relating permeability to the D_{10} grain size.
Accuracy diminishes with >5% passing the #200 Sieve or permeability values <.3 ft/day.
Relationship invalid when D_{10} < .1mm or D_{10} > 3mm

WASHED SIEVE ANALYSIS

CLIENT: Avery Brook LLC
DATE: 12/14/2022
SAMPLE: TH 105 42-48", Split 2 of 2

MOIST WEIGHT	=	**0.872 Kg**
TOTAL DRY WEIGHT	=	**0.852 Kg**
DRY WEIGHT AFTER WASH	=	**0.840 Kg**

Sieve Size	(mm)	Weight Retained	% Retained	% Passing
3"	75.0	0.000	0.0%	100.0%
1 1/2"	37.5	0.000	0.0%	100.0%
1"	25.0	0.076	8.9%	91.1%
3/4"	19.0	0.080	9.4%	81.7%
1/2"	12.5	0.060	7.0%	74.6%
#4	4.75	0.196	23.0%	51.6%
#10	2.00	0.112	13.1%	38.5%
#20	0.850	0.082	9.6%	28.9%
#40	0.425	0.134	15.7%	13.1%
#60	0.250	0.070	8.2%	4.9%
#80	0.180	0.016	1.9%	3.1%
#100	0.150	0.004	0.5%	2.6%
#140	0.106	0.006	0.7%	1.9%
#200	0.075	0.004	0.5%	1.4%
Passing #200		0.012	1.4%	

Weight of Material Passing #200 Sieve = Total Dry Weight - Dry Weight After Wash

Water Content **2.35%**

Unified Soil Classification System

Grain Size Comparison

Cobbles	**0.0%**
Coarse Gravel	**18.3%**
Fine Gravel	**30.0%**
Coarse Sand	**13.1%**
Medium Sand	**25.4%**
Fine Sand	**11.7%**
Silt & Clay	**1.4%**
Uniformity Coeff.	**21.13**

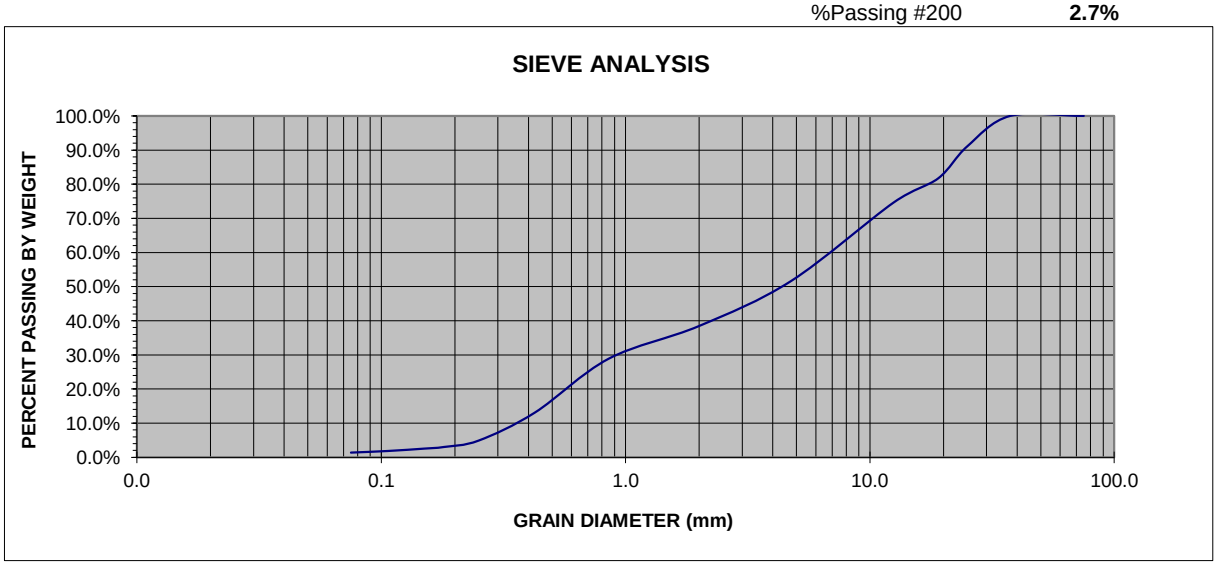
Permeability Range **

Dense	145 ft/day
Loose	436 ft/day

2000 CT. Health Code Septic Fill Specs

%Retained on #4 **48.4%**

% Passing #4-#200 (Fill less Gravel)		**Permitted**
%Passing #4	**100.0%**	**100%**
%Passing #10	**74.5%**	**70%-100%**
%Passing #40	**25.5%**	***10%-50%**
%Passing #100	**5.0%**	**0%-20%**
%Passing #200	**2.7%**	**0%-5%**



* Percent Passing the #40 sieve can be increased to no greater than 75% if the percent passing the #100 sieve does not exceed 10% and the #200 does not exceed 5%.

** Based on empirical relationship by Hazen (1911) relating permeability to the D_{10} grain size.
Accuracy diminishes with >5% passing the #200 Sieve or permeability values <.3 ft/day.
Relationship invalid when D_{10} < .1mm or D_{10} > 3mm

WASHED SIEVE ANALYSIS

CLIENT: Avery Brook LLC
DATE: 12/14/2022
SAMPLE: TH 106 55-60", Split 1 of 2

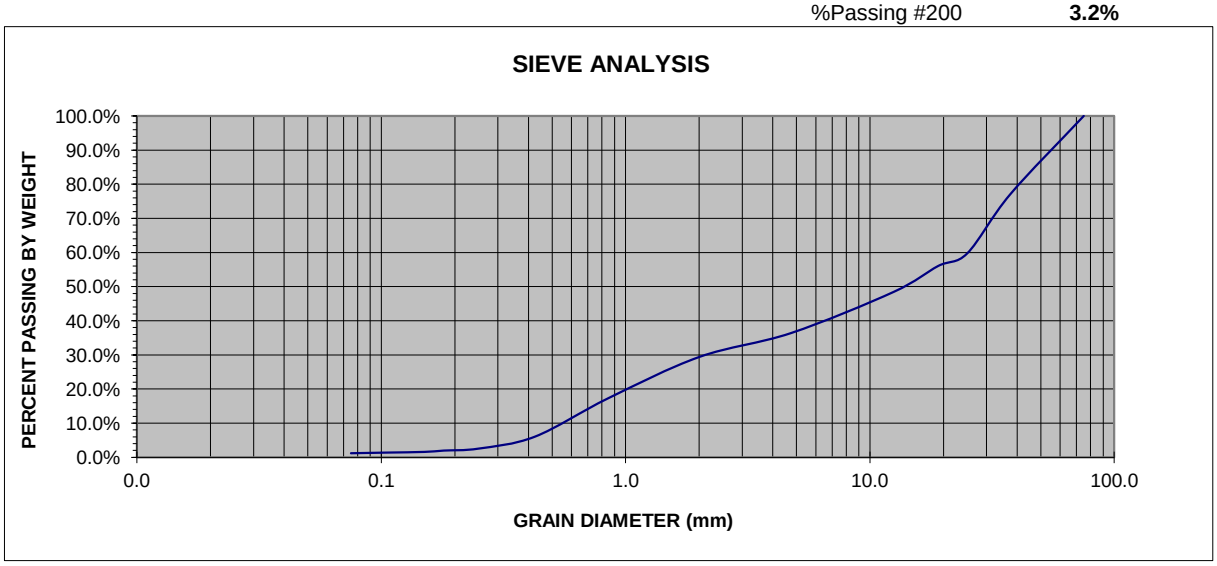
MOIST WEIGHT	=	**1.042**	**Kg**
TOTAL DRY WEIGHT	=	**1.028**	**Kg**
DRY WEIGHT AFTER WASH	=	**1.016**	**Kg**

Sieve Size	(mm)	Weight Retained	% Retained	% Passing
3"	**75.0**	0.000	0.0%	100.0%
1 1/2"	**37.5**	0.236	23.0%	77.0%
1"	**25.0**	0.178	17.3%	59.7%
3/4"	**19.0**	0.038	3.7%	56.0%
1/2"	**12.5**	0.078	7.6%	48.4%
#4	**4.75**	0.124	12.1%	36.4%
#10	**2.00**	0.072	7.0%	29.4%
#20	**0.850**	0.124	12.1%	17.3%
#40	**0.425**	0.116	11.3%	6.0%
#60	**0.250**	0.036	3.5%	2.5%
#80	**0.180**	0.006	0.6%	1.9%
#100	**0.150**	0.004	0.4%	1.6%
#140	**0.106**	0.002	0.2%	1.4%
#200	**0.075**	0.002	0.2%	1.2%
Passing #200		0.012	1.2%	

Weight of Material Passing #200 Sieve = Total Dry Weight - Dry Weight After Wash

Water Content	**1.36%**	
Unified Soil Classification System		
Grain Size Comparison		
Cobbles	**0.0%**	
Coarse Gravel	**44.0%**	
Fine Gravel	**19.6%**	
Coarse Sand	**7.0%**	
Medium Sand	**23.3%**	
Fine Sand	**4.9%**	
Silt & Clay	**1.2%**	
Uniformity Coeff.	**43.86**	
Permeability Range **		
Dense	374	ft/day
Loose	1123	ft/day

2000 CT. Health Code Septic Fill Specs		
%Retained on #4	**63.6%**	
% Passing #4-#200 (Fill less Gravel)		**Permitted**
%Passing #4	**100.0%**	**100%**
%Passing #10	**80.7%**	**70%-100%**
%Passing #40	**16.6%**	***10%-50%**
%Passing #100	**4.3%**	**0%-20%**
%Passing #200	**3.2%**	**0%-5%**



* Percent Passing the #40 sieve can be increased to no greater than 75% if the percent passing the #100 sieve does not exceed 10% and the #200 does not exceed 5%.

** Based on empirical relationship by Hazen (1911) relating permeability to the D_{10} grain size.
Accuracy diminishes with >5% passing the #200 Sieve or permeability values <.3 ft/day.
Relationship invalid when D_{10} < .1mm or D_{10} > 3mm

WASHED SIEVE ANALYSIS

CLIENT: Avery Brook LLC
DATE: 12/14/2022
SAMPLE: TH 106 55-60", Split 2 of 2

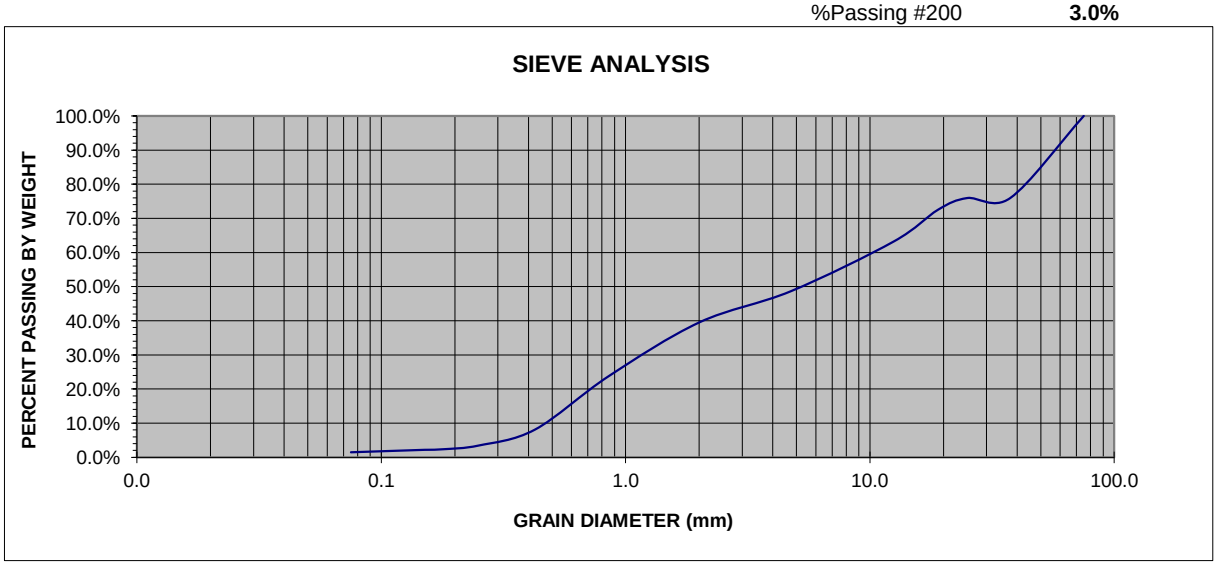
MOIST WEIGHT	=	**1.136 Kg**
TOTAL DRY WEIGHT	=	**1.114 Kg**
DRY WEIGHT AFTER WASH	=	**1.098 Kg**

Sieve Size	(mm)	Weight Retained	% Retained	% Passing
3"	75.0	0.000	0.0%	100.0%
1 1/2"	37.5	0.268	24.1%	75.9%
1"	25.0	0.000	0.0%	75.9%
3/4"	19.0	0.038	3.4%	72.5%
1/2"	12.5	0.104	9.3%	63.2%
#4	4.75	0.162	14.5%	48.7%
#10	2.00	0.102	9.2%	39.5%
#20	0.850	0.176	15.8%	23.7%
#40	0.425	0.174	15.6%	8.1%
#60	0.250	0.052	4.7%	3.4%
#80	0.180	0.012	1.1%	2.3%
#100	0.150	0.002	0.2%	2.2%
#140	0.106	0.004	0.4%	1.8%
#200	0.075	0.004	0.4%	1.4%
Passing #200		0.016	1.4%	

Weight of Material Passing #200 Sieve = Total Dry Weight - Dry Weight After Wash

Water Content	**1.97%**
Unified Soil Classification System	
Grain Size Comparison	
Cobbles	**0.0%**
Coarse Gravel	**27.5%**
Fine Gravel	**23.9%**
Coarse Sand	**9.2%**
Medium Sand	**31.4%**
Fine Sand	**6.6%**
Silt & Clay	**1.4%**
Uniformity Coeff.	**22.62**
Permeability Range **	
Dense	258 ft/day
Loose	775 ft/day

2000 CT. Health Code Septic Fill Specs		
%Retained on #4	**51.3%**	
% Passing #4-#200 (Fill less Gravel)		**Permitted**
%Passing #4	**100.0%**	**100%**
%Passing #10	**81.2%**	**70%-100%**
%Passing #40	**16.6%**	***10%-50%**
%Passing #100	**4.4%**	**0%-20%**
%Passing #200	**3.0%**	**0%-5%**



* Percent Passing the #40 sieve can be increased to no greater than 75% if the percent passing the #100 sieve does not exceed 10% and the #200 does not exceed 5%.

** Based on empirical relationship by Hazen (1911) relating permeability to the D_{10} grain size.
Accuracy diminishes with >5% passing the #200 Sieve or permeability values <.3 ft/day.
Relationship invalid when D_{10} < .1mm or D_{10} > 3mm

WASHED SIEVE ANALYSIS

CLIENT: Avery Brook LLC
DATE: 12/14/2022
SAMPLE: TH 108 46-50", Split 1 of 2

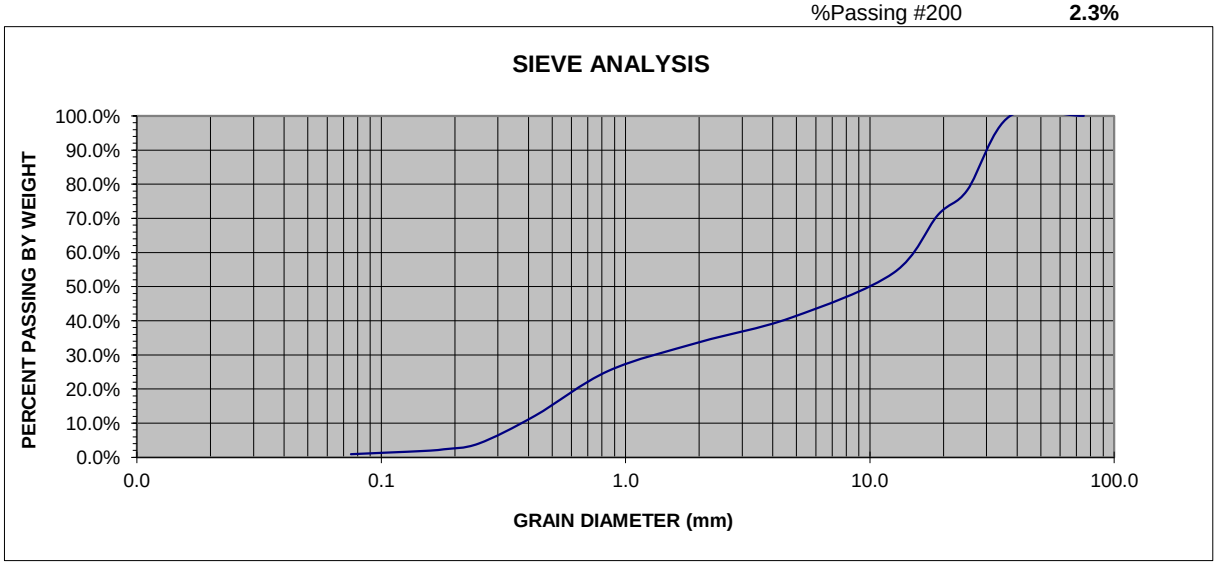
MOIST WEIGHT	=	**0.85**	**Kg**
TOTAL DRY WEIGHT	=	**0.836**	**Kg**
DRY WEIGHT AFTER WASH	=	**0.828**	**Kg**

Sieve Size	(mm)	Weight Retained	% Retained	% Passing
3"	75.0	0.000	0.0%	100.0%
1 1/2"	37.5	0.000	0.0%	100.0%
1"	25.0	0.182	21.8%	78.2%
3/4"	19.0	0.060	7.2%	71.1%
1/2"	12.5	0.142	17.0%	54.1%
#4	4.75	0.110	13.2%	40.9%
#10	2.00	0.060	7.2%	33.7%
#20	0.850	0.070	8.4%	25.4%
#40	0.425	0.110	13.2%	12.2%
#60	0.250	0.068	8.1%	4.1%
#80	0.180	0.014	1.7%	2.4%
#100	0.150	0.004	0.5%	1.9%
#140	0.106	0.004	0.5%	1.4%
#200	0.075	0.004	0.5%	1.0%
Passing #200		0.008	1.0%	

Weight of Material Passing #200 Sieve = Total Dry Weight - Dry Weight After Wash

Water Content	**1.67%**	
Unified Soil Classification System		
Grain Size Comparison		
Cobbles	**0.0%**	
Coarse Gravel	**28.9%**	
Fine Gravel	**30.1%**	
Coarse Sand	**7.2%**	
Medium Sand	**21.5%**	
Fine Sand	**11.2%**	
Silt & Clay	**1.0%**	
Uniformity Coeff.	**39.11**	
Permeability Range **		
Dense	162	ft/day
Loose	485	ft/day

2000 CT. Health Code Septic Fill Specs		
%Retained on #4	**59.1%**	
% Passing #4-#200 (Fill less Gravel)		**Permitted**
%Passing #4	**100.0%**	**100%**
%Passing #10	**82.5%**	**70%-100%**
%Passing #40	**29.8%**	***10%-50%**
%Passing #100	**4.7%**	**0%-20%**
%Passing #200	**2.3%**	**0%-5%**



* Percent Passing the #40 sieve can be increased to no greater than 75% if the percent passing the #100 sieve does not exceed 10% and the #200 does not exceed 5%.

** Based on empirical relationship by Hazen (1911) relating permeability to the D_{10} grain size.
Accuracy diminishes with >5% passing the #200 Sieve or permeability values <.3 ft/day.
Relationship invalid when D_{10} < .1mm or D_{10} > 3mm

WASHED SIEVE ANALYSIS

CLIENT: Avery Brook LLC
DATE: 12/14/2022
SAMPLE: TH 108 46-50", Split 2 of 2

MOIST WEIGHT	=	**0.95 Kg**
TOTAL DRY WEIGHT	=	**0.932 Kg**
DRY WEIGHT AFTER WASH	=	**0.916 Kg**

Sieve Size	(mm)	Weight Retained	% Retained	% Passing
3"	75.0	0.000	0.0%	100.0%
1 1/2"	37.5	0.000	0.0%	100.0%
1"	25.0	0.266	28.5%	71.5%
3/4"	19.0	0.048	5.2%	66.3%
1/2"	12.5	0.088	9.4%	56.9%
#4	4.75	0.174	18.7%	38.2%
#10	2.00	0.062	6.7%	31.5%
#20	0.850	0.070	7.5%	24.0%
#40	0.425	0.108	11.6%	12.4%
#60	0.250	0.072	7.7%	4.7%
#80	0.180	0.016	1.7%	3.0%
#100	0.150	0.004	0.4%	2.6%
#140	0.106	0.004	0.4%	2.1%
#200	0.075	0.004	0.4%	1.7%
Passing #200		0.016	1.7%	

Weight of Material Passing #200 Sieve = Total Dry Weight - Dry Weight After Wash

Water Content **1.93%**

Unified Soil Classification System

Grain Size Comparison

Cobbles	**0.0%**
Coarse Gravel	**33.7%**
Fine Gravel	**28.1%**
Coarse Sand	**6.7%**
Medium Sand	**19.1%**
Fine Sand	**10.7%**
Silt & Clay	**1.7%**
Uniformity Coeff.	**39.66**

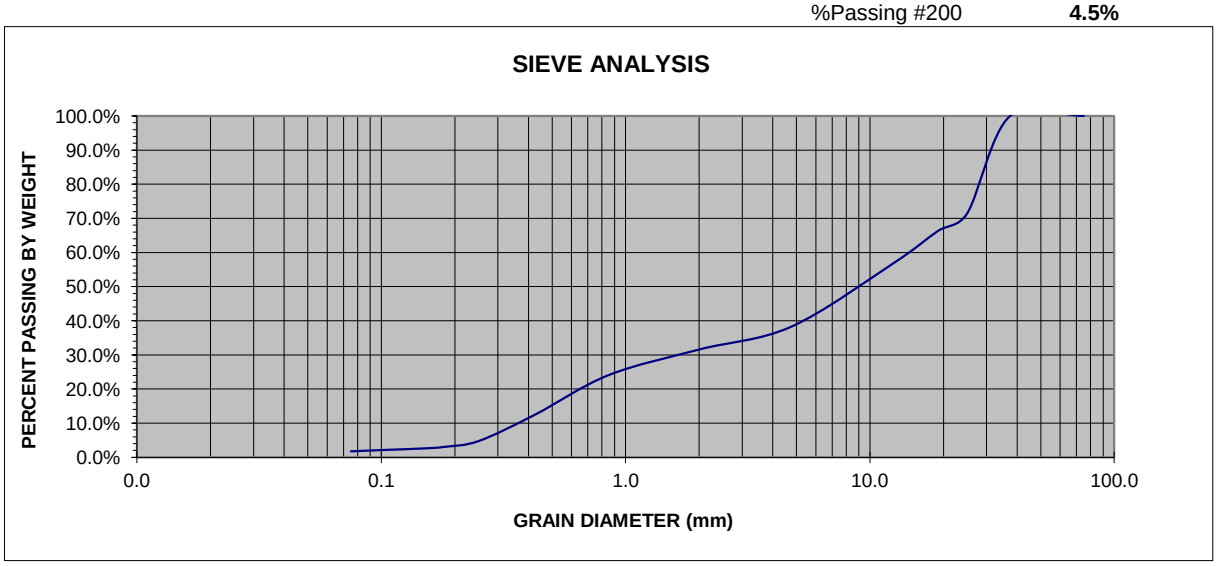
Permeability Range **

Dense	155	ft/day
Loose	465	ft/day

2000 CT. Health Code Septic Fill Specs

%Retained on #4 **61.8%**

% Passing #4-#200 (Fill less Gravel)		**Permitted**
%Passing #4	**100.0%**	**100%**
%Passing #10	**82.6%**	**70%-100%**
%Passing #40	**32.6%**	***10%-50%**
%Passing #100	**6.7%**	**0%-20%**
%Passing #200	**4.5%**	**0%-5%**



* Percent Passing the #40 sieve can be increased to no greater than 75% if the percent passing the #100 sieve does not exceed 10% and the #200 does not exceed 5%.

** Based on empirical relationship by Hazen (1911) relating permeability to the D_{10} grain size.
Accuracy diminishes with >5% passing the #200 Sieve or permeability values <.3 ft/day.
Relationship invalid when D_{10} < .1mm or D_{10} > 3mm

WASHED SIEVE ANALYSIS

CLIENT: Avery Brook LLC
DATE: 12/14/2022
SAMPLE: TH 109 46-52", Split 1 of 2

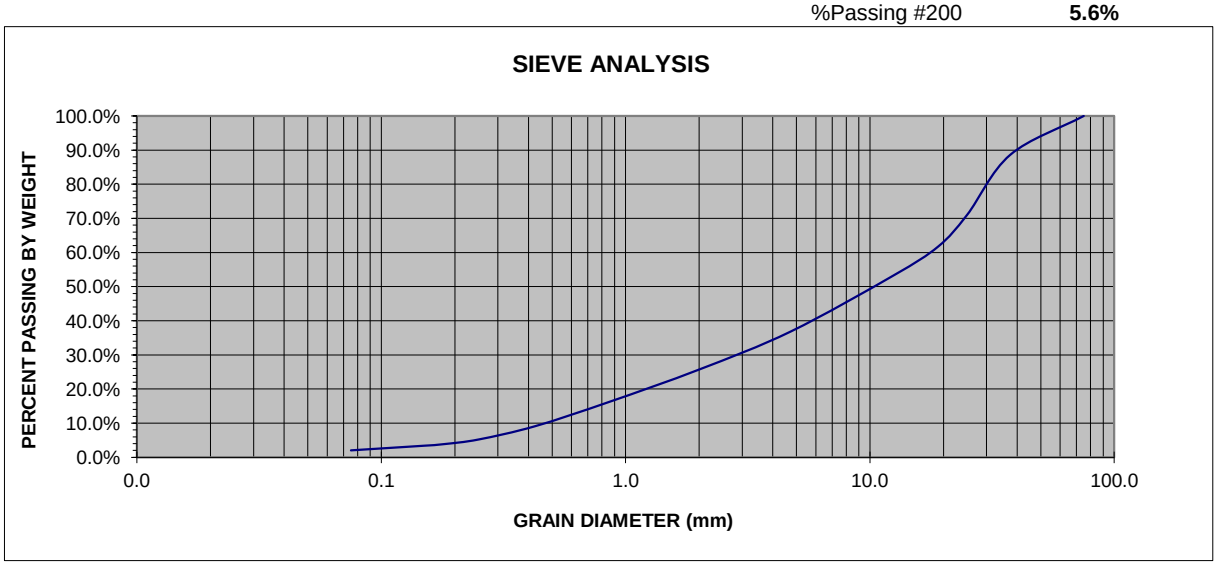
MOIST WEIGHT	=	**0.9 Kg**
TOTAL DRY WEIGHT	=	**0.878 Kg**
DRY WEIGHT AFTER WASH	=	**0.860 Kg**

Sieve Size	(mm)	Weight Retained	% Retained	% Passing
3"	75.0	0.000	0.0%	100.0%
1 1/2"	37.5	0.100	11.4%	88.6%
1"	25.0	0.154	17.5%	71.1%
3/4"	19.0	0.082	9.3%	61.7%
1/2"	12.5	0.074	8.4%	53.3%
#4	4.75	0.144	16.4%	36.9%
#10	2.00	0.098	11.2%	25.7%
#20	0.850	0.084	9.6%	16.2%
#40	0.425	0.062	7.1%	9.1%
#60	0.250	0.034	3.9%	5.2%
#80	0.180	0.012	1.4%	3.9%
#100	0.150	0.004	0.5%	3.4%
#140	0.106	0.006	0.7%	2.7%
#200	0.075	0.006	0.7%	2.1%
Passing #200		0.018	2.1%	

Weight of Material Passing #200 Sieve = Total Dry Weight - Dry Weight After Wash

Water Content	**2.51%**
Unified Soil Classification System	
Grain Size Comparison	
Cobbles	**0.0%**
Coarse Gravel	**38.3%**
Fine Gravel	**24.8%**
Coarse Sand	**11.2%**
Medium Sand	**16.6%**
Fine Sand	**7.1%**
Silt & Clay	**2.1%**
Uniformity Coeff.	**36.92**
Permeability Range **	
Dense	260 ft/day
Loose	779 ft/day

2000 CT. Health Code Septic Fill Specs		
%Retained on #4	**63.1%**	
% Passing #4-#200 (Fill less Gravel)		**Permitted**
%Passing #4	**100.0%**	**100%**
%Passing #10	**69.8%**	**70%-100%**
%Passing #40	**24.7%**	***10%-50%**
%Passing #100	**9.3%**	**0%-20%**
%Passing #200	**5.6%**	**0%-5%**



* Percent Passing the #40 sieve can be increased to no greater than 75% if the percent passing the #100 sieve does not exceed 10% and the #200 does not exceed 5%.

** Based on empirical relationship by Hazen (1911) relating permeability to the D_{10} grain size.
Accuracy diminishes with >5% passing the #200 Sieve or permeability values <.3 ft/day.
Relationship invalid when D_{10} < .1mm or D_{10} > 3mm

WASHED SIEVE ANALYSIS

CLIENT: Avery Brook LLC
DATE: 12/14/2022
SAMPLE: TH 109 46-52", Split 2 of 2

MOIST WEIGHT	=	**0.8 Kg**
TOTAL DRY WEIGHT	=	**0.78 Kg**
DRY WEIGHT AFTER WASH	=	**0.764 Kg**

Sieve Size	(mm)	Weight Retained	% Retained	% Passing
3"	75.0	0.000	0.0%	100.0%
1 1/2"	37.5	0.000	0.0%	100.0%
1"	25.0	0.162	20.8%	79.2%
3/4"	19.0	0.044	5.6%	73.6%
1/2"	12.5	0.082	10.5%	63.1%
#4	4.75	0.136	17.4%	45.6%
#10	2.00	0.106	13.6%	32.1%
#20	0.850	0.100	12.8%	19.2%
#40	0.425	0.070	9.0%	10.3%
#60	0.250	0.038	4.9%	5.4%
#80	0.180	0.012	1.5%	3.8%
#100	0.150	0.004	0.5%	3.3%
#140	0.106	0.006	0.8%	2.6%
#200	0.075	0.004	0.5%	2.1%
Passing #200		0.016	2.1%	

Weight of Material Passing #200 Sieve = Total Dry Weight - Dry Weight After Wash

Water Content **2.56%**

Unified Soil Classification System

Grain Size Comparison

Cobbles	**0.0%**
Coarse Gravel	**26.4%**
Fine Gravel	**27.9%**
Coarse Sand	**13.6%**
Medium Sand	**21.8%**
Fine Sand	**8.2%**
Silt & Clay	**2.1%**
Uniformity Coeff.	**26.77**

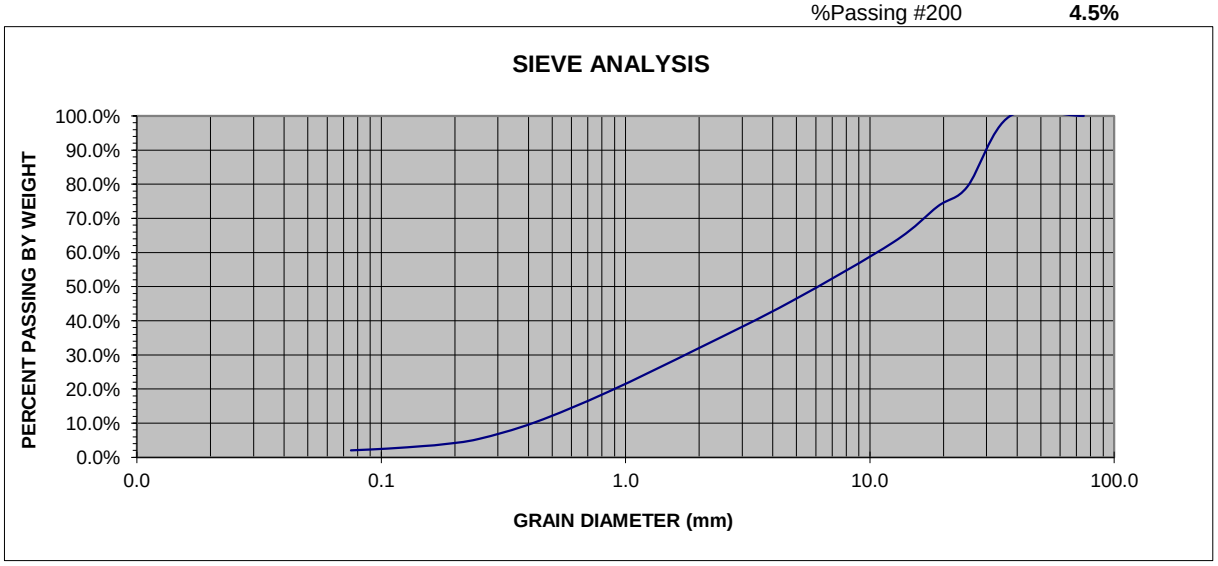
Permeability Range **

Dense	196	ft/day
Loose	588	ft/day

2000 CT. Health Code Septic Fill Specs

%Retained on #4 **54.4%**

% Passing #4-#200 (Fill less Gravel)		**Permitted**
%Passing #4	**100.0%**	**100%**
%Passing #10	**70.2%**	**70%-100%**
%Passing #40	**22.5%**	***10%-50%**
%Passing #100	**7.3%**	**0%-20%**
%Passing #200	**4.5%**	**0%-5%**



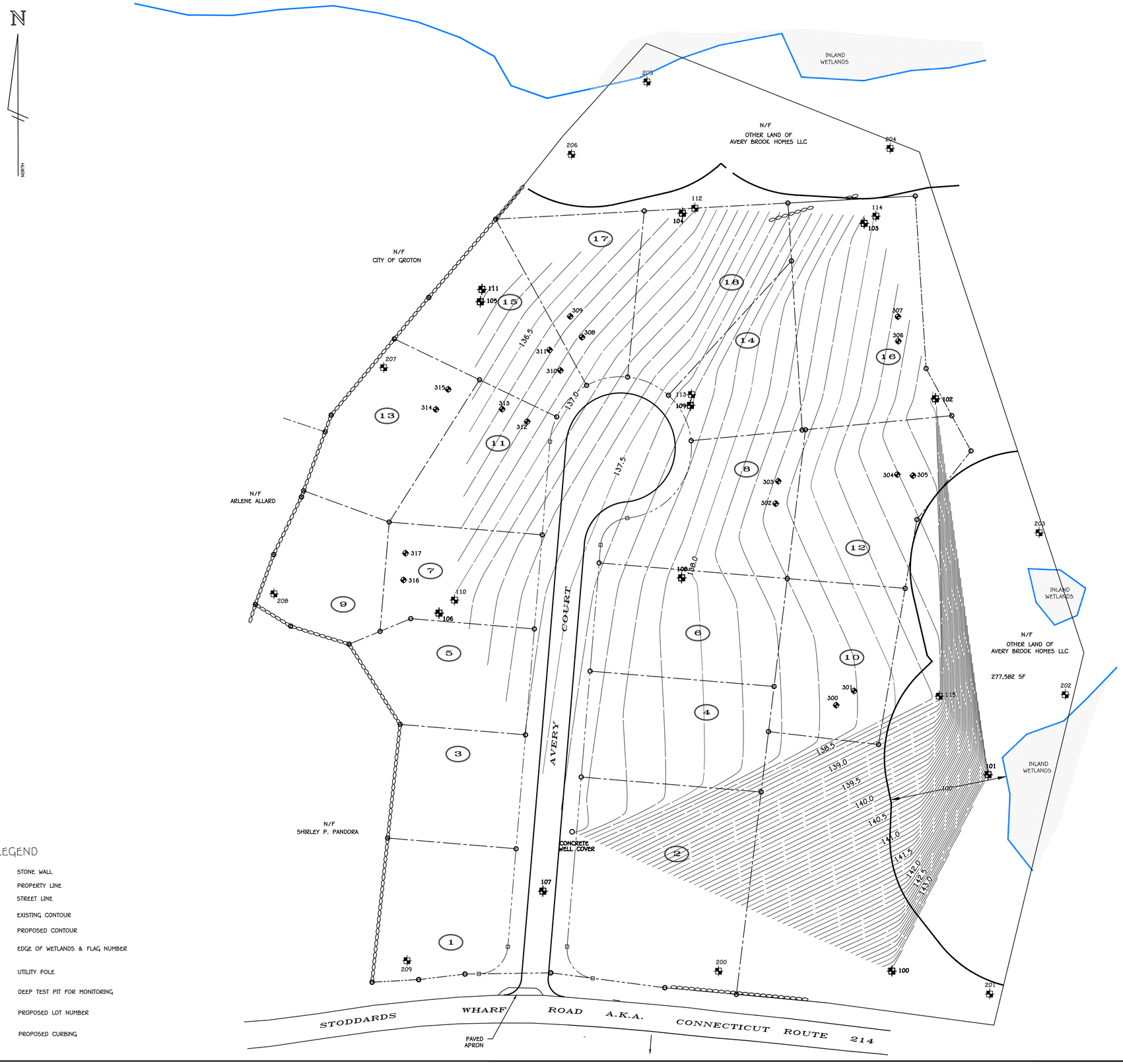
* Percent Passing the #40 sieve can be increased to no greater than 75% if the percent passing the #100 sieve does not exceed 10% and the #200 does not exceed 5%.

** Based on empirical relationship by Hazen (1911) relating permeability to the D_{10} grain size.
Accuracy diminishes with >5% passing the #200 Sieve or permeability values <.3 ft/day.
Relationship invalid when D_{10} < .1mm or D_{10} > 3mm

ANGUS McDONALD
GARY SHARPE
& ASSOCIATES, INC.
SINCE 1966

Appendix C

Ground Water Monitoring / Ground Water Contour Maps



1/5/2023							
Monitor Pipe	Top of Pipe to Grade	Top of Pipe to Grade	Top of Pipe to Bottom	Top of Pipe to Water	Top of Pipe Elevation		Ground Water Elevation
	(In)	(Ft)	(Ft)	(Ft)	(Ft)		
100	63	5.25	19.41	17.48	161.27		143.79
101	16	1.33	9.8	3.37	146.34		142.97
102	35	2.92	19.43	18.14	157.16		139.02
103	43	3.58	19.12	DRY	159.25	Below	140.13
104	27	2.25	19.5	DRY	158.5	Below	139.00
105	31	2.58	19.51	DRY	162.64	Below	143.13
106	33	2.75	16.61	DRY	164.1	Below	147.49
107	23	1.92	9.85	DRY	158.06	Below	148.21
108	15	1.25	19.3	19.24	157.2		137.96
109	20	1.67	17.8	DESTROYED	-		-
Well	3	0.25	-	19.42	157.08		137.66
110	16	1.33	25.97	25.7	162.72		137.02
111	18	1.50	26.25	25.31	161.37		136.06
112	15	1.25	22.62	20.49	157.28		136.79
113	28	2.33	23.7	23.14	160.82		137.68
114	17	1.42	18.45	17.97	156.48		138.51
115	20	1.67	13.35	10.31	148.93		138.62

LEGEND

- STONE WALL
- PROPERTY LINE
- STREET LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- WF 1 — EDGE OF WETLANDS & FLAG NUMBER
- UTILITY POLE
- DEEP TEST PIT FOR MONITORING
- (16) — PROPOSED LOT NUMBER
- PROPOSED CURBING

"GROUNDWATER CONTOURS 1-5-23"

PREPARED FOR
AVERY BROOK HOMES, LLC
STODDARDS WHARF ROAD
LEDYARD, CONNECTICUT

SHEET 1 OF 6
DATE: 6-12-24 SCALE: 1"=40' JOB NO. 226636

LAND & MARINE ENGINEERING SURVEYING PLANNING

ANGUS McDONALD
GARY SHARPE
& ASSOCIATES, INC
SINCE 1966

P.O. BOX 608, 245 BOSTON POST ROAD
OLD SAYBROOK, CONNECTICUT 06475
TEL. (860) 388-4671 FAX (860) 388-3962

1/12/2023							
Monitor Pipe	Top of Pipe to Grade	Top of Pipe to Grade	Top of Pipe to Bottom	Top of Pipe to Water	Top of Pipe Elevation		Ground Water Elevation
	(in)	(Ft)	(Ft)	(Ft)	(Ft)		
100	63	5.25	19.41	17.61	161.27		143.66
101	16	1.33	9.8	3.87	146.34		142.47
102	35	2.92	19.43	18.21	157.16		138.95
103	43	3.58	19.12	DRY	159.25	Below	140.13
104	27	2.25	19.5	DRY	158.5	Below	139.00
105	31	2.58	19.51	DRY	162.64	Below	143.13
106	33	2.75	16.61	DRY	164.1	Below	147.49
107	23	1.92	9.85	DRY	158.06	Below	148.21
108	15	1.25	19.3	19.32	157.2		137.88
109	20	1.67	17.8	DESTROYED	-		-
Well	3	0.25	-	19.56	157.08		137.52
110	16	1.33	25.97	25.78	162.72		136.94
111	18	1.50	26.25	25.59	161.37		135.78
112	15	1.25	22.62	20.69	157.28		136.59
113	28	2.33	23.7	23.21	160.82		137.61
114	17	1.42	18.45	18.03	156.48		138.45
115	20	1.67	13.35	10.51	148.93		138.42

SOIL TYPE LEGEND

SOURCE: NATURAL RESOURCES CONSERVATION SERVICE WEB SOIL SURVEY URL: http://websoilsurvey.nrcs.usda.gov

COLLAPSE STATE OF CONNECTICUT (CT600)
STATE OF CONNECTICUT (CT600)

AfB AGAWAM FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES
HkC HINCKLEY LOAMY SAND, 3 TO 15 PERCENT SLOPES
CdC CANTON AND CHARLTON FINE SANDY LOAMS, 3 TO 15 PERCENT SLOPES, EXTREMELY STONY
HrD HOLLIS-CHATFIELD-ROCK OUTCROP COMPLEX, 15 TO 45 PERCENT SLOPES
Ud UDORTHENTS-URBAN LAND COMPLEX
HcA HAVEN SILT LOAM, 0 TO 3 PERCENT SLOPES
CrD CHARLTON-CHATFIELD COMPLEX, 15 TO 45 PERCENT SLOPES, VERY ROCKY

LEGEND

- STONE WALL
- PROPERTY LINE
- STREET LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- WF 1 — EDGE OF WETLANDS & FLAG NUMBER
- UTILITY POLE
- DEEP TEST PIT FOR MONITORING
- 16 — PROPOSED LOT NUMBER
- PROPOSED CURBING

"GROUNDWATER CONTOURS 1-12-23"
PREPARED FOR
AVERY BROOK HOMES, LLC
STODDARDS WHARF ROAD
LEDYARD, CONNECTICUT

SHEET 2 OF 6
DATE: 6-12-24 SCALE: 1"=40' JOB NO. 226636

ANGUS McDONALD GARY SHARPE & ASSOCIATES, INC
SINCE 1966
LAND & MARINE ENGINEERING SURVEYING PLANNING
P.O. BOX 608, 245 BOSTON POST ROAD
OLD SAYBROOK, CONNECTICUT 06475
TEL. (860) 388-4671 FAX (860) 388-3962

SCALE IN FEET

3/22/2024							
Monitor Pipe	Top of Pipe to Grade (In)	Top of Pipe to Grade (Ft)	Top of Pipe to Bottom (Ft)	Top of Pipe to Water (Ft)	Top of Pipe Elevation (Ft)		Ground Water Elevation
100				15.36	161.27		145.91
101				3.75	146.34		142.59
102				18.02	157.16		139.14
103				DRY	-		#VALUE!
104				DRY	-		#VALUE!
105				DRY	-		#VALUE!
106				DRY	-		#VALUE!
107				DRY	-		#VALUE!
108				18.88	157.2		138.32
109				GONE	-		-
Well				18.9	157.08		138.18
110				24.98	162.72		137.74
111				24.04	161.37		137.33
112				19.57	157.28		137.71
113				22.79	160.82		138.03
114				18.17	156.48		138.31
115				10.08	148.93		138.85

N

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SOIL TYPE LEGEND

SOURCE: NATURAL RESOURCES CONSERVATION SERVICE WEB SOIL
SURVEY URL: http://websoilsurvey.nrcs.usda.gov

COLLAPSE STATE OF CONNECTICUT (CT600)
STATE OF CONNECTICUT (CT600)

AfB AGAWAM FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES
HkC HINCKLEY LOAMY SAND, 3 TO 15 PERCENT SLOPES
CdC CANTON AND CHARLTON FINE SANDY LOAMS, 3 TO 15 PERCENT SLOPES, EXTREMELY STONY
HrD HOLLIS-CHATFIELD-ROCK OUTCROP COMPLEX, 15 TO 45 PERCENT SLOPES
Ud UDORTHENTS-URBAN LAND COMPLEX
HcA HAVEN SILT LOAM, 0 TO 3 PERCENT SLOPES
CrD CHARLTON-CHATFIELD COMPLEX, 15 TO 45 PERCENT SLOPES, VERY ROCKY

LEGEND

- STONE WALL
- PROPERTY LINE
- STREET LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- WF 1 — EDGE OF WETLANDS & FLAG NUMBER
- UTILITY POLE
- DEEP TEST PIT FOR MONITORING
- 16 — PROPOSED LOT NUMBER
- PROPOSED CURBING

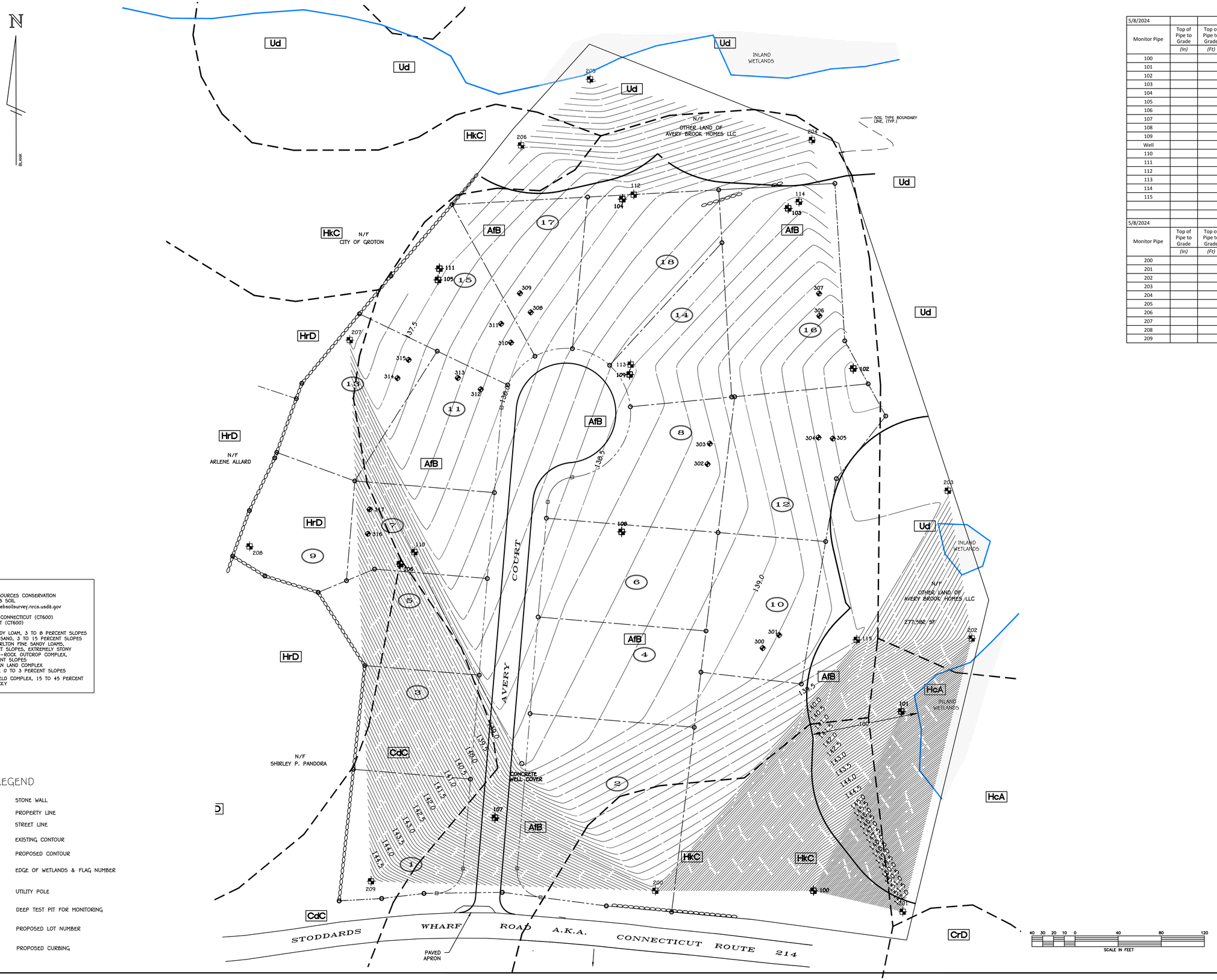
Ud
HkC
AfB
HrD
CdC
HcA
CrD
INLAND WETLANDS
N/F OTHER LAND OF AVERY BROOK HOMES LLC
277,582 SF
N/F CITY OF GROTON
N/F ARLENE ALLARD
N/F SHIRLEY P. PANDORA
SOIL TYPE BOUNDARY LINE, (TYP.)
AVERY COURT
STODDARDS WHARF ROAD A.K.A. CONNECTICUT ROUTE 214
CONCRETE WELL COVER
GUY WIRE
SNET 4152
POLE NO#
25MPH SIGN
AT&T 3177
PAVED APRON
METAL GUIDE
15" CMP
137.5
138.0
138.5
139.0
139.5
140.0
140.5
141.0
141.5
142.0
142.5
143.0
143.5
144.0
144.5
145.0

SCALE IN FEET: 40 30 20 10 0 40 80 120

"GROUNDWATER CONTOURS 3-22-24"
PREPARED FOR
AVERY BROOK HOMES, LLC
STODDARDS WHARF ROAD
LEDYARD, CONNECTICUT

SHEET 3 OF 6
DATE: 6-12-24 SCALE: 1"=40' JOB NO. 226636

LAND & MARINE ENGINEERING SURVEYING PLANNING
ANGUS McDONALD GARY SHARPE & ASSOCIATES, INC
SINCE 1966
P.O. BOX 608, 245 BOSTON POST ROAD
OLD SAYBROOK, CONNECTICUT 06475
TEL. (860) 388-4671 FAX (860) 388-3062



5/8/2024							
Monitor Pipe	Top of Pipe to Grade	Top of Pipe to Grade	Top of Pipe to Bottom	Top of Pipe to Water	Top of Pipe Elevation		Ground Water Elevation
	(In)	*(Ft)*	*(Ft)*	*(Ft)*	*(Ft)*		
100				14.28	161.27		146.99
101				3.46	146.34		142.88
102				17.62	157.16		139.54
103				DRY	-		#VALUE!
104				DRY	-		#VALUE!
105				DRY	-		#VALUE!
106				DRY	-		#VALUE!
107				DRY	-		#VALUE!
108				18.46	157.2		138.74
109				GONE	-		-
Well				18.4	157.08		138.68
110				DRY	-	Below	#VALUE!
111				23.9	161.37		137.47
112				19.26	157.28		138.02
113				22.34	160.82		138.48
114				17.94	156.48		138.54
115				9.64	148.93		139.29

5/8/2024							
Monitor Pipe	Top of Pipe to Grade	Top of Pipe to Grade	Top of Pipe to Bottom	Top of Pipe to Water	Top of Pipe Elevation		Ground Water Elevation
	(In)	*(Ft)*	*(Ft)*	*(Ft)*	*(Ft)*		
200				8.27	148.94		140.67
201				7.95	160.72		152.77
202				5.02	147.04		142.02
203				16.06	155.47		139.41
204				13.64	151.65		138.01
205				2.07	138.12		136.05
206				10.5	147.77		137.27
207				26.6	163.87		137.27
208				NOT DONE			-
209				14.72	159.8		145.08

"GROUNDWATER CONTOURS 4-8-24"
PREPARED FOR
AVERY BROOK HOMES, LLC
STODDARDS WHARF ROAD
LEDYARD, CONNECTICUT

SHEET 4 OF 6
DATE: 6-12-24 SCALE: 1"=40' JOB NO. 226636

LAND & MARINE ENGINEERING SURVEYING PLANNING
ANGUS McDONALD GARY SHARPE & ASSOCIATES, INC
SINCE 1966
P.O. BOX 608, 245 BOSTON POST ROAD
OLD SAYBROOK, CONNECTICUT 06475
TEL. (860) 388-4671 FAX (860) 388-3962

4/19/2024							
Monitor Pipe	Top of Pipe to Grade	Top of Pipe to Grade	Top of Pipe to Bottom	Top of Pipe to Water	Top of Pipe Elevation		Ground Water Elevation
	(In)	*(Ft)*	*(Ft)*	*(Ft)*	*(Ft)*		
100				15.94	161.27		145.33
101				3.52	146.34		142.82
102				18.11	157.16		139.05
103				DRY	-		#VALUE!
104				DRY	-		#VALUE!
105				DRY	-		#VALUE!
106				DRY	-		#VALUE!
107				DRY	-		#VALUE!
108				19.11	157.2		138.09
109				GONE	-		-
Well				19.12	157.08		137.96
110				25.41	162.72		137.31
111				24.59	161.37		136.78
112				19.9	157.28		137.38
113				23	160.82		137.82
114				18.14	156.48		138.34
115				10.22	148.93		138.71

4/19/2024							
Monitor Pipe	Top of Pipe to Grade	Top of Pipe to Grade	Top of Pipe to Bottom	Top of Pipe to Water	Top of Pipe Elevation		Ground Water Elevation
	(In)	*(Ft)*	*(Ft)*	*(Ft)*	*(Ft)*		
200				9.04	148.94		139.90
201				8.96	160.72		151.76
202				5.01	147.04		142.03
203				16.45	155.47		139.02
204				13.8	151.65		137.85
205				2.3	138.12		135.82
206				11.03	147.77		136.74
207				27.21	163.87		136.66
208				NOT DONE			-
209				16.57	159.8		143.23

SOIL TYPE LEGEND

SOURCE: NATURAL RESOURCES CONSERVATION SERVICE WEB SOIL
SURVEY URL: http://websoilsurvey.nrcs.usda.gov

COLLAPSE STATE OF CONNECTICUT (CT600)
STATE OF CONNECTICUT (CT600)

AfB AGAWAM FINE SANDY LOAM, 3 TO 8 PERCENT SLOPES
HkC HINCKLEY LOAMY SAND, 3 TO 15 PERCENT SLOPES
CdC CANTON AND CHARLTON FINE SANDY LOAMS, 3 TO 15 PERCENT SLOPES, EXTREMELY STONY
HrD HOLLIS-CHATFIELD-ROCK OUTCROP COMPLEX, 15 TO 45 PERCENT SLOPES
Ud UDORTHENTS-URBAN LAND COMPLEX
HcA HAVEN SILT LOAM, 0 TO 3 PERCENT SLOPES
CrD CHARLTON-CHATFIELD COMPLEX, 15 TO 45 PERCENT SLOPES, VERY ROCKY

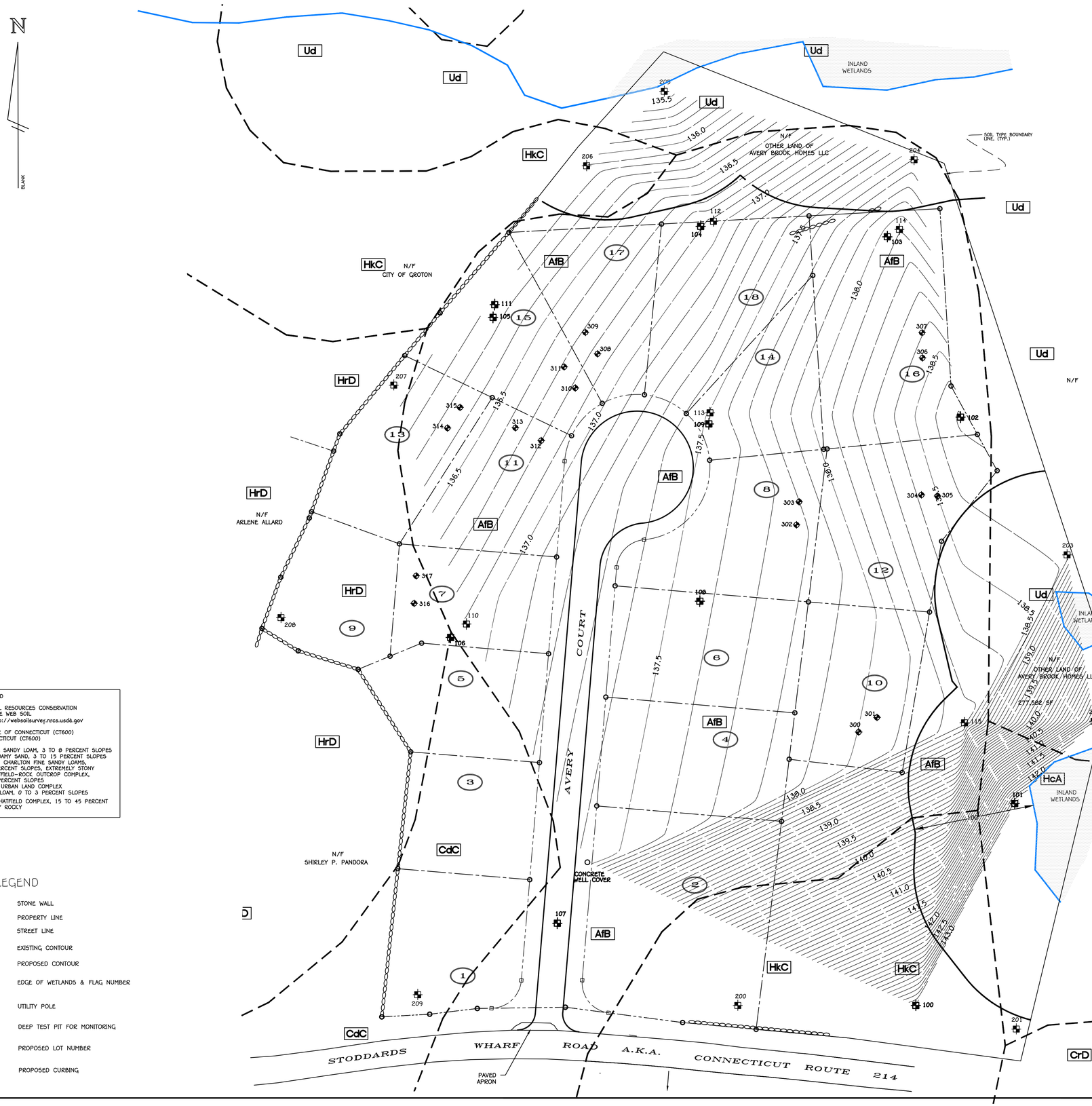
LEGEND

- STONE WALL
- PROPERTY LINE
- STREET LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- WF 1 — EDGE OF WETLANDS & FLAG NUMBER
- UTILITY POLE
- DEEP TEST PIT FOR MONITORING
- 16 — PROPOSED LOT NUMBER
- PROPOSED CURBING

"GROUNDWATER CONTOURS 4-19-24"
PREPARED FOR
AVERY BROOK HOMES, LLC
STODDARDS WHARF ROAD
LEDYARD, CONNECTICUT

SHEET 5 OF 6
DATE: 6-12-24 SCALE: 1"=40' JOB NO. 226636

ANGUS McDONALD GARY SHARPE & ASSOCIATES, INC
LAND & MARINE ENGINEERING SURVEYING PLANNING
SINCE 1966
P.O. BOX 608, 245 BOSTON POST ROAD
OLD SAYBROOK, CONNECTICUT 06475
TEL (860) 388-4671 FAX (860) 388-3962



5/2/2024							
Monitor Pipe	Top of Pipe to Grade	Top of Pipe to Grade	Top of Pipe to Bottom	Top of Pipe to Water	Top of Pipe Elevation		Ground Water Elevation
	(In)	(Ft)	(Ft)	(Ft)	(Ft)		
100				17.74	161.27		143.53
101				3.9	146.34		142.44
102				18.44	157.16		138.72
103				DRY	-		#VALUE!
104				DRY	-		#VALUE!
105				DRY	-		#VALUE!
106				DRY	-		#VALUE!
107				DRY	-		#VALUE!
108				DRY	157.2		
109				GONE	-		-
Well				19.65	157.08		137.43
110				25.8	162.72		136.92
111				25.14	161.37		136.23
112				20.35	157.28		136.93
113				23.31	160.82		137.51
114				18.39	156.48		138.09
115				10.67	148.93		138.26
5/2/2024							
Monitor Pipe	Top of Pipe to Grade	Top of Pipe to Grade	Top of Pipe to Bottom	Top of Pipe to Water	Top of Pipe Elevation		Ground Water Elevation
	(In)	(Ft)	(Ft)	(Ft)	(Ft)		
200				DRY	148.94		#VALUE!
201				DRY	160.72		#VALUE!
202				5.45	147.04		141.59
203				16.84	155.47		138.63
204				14.04	151.65		137.61
205				2.71	138.12		135.41
206				11.66	147.77		136.11
207				27.85	163.87		136.02
208				NOT DONE			-
209				DRY	159.8		#VALUE!

SOIL TYPE LEGEND

SOURCE: NATURAL RESOURCES CONSERVATION SERVICE WEB SOIL
SURVEY URL: http://websoilsurvey.nrcs.usda.gov

COLLAPSE STATE OF CONNECTICUT (CT600)
STATE OF CONNECTICUT (CT600)

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CdC CANTON AND CHARLTON FINE SANDY LOAMS, 3 TO 15 PERCENT SLOPES, EXTREMELY STONY
HrD HOLLIS-CHATFIELD-ROCK OUTCROP COMPLEX, 15 TO 45 PERCENT SLOPES
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CrD CHARLTON-CHATFIELD COMPLEX, 15 TO 45 PERCENT SLOPES, VERY ROCKY

LEGEND

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- PROPOSED CONTOUR
- WF 1 — EDGE OF WETLANDS & FLAG NUMBER
- UTILITY POLE
- DEEP TEST PIT FOR MONITORING
- 16 — PROPOSED LOT NUMBER
- PROPOSED CURBING

"GROUNDWATER CONTOURS 5-2-24"

PREPARED FOR
AVERY BROOK HOMES, LLC
STODDARDS WHARF ROAD
LEDYARD, CONNECTICUT

SHEET 6 OF 6
DATE: 6-12-24 SCALE: 1"=40' JOB NO. 226636

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SINCE 1966

P.O. BOX 608, 245 BOSTON POST ROAD
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LAND & MARINE
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SURVEYING
PLANNING

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GARY SHARPE
& ASSOCIATES, INC.
SINCE 1966

Appendix D

12-8-2022 Test Hole Logs

TEST HOLE DATA
DATE: 12-8-2022
PRESENT: STUART FAIRBANK (ALMGPS)
FERN TREMBLAY (ALM/GPS)
PETER GARDNER (OWNER)

TP 100
0-9" TOPSOIL
9-34" ORANGE BROWN FINE SILTY LOAM
34-175" LIGHT GRAY BROWN MEDIUM LOAMY SAND
W/ GRAVEL & ROCKS

TUBE @ 47"
BAG @ 42-48"

NO MOTTLING NO WATER NO LEDGE

TP 101
0-9" TOPSOIL
9-16" TAN FINE SILTY LOAM
16-36" DARK BROWN MEDIUM-COARSE LOAMY
SAND & GRAVEL
36-96" GRAY BROWN MEDIUM LOAMY SAND
POCKET OF FINE GRAY SAND 36-45"
NORTH SIDE OF TEST HOLE

TUBE @ 38"
BAG @ 30-36"

MOTTLING @21" WATER @ 26" NO LEDGE

TP 102
0-9" TOPSOIL
9-34" ORANGE BROWN FINE SILTY LOAM
34-175" LIGHT BROWN MEDIUM-COARSE
SAND & GRAVEL W/ STONES

TUBE @ 48"
BAG @ 42-48"
BAG @180-186"

NO MOTTLING WATER @ 204" NO LEDGE

TP 103
0-10" TOPSOIL
10-31" ORANGE BROWN FINE SILTY LOAM
31-198" LIGHT BROWN BANDED MEDIUM-COARSE
SAND & GRAVEL W/ STONES

TUBE @ 48"
BAG @ 42-48"
BAG @ 165-171"

NO MOTTLING NO WATER NO LEDGE

TP 104
0-17" TOPSOIL
7-37" ORANGE BROWN FINE SILTY LOAM
37-210" LIGHT BROWN BANDED MEDIUM-COARSE
SAND & GRAVEL W/ STONES

TUBE @ 48"
BAG @ 42-48"

NO MOTTLING NO WATER NO LEDGE

TP 105
0-9" TOPSOIL
9-32" ORANGE BROWN FINE SILTY LOAM
32-216" LIGHT BROWN BANDED MEDIUM-COARSE
SAND & GRAVEL W/ STONES

TUBE @ 48"
BAG @ 42-48"

NO MOTTLING NO WATER NO LEDGE

TP 106
0-9" TOPSOIL
9-23" ORANGE BROWN FINE SILTY LOAM
23-204" LIGHT BROWN BANDED MEDIUM-COARSE
SAND & GRAVEL W/ STONES

TUBE @ 57"
BAG @ 55-60"

NO MOTTLING NO WATER NO LEDGE

TP 107
0-12" TOPSOIL
12-35" DARK BROWN FINE SILTY LOAM
35-91" BROWN MEDIUM-COARSE BANDED
SAND & GRAVEL W/ STONES

NO MOTTLING NO WATER LEDGE @ 91"

TP 108
0-13" TOPSOIL
13-39" ORANGE BROWN FINE SILTY LOAM
39-210" LIGHT BROWN BANDED MEDIUM-COARSE
SAND & GRAVEL W/ STONES

TUBE @ 48"
BAG @ 46-50"

NO MOTTLING NO WATER NO LEDGE

WELL
22' DEEP (30' NORTH TP 107)
WATER @ 19'

TP 109
0-11" TOPSOIL
11-36" ORANGE BROWN FINE SILTY LOAM
36-194" LIGHT BROWN BANDED MEDIUM-COARSE
SAND & GRAVEL W/ STONES

TUBE @ 52"
BAG @ 46-52"

NO MOTTLING NO WATER NO LEDGE

ANGUS McDONALD
GARY SHARPE
& ASSOCIATES, INC.
SINCE 1966

Appendix E

Onsite Wastewater Technology Testing Report

Onsite Wastewater Technology Testing Report

Massachusetts Alternative Septic System Test Center
Air Station Cape Cod, Massachusetts 02542
Telephone: 508-563-6757
MASSTC@barnstablecounmty.org

Massachusetts
Alternative
Septic
System
Test
Center

-- May 2021—

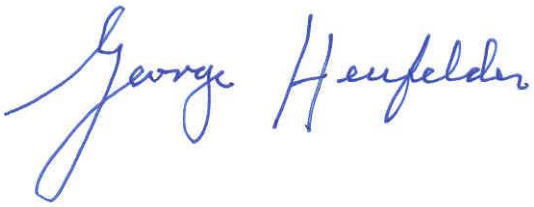
Performance Evaluation
Geomatrix™ GST 6212

January 2019 – March 2021

Technology Vendor

Geomatrix™ Systems LLC
114 Mill Rock Road East
Old Saybrook, CT 06475
geomatrixsystems.com

I certify that I represent the Massachusetts Alternative Septic System Test Center, a project of the Barnstable County Department of Health and Environment, Barnstable County Massachusetts. I further certify that I am authorized to report the testing results for this proprietary treatment product. I attest that the details described in this report regarding the test protocol and results are true and accurate to the best of my knowledge.



George Heufelder, M.S., R.S.
Barnstable County Department of Health and Environment
Massachusetts Alternative Septic System Test Center

Section 1.0 Introduction

The Massachusetts Alternative Septic System Test Center (MASSTC) is located at the Otis Air National guard military base in Falmouth, Massachusetts. The Test Center is operated by the Barnstable County Department of Health and Environment.

The mission of MASSTC is to provide a location for the verification and testing of onsite wastewater treatment technologies and components. MASSTC conducts testing under various protocols, some of which are widely recognized. Of note, the National Sanitation Foundation International (NSF) has employed MASSTC to conduct its standard protocol ANSI/NSF Standard 40 on a number of onsite septic system technologies. In addition, MASSTC has performed a number of verification tests in accordance with a nutrient testing protocol jointly developed with industry, NSF, and the United States Environmental Protection Agency (USEPA) known as the Environmental Technology Verification Program (ETV). Finally, MASSTC has been used to conduct the nitrogen reduction standard NSF/ANSI Standard 245. The Center also conducts independent research for the Commonwealth of Massachusetts and assists the onsite industry by providing a platform and facility for research and development of wastewater treatment products.

This report describes the GST 6212 product hydraulic response and treatment performance over 109 weeks (testing continues through to the date of this report). For this evaluation, the same influent and discharge parameter requirements specified in NSF/ANSI Standard 40 were used and more data points were collected, additionally the present test was conducted over a more extensive time period than required in the NSF/ANSI Standard 40. A comparison of the present test metrics, the NSF/ANSI Standard 40, and the USEPA ETV Program are provided in Table 1. Of particular note is that the duration of this reported test was four times that of the aforementioned standard and allowed the evaluation of the system to span all seasons. In addition, stress test laundry loads specified in the ANSI/NSF 40 Standard were added instead of being substituted to daily hydraulic loads and the present test included a period of extended stress representing two types of added stress compared with Standard 40.

Section 2.0 Test Cell Construction

The GST Leaching System (GST) was installed using patented removable forms that create three-dimensional leaching “fingers” along the side of a central distribution channel. Each finger is filled with washed stone aggregate, alternating, and then surrounded by ASTM C-33 sand (Figure 1). Once the form was filled to 12 inches, it was removed, and a distribution pipe was positioned down the central channel to distribute effluent to the GST. The GST was placed above 12 inches of ASTM C33 sand. The entire system was constructed within a lined test cell such that all percolate passing through the system could be sampled.

Observation ports were installed at the stone-sand interface for monitoring the ponding depth throughout the study period. A 1500-gallon septic tank was installed with a distribution box which conveyed the septic tank effluent to the GST. A central underdrain within the containment liner served as a sample collection point and was flushed weekly on Fridays to avoid compromising regular samples (since no samples were taken for the two following days). This flushing schedule was modified as necessary during stress loading to avoid sampling days required during those events.

Table 1: Differences between ANSI/NSF Standard 40, USEPA ETV, and the present test;

	ANSI/NSF 40	**USEPA ETV**	**MASSTC Test**
Testing duration	26-34 weeks	52 weeks	109 weeks
Data days	96 (5x per week)	16 (12 samples taken each calendar month no less than ten days after the preceding sample and 4 supplemental samples immediately preceding or following one of the monthly samples)	100 (1x per week for 17 weeks, every other week for 11 weeks, and 1x per month for 40 weeks, <5x per week for 8 weeks (stress test), approx. 2x per month for 24 weeks, and 5x per week for 9 weeks)
Start-up	3 weeks if requested	Vendor-specified	None (results do not change when first 3 weeks excluded)
Timeframe requirements	May occur in any seasons spanning the 6-month test- not prescribed by protocol.	Spanned all seasons for cold weather performance verification.	Spanned all seasons for cold weather performance verification.
Stress Test	Four phases: wash days, working parent, and power failure.	Not performed	Five phases: wash days (added in addition to design load), working parent, power failure, and extended stress (loading at twice the hydraulic loading rate every day for three months)
Analytic parameters	TSS, $BOD_{5\text{-}day}$, $cBOD_{5\text{-}day}$, pH, temperature, Dissolved Oxygen	TSS, $cBOD_{5\text{-}day}$, COD, temperature, pH, FOG, TKN, NO_3^-+NO_2^-, NH_3, Alkalinity, TP, SP, Fecal coliform, *E. coli*	TSS, $BOD_{5\text{-}day}$/$cBOD_{5\text{-}day}$, pH, Fecal coliform, NH_4^+, NO_2^-, NO_3^-, TKN, TN (by calculation), TP, Dissolved Oxygen, temperature
Hydraulic analysis	Visual inspection for surface breakout; no hydraulic function analysis	None specified	Ponding measurements collected twice weekly from a proximal and distal observation port

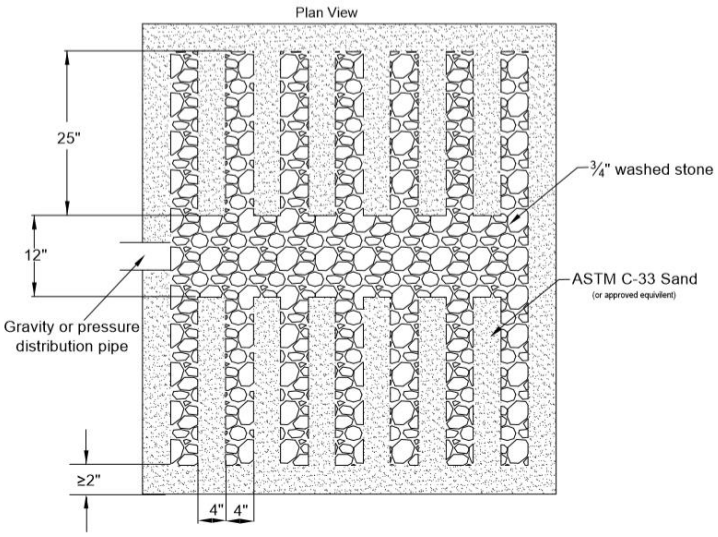


Figure 1. Plan view of the GST (series 62) product. Twelve-inch height of system was used in the test (source Geomatrix™ LLC)

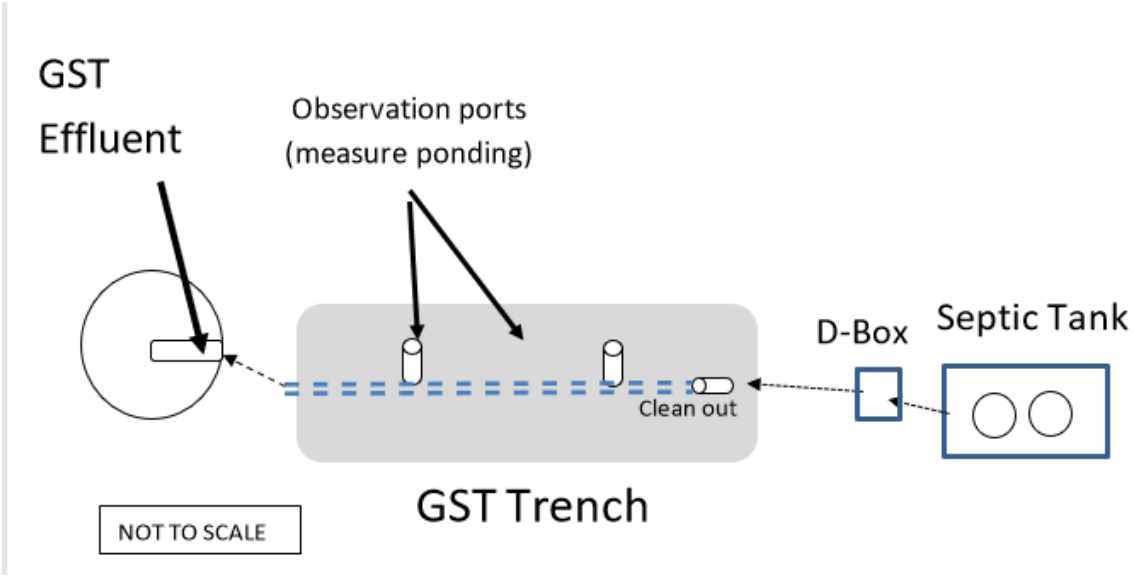


Figure 2 Experimental design of GST trench. Ports indicate location of ponding observations.

Section 3.0 Sampling protocol and schedule

Raw wastewater was supplied in thirty discrete doses totaling 300 gallons per day to the septic tank in accordance with the following schedule: 0600 – 0900h 35% of daily flow, 1100 – 1400 25% of daily flow, and 1700 – 2000 h 40% of daily flow. The GST component received 150 gallons per day from the septic tank, while the other 150 gallons was diverted elsewhere. Each dose to the septic tank during these periods did not exceed 10 gallons which follows the ANSI/NSF Standard 40 requirement; we define this as the "normal" hydraulic load. Wastewater treatment performance was evaluated using parameters of ANSI/NSF Standard 40 tests (cBOD $_{5\text{-day}}$ and TSS) and supplemental tests for nutrients, as described in the introduction. Final effluent was collected from the bottom drain over a 24-hour period using an ISCO™ composite sampler. Hydraulic performance was determined using ponding observations from two ports in the GST (Figure 2). All sample collection and ponding measurements were taken by staff of MASSTC/Barnstable County Department of Health and Environment. All analyses were performed using Standard Methods at laboratories certified by the Commonwealth of Massachusetts including the Barnstable County Department of Health and Environment Laboratory.

Twenty-four-hour composite samples were taken weekly for five-day Carbonaceous Biological Oxygen Demand ($cBOD_{5\text{-day}}$), Total Suspended Solids) TSS, NH_4^+, NO_2^-, NO_3^-, Total Kjeldahl Nitrogen (TKN), and Total Phosphorus (TP) from January 31, 2019 through May 22, 2019. From June through August of 2019, sampling was reduced to every two weeks. The system was sampled once a month from October 2019 through May 2020. Total nitrogen values reported are by calculation of TKN plus nitrate-nitrite. Fecal coliform concentrations were collected from the system twice a week from January 31 through May 22, 2019 and was reduced to approximately once per week from May 28 through October 16, 2019 and further reduced to twice a month from November through January 2020. Fecal coliform was analyzed at least once a month from February through May of 2020. Fecal coliform and field parameters including temperature, pH and dissolved oxygen were taken as grab samples, while all other chemical parameters and biochemical oxygen demands ($BOD_{5\text{-day}}$and $cBOD_{5\text{-day}}$) were obtained from 24-hour composites samples. For any samples indicating levels of $cBOD_{5\text{-day}}$ or TSS below the detection limit of 2 mg/L, one-half of the detection limit (1.0 mg/L) was reported and used in calculations.

Four stress tests were performed from June through August of 2020. The first stress test was a wash day stress occurring from June 2 through June 6, 2020 and consisted of three wash days with 24 hours between each wash day for a total of five consecutive days. During the wash days, the system was dosed normally plus three wash loads (one wash cycle and two rinse cycles each) in the first two daily doses. This differs from the stress tests performed under NSF STD 40 in that, for NSF STD 40, the normal hydraulic load is discontinued and the wash loads are *substituted* for the normal hydraulic loads. The second stress test was the working parent stress test performed June 15 through June 20, 2020. During this stress, the system was dosed with 40% of its daily hydraulic capacity between 6:00 am and 9:00 am. Between 5:00 pm and 8:00 pm, the system is dosed with the remaining 60% of its daily hydraulic capacity, which included one wash load. The third stress test was the power/equipment failure test which was performed from July 3 through July 6, 2020. The power failure test as described in the standard was originally designed for mechanical units requiring electric power. Since the GST requires no power, the test is simply comprised of turning flow to the system off as prescribed in the test. Accordingly, flow was turned off on July 3, 2020 at 8 p.m. for 48 hours. Flow was restored to the system on July 6, 2020 and was dosed with 60% of the daily load between 6 a.m. and 9 a.m. The vacation stress test was the final stress and was performed from July 20 through July 27, 2020. For this stress, flow to the system is discontinued for eight consecutive days and then flow is restored and 60% of the daily load (including

three wash loads) is delivered to the system between 5 p.m. and 8 p.m. During the stress test in the summer of 2020, final effluent was analyzed for fecal coliform, TSS, and $cBOD_{5\text{-day}}$ concentrations on June 2, June 8-12, June 15, June 24-26, June 29, July 8-10, July 13-14, July 28-30. Samples were also analyzed for nutrients on June 25, July 14, and July 29, 2020.

After the four stress test phases, the system was loaded with twice the normal design flow from August 26, 2020 through December 29, 2020 to simulate extended stress. During the extended stress test, effluent was analyzed nine times for fecal coliform and five times for $cBOD_{5\text{-day}}$ and TSS. From January 4 through March 3, 2021, effluent from the GST was analyzed each week for Fecal coliforms and 5 days a week for $cBOD_{5\text{-day}}$ and TSS.

Ponding observations were taken from each of the two ports twice weekly from February 2019 through March 2021 by measuring the liquid level with a measuring tape. We translated ponding measurements into the amount of area hydraulically in use by determining what portion of the system would be in use/wetted given the level of ponding. We have reported hydraulic function using raw ponding level data and the amount of surface area in use during a ponding observation.

Section 4.0 Results

Section 4.1 Influent Characteristics

Wastewater influent levels were measured throughout the effluent sampling period, however at a greater sampling frequency than effluent. During the non-stress period, January 2019 – March 2021, over 350 influent samples were taken. Biochemical Oxygen Demand Levels ($BOD_{5\text{-day}}$) averaged 192 mg/L (185–199 mg/L, p=.05, n=359). TSS level averaged 157 mg/L (149 – 165 mg/L, p=.05, n=359). The range in pH was 6.6 – 7.4 pH units. The geometric mean fecal coliform density was 2.7×10^6 cfu/100 ml. Influent temperatures varied seasonally and ranged from 5.5 – 22.9 C^o. Other chemical parameters measured included TN (calculated by the addition of nitrate-nitrite + Total Kjeldahl Nitrogen), ammonia, TP, dissolved oxygen (mg/L), and alkalinity. All influent parameters met the requirements specified in national testing protocols.

Section 4.2 Treatment performance results

The GST test was initiated during the winter months to simulate worst possible conditions for start-up performance. The system was loaded at non stress levels (full design loading) from January 2019 through May 2020 and January through March 2021. A stress test in four phases (wash day, power failure, vacation, and working parent) was performed during June and July 2020. In August 2020, and extended stress test was started and the system was loaded at twice the daily load every day through December 2020.

A summary of all data is presented in Table 2 and all data points are presented in the appendices. There were no data exclusions; that is no data were excluded from the statistical analyses.

Table 2 Summary of GST water quality analysis collected by MASSTC (2019-01-30 through 2021-03-03).

	cBOD/BOD (mg/L)	TSS (mg/L)	Ammonia (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)	Fecal coliform (cfu)
GST product trench (n=)	2.0 (101)	2.4 (100)	15.6 (41)	35.5 (41)	3.2 (41)	2.2×10^3 (109)
confidence limits p=0.05	1.9 - 2.2	1.8 – 2.7	14.2 – 16.9	34.6 – 36.4	3.1 – 3.3	Geometric Mean
Influent (n=)	192 (359)	157 (359)	29.7 (297)	43.1 (262)	4.8 (86)	2.7×10^6 (359)
confidence limits p=0.05	185 – 199	149 – 165	29.0 – 30.0	42.6 – 44.0	4.5 – 5.2	Geometric Mean

The GST product removed ~98% of the secondary wastewater constituents of $BOD_{5\text{-day}}$ and TSS. In addition, there was a three $\log_{10}$ removal (99.9 %) of fecal coliform, the commonly accepted surrogate for human pathogen removal.

Section 4.2 Treatment Performance following wash days, working parent, power failure, and vacation stress testing

Sample data taken following the above-referenced stress tests show no significant difference when compared with non-stress periods (Table 3). In addition to the secondary treatment contaminants, nutrient concentrations from the GST were analyzed once following each stress event (Table 3).

Table 3. Summary of influent and discharge data taken following four stress events. Data from all samples following the stress events are combined.

	cBOD/BOD (mg/L)	TSS (mg/L)	Ammonia (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus mg/L	Fecal coliform (cfu)
GST product trench (n=)	1.0 (24)	1.5 (24)	3.7 (4)	40.7 (4)	1.5 (4)	**3.9×10^2 (24)**
confidence limits p=.05	0.8 - 1.2	1.0 - 2.0	0.0 - 8.5	31.1 - 50.3	1.0 - 2.0	Geometric Mean
Influent (n=)	186 (37)	160 (37)	28.6 (23)	43.7 (24)	1.5 (10)	**1.8×10^6 (32)**
confidence limits p=.05	166 - 206	126 -194	26.1 - 31.1	41.7 - 45.7	1.2 - 1.8	Geometric Mean

TSS were not detected from the GST during the first three stress tests and only increased to 4 mg/L after the vacation stress test (Figure 3). Coincident TSS concentrations in the influent wastewater source ranged from 82-330 mg/L. Changes in fecal coliform concentrations from the GST during the stress test showed a similar pattern as the TSS concentrations. The peak density of fecal coliform following the first four phases of the stress tests was 16,000 cfu/100 ml, with a geometric mean of all 23 post-stress observations equal to 390 cfu/ 100ml During the stress tests, fecal coliform concentration in the raw wastewater had a geometric mean of 1.8×10^6 cfu/100 ml.

The $cBOD_{(5\text{-}day)}$ levels were below detection levels in the GST for all portions of the stress test except for after the vacation portion of the stress test when the concentration was 3 mg/L (Figure 3). During the stress test, the BOD in the wastewater source ranged from 100 to 250 mg/L, BOD.

Section 4.3 Treatment Performance during extended stress

Table 4. Summary of GST water quality analysis collected by MASSTC during a period of extended stress (2020-08-26 through 2020-12-30).

	cBOD/BOD (mg/L)	TSS (mg/L)	Ammonia (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)	Fecal coliform (cfu)
GST product trench (n=)	2.0 (5)	1.7 (5)	3.8 (5)	29.2 (5)	4.0 (5)	3.0×10^4 (9)
confidence limits p=0.05	3.1 – 4.5	1.5 – 1.9	3.1 – 4.5	27.9 – 30.5	3.8 – 4.2	Geometric Mean
Influent (n=)	161(83)	123(83)	27.0(60)	41.4(45)	5.4(19)	2.8×10^6 (83)
confidence limits p=0.05	152 – 171	115 – 130	25.8 – 28.4	39.0 – 43.8	5.7 – 5.7	Geometric Mean

There were no significant differences in Total Nitrogen, $cBOD_{5\text{-}Day}$, or Fecal coliform concentrations between normal use and this period of extended stress. Ammonia and TSS concentrations were significantly lower during extended stress than during normal use, and Total Phosphorus is significantly higher during extended stress than during the periods of normal use.

Section 4.4 Hydraulic performance results

No breakout of effluent was observed during the test. The ponding in the GST ranged from no observed ponding to 6.8 inches of ponded water. We estimate that less than 25% of the effective soil absorption surface was used during the normal use and first four stress test phases of this test. After the period of extended stress, ponding increased and we estimate that less than 60% of the effective soil absorption was used.

Section 5.0 Summary

Under the conditions of this test, the GST produced a percolate that exceeds secondary treatment standards (30 mg/L Carbonaceous Biochemical Oxygen Demand and Total Suspended Solids). Throughout the test, which included five stress periods, the percolate did not exceed 10 mg/L $cBOD_{5\text{-}day}$, or 20 mg/L TSS. For the entire test period including the five stress events, less than 25% of the effective soil absorption area was utilized.

Data Appendices

Key

NH_4 – ammonium (mg/L)

BOD – 5-day Biochemical Oxygen Demand (mg/L)

cBOD – 5-day Carbonaceous Biochemical Oxygen Demand (mg/L)

DO – Dissolved Oxygen (mg/L)

NO_2 – Nitrite nitrogen (mg/L)

NO_3 – Nitrate nitrogen (mg/L)

Fecal Coli – Fecal coliform (colony forming units/100 mL)

pH – pH units

Temp – Temperature in degrees Celsius

TKN – Total Kjeldahl nitrogen

TP – Total Phosphorus

TSS – Total Suspended Solids (mg/L)

Sample Date		Alkalinity	NH_4	$cBOD_5$	DO	Fecal Coli	NO_3	NO_2	pH	Temp	TKN	TN	TP	TSS
2019-01-31	GST		50	6.5	10.3	210,000	0.74	0.46	7.5	0.62	47	48.2	1.5	7
2019-02-05	GST					340,000								
2019-02-07	GST	220	29	10	8.73	770,000	0.05	0.03	7.3	2.99	34	34.1	2.7	9
2019-02-11	GST				8.92	32,000			7.06	3.37				
2019-02-14	GST		23	7.2	8.23	200,000	0.67	0.03	7.04	3.15	30	30.7	2.5	7
2019-02-19	GST					30,000								
2019-02-20	GST		36	4.7	8.21	13,000	0.79	0.03	6.96	3.26	35	35.8	3.6	8
2019-02-25	GST				10.7	5,600			6.06	3.46				
2019-02-27	GST		31	4.9	5.75	2,500	4.1	0.03	6.7	3.2	32	36.1	3.2	5
2019-03-04	GST				4.47	13,000			6.83	3.13				
2019-03-06	GST		35	4.9	6.58	4,500	1.6	0.03	6.72	2.84	36	37.6	3.8	6
2019-03-11	GST				4.05	4,700			6.41	2.78				
2019-03-13	GST		27	5.7	9.19	2,800	1.9	0.03	6.41	2.81	27	28.9	3.2	6
2019-03-18	GST				6.68	7,700			6.98	4.17				
2019-03-20	GST		32	6.5	4.84	4,000	1.3	0.11	6.69	3.62	32	33.4	3.8	3
2019-03-25	GST				6.28	730			6.56	4.51				
2019-03-27	GST		33	3.3	7.02	1,200	1.9	0.13	6.84	4.69	30	32	3.9	4
2019-04-01	GST				7.72	8,900			7.05	5.49				
2019-04-03	GST		36	3.6	5.72	5,300	0.98	0.11	6.85	5.81	36	37.1	4	7
2019-04-03	GST				5.72				6.85	5.81				
2019-04-08	GST				5.22	600			6.71	6.32				
2019-04-10	GST		35	7.8	4.06	450	5	0.16	6.72	7.8	33	38.2	4.3	4
2019-04-16	GST				5.34	72			6.63	8.6				
2019-04-18	GST		23	1	4.13	120	9.4	0.44	6.67	8.9	32	41.8	4.3	2
2019-04-22	GST				3.64	54			6.5	9.8				
2019-04-24	GST		30	1	3.66	2,300	8.6	0.68	6.42	10.1	31	40.3	4.7	4
2019-04-29	GST				5.78	3,800			6.4	10.6				
2019-05-01	GST		20	1	4.2	8,500	16	0.82	6.47	10.4	24	40.8	3.8	1
2019-05-06	GST				3.55	38,000			6.42	10.7				
2019-05-09	GST		15	1	4.62	4,100	19	1.2	6.38	10.8	16	36.2	3.3	1
2019-05-14	GST				4.61	32,000			6.25	11.5				
2019-05-15	GST		12	3.4	2.66	140,000	20	3	6.34	11.4	14	37	3.8	3
2019-05-20	GST				2.77	2,700			6.14	12.1				
2019-05-22	GST		11	6.2	3.73	20,000	20	4.9	6.22	12.8	16	40.9	3.8	0.75
2019-05-28	GST				5.66	3,900			6.71	14.1				
2019-06-05	GST		17	6.1	1.87	9,200	14	2.4	6.46	15.2	15	31.4	3.1	8
2019-06-12	GST				4.37	11,000			6.45	16.8				
2019-06-19	GST		13	6.1	2.89	6,600	22	3.2	6.26	17.1	16	41.2	3.7	11
2019-06-26	GST				3.52	3,000			6.16	18				
2019-07-02	GST		12	8.5	3.8	33,000	23	0.32	6.16	19.3	16	39.3	2.1	7.5
2019-07-10	GST				3.32	14,000			6.11	20.8				

2019-07-17	GST		12	1	3.54	3,200	30	1.2	6.09	22	14	45.2	3.7	5
2019-07-24	GST				5.18	6,100			5.95	22.6				
2019-07-31	GST		1.7	1	3.77	10,000	43	0.93	5.27	22.9	3.4	47.3	3.6	4.7
2019-08-07	GST				4.16	3,200			5.65	23.6				
2019-08-14	GST		2.3	1	4.69	690	47	0.22	5.16	23.2	3.2	50.4	3.6	5
2019-08-14	GST				4.67				6.28	21.3				
2019-08-21	GST				4.48	2,100			4.96	23.4				
2019-08-28	GST				5.5	2,200			4.77	22.7				
2019-09-04	GST				8.04	1,300			6.27	21.9				
2019-09-18	GST				7.98	9,400			5.5	19.2				
2019-09-25	GST				7.71	1,100			5.33	20.2				
2019-10-02	GST				3.87	11,000			5.79	19.7				
2019-10-09	GST		3.8	1	8.11	7,600	27	0.21	5.96	16.6	5.3	32.5	4.2	2
2019-10-09	GST				8.11				5.96	16.6				
2019-10-16	GST				6.95	430			5.48	16.5				
2019-10-16	GST				7.78				5.62	15.8				
2019-11-07	GST				8.37	130			5.18	14.4				
2019-11-14	GST		0.36	1	6.99	310	0.38	0.03	4.41	12.6	1.1	1.51	3.1	1
2019-12-05	GST				7.12	870			6.23	8.9				
2019-12-12	GST		5.3	1	6.56	99	15	0.23	6.03	8.5	5	20.2	1.6	1
2019-12-19	GST				5.13	3,700			5.99	8				
2020-01-09	GST		13	6.6	3.78	29,000	11	0.29	6.37	6.5	15	26.3	3.1	3.6
2020-01-30	GST				6.3	990			6	5.4				
2020-02-11	GST		7.1	1	6.19	9	25	0.29	5.83	5.4	8.7	34	3.8	1
2020-02-25	GST				6.17	250			6.25	5.3				
2020-03-10	GST		10	1	5.21	680	23	0.23	6.09	6.1	12	35.2	1.5	1
2020-04-29	GST		7.8	1	5.59	1,200	19	0.16	5.65	8.3	8.5	27.7	3	2.4
2020-05-13	GST				5.75	310			4.98	10.4				
2020-05-27	GST		5.6	1	3.31	100	32	0.16	5	13.3	7.6	39.8	1	2
STRESS TEST DATA														
2020-06-02	GST			1	4.37	5			3.57	15.1				1
2020-06-08	GST			1	6.97	31			5.01	16.6				1
2020-06-09	GST			1	6.17	130			5.13	16.4				1
2020-06-10	GST			1	5.92	270			4.91	16.7				1
2020-06-11	GST		0.27	1	7.09	120	46	0.17	5.47	16.9	2.4	48.6	1.2	1
2020-06-12	GST			1	8.62	30			5.28	17.4				1
2020-06-15	GST			1	5.18	370			4.22	17				1
2020-06-22	GST			1	7.45	220			3.45	19.3				1
2020-06-23	GST			1	5.32	500			3.47	18.9				1
2020-06-24	GST			1	4.32	110			3.87	19				1
2020-06-25	GST		2.1	1	4.62	400	23	0.2	4.07	19.3	4.3	27.5	1.4	1
2020-06-26	GST			1	4.4	260			3.99	19.3				1
2020-06-29	GST			1	4.25	510			4.63	19.7				1

2020-07-08	GST			1	5.02				3.42	20.1				1
2020-07-09	GST			1	4.66	1,500			3.69	20.1				1
2020-07-10	GST			1	4.64	380			3.3	20.2				1
2020-07-13	GST			1	5.34	540			3.3	20.8				1
2020-07-14	GST		1.4	1	4.46	120	34	0.15	3.39	21	4.9	39.1	1.4	1
2020-07-28	GST			3	3.46	16,000			5.11	22.4				4
2020-07-29	GST		11	1	3.33	14,000	34	0.6	5.5	22.5	13	47.6	1.4	4
2020-07-30	GST			1	3.04	4,100			5.27	22.8				3.2
2020-07-31	GST			1	3.16	390			5.23	22.9				5.2
2020-08-03	GST			1	3.26	2,200			3.99	22.8				1
2020-08-04	GST			1	3.71	2,900			3.84	22.9				1
2020-08-19	GST				4.7	2,700			5.11	22.5				
2020-09-02	GST		10	4	2.78	20,000	30	0.41	5.78	22.2	12	42.4	4.8	1
2020-09-16	GST				2.5	140,000			6.25	21.5				
2020-09-30	GST		1.5	1	3.2	2,800	32	0.57	5.98	20.3	2.7	35.3	4.5	2
2020-10-14	GST				3.25	1,200			5.66	18.6				
2020-10-28	GST		2.3	1	2.67	8,800	26	0.82	5.93	17.3	3.5	30.3	4.5	1
2020-11-12	GST				2.66	2,900			5.69	15.2				
2020-11-23	GST				3.39	2,200			5.71	13.4				
2020-11-24	GST		3.5	1	3.48		23	0.54	5.57	13.2	4.5	28	3.7	1
2020-12-09	GST				3.1	87,000			6.12	11.3				
12/22/2020	GST		7.9	5	2.48	41,000	13	0.58	6.34	9.2	9.6	23.2	3.3	2.8
NORMAL LOADING RESTARTED														
2021-01-04	GST			1	3.09				6.12	8.3				1
2021-01-05	GST			1	2.98				6.05	8.2				1
2021-01-06	GST			1	3.19	980			5.98	8.2				20
2021-01-07	GST			1	3.11				6.12	7.8				1
2021-01-08	GST			1	3.04				6.14	8				1
2021-01-11	GST			1	2.44				6.26	7.5				1
2021-01-12	GST			1	2.46				6.21	7.4				1
2021-01-13	GST			1	3.97	6,500			6.22	7				1
2021-01-14	GST			1	2.32				6.22	7.1				1
2021-01-15	GST			1	2.46				6.1	7.1				1
2021-01-19	GST			1	4.66				6	7.3				1
2021-01-20	GST		8.8	1	3.94	3,900	21	0.55	5.9	6.9	10	31.6	4.1	1
2021-01-21	GST			1	4.33				5.91	7.1				1
2021-01-22	GST			1	3.72				5.89	7				1
2021-01-25	GST			1	3.35				6.03	6.6				1
2021-01-26	GST			1	2.76				5.89	6.1				1
2021-01-27	GST			1	2.78	1,200			5.84	6.3				1
2021-01-28	GST			1	6.45				5.83	5.9				1
2021-01-29	GST			1	4.23				5.61	5.8				2
2021-02-01	GST			1	3.13				5.84	5.7				2.4

2021-02-02	GST			3	3.71				5.89	5.4				1
2021-02-03	GST			1	2.95				5.9	5.4				
2021-02-04	GST			1	3.81				5.84	5.3				1
2021-02-05	GST			1	7.95				5.83	4.4				1
2021-02-08	GST			1	2.95				6.04	5.3				1
2021-02-09	GST			3	3.54				5.94	5.3				1
2021-02-10	GST			3	3.01	6,500			6	5.3				1
2021-02-11	GST			3	3.51				6.29	5.1				1
2021-02-12	GST			3	2.84				6.01	5.2				1
2021-02-16	GST			1	2.85				6.22	5.1				1
2021-02-17	GST			1	3.15	3,100			6.23	4.9				1
2021-02-18	GST			1	2.94				6.15	5				1
2021-02-19	GST			1	7.49				6.53	4.6				1
2021-02-22	GST			1	8.46				6.31	4.2				1
2021-02-23	GST			1	3.63				6	4.8				1
2021-02-24	GST			1	5	560			5.95	4.6				1
2021-02-25	GST			1	3.04				5.96	4.8				1
2021-02-26	GST			1	7.68				6.19	4.7				1
2021-03-01	GST			1	4.13				6.19	5.3				1
2021-03-02	GST			1	3.56				6.15	5.3				1
2021-03-03	GST			1	5.02	480			5.89	5.3				1
2021-03-18	GST				3.64	850			6.14	5.7				
2021-04-01	GST				2.72	840			5.99	7.9				
2021-04-15	GST				3.65				5.95	9.2				
						GEOMEAN								
Count		1	41	101	147	109	41	41	147	147	41	41	41	100
Average		220.0	15.6	2.0	4.8	2187.2	17.7	0.6	5.8	11.5	17.1	35.5	3.2	2.4
standard deviation		0	12.793	2.04	1.9		13.3	0.99	0.87	6.74	12.3	8.78	1.06	2.81
confidence interval (95%)			1.3476	0.14	0.11		1.4	0.1	0.05	0.37	1.3	0.92	0.11	0.19
Upper limit			16.9	2.2	4.9		19.1	0.8	5.9	11.9	18.4	36.4	3.3	2.6
Lower limit			14.2	1.9	4.7		16.3	0.5	5.8	11.2	15.8	34.6	3.1	2.2

Sample Date	Alkalinity	NH4	BOD5	DO	Fecal Coli	pH	Temp	TKN	TN	TP	TSS
2019-01-30	140	33	74	2.9	4600000	7.23	7.56	39	39	4.2	53
2019-01-31	140	30	110	1.6	4600000	7.16	6.87	40	40	5.5	190
2019-02-01	150	31	120	3.11		7.4	6.05	45	45	5.3	130
2019-02-02	150	29	160	2.15		7.29	7.16	42	42	5.1	160
2019-02-04			150	1.79	9900000	7.17	6.92				150
2019-02-05		27	230	1.78	9400000	7.22	7.04	40	40		150
2019-02-06			180	3.45	7500000	7.13	7.2				180
2019-02-07	220	31	180	4.3	5800000	7.04	6.52	45	45	4.5	190
2019-02-11			240	1.86	5200000	6.93	6.79				170
2019-02-12		30	270	1.96	7200000	7.05	6.48	54	54		220
2019-02-13			200	3.98	6700000	7.31	6.28				220
2019-02-14	170	28	110	2.31	11000000	7.15	6.39	45	45	5.3	150
2019-02-19		32	190	2.47	5000000	7.08	6.52	49	49		200
2019-02-20	180	27	160	1.77	3800000	7.22	6.58	49	49	6.9	220
2019-02-21		31	410	2.22	5200000	7.35	6.89	57	57		430
2019-02-25			250	2.14	2300000	7.07	6.94				260
2019-02-26			200	2.01	3800000	6.97	6.52				230
2019-02-27		33	200	1.74	2600000	6.97	6.01	47	47	5.8	230
2019-02-28		37	180	0.62	4300000	7.27	6.38	47	47		240
2019-03-04			220	2.7	1400000	6.75	5.81				130
2019-03-05		23	170	1.9	1500000	6.62	5.98	30	30		160
2019-03-06	100	23	150	0.76	1200000	7.21	5.87	33	33	4.1	110
2019-03-07		22	140	0.33	960000	6.85	6.02	31	31		210
2019-03-11			270	0.2	3300000	7.21	6.3				250
2019-03-12		29	130	0.74	3400000	7.02	5.93	42	42		280
2019-03-13	170	31	410	0.82	5000000	6.91	5.95	48	48	6.3	330
2019-03-14		33	200	0.34	4700000	6.94	6.09	38	38		310
2019-03-18			430	0.35	4400000	6.97	6.43				350
2019-03-19	150	34	270	0.39	4700000	6.92	5.51	47	47		
2019-03-20	190	39	250	0.58	7000000	7.35	6.39	51	51	7.1	170
2019-03-21		35	190	0.54	520000	7.25	6.12	48	48		140
2019-03-25			330	1.22	3900000	6.82	6.77				240
2019-03-26		35	350	0.59		6.77	6.64	46	46		260
2019-03-27	190	35	330	0.47	4000000	6.8	6.86	42	42	6.6	220
2019-03-28		32	360	0.58	2300000	6.77	7.28	52	52		270
2019-04-01	170	35	350		6900000			54	54	5.8	350
2019-04-02			260	0.07		7.03	7.1				150
2019-04-03	160	35	160	0.26	1300000	6.93	7.29	50	50	6	290
2019-04-04			180	0.28	2500000	6.91	7.44				230
2019-04-05	200	35	350	0.63		6.67	7.33	45	45	6.8	330
2019-04-08	180	41	330	1.69	2300000	6.97	7.18	53	53	8	250
2019-04-09	180	30	150	0.14		6.92	7.45	41	41	5.5	110
2019-04-10	230	31	130	0.93	2700000	7.43	8.5	42	42	4.8	120
2019-04-11	220	31	240	0.11	3800000	7.01	9	42	42	5.6	120
2019-04-16	160	31	190	-0.02	3500000	6.72	9.8	39	39		140
2019-04-17			320	-0.03	3100000	7.17	10.5				300
2019-04-18	190	29	220	-0.02	2400000	7.17	9.9	42	42		240
2019-04-22			260	0.08	2800000	6.81					270
2019-04-23	150	22	380	0.08	3800000	6.93	10.7	39	39		250
2019-04-24				0.04		7.1	10.3				
2019-04-25	280	24	270	-0.04	4400000	6.8	11.06	42	42		250
2019-04-29				0.02	670000	7.01	11.3				
2019-04-30	170	26	220	0.07	3700000	6.96	11.2	38	38		220
2019-05-01		18	170	-0.01	3900000	7.07	11.4	24	24	3	120
2019-05-02	150	19	200		3000000			28	28		60
2019-05-06					5300000						
2019-05-07	190	31	410		4900000			52	52		390
2019-05-09	180	33	240		7500000			47	47	5.4	210
2019-05-14	220	35	320		4800000			54	54		290

Sample Date	Alkalinity	NH4	BOD5	DO	Fecal Coli	pH	Temp	TKN	TN	TP	TSS
2019-05-15		33	220		2000000			51	51	5.8	170
2019-05-16	230	36	250		2400000			58	58		310
2019-05-20					5300000						
2019-05-21	170	28	260		5000000			42	42		60
2019-05-22		31	290		7700000			52	52	4.8	220
2019-05-23	160	28	280		7200000			46	46		210
2019-05-28	160	26	170		5900000			42	42		250
2019-05-30	160	29	180		7500000			48	48		320
2019-06-04	190	34	160		17000000			46	46		72
2019-06-05		44	280		8000000			58	58	6.9	190
2019-06-11	180	31	210		7700000			51	51		270
2019-06-12	160	28	190		5300000			43	43		220
2019-06-13	190	31	150		6500000			47	47		200
2019-06-18	180	27	190		6500000			46	46		220
2019-06-19	190	30	151		6400000			46	46	4.9	190
2019-06-20	190	27	150		3600000			43	43		200
2019-06-25	190	28	240		3900000			46	46		220
2019-06-26					4600000						
2019-06-27	190	32	130		9400000			39	39		130
2019-07-02	180	29	230		5700000			43	43	6.7	290
2019-07-09	130	25	150		5700000			39	39		120
2019-07-10	150	29	140		2500000			18	18		110
2019-07-11	160	27			2200000			42	42		
2019-07-16		27	94		14000000			43	43		
2019-07-17	220	34	76		5700000			48	48	4.8	150
2019-07-18		28	134		4400000			44	44		97
2019-07-23		35	190		9300000			46	46		20
2019-07-25		26	82		6600000			38	38		66
2019-07-30		39	170		11000000			60	60		380
2019-07-31	220	34	120		9900000			55	55	5.2	210
2019-08-01		32	110		9300000			47	47		210
2019-08-06		36	167		8500000			53	53		220
2019-08-07	220	32	110		9000000			49	49		140
2019-08-08					11000000						
2019-08-13	210	38	140		630000			45	45		100
2019-08-14	210	37	140		9900000			51	51	5.5	190
2019-08-15	220	33	135		3000000			52	52		360
2019-08-20	190	28	210		11000000			44	44		130
2019-08-21	200	31	0		5100000			41	41		120
2019-08-22	180	28			6300000			46	46		130
2019-08-27	160	28	200		2000000			44	44		250
2019-08-28	170	15	120		6000000			46	46		240
2019-08-29	170	22	86		3500000			34	34		180
2019-09-03					4200000						
2019-09-04	180	30	240		1300000			44	44		140
2019-09-05	140	26	260		3500000			45	45		210
2019-09-10	150	28	200		4600000			40	40		230
2019-09-12	170	28			3200000			42	42		240
2019-09-16	180	34	170		7500000			43	43		
2019-09-17	170	31	240		9800000			43	43		18
2019-09-18	160	34	150		6800000			47	47		140
2019-09-19	150	35			11000000			48	48		260
2019-09-24	180	28	140		5300000			38	38		79
2019-09-25					10000000						
2019-09-26	200	29	190		6100000			48	48		280
2019-10-01	150	24	400		5900000			49	49		500
2019-10-02	170	30	170		3200000			46	46		120
2019-10-03	160	31	270		4900000			45	45		210

Sample Date	Alkalinity	NH4	BOD5	DO	Fecal Coli	pH	Temp	TKN	TN	TP	TSS
2019-10-07	180	40	300					58	58		120
2019-10-08	150	27	101		3100000			40	40		60
2019-10-09	150	27	120		3600000			40	40	5.2	130
2019-10-10			130								
2019-10-11	150	29	120					41	41		110
2019-10-14	120	26	130					40	40		130
2019-10-15	150	27	95		3300000			35	35		83
2019-10-16	140	25	200		4400000			43	43		190
2019-10-17	160	27	110					40	40		160
2019-10-22	180	27	150		5700000			38	38		190
2019-10-24	140	26	160		7700000			40	40		160
2019-10-29		18	84		4700000			26	26		130
2019-10-31	180	29	180		5400000			37	37		150
2019-11-05	170	29	240		8500000			47	47		260
2019-11-07		24	240		7200000			40	40		180
2019-11-12		29	270		5100000			43	43		46
2019-11-14	120	28	260		5500000			38	38	4.6	76
2019-11-19	93	17	170		7400000			26	26		25
2019-11-21	190	28	130		8900000			38	37		100
2019-11-26	150	22	310		2400000			39	39		180
2019-12-02					1300000						
2019-12-03	170	20	160		1900000			32	32		180
2019-12-04					2000000						
2019-12-05	150	24	160		4200000			34	34		150
2019-12-09					1900000						
2019-12-10	160	23	180		1600000			34	34		170
2019-12-11					1300000						
2019-12-12	110	25	197		2500000			34	34	3	130
2019-12-17	160	25	270		2800000			39	39		200
2019-12-18					1100000						
2019-12-19	190	27	100		1900000			36	34		100
2019-12-23	99	26	400		700000			41	41		200
2019-12-26	130	24	150		1400000			36	36		170
2019-12-30	150	29	140		300000			40	40		140
2020-01-02	98	21	130					36	36		220
2020-01-07	180	27	110		2800000			37	37		88
2020-01-09	250	36	140		2700000			44	44	4.8	120
2020-01-14	210	30	150		2000000			42	42		120
2020-01-16	210	35			4200000			46	46		170
2020-01-21	180	29	200		2500000			37	37		210
2020-01-23	140	28	160		1700000			39	39		120
2020-01-24	220	27	190					41	42.13		140
2020-01-28	140	33	200		820000			40	40		130
2020-01-30	150	34	410		1300000			44	44		170
2020-02-04	130	31	150		1100000			45	45		190
2020-02-06	140	30	280		640000			43	43		44
2020-02-11	140	29	110		1100000			45	45	4.6	230
2020-02-13	140	28	180		940000			44	44		170
2020-02-18	150	33	320		1700000			50	50		170
2020-02-20	140	33	200		4200000			44	44		84
2020-02-25	140	31	180		5200000			45	45		160
2020-02-27	160	32	300		3900000			45	45		110
2020-03-03	120	30	250		2600000			45	45		200
2020-03-05	130	34	220		2800000			45	45		96
2020-03-10	140	36	240		2900000			54	54	1.9	130
2020-03-12	160	37	250		6500000			55	55		190
2020-03-17	130	30	230		1400000			46	46		150
2020-03-19	140	24	12		600000			43	43		130
2020-04-16								43	43.1		
2020-04-28			200					39	39		130

Sample Date	Alkalinity	NH4	BOD5	DO	Fecal Coli	pH	Temp	TKN	TN	TP	TSS
2020-04-29		31	150		860000			45	45	3.5	170
2020-04-30	150	32	160		1600000			48	48		180
2020-05-05	140	31	200					50	50		280
2020-05-07	160	34	150		1100000			54	54		170
2020-05-12	150	30	180					47	47		200
2020-05-13	150	33	210		1000000			53	53.34		220
2020-05-14	150	33	180		1100000			53	53		210
2020-05-19	140	31	150					48	48		140
2020-05-21			170								90
2020-05-26			150					42	42		68
2020-05-27	130										
2020-06-02			250		1700000			43	43		170
2020-06-03										1.1	
2020-06-04		29	260		1500000			44	44		140
2020-06-08			200		420000						190
2020-06-09			200		1600000			40	40		150
2020-06-10		24	220		990000			42	42	1.3	310
2020-06-11	130	5.5	150		1500000			36	36		130
2020-06-12			250		3800000						200
2020-06-15			200		2200000						330
2020-06-16			230					40	40		300
2020-06-17										1.4	
2020-06-18		27	410		5200000			55	55		530
2020-06-22			160		1000000						170
2020-06-23		23	110		1400000			37	37		68
2020-06-24	140	24	100		1600000			35	35	1.4	96
2020-06-25		29	150		2000000			40	41.77	1.4	64
2020-06-26			200		800000						82
2020-06-29			140		3300000						140
2020-06-30			180					45	45		140
2020-07-01		28	160		1100000			39	39	2.8	110
2020-07-07			170					47	47		170
2020-07-08		28	180		3600000			45	45	1.4	140
2020-07-09	150	29	150		1400000			42	42.6		140
2020-07-10			160		2700000						110
2020-07-13			200		680000						240
2020-07-14		28	210		1700000			48	48	1.5	240
2020-07-15		29	360		1900000			51	51		420
2020-07-20	190	32	160					41	43.1		72
2020-07-21			180								36
2020-07-22	180	30	170		1900000			40	42.02	1.5	70
2020-07-23	190	28	100		2500000			40	40		56
2020-07-24	170	32	190		2500000			46	47.22		160
2020-07-27	190	30	120		1600000			43	44.98		86
2020-07-28		32	150		3100000						160
2020-07-29		35	170		2500000			49	49	1.6	130
2020-07-30		33	150		2900000						62
2020-07-31		37	210		1400000						150
2020-08-03		36	130		3900000			50	50		120
2020-08-04		29	150		1600000						56
2020-08-05		20	120		1200000			28	28	1	60
2020-08-06	170	25	130		2200000			34	35.23		62
2020-08-07		25	140		2200000						74
2020-08-10		40	190		2500000			53	53		120
2020-08-11		35	170		5200000						110
2020-08-12		39	200		2700000					1.5	120
2020-08-13		43	190		2400000						140
2020-08-14		43	190		3300000						120
2020-08-17		45	210		1400000						140

Sample Date	Alkalinity	NH4	BOD5	DO	Fecal Coli	pH	Temp	TKN	TN	TP	TSS
2020-08-18		41	190		960000						98
2020-08-19		38	180		1200000			46	46	1.4	86
2020-08-20		39	160		4600000						150
2020-08-21		42	190		4900000						160
2020-08-24	230	37	170		2600000			52	53.18		150
2020-08-25		39	190		1400000						140
2020-08-26	240	38	210		6400000			55	62.26	6.2	240
2020-08-27		41	220		5900000						190
2020-08-28	230	38	220					60	61.1		190
2020-08-31	220	33	150		5400000			47	47.31		100
2020-09-01		33	97		8700000						52
2020-09-02	230	36	180		6100000			50	50.86	6.6	130
2020-09-03		32	160		5900000						140
2020-09-04	180	26	150		3500000			39	40.06		76
2020-09-07			140								110
2020-09-08		21	150		5800000			33	33		120
2020-09-09		24	140		4000000			36	38.46	4.9	130
2020-09-10		24	180		6400000						110
2020-09-11		20	140		3300000						74
2020-09-14	260	44	260		4700000			62	64.83		150
2020-09-15		31	290		5400000						210
2020-09-16	200	30	310		8200000			48	50.4	6.5	250
2020-09-17		30	150		2700000						180
2020-09-18	200	29	170		2800000			44	46.86		160
2020-09-21		19	120		3000000			30	30		82
2020-09-22		17	120		2600000						100
2020-09-23	190	19	130		3400000			31	32.16	4.1	120
2020-09-24	200	30	130		3400000			45	46.11		160
2020-09-25		30	120		1600000						140
2020-09-28	190	26	110		4300000			39	40.06		110
2020-09-29		26	130		4000000						130
2020-09-30	190	26	150		2900000			39	40.82	5.8	160
2020-10-01	200	27	110		1900000			38	39.3		120
2020-10-02		26	87		2100000						110
2020-10-05	190	27	93		2500000			36	37.26		98
2020-10-06		26	140		1900000						100
2020-10-07		26	120		2100000			38	39.44	5.2	130
2020-10-08		26	110		2200000						96
2020-10-09		26	140		2900000						130
2020-10-12			98								96
2020-10-13		24	110		3900000			37	37		94
2020-10-14		23	120		3600000			34	35.15	5.6	110
2020-10-15		25	140		3200000						110
2020-10-16		25	170		2800000						120
2020-10-19		41	200		11000000			60	60		180
2020-10-20		26	190		5800000						140
2020-10-21		25	110		4500000			36	37.18	5.2	87
2020-10-22		29	120		8300000						100
2020-10-23		30	160		1800000						110
2020-10-26		30	160		5500000			42	42		130
2020-10-27		27	170		11000000						110
2020-10-28	190	28	130		8200000			37	38.34	5.2	110
2020-10-29	180	26	170		1400000			37	38.22		130
2020-10-30		21	210		2500000						74
2020-11-02		24	110		4300000			30	30		62
2020-11-03		25	120		5400000						90
2020-11-04		24	100		6600000			32	33.3	4.7	100
2020-11-05		23	91		4400000						98

Sample Date	Alkalinity	NH4	BOD5	DO	Fecal Coli	pH	Temp	TKN	TN	TP	TSS
2020-11-09			150		3700000			45	45		160
2020-11-10		27	130					39	40.01	5.4	86
2020-11-11			200								130
2020-11-12			140		1900000						110
2020-11-13			160								120
2020-11-16			150					52	52		110
2020-11-17			190		1800000						96
2020-11-18	160	26	250		2500000			40	40.97	5.9	150
2020-11-19			210		2600000						150
2020-11-20	170	25	160					37	37.92		130
2020-11-23			190		1100000			37	37		150
2020-11-24		23	200					39	39.87	5.1	140
2020-11-25			160								120
2020-11-30			200					37	37		130
2020-12-01					1200000						
2020-12-02		19	160		2400000			36	36.99	4.5	110
2020-12-03					1800000						
2020-12-04			200								120
2020-12-07			140					30	30		82
2020-12-08			160		720000						100
2020-12-09		23	260		930000			42	44.55	5.6	130
2020-12-10			160		1100000						98
2020-12-11			200								130
2020-12-12			180								94
2020-12-14								39	39		
2020-12-15					560000						
2020-12-16	180	25	180		1700000			41	42.725	5.2	120
2020-12-17					830000						
2020-12-18			180								120
2020-12-19			210								160
2020-12-20			180								140
2020-12-21			190		500000			36	36		110
2020-12-22		23	220					38	39.278	5.6	120
2020-12-28					320000			37	37		
2020-12-29		24	180		500000			36	36		100
2020-12-30		24	180		650000			37	39.06	5.1	140
2021-01-03			150								100
2021-01-04			210		280000			38	38		140
2021-01-05			140								80
2021-01-06		28	140		410000			40	42.04	5.3	96
2021-01-07			220								150
2021-01-08			180								60
2021-01-11			260		480000			46	46		120
2021-01-12		29	200		600000			39	39		120
2021-01-13	200	32	170		480000			42	43.125	5.7	100
2021-01-14	210	34	130					44	45.41		88
2021-01-16			360								170
2021-01-17			240								120
2021-01-18											100
2021-01-19			220		310000			40	40		90
2021-01-20		28	170		480000			40	41.98	5.6	84
2021-01-21			160								76
2021-01-22			160								78
2021-01-25		23	180		2500000			37	37		100
2021-01-26		25	230		1200000						110
2021-01-27		26	180		1900000			40	41.14	5.4	86
2021-01-28		27	180		290000						120
2021-01-29		28	160		48000						68

Sample Date	Alkalinity	NH4	BOD5	DO	Fecal Coli	pH	Temp	TKN	TN	TP	TSS
2021-02-02		36	190		900000			50	51.46	5.8	110
2021-02-03		31	110		2600000			41	42.41	4.6	66
2021-02-04		39	310		2000000						250
2021-02-05		41	330		590000						160
2021-02-08		43	200		1300000			56	56		66
2021-02-09		39	220		1800000			57	59.12	6.7	92
2021-02-10		43	250		2800000			59	60.78	7	120
2021-02-11		43	220		2500000						130
2021-02-12			120								
2021-02-16		26	280		1100000			40	41.19	5.5	150
2021-02-17		22	210		1600000			33	34.86	4.2	96
2021-02-18		26	200		1300000						110
2021-02-19		26	180		790000						100
2021-02-22		27	120		1900000			37	37		80
2021-02-23		29	170		1900000			36	37.31	4.9	100
2021-02-24	170	26	260		3000000			42	43.75	5.3	150
2021-02-25		30	250		1600000						280
2021-02-26		28	230		700000						200
2021-03-01		29	250		2300000			46	46		170
2021-03-02		26	220		2700000			38	39.15	5.4	150
2021-03-03		30	260		4300000			45	46.18	5.9	170
2021-03-04		29	250		3100000						200
2021-03-05		33	310		800000						110
2021-03-08		39	270		2900000						170
2021-03-09		29	240		4000000			49	50.18	6.6	180
2021-03-10		32	240		1600000			51	52.26	6.2	160
2021-03-11		36	330		3600000						260
2021-03-12		32	260		450000						220
2021-03-15		36	340		4000000			54	54		220
2021-03-16		37	260		3800000			52	53.31	6.9	180
2021-03-17	170	34	230		3100000			46	47.23	6.2	170
2021-03-18		35	330		1800000						340
2021-03-19		32	240		1000000						210
2021-03-22		25	110		1100000			36	36		100

ANGUS McDONALD
GARY SHARPE
& ASSOCIATES, INC.
SINCE 1966

Appendix F

Phosphorous Sorption Capacities

Lot 1

Bedrooms	3	
gpd/Bedroom	150	
gpd	450	
L/day = (gpd x 3.8) =	1,710	L/day
P conc to ground	12	mg/L
1 day P to ground	20,520	mg
183 days P to ground	3,755,160	mg

Leachfield type	Geomatrix GST 6236	
Length	30	
Width	5.2	
Height	3	
Unfolded area (L x (W+(2 x H)))	336	
Unsaturated soil under leachfield	9	ft
Unsaturated soil volume	3,024	

Soil Density	110	lbs/cf
Soil mass	151,018,560	gms
50% soil mass	75,509,280	gms
soil P sorption	6	mg/100 gms soil
50% soil mass P sorption	4,530,557	mg

Excess P sorption capacity - discharge = 775,397 mg

Lot 2

Bedrooms	3	
gpd/Bedroom	150	
gpd	450	
L/day = (gpd x 3.8) =	1,710	L/day
P conc to ground	12	mg/L
1 day P to ground	20,520	mg
183 days P to ground	3,755,160	mg

Leachfield type	Geomatrix GST 6236	
Length	40	
Width	5.2	
Height	3	
Unfolded area (L x (W+(2 x H)))	448	
Unsaturated soil under leachfield	6	ft
Unsaturated soil volume	2,688	

Soil Density	110	lbs/cf
Soil mass	134,238,720	gms
50% soil mass	67,119,360	gms
soil P sorption	6	mg/100 gms soil
50% soil mass P sorption	4,027,162	mg

Excess P sorption capacity - discharge = 272,002 mg

Lot 3

Bedrooms	3	
gpd/Bedroom	150	
gpd	450	
L/day = (gpd x 3.8) =	1,710	L/day
P conc to ground	12	mg/L
1 day P to ground	20,520	mg
183 days P to ground	3,755,160	mg

Leachfield type	Geomatrix GST 6236	
Length	20	
Width	5.2	
Height	3	
Unfolded area (L x (W+(2 x H)))	224	
Unsaturated soil under leachfield	12	ft
Unsaturated soil volume	2,688	

Soil Density	110	lbs/cf
Soil mass	134,238,720	gms
50% soil mass	67,119,360	gms
soil P sorption	6	mg/100 gms soil
50% soil mass P sorption	4,027,162	mg

Excess P sorption capacity - discharge = 272,002 mg

Lot 4

Bedrooms	3	
gpd/Bedroom	150	
gpd	450	
L/day = (gpd x 3.8) =	1,710	L/day
P conc to ground	12	mg/L
1 day P to ground	20,520	mg
183 days P to ground	3,755,160	mg

Leachfield type	Geomatrix GST 6236	
Length	30	
Width	5.2	
Height	3	
Unfolded area (L x (W+(2 x H)))	336	
Unsaturated soil under leachfield	9	ft
Unsaturated soil volume	3,024	

Soil Density	110	lbs/cf
Soil mass	151,018,560	gms
50% soil mass	75,509,280	gms
soil P sorption	6	mg/100 gms soil
50% soil mass P sorption	4,530,557	mg

Excess P sorption capacity - discharge = 775,397 mg

Lot 5

Bedrooms	3	
gpd/Bedroom	150	
gpd	450	
L/day = (gpd x 3.8) =	1,710	L/day
P conc to ground	12	mg/L
1 day P to ground	20,520	mg
183 days P to ground	3,755,160	mg
Leachfield type	Geomatrix GST 6236	
Length	20	
Width	5.2	
Height	3	
Unfolded area (L x (W+(2 x H)))	224	
Unsaturated soil under leachfield	15	ft
Unsaturated soil volume	3,360	
Soil Density	110	lbs/cf
Soil mass	167,798,400	gms
50% soil mass	83,899,200	gms
soil P sorption	6	mg/100 gms soil
50% soil mass P sorption	5,033,952	mg

Excess P sorption capacity - discharge = 1,278,792 mg

Lot 6

Bedrooms	3	
gpd/Bedroom	150	
gpd	450	
L/day = (gpd x 3.8) =	1,710	L/day
P conc to ground	12	mg/L
1 day P to ground	20,520	mg
183 days P to ground	3,755,160	mg
Leachfield type	Geomatrix GST 6236	
Length	22	
Width	5.2	
Height	3	
Unfolded area (L x (W+(2 x H)))	246	
Unsaturated soil under leachfield	11	ft
Unsaturated soil volume	2,710	
Soil Density	110	lbs/cf
Soil mass	135,357,376	gms
50% soil mass	67,678,688	gms
soil P sorption	6	mg/100 gms soil
50% soil mass P sorption	4,060,721	mg

Excess P sorption capacity - discharge = 305,561 mg

Lot 7

Bedrooms	3	
gpd/Bedroom	150	
gpd	450	
L/day = (gpd x 3.8) =	1,710	L/day
P conc to ground	12	mg/L
1 day P to ground	20,520	mg
183 days P to ground	3,755,160	mg
Leachfield type	Geomatrix GST 6236	
Length	20	
Width	5.2	
Height	3	
Unfolded area (L x (W+(2 x H)))	224	
Unsaturated soil under leachfield	16	ft
Unsaturated soil volume	3,584	
Soil Density	110	lbs/cf
Soil mass	178,984,960	gms
50% soil mass	89,492,480	gms
soil P sorption	6	mg/100 gms soil
50% soil mass P sorption	5,369,549	mg

Excess P sorption capacity - discharge = 1,614,389 mg

Lot 8

Bedrooms	3	
gpd/Bedroom	150	
gpd	450	
L/day = (gpd x 3.8) =	1,710	L/day
P conc to ground	12	mg/L
1 day P to ground	20,520	mg
183 days P to ground	3,755,160	mg
Leachfield type	Geomatrix GST 6236	
Length	20	
Width	5.2	
Height	3	
Unfolded area (L x (W+(2 x H)))	224	
Unsaturated soil under leachfield	12	ft
Unsaturated soil volume	2,688	
Soil Density	110	lbs/cf
Soil mass	134,238,720	gms
50% soil mass	67,119,360	gms
soil P sorption	6	mg/100 gms soil
50% soil mass P sorption	4,027,162	mg

Excess P sorption capacity - discharge = 272,002 mg

Lot 9

Bedrooms	3	
gpd/Bedroom	150	
gpd	450	
L/day = (gpd x 3.8) =	1,710	L/day
P conc to ground	12	mg/L
1 day P to ground	20,520	mg
183 days P to ground	3,755,160	mg
Leachfield type	Geomatrix GST 6236	
Length	20	
Width	5.2	
Height	3	
Unfolded area (L x (W+(2 x H)))	224	
Unsaturated soil under leachfield	18	ft
Unsaturated soil volume	4,032	
Soil Density	110	lbs/cf
Soil mass	201,358,080	gms
50% soil mass	100,679,040	gms
soil P sorption	6	mg/100 gms soil
50% soil mass P sorption	6,040,742	mg

Excess P sorption capacity - discharge = 2,285,582 mg

Lot 10

Bedrooms	3	
gpd/Bedroom	150	
gpd	450	
L/day = (gpd x 3.8) =	1,710	L/day
P conc to ground	12	mg/L
1 day P to ground	20,520	mg
183 days P to ground	3,755,160	mg
Leachfield type	Geomatrix GST 6236	
Length	30	
Width	5.2	
Height	3	
Unfolded area (L x (W+(2 x H)))	336	
Unsaturated soil under leachfield	8	ft
Unsaturated soil volume	2,688	
Soil Density	110	lbs/cf
Soil mass	134,238,720	gms
50% soil mass	67,119,360	gms
soil P sorption	6	mg/100 gms soil
50% soil mass P sorption	4,027,162	mg

Excess P sorption capacity - discharge = 272,002 mg

Lot 11

Bedrooms	3	
gpd/Bedroom	150	
gpd	450	
L/day = (gpd x 3.8) =	1,710	L/day
P conc to ground	12	mg/L
1 day P to ground	20,520	mg
183 days P to ground	3,755,160	mg
Leachfield type	Geomatrix GST 6236	
Length	20	
Width	5.2	
Height	3	
Unfolded area (L x (W+(2 x H)))	224	
Unsaturated soil under leachfield	16	ft
Unsaturated soil volume	3,584	
Soil Density	110	lbs/cf
Soil mass	178,984,960	gms
50% soil mass	89,492,480	gms
soil P sorption	6	mg/100 gms soil
50% soil mass P sorption	5,369,549	mg

Excess P sorption capacity - discharge = 1,614,389 mg

Lot 12

Bedrooms	3	
gpd/Bedroom	150	
gpd	450	
L/day = (gpd x 3.8) =	1,710	L/day
P conc to ground	12	mg/L
1 day P to ground	20,520	mg
183 days P to ground	3,755,160	mg
Leachfield type	Geomatrix GST 6236	
Length	25	
Width	5.2	
Height	3	
Unfolded area (L x (W+(2 x H)))	280	
Unsaturated soil under leachfield	10	ft
Unsaturated soil volume	2,800	
Soil Density	110	lbs/cf
Soil mass	139,832,000	gms
50% soil mass	69,916,000	gms
soil P sorption	6	mg/100 gms soil
50% soil mass P sorption	4,194,960	mg

Excess P sorption capacity - discharge = 439,800 mg

Lot 13

Bedrooms	3	
gpd/Bedroom	150	
gpd	450	
L/day = (gpd x 3.8) =	1,710	L/day
P conc to ground	12	mg/L
1 day P to ground	20,520	mg
183 days P to ground	3,755,160	mg
Leachfield type	Geomatrix GST 6236	
Length	20	
Width	5.2	
Height	3	
Unfolded area (L x (W+(2 x H)))	224	
Unsaturated soil under leachfield	17	ft
Unsaturated soil volume	3,808	
Soil Density	110	lbs/cf
Soil mass	190,171,520	gms
50% soil mass	95,085,760	gms
soil P sorption	6	mg/100 gms soil
50% soil mass P sorption	5,705,146	mg

Excess P sorption capacity - discharge = 1,949,986 mg

Lot 14

Bedrooms	3	
gpd/Bedroom	150	
gpd	450	
L/day = (gpd x 3.8) =	1,710	L/day
P conc to ground	12	mg/L
1 day P to ground	20,520	mg
183 days P to ground	3,755,160	mg
Leachfield type	Geomatrix GST 6236	
Length	20	
Width	5.2	
Height	3	
Unfolded area (L x (W+(2 x H)))	224	
Unsaturated soil under leachfield	14	ft
Unsaturated soil volume	3,136	
Soil Density	110	lbs/cf
Soil mass	156,611,840	gms
50% soil mass	78,305,920	gms
soil P sorption	6	mg/100 gms soil
50% soil mass P sorption	4,698,355	mg

Excess P sorption capacity - discharge = 943,195 mg

Lot 15

Bedrooms	3	
gpd/Bedroom	150	
gpd	450	
L/day = (gpd x 3.8) =	1,710	L/day
P conc to ground	12	mg/L
1 day P to ground	20,520	mg
183 days P to ground	3,755,160	mg
Leachfield type	Geomatrix GST 6236	
Length	20	
Width	5.2	
Height	3	
Unfolded area (L x (W+(2 x H)))	224	
Unsaturated soil under leachfield	16	ft
Unsaturated soil volume	3,584	
Soil Density	110	lbs/cf
Soil mass	178,984,960	gms
50% soil mass	89,492,480	gms
soil P sorption	6	mg/100 gms soil
50% soil mass P sorption	5,369,549	mg

Excess P sorption capacity - discharge = 1,614,389 mg

Lot 16

Bedrooms	3	
gpd/Bedroom	150	
gpd	450	
L/day = (gpd x 3.8) =	1,710	L/day
P conc to ground	12	mg/L
1 day P to ground	20,520	mg
183 days P to ground	3,755,160	mg
Leachfield type	Geomatrix GST 6236	
Length	24	
Width	5.2	
Height	3	
Unfolded area (L x (W+(2 x H)))	269	
Unsaturated soil under leachfield	10	ft
Unsaturated soil volume	2,688	
Soil Density	110	lbs/cf
Soil mass	134,238,720	gms
50% soil mass	67,119,360	gms
soil P sorption	6	mg/100 gms soil
50% soil mass P sorption	4,027,162	mg

Excess P sorption capacity - discharge = 272,002 mg

Lot 17

Bedrooms	3	
gpd/Bedroom	150	
gpd	450	
L/day = (gpd x 3.8) =	1,710	L/day
P conc to ground	12	mg/L
1 day P to ground	20,520	mg
183 days P to ground	3,755,160	mg
Leachfield type	Geomatrix GST 6236	
Length	20	
Width	5.2	
Height	3	
Unfolded area (L x (W+(2 x H)))	224	
Unsaturated soil under leachfield	16	ft
Unsaturated soil volume	3,584	
Soil Density	110	lbs/cf
Soil mass	178,984,960	gms
50% soil mass	89,492,480	gms
soil P sorption	6	mg/100 gms soil
50% soil mass P sorption	5,369,549	mg

Excess P sorption capacity - discharge = 1,614,389 mg

Lot 18

Bedrooms	3	
gpd/Bedroom	150	
gpd	450	
L/day = (gpd x 3.8) =	1,710	L/day
P conc to ground	12	mg/L
1 day P to ground	20,520	mg
183 days P to ground	3,755,160	mg
Leachfield type	Geomatrix GST 6236	
Length	20	
Width	5.2	
Height	3	
Unfolded area (L x (W+(2 x H)))	224	
Unsaturated soil under leachfield	15	ft
Unsaturated soil volume	3,360	
Soil Density	110	lbs/cf
Soil mass	167,798,400	gms
50% soil mass	83,899,200	gms
soil P sorption	6	mg/100 gms soil
50% soil mass P sorption	5,033,952	mg

Excess P sorption capacity - discharge = 1,278,792 mg

Lot #94 Stoddards Wharf Road

Bedrooms	3	
gpd/Bedroom	150	
gpd	450	
L/day = (gpd x 3.8) =	1,710	L/day
P conc to ground	12	mg/L
1 day P to ground	20,520	mg
183 days P to ground	3,755,160	mg
Leachfield type	Geomatrix GST 6236	
Length	60	
Width	5.2	
Height	3	
Unfolded area (L x (W+(2 x H)))	672	
Unsaturated soil under leachfield	4	ft
Unsaturated soil volume	2,688	
Soil Density	110	lbs/cf
Soil mass	134,238,720	gms
50% soil mass	67,119,360	gms
soil P sorption	6	mg/100 gms soil
50% soil mass P sorption	4,027,162	mg

Excess P sorption capacity - discharge = 272,002 mg