SEBAGO TECHNICS

CIVIL ENGINEERING • SURVEYING • LANDSCAPE ARCHITECTURE

STORMWATER MANAGEMENT REPORT

For

Franklin Drive Subdivision
Multi-Family Development &
Commercial Development
Windham, Maine

Prepared for:

Land of New Gen Estates, LLC
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July 2025

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230411-01

STORMWATER MANAGEMENT REPORT
FRANKLIN DRIVE SUBDIVISION
MULTI-FAMILY DEVELOPMENT &
COMMERCIAL DEVELOPMENT
WINDHAM, MAINE

1. Introduction

This Stormwater Management Report has been prepared to address the potential impacts associated with the multi-family and commercial projects due to proposed modifications to stormwater runoff characteristics and land cover changes. The stormwater management controls outlined in this report have been designed to suit the proposed development and to comply with applicable regulatory requirements.

2. Existing Conditions

The project sites can be identified as Lot #1, Lot #2, and Lot #3 in the Franklin Drive Subdivision. The total subdivision consists of approximately 38.59 acres of undeveloped land located at 20 Franklin Drive in Windham, Maine. The subdivision is bounded by The Home Depot (part of the Windham Mall) to the south, the Windham Veterans Center to the east, and undeveloped land to the north and west. Lot #1 of the Franklin Drive Subdivision is approximately 3.35 acres and is bounded by the extension of Franklin Drive to the west, undeveloped land to the north, the Windham Veterans Center to the east, and land used for stormwater treatment from The Home Depot to the south. Lot #2 of the Franklin Drive Subdivision is approximately 7.88 acres and is bounded by The Home Depot (part of the Windham Mall) to the south, undeveloped land to the west, Lot #3 to the north, and the extension of Franklin Drive to the east. Lot #3 of the Franklin Drive Subdivision is approximately 23.9 acres and is bounded by Lot #1 to the south, Lot #2 to the west, residential properties along Sand Bar Road to the east, and undeveloped land to the north.

The Franklin Drive Subdivision project was permitted and approved by the Town of Windham Planning Board on January 13th, 2025. This project included the subdivision of the existing parcel into four (4) lots (labeled Lot #1 through Lot #4) along with the extension of Franklin Drive along the frontage of the subject site. The applicant is proposing to develop Lots #1 through #3, starting with Lot #2 (this project)

Slopes on the site range from generally flat along Franklin Drive but range from flat to steep throughout the wooded portion of the property. There are approximately 2.5 acres of steep slopes located throughout the site. There are approximately 13.4 acres of wetlands located on the site within Lot #3, including a vernal pool of special significance with an approximate size of 0.53 acres. Wetland and vernal pool delineations were conducted by Mark Hampton Associates and Flycatcher, respectively, in 2020.

Most of the site is located within the Sebago Lake Watershed. This lake is listed in Chapter 502 of the Maine Department of Environmental Protection (MDEP) regulations as a Lake Most at Risk from New Development but is not severely blooming. Phosphorus calculations have been included in Appendix A.

The proposed development area of the site is not located in an identified flood zone, nor is the site located in any Shoreland Zone. The site is in the Commercial 1 (C-1) District and is identified on the Town of Windham Tax Map 18 as Lot 26-2-A.

3. Soils

Soil characteristics were obtained from the NRCS Web Soil Survey completed by Sebago Technics. The Hydrologic Groups (HSG) of the soils is classified by Technical Release TR-55 of the Soil Conservation Service as follows:

Soil Map Symbol	Soil Name	Slope (%)	HSG
HlB	Hinckley loamy sand	3-8	A
HgB	Hermon sandy loam	3-8	A
Wa	Walpole fine sandy loam	0-3	A/D
Sp	Sebago mucky peat	0-1	A/D

Hydrologic Soil Group boundaries are delineated on the Watershed Map. A copy of the Class D Medium Intensity Soil Survey is included as Appendix 4.

4. Proposed Site Improvements

The proposed development for Lot #1 is the construction of a commercial building with landscaped areas, parking, sidewalks, and access driveways connecting to Franklin Drive. The proposed development for Lot #2 includes the construction of two (2) 150-unit residential buildings with resident amenities, landscaped areas, parking, sidewalks, and access driveways connecting to Franklin Drive. The proposed development for Lot #3 is the construction of a proposed solar array and gravel access road. The projects for Lots #1, #2, and #3 will also consist of associated grading, underground utility connections, and stormwater management infrastructure. The project will result in the creation of 8.0 acres of impervious area and 11.1 acres of total developed area.

5. Existing Conditions Model

The pre-development watershed plan consists of six (6) subcatchments labeled 1.0S, 1.1S, 2.0S, 2.1S, 3.0S, and 4.0S in the HydroCAD model. Four (4) locations were identified as Points of Analysis (POA) for comparing peak runoff rates. The first point of analysis represents an existing best management practice (BMP) that is located south of Franklin Drive, on the abutting property. The second point of analysis represents a significant

vernal pool, which is located in the eastern portion of Lot #3. The third point of analysis represents a low point located in the northern corner of Lot #3 that contains a wetland. The fourth point of analysis represents the abutting property west of the subject site.

POA-1: Subcatchments 1.0S and 1.1S are tributary to this point of analysis with a combined area of approximately 8.5 acres. This area includes a portion of Franklin Drive, portions of the abutting properties along the southern border of the site, and a portion of both the cleared and wooded areas in the southern region of Lot #1 and Lot #2.

POA-2: Subcatchments 2.0S and 2.1S are tributary to this point of analysis with a cumulative area of approximately 14.4 acres. Subcatchment 2.0S includes the extension of Franklin Drive that was proposed and approved by the Town of Windham Planning Board in January 2025. This area is proposed to be treated by an underdrained soil filter that has an outlet pipe towards POA-2. Subcatchment 2.01S includes the majority of the wooded area in Lot #1 and a portion of the wooded area in Lot #3.

POA-3: Subcatchment 3.0S is tributary to this point of analysis with an area of approximately 14.5 acres. This area includes a portion of both the cleared and wooded areas in Lot #2 and a portion of the wooded area in Lot #3.

POA-4: Subcatchment 4.0S is tributary to this point of analysis within an area of approximately 0.9 acres. This area primarily consists of an undeveloped wooded area located in the northern portion of Lot #2.

The total acreage within this study is approximately 38.3 acres.

6. Proposed Conditions Model

The post-development watershed area consists of the same overall area as the pre-development plan; however, the pre-development subcatchments have been broken into smaller watersheds as a result of the proposed development. There is a total of nine (9) subcatchments in the proposed conditions model for a total area of approximately 38.3 acres.

The project is proposed to meet the flooding standard by infiltration of a portion of the runoff into the subsurface soils to mimic the existing on-site condition of the HSG A soils. Infiltration tests were performed by SW Cole and indicated infiltration rates of 18.7 and 22.9 in/hr. Treatment will occur in subsurface sand filters, and treated water will be directed to a secondary infiltration bed that has been conservatively designed for 10 in/hr.

POA-1: Subcatchment 10.0S is tributary to this point of analysis with an approximate area of 4.8 acres. This area includes a portion of Franklin Drive, portions of the abutting properties along the southern border of the site, and a portion of both the cleared and wooded areas in the southern region of Lot #1 and Lot #2.

POA-2: Subcatchments 20.0S, 21.0S, and 22.0S are tributary to this point of analysis with a cumulative area of approximately 15.3 acres. Subcatchment 21.0S includes the extension of Franklin Drive that was proposed and approved by the Town of Windham Planning Board in January 2025. This area is proposed to be treated by an underdrained soil filter that has an outlet pipe towards POA-2. Subcatchment 20.0S includes the proposed solar array, a majority of the wooded area in Lot #1, and a portion of the wooded area in Lot #3. Subcatchment 22.0S includes the proposed commercial development of Lot #1. Stormwater from this subcatchment will be treated by a subsurface sand filter to meet water quality treatment requirements, and will utilize a separate subsurface chamber system for detention and infiltration to meet flooding standards.

POA-3: Subcatchments 30.0S through 30.3S are tributary to this point of analysis with a cumulative area of approximately 17.6 acres. Stormwater from subcatchments 30.2S and 30.3S will flow to two (2) separate subsurface sand filters for water quality treatment. The stormwater from these subcatchments will then flow to a separate subsurface chamber system for detention and infiltration to meet flooding standards. Stormwater from subcatchment 30.1S will flow to a subsurface sand filter for both water quality treatment and detention to meet flooding standards.

POA-4: Subcatchment 4.0S is tributary to this point of analysis within an area of approximately 0.6 acres. This area primarily consists of an undeveloped wooded area located in the northern portion of Lot #2.

The proposed Best Management Practices (subsurface sand filters) have been designed and sized in accordance with DEP BMP standards contained within Chapter 500 and the BMP Manual. Sizing calculations can be found in Appendix 1.

7. Stormwater Management

Basic Standard - Chapter 500, Section 4(B)

Since the project will disturb more than one (1) acre of land area, MDEP Basic Standards apply, requiring that grading or other construction activities on the site do not impede or otherwise alter drainage ways to have an unreasonable adverse impact. We have avoided adverse impacts by providing an Erosion & Sedimentation Control Plan, and an Inspection, Maintenance, and Housekeeping Plan (Appendix 3) to be implemented during construction and post-construction stabilization of the site. These construction requirements have been developed following Best Management Practice guidelines.

General Standard - Chapter 500, Section 4(C)

Since the project will create more than one (1) acre of impervious surface, MDEP General Standards apply, which require a project's stormwater management system to include treatment measures that will mitigate for the increased frequency and duration of channel erosive flows due to runoff from smaller storms, provide for effective treatment of pollutants in stormwater, and mitigate potential temperature impacts. The General Standards require treatment of no less than 95% of the site's created impervious area and no less than 80% of the site's created developed area (landscaped area and impervious area combined).

To mitigate the changes in hydrologic patterns due to this phase of the development, three (3) subsurface sand filters with associated subsurface chamber systems have been implemented into the stormwater management infrastructure. Filtration BMPs are very effective at removing a wide range of pollutants through the use of granular filter media.

Through the use of the aforementioned BMP's at least 95% of new impervious area and at least 80% of new developed area will be receiving treatment. This meets the requirements for the Maine DEP General Standards. BMP sizing and treatment calculations are provided as Appendix 1.

Phosphorus Standard - Chapter 500, Section 4(D)

As stated previously, Sebago Lake is identified as a Lake Most at Risk, but not categorized as severely blooming, as referenced in MDEP Chapter 502. Therefore, because the project results in 1 acre or more of impervious area, the project is subject to the Phosphorus Standards of MDEP Chapter 500.

Four (4) subsurface chamber systems with subsurface sand filters are proposed for the treatment of stormwater runoff generated by the proposed development. Two (2) separate subsurface chamber systems are proposed for the attenuation of stormwater runoff by infiltrating the stormwater into the ground. Through the use of infiltration, under the chambers, there is no stormwater discharge from these BMPs for the 2-, 10-, and 25-year storm events. The BMPs have been designed per the MDEP Stormwater BMP Manual, as well as Volume II: Phosphorus Control Manual of the Maine Stormwater Management Design Manual. The subsurface filtration strategy was chosen as the most appropriate BMP for this project since it provides an effective means of filtration for contaminants commonly found in stormwater and is the best fit for the current site constraints.

A per-acre phosphorus allocation calculation was completed for the project using the High Export Option to determine if the allowable per-acre phosphorus allocation for the Sebago Lake Watershed is achieved. The total acreage of the development parcel is approximately 38.6 acres. The wetland area was obtained using NWI wetlands, as well as wetlands mapped by Mark Hampton, and is equal to 13.4 acres. Steep slope areas (slopes

greater than 25%) equal 2.5 acres. Therefore, the project phosphorus budget for the project parcel is equal to 1.20 lbs. P/year. The pre-treatment phosphorus export (pre-PPE) was calculated to be 10.71 lbs. P/year. With the implementation of the proposed stormwater treatment for newly developed areas and infiltration, approximately 1.22 lbs. P/year (post-PPE) will be exported off-site in the proposed condition. Since the post-treatment phosphorus export is larger than the pre-treatment phosphorus export, the project is proposing mitigation by paying the compensation fee. Calculations associated with the removal of phosphorus can be referenced in Appendix 1.

Flooding Standard - Chapter 500, Section 4(F)

The proposed project will create more than three (3) acres of impervious surface, MDEP Flooding Standards must be met. The Flooding Standard requires that a project's stormwater management system detain, retain, or result in the infiltration of stormwater from 24-hour storms of the 2, 10, and 25-year frequencies such that the peak flows of stormwater from the project site do not exceed the peak flows of stormwater prior to undertaking the project. As such, a runoff evaluation was performed using the methodology outlined in the USDA Soil Conservation Service's "Urban Hydrology for Small Watersheds - Technical Release #55 (TR-55)". HydroCAD computer software was utilized to perform the calculations.

HydroCAD Stormwater Analysis

Runoff curve numbers were determined for each of the watersheds by measuring the area of each hydrologic soil group within each type of land cover. The type of land cover was determined based on survey data, field reconnaissance and aerial photography. Times of concentration were determined from site topographic maps in accordance with SCS procedures.

The 24-hour rainfall values utilized in the hydrologic model were obtained from Appendix H of MDEP's Chapter 500: Stormwater Management (effective date August 2015). Rainfall values for York County are listed in the table below.

Storm Frequency Precipitation (in./24 hr) York County	
2-year	3.3
10-year	4.9
25-year	6.2

The following table presents the results of the peak runoff calculations at the analysis points for the existing and proposed conditions.

Peak Runoff Rate Summary Table			
Analysis Point	**Storm Event**	**Existing Conditions (cfs)**	**Proposed Conditions (cfs)**
POA-1	2-year	0.9	0.7
	10-year	1.4	1.0
	25-year	1.8	1.3
POA-2	2-year	0.0	0.0
	10-year	0.0	0.0
	25-year	0.0	0.0
POA-3	2-year	0.4	0.3
	10-year	0.7	0.4
	25-year	0.8	0.5
POA-4	2-year	0.0	0.0
	10-year	0.0	0.0
	25-year	0.0	0.0

The HydroCAD Data output sheets from this analysis are appended to this report (Appendix 2) along with the Stormwater Management Plans (Appendix 5). The model predicts that the peak runoff rates in the post-development condition at the points of analysis are at or below pre-development runoff rates for the 2, 10, and 25-year storm events with implementation of the proposed stormwater management practices.

8. Summary

The proposed development has been designed to manage stormwater runoff through Best Management Practices approved by MDEP. Stormwater BMPs provide treatment to at least 95% of impervious areas and at least 80% of the total developed area. Runoff discharging from the site will be at or below pre-development conditions for the 2, 10, and 25-year storm events at all four points of analysis. Additionally, erosion and sedimentation controls, along with associated maintenance and housekeeping procedures, have been outlined to prevent unreasonable impacts on the site and the surrounding environment.

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Maine License No. 8588
July 17, 2025

Brandon Blake
Senior Civil Engineer

Appendix 1

Stormwater Quality Calculations & Phosphorus Calculations

Table 1: MDEP GENERAL STANDARD CALCULATIONS

Job # 230411-01

AREA ID	WATERSHED SIZE (S.F.)	EXISTING ONSITE IMPERVIOUS AREA TO REMAIN (S.F.)	NEW ONSITE IMPERVIOUS AREA (S.F.)	EXISTING ONSITE LANDSCAPED AREA TO REMAIN (S.F.)	NEW ONSITE LANDSCAPED AREA (S.F.)	NET NEW DEVELOPED AREA (S.F.)	NET EXISTING DEVELOPED AREAS (S.F.)	TREATMENT PROVIDED?	IMPERVIOUS AREA TREATED (S.F.)	LANDSCAPED AREA TREATED (S.F.)	DEVELOPED AREA TREATED (S.F.)	TREATMENT BMP
10.0S	207,220	15,903	0	9,266	18,405	18,405	25,169	NO	0	0	0	None
20.0S	496,893	32,271	10,244	0	9,909	20,153	32,271	NO	0	0	0	None
21.0S	50,218	0	28,127	0	22,091	50,218	0	YES	28,127	22,091	50,218	UDSF-1
22.0S	120,447	0	92,992	0	27,455	120,447	0	YES	92,992	27,455	120,447	SSF-4
30.0S	516,831	4,008	0	0	15,855	15,855	4,008	NO	0	0	0	None
30.1S	52,105	0	42,649	0	9,456	52,105	0	YES	42,649	9,456	52,105	SSF-3
30.2S	131,790	0	115,447	0	16,343	131,790	0	YES	115,447	16,343	131,790	SSF-1
30.3S	67,415	0	59,055	0	8,360	67,415	0	YES	59,055	8,360	67,415	SSF-2
40.0S	27,615	0	0	0	7,647	7,647	0	NO	0	0	0	None
TOTAL (S.F.)	**1,670,534**	**52,182**	**348,514**	**9,266**	**135,521**	**484,035**	**61,448**		**338,270**	**83,705**	**421,975**	

TOTAL NEW IMPERVIOUS AREA (S.F.)	**348,514**	**TOTAL NEW DEVELOPED AREA (S.F.)**	**484,035**
TOTAL IMPERVIOUS AREA RECEIVING TREATMENT (S.F.)	**338,270**	**TOTAL AREA RECEIVING TREATMENT (S.F.)**	**421,975**
% OF IMPERVIOUS AREA RECEIVING TREATMENT*	**97.06%**	**% OF AREA RECEIVING TREATMENT**	**87.18%**

***INCLUDES THE TREATMENT OF EXISTING IMPERVIOUS AND DEVELOPED AREAS THAT ARE NOT CURRENTLY RECEIVING TREATMENT**

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JOB	230411-01		
SHEET NO.	1	OF	1
CALCULATED BY	BJB	DATE	5/23/2025
FILE NAME	230411-01 WQV.xlsx	PRNT DATE	7/17/2025

UNDERDRAINED SUBSURFACE SAND FILTER

Task: Calculate water quality volume per MDEP chapter 500 regulations

References
1. Maine DEP Chapter 500, Section 4.C.(3)(b)
"must detain a runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's landscaped area"

2. Maine DEP Best Management Practices Stormwater Manual, Section 7.3.2
a. "detain runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's landscaped area"
b. "surface area of the sand filter bed and chamber system must be at least equal to 5% of the impervious area draining to it and 2% of the landscaped area."
c. "treatment flow rate for the Stormtech Isolator Row is the projected one year peak flow rate for the drainage area feeding the Isolator Row"

Flow rates:

SC-310	0.10	cfs/chamber
SC-800	0.20	cfs/chamber
DC-780	0.20	cfs/chamber
MC-3500	0.30	cfs/chamber

d. Inspection ports to the underdrain gravel layer should be provided with at least one port per 500 square-feet of subsurface filter area.

Tributary to Subsurface Sand Filter: SSF-1

Landscaped Area	16,343.00	SF
Impervious Area	115,447.00	SF

Minimum Surface Area for sand filter and chamber system

Required (2% X Landscaped + 5%" X Impervious)

Total Landscaped Area	16,343.00	SF	Area	326.9	SF
Total Impervious Area	115,447.00	SF	Area	5,772.4	SF
Required Minimum Surface Area				6,099.2	SF
Provided Surface Area				7,688.0	SF

Required No. of Inspection Ports: 16

Treatment Volume

Required (0.4" X Landscaped + 1.0" X Impervious)

Landscaped Area	16,343.00	SF	Volume	544.8	
Impervious Area	115,447.00	SF	Volume	9,620.6	
Treatment Volume Required				10,165.4	CF (0.233 AF)
Provided Treatment Volume				10,658.0	CF (WQV Elev.= 317.50)

Sediment Pre-Treatment

Per Reference 2.c above

One year flow rate out put from Hydrocad:	6.90	cfs
ISO Row sizing for: **SC-800**	**0.2**	cfs
Total number of Isolator Row Chambers required:	35	

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JOB	230411-01		
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CHECKED BY	RAM		
FILE NAME	230411-01 WQC	PRINT DATE	7/17/2025

ORIFICE SIZING CALCULATION

Stormwater BMP: SSF-1

Orifice Equation $Q = CA\sqrt{(2gh)}$

Q = Rate of Discharge (cfs)
A = Orifice Area (sf)
G = Gravitational Constant (32.2 ft/s^2)
h = Depth of water above the flow line (center) of the orifice (ft)
C = 0.6 Orifice coefficient (usually assumed = 0.6)

Average discharge rate required to drawdown the treatment volume in a desired amount of time is:

$$Q = \frac{WQv}{Tcf}$$

TV = Treatment Volume (cf)
T = Target Drain Time (Hours)
cf = Conversion Factor = 3600 sec/hr

TV = 10,165 cf
t = 24 hr

$$Q = \frac{TV}{tCF}$$ 0.12 cfs Target Rate for 24 hour discharge

surface area of filter = 6,099 SF

hmax = 1.67 ft h/2= 0.83 ft

$$A = \frac{Q}{C\sqrt{(2gh)}}$$ A = 0.027 sf = 3.85 sq. in.

Diam = 2.22 in

Summary for Pond 30.2P: SSF-1

Inflow Area = 131,790 sf, 87.60% Impervious, Inflow Depth = 0.93" for SSF-1 WQV event
Inflow = 3.1 cfs @ 12.08 hrs, Volume= 10,236 cf
Outflow = 0.2 cfs @ 13.36 hrs, Volume= 10,238 cf, Atten= 93%, Lag= 76.7 min
Primary = 0.2 cfs @ 13.36 hrs, Volume= 10,238 cf
Routed to Pond 5P : StormTech - Detention Only

Routing by Dyn-Stor-Ind method, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Peak Elev= 316.43' @ 13.36 hrs Surf.Area= 15,177 sf Storage= 4,241 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 161.7 min (941.7 - 780.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	315.50'	6,826 cf	**82.25'W x 89.17'L x 3.75'H Field A** 27,502 cf Overall - 10,437 cf Embedded = 17,065 cf x 40.0% Voids
#2A	316.00'	10,437 cf	**ADS_StormTech SC-800 +Cap** x 204 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 204 Chambers in 17 Rows Cap Storage= 3.4 cf x 2 x 17 rows = 116.3 cf
#3B	315.50'	311 cf	**6.25'W x 46.47'L x 3.75'H Field B** 1,089 cf Overall - 310 cf Embedded = 779 cf x 40.0% Voids
#4B	316.00'	310 cf	**ADS_StormTech SC-800 +Cap** x 6 Inside #3 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap Cap Storage= 3.4 cf x 2 x 1 rows = 6.8 cf
#5	313.33'	0 cf	**Build up to UD (Prismatic)** Listed below (Recalc) 16,390 cf Overall x 0.0% Voids
		17,885 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
313.33	7,553	0	0
315.50	7,553	16,390	16,390

Device	Routing	Invert	Outlet Devices
#1	Primary	313.23'	**24.0" Round Culvert** L= 46.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 313.23' / 312.05' S= 0.0257 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	313.33'	**2.2" Vert. UD cap for bleeder** C= 0.600 Limited to weir flow at low heads
#3	Device 1	317.50'	**6.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 3	316.20'	**24.0" Round Overflow to OCS**

L= 6.0' CPP, square edge headwall, Ke= 0.500
Inlet / Outlet Invert= 316.20' / 316.14' S= 0.0100 '/' Cc= 0.900
n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=0.2 cfs @ 13.36 hrs HW=316.43' TW=311.28' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.2 cfs of 22.4 cfs potential flow)
  ├─**2=UD cap for bleeder** (Orifice Controls 0.2 cfs @ 8.35 fps)
  └─**3=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)
    └─**4=Overflow to OCS** (Controls 0.0 cfs)

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UNDERDRAINED SUBSURFACE SAND FILTER

Task: Calculate water quality volume per MDEP chapter 500 regulations

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"must detain a runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's landscaped area"

2. Maine DEP Best Management Practices Stormwater Manual, Section 7.3.2
a. "detain runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's landscaped area"
b. "surface area of the sand filter bed and chamber system must be at least equal to 5% of the impervious area draining to it and 2% of the landscaped area."
c. "treatment flow rate for the Stormtech Isolator Row is the projected one year peak flow rate for the drainage area feeding the Isolator Row"

Flow rates:

SC-310	0.10	cfs/chamber
SC-740	0.20	cfs/chamber
DC-780	0.20	cfs/chamber
MC-3500	0.30	cfs/chamber

d. Inspection ports to the underdrain gravel layer should be provided with at least one port per 500 square-feet of subsurface filter area.

Tributary to Subsurface Sand Filter: SSF-2

Landscaped Area	8,360.00	SF				
Impervious Area	59,055.00	SF				

Minimum Surface Area for sand filter and chamber system

Required (2% X Landscaped + 5%" X Impervious)

Total Landscaped Area	8,360.00	SF	Area	167.2	SF	
Total Impervious Area	59,055.00	SF	Area	2,952.8	SF	
Required Minimum Surface Area				3,120.0	SF	
Provided Surface Area				3,651.0	SF	Required No. of Inspection Ports: 8

Treatment Volume

Required (0.4" X Landscaped + 1.0" X Impervious)

Landscaped Area	8,360.00	SF	Volume	278.7				
Impervious Area	59,055.00	SF	Volume	4,921.3				
Treatment Volume Required				5,199.9	CF	0.119	AF	
Provided Treatment Volume				7,016.0	CF	WQV Elev.= 316.76		

Sediment Pre-Treatment

Per Reference 2.c above

One year flow rate out put from Hydrocad:	4.00	cfs	
ISO Row sizing for:	**SC-740**	**0.2**	cfs
Total number of Isolator Row Chambers required:	20		

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ORIFICE SIZING CALCULATION

Stormwater BMP: SSF-2

Orifice Equation $Q = CA\sqrt{(2gh)}$

Q = Rate of Discharge (cfs)
A = Orifice Area (sf)
G = Gravitational Constant (32.2 ft/s^2)
h = Depth of water above the flow line (center) of the orifice (ft)
C = 0.6 Orifice coefficient (usually assumed = 0.6)

Average discharge rate required to drawdown the treatment volume in a desired amount of time is:

$$Q = \frac{WQv}{Tcf}$$

TV = Treatment Volume (cf)
T = Target Drain Time (Hours)
cf = Conversion Factor = 3600 sec/hr

TV = 5,200 cf
t = 24 hr

$$Q = \frac{TV}{tCF}$$ 0.06 cfs Target Rate for 24 hour discharge

surface area of filter = 3,120 SF

hmax = 1.67 ft h/2= 0.83 ft

$$A = \frac{Q}{C\sqrt{(2gh)}}$$ A = 0.014 sf = 1.97 sq. in.

Diam =	1.58	in

Summary for Pond 30.3P: SSF-2

Inflow Area = 67,415 sf, 87.60% Impervious, Inflow Depth = 0.93" for SSF-2 WQV event
Inflow = 1.6 cfs @ 12.08 hrs, Volume= 5,236 cf
Outflow = 0.1 cfs @ 13.33 hrs, Volume= 5,237 cf, Atten= 93%, Lag= 74.9 min
Primary = 0.1 cfs @ 13.33 hrs, Volume= 5,237 cf
Routed to Pond 5P : StormTech - Detention Only

Routing by Dyn-Stor-Ind method, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Peak Elev= 315.53' @ 13.33 hrs Surf.Area= 8,744 sf Storage= 2,149 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 156.5 min (936.5 - 780.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	314.76'	4,865 cf	**40.50'W x 125.75'L x 3.75'H Field A** 19,098 cf Overall - 6,935 cf Embedded = 12,163 cf x 40.0% Voids
#2A	315.26'	6,935 cf	**ADS_StormTech SC-800 +Cap** x 136 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 136 Chambers in 8 Rows Cap Storage= 3.4 cf x 2 x 8 rows = 54.7 cf
#3	312.59'	0 cf	**Build up to UD (Prismatic)** Listed below (Recalc) 7,923 cf Overall x 0.0% Voids
		11,800 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
312.59	3,651	0	0
314.76	3,651	7,923	7,923

Device	Routing	Invert	Outlet Devices
#1	Primary	312.49'	**24.0" Round Culvert** L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 312.49' / 312.03' S= 0.0131 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	312.59'	**1.6" Vert. UD cap for bleeder** C= 0.600 Limited to weir flow at low heads
#3	Device 1	316.76'	**6.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 3	315.46'	**24.0" Round Overflow to OCS** L= 6.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 315.46' / 315.34' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=0.1 cfs @ 13.33 hrs HW=315.53' TW=311.28' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.1 cfs of 21.6 cfs potential flow)
  ├─**2=UD cap for bleeder** (Orifice Controls 0.1 cfs @ 8.16 fps)
  └─**3=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)
    └─**4=Overflow to OCS** (Controls 0.0 cfs)

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UNDERDRAINED SUBSURFACE SAND FILTER

Task: Calculate water quality volume per MDEP chapter 500 regulations

References
1. Maine DEP Chapter 500, Section 4.C.(3)(b)
"must detain a runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's landscaped area"

2. Maine DEP Best Management Practices Stormwater Manual, Section 7.3.2
a. "detain runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's landscaped area"
b. "surface area of the sand filter bed and chamber system must be at least equal to 5% of the impervious area draining to it and 2% of the landscaped area."
c. "treatment flow rate for the Stormtech Isolator Row is the projected one year peak flow rate for the drainage area feeding the Isolator Row"

Flow rates:

SC-310	0.10	cfs/chamber
SC-740	0.20	cfs/chamber
DC-780	0.20	cfs/chamber
MC-3500	0.30	cfs/chamber

d. Inspection ports to the underdrain gravel layer should be provided with at least one port per 500 square-feet of subsurface filter area.

Tributary to Subsurface Sand Filter: SSF-3

Landscaped Area	9,456.00	SF
Impervious Area	42,649.00	SF

Minimum Surface Area for sand filter and chamber system

Required (2% X Landscaped + 5%" X Impervious)

Total Landscaped Area	9,456.00	SF	Area	189.1	SF
Total Impervious Area	42,649.00	SF	Area	2,132.5	SF
Required Minimum Surface Area				2,321.6	SF
Provided Surface Area				6,731.0	SF

Required No. of Inspection Ports: 14

Treatment Volume

Required (0.4" X Landscaped + 1.0" X Impervious)

Landscaped Area	9,456.00	SF	Volume	315.2	
Impervious Area	42,649.00	SF	Volume	3,554.1	
Treatment Volume Required				3,869.3	CF
Provided Treatment Volume				9,061.0	CF

0.089 AF

WQV Elev.= 310.35

Sediment Pre-Treatment

Per Reference 2.c above

One year flow rate out put from Hydrocad: 1.80 cfs

ISO Row sizing for: **SC-740** **0.2** cfs

Total number of Isolator Row Chambers required: 9

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ORIFICE SIZING CALCULATION

Stormwater BMP: SSF-3

Orifice Equation $Q = CA\sqrt{(2gh)}$

Q = Rate of Discharge (cfs)
A = Orifice Area (sf)
G = Gravitational Constant (32.2 ft/s^2)
h = Depth of water above the flow line (center) of the orifice (ft)
C = 0.6 Orifice coefficient (usually assumed = 0.6)

Average discharge rate required to drawdown the treatment volume in a desired amount of time is:

$$Q = \frac{WQv}{Tcf}$$

TV = Treatment Volume (cf)
T = Target Drain Time (Hours)
cf = Conversion Factor = 3600 sec/hr

TV = 3,869 cf
t = 24 hr

$$Q = \frac{TV}{tCF}$$ 0.04 cfs Target Rate for 24 hour discharge

surface area of filter = 2,321 SF

hmax = 1.67 ft h/2= 0.83 ft

$$A = \frac{Q}{C\sqrt{(2gh)}}$$ A = 0.010 sf = 1.47 sq. in.

Diam =	1.37	in

Summary for Pond 30.1P: SSF-3

Inflow Area = 52,105 sf, 81.85% Impervious, Inflow Depth = 0.89" for SSF-3 WQV event
Inflow = 1.2 cfs @ 12.08 hrs, Volume= 3,886 cf
Outflow = 0.1 cfs @ 13.34 hrs, Volume= 3,887 cf, Atten= 93%, Lag= 75.5 min
Primary = 0.1 cfs @ 13.34 hrs, Volume= 3,887 cf
Routed to Link POA-3 : POA-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Peak Elev= 308.90' @ 13.34 hrs Surf.Area= 8,922 sf Storage= 1,586 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 155.3 min (934.7 - 779.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	308.35'	6,022 cf	**49.00'W x 131.87'L x 3.75'H Field A** 24,231 cf Overall - 9,175 cf Embedded = 15,055 cf x 40.0% Voids
#2A	308.85'	9,175 cf	**ADS_StormTech SC-800 +Cap** x 180 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 180 Chambers in 10 Rows Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf
#3	306.18'	0 cf	**Build up to UD (Prismatic)** Listed below (Recalc) 5,340 cf Overall x 0.0% Voids
		15,197 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
306.18	2,461	0	0
308.35	2,461	5,340	5,340

Device	Routing	Invert	Outlet Devices
#1	Primary	306.08'	**24.0" Round Culvert** L= 112.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 306.08' / 301.50' S= 0.0409 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	306.18'	**1.4" Vert. UD cap for bleeder** C= 0.600 Limited to weir flow at low heads
#3	Device 5	309.05'	**24.0" Round Overflow to OCS** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 309.05' / 308.93' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#4	Device 1	310.35'	**2.0" Vert. WQV Orifice** C= 0.600 Limited to weir flow at low heads
#5	Device 1	311.00'	**6.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.1 cfs @ 13.34 hrs HW=308.90' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.1 cfs of 16.1 cfs potential flow)
  ├─**2=UD cap for bleeder** (Orifice Controls 0.1 cfs @ 7.86 fps)
  ├─**4=WQV Orifice** (Controls 0.0 cfs)
  └─**5=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)
    └─**3=Overflow to OCS** (Controls 0.0 cfs)

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UNDERDRAINED SUBSURFACE SAND FILTER

Task: Calculate water quality volume per MDEP chapter 500 regulations

References

1. Maine DEP Chapter 500, Section 4.C.(3)(b)
   "must detain a runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's landscaped area"
2. Maine DEP Best Management Practices Stormwater Manual, Section 7.3.2
   a. "detain runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's landscaped area"
   b. "surface area of the sand filter bed and chamber system must be at least equal to 5% of the impervious area draining to it and 2% of the landscaped area."
   c. "treatment flow rate for the Stormtech Isolator Row is the projected one year peak flow rate for the drainage area feeding the Isolator Row"

Flow rates:

SC-310	0.10	cfs/chamber
SC-740	0.20	cfs/chamber
DC-780	0.20	cfs/chamber
MC-3500	0.30	cfs/chamber

   d. Inspection ports to the underdrain gravel layer should be provided with at least one port per 500 square-feet of subsurface filter area.

Tributary to Subsurface Sand Filter: SSF-4

Landscaped Area	27,455.00	SF
Impervious Area	92,992.00	SF

Minimum Surface Area for sand filter and chamber system

Required (2% X Landscaped + 5%" X Impervious)

Total Landscaped Area	27,455.00	SF	Area	549.1	SF
Total Impervious Area	92,992.00	SF	Area	4,649.6	SF
Required Minimum Surface Area				5,198.7	SF
Provided Surface Area				5,208.0	SF

Required No. of Inspection Ports: 11

Treatment Volume

Required (0.4" X Landscaped + 1.0" X Impervious)

Landscaped Area	27,455.00	SF	Volume	915.2	
Impervious Area	92,992.00	SF	Volume	7,749.3	
Treatment Volume Required				8,664.5	CF (0.199 AF)
Provided Treatment Volume				9,832.0	CF (WQV Elev.= 316.67)

Sediment Pre-Treatment

Per Reference 2.c above

One year flow rate out put from Hydrocad:	1.80	cfs
ISO Row sizing for:	**SC-740**	**0.2** cfs
Total number of Isolator Row Chambers required:	9	

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ORIFICE SIZING CALCULATION

Stormwater BMP: SSF-4

Orifice Equation $Q = CA\sqrt{(2gh)}$

Q = Rate of Discharge (cfs)
A = Orifice Area (sf)
G = Gravitational Constant (32.2 ft/s^2)
h = Depth of water above the flow line (center) of the orifice (ft)
C = 0.6 Orifice coefficient (usually assumed = 0.6)

Average discharge rate required to drawdown the treatment volume in a desired amount of time is:

$$Q = \frac{WQv}{Tcf}$$

TV = Treatment Volume (cf)
T = Target Drain Time (Hours)
cf = Conversion Factor = 3600 sec/hr

TV = 8,664 cf
t = 24 hr

$$Q = \frac{TV}{tCF}$$ 0.10 cfs Target Rate for 24 hour discharge

surface area of filter = 5,197 SF

hmax = 1.67 ft h/2= 0.83 ft

$$A = \frac{Q}{C\sqrt{(2gh)}}$$ A = 0.023 sf = 3.28 sq. in.

Diam = 2.05 in

Summary for Pond 22.0P: SSF-4

Inflow Area = 120,447 sf, 77.21% Impervious, Inflow Depth = 0.87" for SSF-4 WQV event
Inflow = 2.6 cfs @ 12.08 hrs, Volume= 8,701 cf
Outflow = 0.2 cfs @ 13.44 hrs, Volume= 8,701 cf, Atten= 93%, Lag= 81.5 min
Primary = 0.2 cfs @ 13.44 hrs, Volume= 8,701 cf
Routed to Pond 24P : StormTech - Detention Only

Routing by Dyn-Stor-Ind method, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Peak Elev= 315.55' @ 13.44 hrs Surf.Area= 14,558 sf Storage= 3,642 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 169.5 min (948.1 - 778.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	314.67'	6,520 cf	**72.75'W x 96.28'L x 3.75'H Field A** 26,267 cf Overall - 9,968 cf Embedded = 16,299 cf x 40.0% Voids
#2A	315.17'	9,968 cf	**ADS_StormTech SC-800 +Cap** x 195 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 195 Chambers in 15 Rows Cap Storage= 3.4 cf x 2 x 15 rows = 102.6 cf
#3	312.50'	0 cf	**Build up to UD (Prismatic)** Listed below (Recalc) 16,390 cf Overall x 0.0% Voids
		16,488 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
312.50	7,553	0	0
314.67	7,553	16,390	16,390

Device	Routing	Invert	Outlet Devices
#1	Primary	312.40'	**24.0" Round Culvert** L= 80.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 312.40' / 312.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	312.50'	**2.0" Vert. UD cap for bleeder** C= 0.600 Limited to weir flow at low heads
#3	Device 1	316.67'	**6.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 3	315.37'	**24.0" Round Overflow to OCS** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 315.37' / 315.31' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=0.2 cfs @ 13.44 hrs HW=315.55' TW=311.25' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.2 cfs of 19.9 cfs potential flow)
  ├─**2=UD cap for bleeder** (Orifice Controls 0.2 cfs @ 8.29 fps)
  └─**3=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)
    └─**4=Overflow to OCS** (Controls 0.0 cfs)

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UNDERDRAINED SOIL FILTER

Task: Calculate water quality volume per MDEP chapter 500 regulations

References

1. Maine DEP Chapter 500, Section 4.C.(3)(b)
   a. "must detain a runoff volume equal to 1.0 inch times the subcatchment's impervious area plus 0.4 inch times the subcatchment's landscaped area"
2. Maine DEP Best Management Practices Stormwater Manual, Section 7.1
   a. "surface should represent 5% of impervious area and 2% of landscaped area"

Tributary to Underdrained Filter: UDSF-1

Landscaped Area	24,090	SF				
Impervious Area	24,154	SF				

Minimum Surface Area

Required (2% X Landscaped + 5%" X Impervious)

Total Landscaped Area	24,090	SF	Area	481.8	SF	
Total Impervious Area	24,154.00	SF	Area	1,207.7	SF	
Required Minimum Surface Area				1,689.5	SF	
Provided Surface Area				3,000.0	SF	

Treatment Volume

Required (0.4" X Landscaped + 1.0" X Impervious)

Landscaped Area	24,090	SF	Volume	803.0				
Impervious Area	24,154	SF	Volume	2,012.8				
Treatment Volume Required				2,815.8	CF	0.065	AF	
Provided Treatment Volume				5,951.0	CF	Elev. 313.00 - 314.50		

Sediment Pre-Treatment

Per Reference 2, Chapter 7.1 "Pretreatment devices shall be provided to minimize discharge of sediment to the soil filter"

Annual Sediment Load:	55 cubic feet per acre per year of sanded area						
Area to be sanded:	24,154	SF					
Sediment Volume	30	CF					
Provided	672	CF	12	Inch Deep Forebay	with area of	672	sf

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ORIFICE SIZING CALCULATION

Stormwater BMP: UDSF-1

Orifice Equation $Q = CA\sqrt{(2gh)}$

Q = Rate of Discharge (cfs)
A = Orifice Area (sf)
G = Gravitational Constant (32.2 ft/s^2)
h = Depth of water above the flow line (center) of the orifice (ft)
C = 0.6 Orifice coefficient (usually assumed = 0.6)

Average discharge rate required to drawdown the treatment volume in a desired amount of time is:

$$Q = \frac{WQv}{Tcf}$$

TV = Treatment Volume (cf)
T = Target Drain Time (Hours)
cf = Conversion Factor = 3600 sec/hr

TV = 5,951 cf
t = 48 hr

$$Q = \frac{TV}{tCF}$$ 0.03 cfs Target Rate for 48 hour discharge

surface area of filter = 3,000 SF

hmax = 1.98 ft h/2= 0.99 ft

$$A = \frac{Q}{C\sqrt{(2gh)}}$$ A = 0.007 sf = 1.03 sq. in.

Diam = 1.15 in

Summary for Pond 21.0P: USDF-1

Inflow Area = 50,218 sf, 56.01% Impervious, Inflow Depth = 0.69" for UDSF-1 WQV event
Inflow = 0.9 cfs @ 12.08 hrs, Volume= 2,885 cf
Outflow = 0.0 cfs @ 14.46 hrs, Volume= 2,885 cf, Atten= 95%, Lag= 142.6 min
Primary = 0.0 cfs @ 14.46 hrs, Volume= 2,885 cf
Routed to Pond 20.0P : Existing Wetlands
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond 20.0P : Existing Wetlands

Routing by Dyn-Stor-Ind method, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Peak Elev= 313.42' @ 14.46 hrs Surf.Area= 3,570 sf Storage= 1,420 cf
Flood Elev= 317.50' Surf.Area= 6,968 sf Storage= 20,572 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 315.5 min (1,091.8 - 776.3)

Volume	Invert	Avail.Storage	Storage Description
#1	310.83'	20,572 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
310.83	3,000	0.0	0	0
312.99	3,000	0.0	0	0
313.00	3,000	100.0	30	30
314.00	4,348	100.0	3,674	3,704
315.00	5,168	100.0	4,758	8,462
316.00	6,042	100.0	5,605	14,067
317.00	6,968	100.0	6,505	20,572

Device	Routing	Invert	Outlet Devices
#1	Primary	310.73'	**12.0" Round Outlet Pipe** L= 82.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 310.73' / 310.30' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	310.83'	**1.2" Vert. UD Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 2	310.83'	**0.500 in/hr Infiltration over Surface area** Phase-In= 0.01'
#4	Device 1	314.50'	**1.0" W x 3.0" H Vert. WQV Orifice** C= 0.600 Limited to weir flow at low heads
#5	Device 1	316.00'	**1.0" W x 7.0" H Vert. Beehive Grate X 29.00** C= 0.600 Limited to weir flow at low heads
#6	Secondary	316.50'	**14.0' long x 9.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.46 2.55 2.70 2.69 2.68 2.68 2.67 2.64 2.64 2.64 2.65 2.64 2.65 2.65 2.66 2.67 2.69

Primary OutFlow Max=0.0 cfs @ 14.46 hrs HW=313.42' TW=294.04' (Dynamic Tailwater)
- **1=Outlet Pipe** (Passes 0.0 cfs of 4.3 cfs potential flow)
  - **2=UD Orifice** (Passes 0.0 cfs of 0.1 cfs potential flow)
    - **3=Infiltration** (Exfiltration Controls 0.0 cfs)
  - **4=WQV Orifice** (Controls 0.0 cfs)
  - **5=Beehive Grate** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=310.83' TW=294.00' (Dynamic Tailwater)
- **6=Broad-Crested Rectangular Weir**(Controls 0.0 cfs)

Worksheet 1 - PPB calculations

Project Name:	**Franklin Drive Multi-Family Development**
Lake Watershed:	**Sebago Lake**
Town: Windham, ME	

Standard Calculations

Watershed per acre phosphorus budget (Appendix C)	**PAPB**	0.053	lbs P/acre/year
Total acreage of development parcel:	**TA**	38.6	acres
NWI wetland acreage:	**WA**	13.4	acres
Steep slope acreage:	**SA**	2.5	acres
Project acreage: A = TA - (WA+ SA)	**A**	22.69	acres
Project Phosphorus Budget: PPB = P x A	**PPB**	1.20257	**lbs P/year**

Small Watershed Adjustment

If Project Acreage (A) is greater than the threshold acreage for the small watershed threshold (SWT, from pertinent lake and town info in the table in Appendix C), calculate an alternative PPB using the analysis below and use this value if it is less than the the Standard Calculation PPB.

Small Watershed Threshold (Appendix C):	**SWT**		acres
Project acreage:	**A**		acres
Allowable increase in town's share of annual phosphorus load to lake (Appendix C):	**FC**		lbs P/year
Area available for development (Appendix C):	**AAD**		acres
Ratio of A to AAD (R=A/AAD)	**R**		

Project Phosphorus Budget

If R < 0.5,	PPB = [(FC x R)/2] + [FC/4]	**PPB**		**lbs P/year**
If R> 0.5,	PPB = FC x R	**PPB**		**lbs P/year**

Worksheet 2

Pre-PPE and Post-PPE Calculations

Calculate phosphorus export from development for before and after treatment
Use as many sheets as needed for each development type (commercial, roads, residential lots, etc.)

Project name: Franklin Drive Multi-Family Development **Development Type**: Residential **Sheet #:** 2

Land Surface Type or Lot #(s) with description	Acres or # of lots	Export Coefficient from Table 3.1 Table 3.2	Pre-treatment Algal Av. P Export (lbs P/year)	Treatment Factor for BMP(s) from Chapter 6	Post- treatment Algal Av. P Export (lbs P/year)	Description of BMPs	CALCULATED TF	MIN TF
Landscape (HSG A)	0.37	0.20	0.07	0.00	0.00	Subsurface sand Filter 1 (SSF-1)	0.38	0.25
Roads/Driveways (HSG A)	1.07	1.75	1.87	0.00	0.00			
Parking (HSG A)	0.95	1.25	1.18	0.00	0.00			
Sidewalks (HSG A)	0.14	0.50	0.07	0.00	0.00			
Roof (HSG A)	0.50	0.50	0.25	0.00	0.00			
Landscape (HSG A)	0.19	0.20	0.04	0.00	0.00	Subsurface sand Filter 2 (SSF-2)	0.30	0.25
Roads/Driveways (HSG A)	0.46	1.75	0.81	0.00	0.00			
Parking (HSG A)	0.41	1.25	0.51	0.00	0.00			
Sidewalks (HSG A)	0.06	0.50	0.03	0.00	0.00			
Roof (HSG A)	0.41	0.50	0.21	0.00	0.00			
Landscape (HSG A)	0.22	0.20	0.04	0.25	0.01	Subsurface sand Filter 3 (SSF-3)	0.17	0.25
Roads/Driveways (HSG A)	0.40	1.75	0.70	0.25	0.17			
Parking (HSG A)	0.23	1.25	0.29	0.25	0.07			
Sidewalk (HSG A)	0.07	0.50	0.04	0.25	0.01			
Roof (HSG A)	0.28	0.50	0.14	0.25	0.04			
Landscape (HSG A)	0.51	0.20	0.10	0.25	0.03	Underdrained Soil Filter 1 (UDSF-1)	0.19	0.25
Roads/Driveways (HSG A)	0.33	1.75	0.58	0.25	0.15			
Parking (HSG A)	0.09	1.25	0.11	0.25	0.03			
Sidewalk (HSG A)	0.13	0.50	0.07	0.25	0.02			
Roof (HSG A)	0.09	0.50	0.05	0.25	0.01			
Landscape (HSG A)	0.63	0.20	0.13	0.00	0.00	Subsurface Sand Filter 4 (SSF-4)	0.35	0.25
Roads/Driveways (HSG A)	1.01	1.75	1.76	0.00	0.00			
Parking (HSG A)	0.55	1.25	0.69	0.00	0.00			
Sidewalks (HSG A)	0.13	0.50	0.06	0.00	0.00			
Roof (HSG A)	0.45	0.50	0.22	0.00	0.00			
Landscape (HSG A)	1.73	0.20	0.35	1.00	0.35	Untreated	1.00	1
Roads/Driveways (HSG A)	0.20	1.75	0.35	1.00	0.35			
Parking (HSG A)	0.00	1.25	0.00	1.00	0.00			
Sidewalk (HSG A)	0.00	0.50	0.00	1.00	0.00			
		Total Pre-PPE (lbs P/year)	10.71	**Total PostPPE (lbs P/year)**	1.22			

*MIN TREATMENT FACTOR (TF) USED WHEN CALCULATED TF WAS LESS THAN MIN TF, PER VOLUME II - PHOSPHORUS CONTROL MANUAL
*LOW EXPORT OPTION COEFFICIENTS FROM TABLE 3.1 USED DUE TO SURFACES BEING STABILIZED WITH PAVEMENT OR VEGETATION & PHOSPHORUS RESTRICTION ON SITE

Appendix D: Worksheet 3 - Mitigation credit

Project name: Franklin Drive Multi-Family Development **Development type**: Residential Sheet # 3

Mitigation credit when a pre-existing source is being eliminated

Mitigation Source Area Land Use	Acres	Export Coefficient (lbs P/acre/year)	Modifier	Pre-treatment Historical P Export (lbs P/year)	Treatment Factor for Historical BMP(s) (1.0 if no BMPs)	Historical P Export (lbs P/year)			Mitigation Credit (lbs P/year)	Comments
			0.5	0	1	0			0	
			0.5	0	1	0			0	
			0.5	0	1	0			0	
				Total source elimination mitiagion credit (SEC)					**0**	**lbs P/year**

Mitigation credit when a pre-existing source is treated by a new BMP

Mitigation Source Area Land Use	Acres	Export Coefficient (lbs P/acre/year)	Modifier	Pre-treatment Historical P Export (lbs P/year)	Treatment Factor for Historical BMP(s) (1.0 if no BMPs)	Historical P Export (lbs P/year)		Treatment Factor for New BMP(s) Chapter 6	Mitigation Credit (lbs P/year)	Comments
			0.5	0	1	0	1 -		0	
			0.5	0	1	0	1 -		0	
			0.5	0	1	0	1 -		0	
				Total source treatment mitiagion credit (STC)					**0**	**lbs P/year**

TOTAL MITIGATION CREDIT (SEC + STC)	**0**	**lbs P/year**

WORKSHEET 4 - PROJECT PHOSPHORUS EXPORT SUMMARY

Summarizing the project's algal available phosphorus export (PPE)

Project Name: Franklin Drive Multi-Family Development

Project Phosphorus Budget - Worksheet 1	**PPB**	1.20	lbs P/year
Total Pre-Treatment Phosphorus Export - Worksheet 2	**Pre-PPE**	10.71	lbs P/year
Total Post-Treatment Phosphorus Export - Worksheet 2	**Post-PPE**	1.22	lbs P/year
Total Phosphorus Mitigation Credit - Worksheet 3	**TMC**	0.00	lbs P/year
Project Phosphorus Export (Post-PPE - TMC)	**PPE**	1.22	lbs P/year

Is the Project Phosphorus Export ≤ the Project Phosphorus Budget? (PPE≤PPB)

*If **YES**, PPE is less than or equal to PPB and the project meets its phosphorus budget .* *If **NO,** PPE is greater than PPB, more reduction in phosphorus export is required or the payment of a compensation fee may be an option*	NO
The amount of phosphorus that needs further treatment or compensation	0.02 lbs P/year

Has Project Phosphorus Export been sufficiently reduced?
Is (Pre-PPE - Post-PPE)/Pre-PPE greater than 0.60?

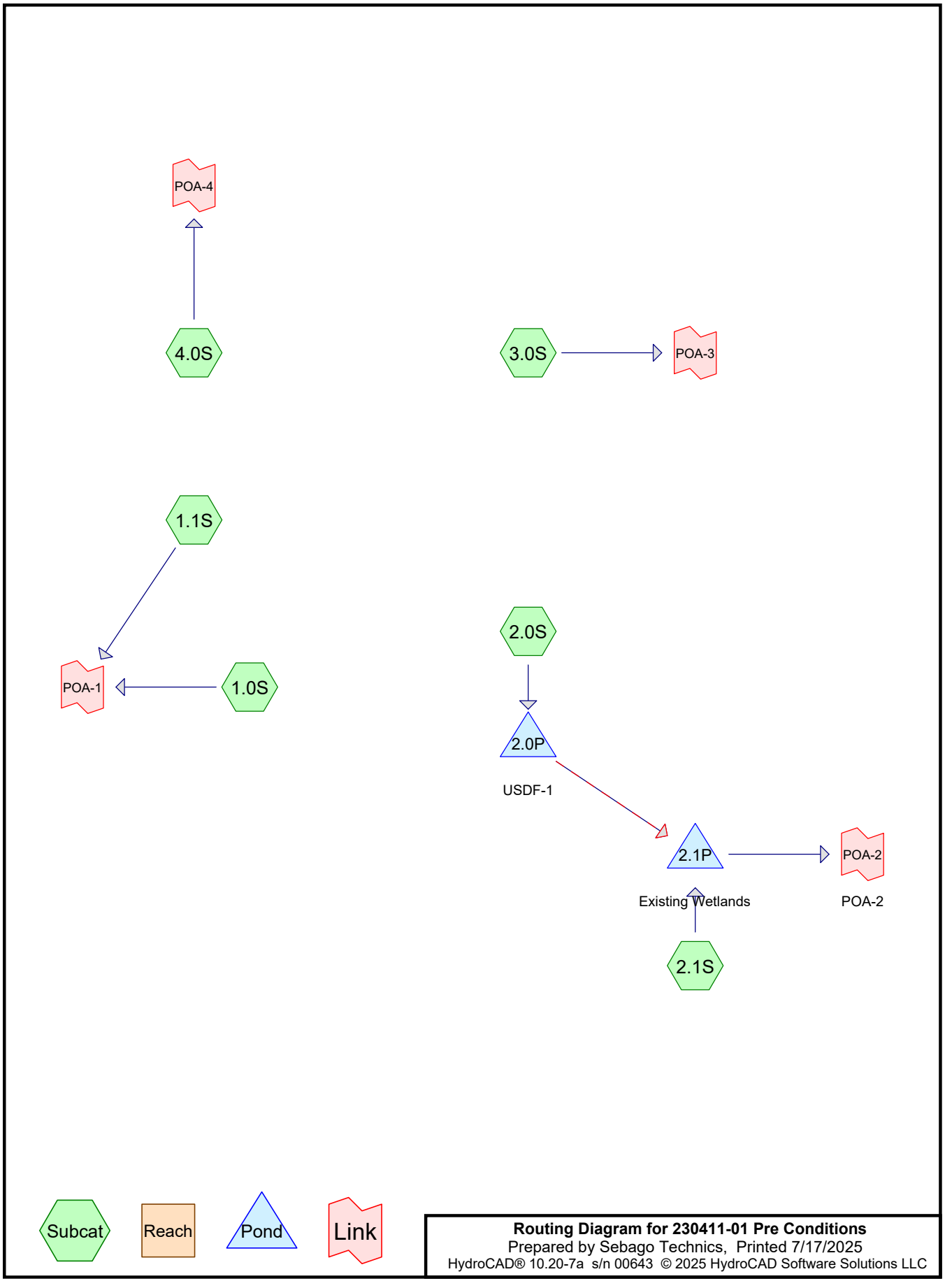
*If **YES**, in some watersheds the compensation fee is an available option.* *If **NO**, more treatment must be provided. PPE must be further reduced.*	YES
*The post-treatment phosphorus export must be less than 40% of the pre-treatment export (Post-PPE < 0.4*Pre-PPE)*	88.59 %

If the project is located in a watershed that is eligible for a compensation fee (or is a residential subdivision with buffers), a compensation fee may be appropriate as follows:

If Project Export has been reduced by greater than 60% and less than 75%, $25,000 per pound minus $833 per 1% Percent Export	
If Project Export has been reduced by greater than 75%, $12,500 per pound minus $500 per 1% Project Export	**$113**

Appendix 2A

Existing Conditions
HydroCAD Summary



Routing Diagram for 230411-01 Pre Conditions
Prepared by Sebago Technics, Printed 7/17/2025

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
21,215	39	>75% Grass cover, Good, HSG A (1.0S, 2.0S, 2.1S)
26,539	96	Gravel surface, HSG A (1.0S, 1.1S, 2.1S, 3.0S)
136,866	30	Meadow, non-grazed, HSG A (1.0S, 2.1S)
61,359	98	Paved parking, HSG A (1.0S, 2.0S, 2.1S)
1,424,555	30	Woods, Good, HSG A (1.0S, 1.1S, 2.1S, 3.0S, 4.0S)
1,670,534	**34**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
1,670,534	HSG A	1.0S, 1.1S, 2.0S, 2.1S, 3.0S, 4.0S
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
1,670,534		**TOTAL AREA**

Time span=0.00-75.00 hrs, dt=0.01 hrs, 7501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1.0S: Runoff Area=276,563 sf 4.34% Impervious Runoff Depth=0.17"
Flow Length=490' Tc=23.4 min CN=WQ Runoff=0.8 cfs 4,018 cf

Subcatchment1.1S: Runoff Area=93,625 sf 0.00% Impervious Runoff Depth=0.10"
Flow Length=377' Tc=18.6 min CN=WQ Runoff=0.2 cfs 803 cf

Subcatchment2.0S: Runoff Area=32,969 sf 64.21% Impervious Runoff Depth=1.84"
Flow Length=134' Tc=6.0 min CN=WQ Runoff=1.5 cfs 5,059 cf

Subcatchment2.1S: Runoff Area=595,847 sf 4.73% Impervious Runoff Depth=0.18"
Flow Length=441' Tc=17.6 min CN=WQ Runoff=1.8 cfs 8,697 cf

Subcatchment3.0S: Runoff Area=631,735 sf 0.00% Impervious Runoff Depth=0.04"
Flow Length=526' Tc=17.0 min CN=WQ Runoff=0.4 cfs 1,948 cf

Subcatchment4.0S: Runoff Area=39,795 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=153' Tc=10.3 min CN=30 Runoff=0.0 cfs 0 cf

Pond 2.0P: USDF-1 Peak Elev=313.81' Storage=2,909 cf Inflow=1.5 cfs 5,059 cf
Primary=0.0 cfs 5,060 cf Secondary=0.0 cfs 0 cf Outflow=0.0 cfs 5,060 cf

Pond 2.1P: Existing Wetlands Peak Elev=294.12' Storage=13,757 cf Inflow=1.9 cfs 13,757 cf
Outflow=0.0 cfs 0 cf

Link POA-1: Inflow=0.9 cfs 4,821 cf
Primary=0.9 cfs 4,821 cf

Link POA-2: POA-2 Inflow=0.0 cfs 0 cf
Primary=0.0 cfs 0 cf

Link POA-3: Inflow=0.4 cfs 1,948 cf
Primary=0.4 cfs 1,948 cf

Link POA-4: Inflow=0.0 cfs 0 cf
Primary=0.0 cfs 0 cf

Total Runoff Area = 1,670,534 sf Runoff Volume = 20,526 cf Average Runoff Depth = 0.15"
96.33% Pervious = 1,609,175 sf 3.67% Impervious = 61,359 sf

Time span=0.00-75.00 hrs, dt=0.01 hrs, 7501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1.0S: Runoff Area=276,563 sf 4.34% Impervious Runoff Depth=0.27"
Flow Length=490' Tc=23.4 min CN=WQ Runoff=1.1 cfs 6,256 cf

Subcatchment1.1S: Runoff Area=93,625 sf 0.00% Impervious Runoff Depth=0.16"
Flow Length=377' Tc=18.6 min CN=WQ Runoff=0.3 cfs 1,253 cf

Subcatchment2.0S: Runoff Area=32,969 sf 64.21% Impervious Runoff Depth=2.85"
Flow Length=134' Tc=6.0 min CN=WQ Runoff=2.2 cfs 7,823 cf

Subcatchment2.1S: Runoff Area=595,847 sf 4.73% Impervious Runoff Depth=0.27"
Flow Length=441' Tc=17.6 min CN=WQ Runoff=2.7 cfs 13,311 cf

Subcatchment3.0S: Runoff Area=631,735 sf 0.00% Impervious Runoff Depth=0.06"
Flow Length=526' Tc=17.0 min CN=WQ Runoff=0.7 cfs 3,040 cf

Subcatchment4.0S: Runoff Area=39,795 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=153' Tc=10.3 min CN=30 Runoff=0.0 cfs 0 cf

Pond 2.0P: USDF-1 Peak Elev=314.30' Storage=5,033 cf Inflow=2.2 cfs 7,823 cf
Primary=0.0 cfs 7,823 cf Secondary=0.0 cfs 0 cf Outflow=0.0 cfs 7,823 cf

Pond 2.1P: Existing Wetlands Peak Elev=294.17' Storage=21,134 cf Inflow=2.8 cfs 21,134 cf
Outflow=0.0 cfs 0 cf

Link POA-1: Inflow=1.4 cfs 7,509 cf
Primary=1.4 cfs 7,509 cf

Link POA-2: POA-2 Inflow=0.0 cfs 0 cf
Primary=0.0 cfs 0 cf

Link POA-3: Inflow=0.7 cfs 3,040 cf
Primary=0.7 cfs 3,040 cf

Link POA-4: Inflow=0.0 cfs 0 cf
Primary=0.0 cfs 0 cf

Total Runoff Area = 1,670,534 sf Runoff Volume = 31,683 cf Average Runoff Depth = 0.23"
96.33% Pervious = 1,609,175 sf 3.67% Impervious = 61,359 sf

Time span=0.00-75.00 hrs, dt=0.01 hrs, 7501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1.0S: Runoff Area=276,563 sf 4.34% Impervious Runoff Depth=0.40"
Flow Length=490' Tc=23.4 min CN=WQ Runoff=1.4 cfs 9,270 cf

Subcatchment1.1S: Runoff Area=93,625 sf 0.00% Impervious Runoff Depth=0.26"
Flow Length=377' Tc=18.6 min CN=WQ Runoff=0.3 cfs 2,008 cf

Subcatchment2.0S: Runoff Area=32,969 sf 64.21% Impervious Runoff Depth=3.71"
Flow Length=134' Tc=6.0 min CN=WQ Runoff=2.8 cfs 10,196 cf

Subcatchment2.1S: Runoff Area=595,847 sf 4.73% Impervious Runoff Depth=0.39"
Flow Length=441' Tc=17.6 min CN=WQ Runoff=3.5 cfs 19,455 cf

Subcatchment3.0S: Runoff Area=631,735 sf 0.00% Impervious Runoff Depth=0.13"
Flow Length=526' Tc=17.0 min CN=WQ Runoff=0.8 cfs 6,642 cf

Subcatchment4.0S: Runoff Area=39,795 sf 0.00% Impervious Runoff Depth=0.05"
Flow Length=153' Tc=10.3 min CN=30 Runoff=0.0 cfs 174 cf

Pond 2.0P: USDF-1 Peak Elev=314.55' Storage=6,230 cf Inflow=2.8 cfs 10,196 cf
Primary=0.1 cfs 10,196 cf Secondary=0.0 cfs 0 cf Outflow=0.1 cfs 10,196 cf

Pond 2.1P: Existing Wetlands Peak Elev=294.23' Storage=29,651 cf Inflow=3.5 cfs 29,651 cf
Outflow=0.0 cfs 0 cf

Link POA-1: Inflow=1.8 cfs 11,277 cf
Primary=1.8 cfs 11,277 cf

Link POA-2: POA-2 Inflow=0.0 cfs 0 cf
Primary=0.0 cfs 0 cf

Link POA-3: Inflow=0.8 cfs 6,642 cf
Primary=0.8 cfs 6,642 cf

Link POA-4: Inflow=0.0 cfs 174 cf
Primary=0.0 cfs 174 cf

Total Runoff Area = 1,670,534 sf Runoff Volume = 47,744 cf Average Runoff Depth = 0.34"
96.33% Pervious = 1,609,175 sf 3.67% Impervious = 61,359 sf

Summary for Subcatchment 1.0S:

Runoff = 1.4 cfs @ 12.30 hrs, Volume= 9,270 cf, Depth= 0.40"
Routed to Link POA-1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
12,000	98	Paved parking, HSG A
5,208	96	Gravel surface, HSG A
9,266	39	>75% Grass cover, Good, HSG A
118,189	30	Woods, Good, HSG A
131,900	30	Meadow, non-grazed, HSG A
276,563		Weighted Average
264,563		95.66% Pervious Area
12,000		4.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	50	0.0300	0.08		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.30"
12.8	385	0.0100	0.50		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.3	55	0.2000	3.13		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
23.4	490	Total			

Summary for Subcatchment 1.1S:

Runoff = 0.3 cfs @ 12.25 hrs, Volume= 2,008 cf, Depth= 0.26"
Routed to Link POA-1 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
3,635	96	Gravel surface, HSG A
89,990	30	Woods, Good, HSG A
93,625		Weighted Average
93,625		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	44	0.0280	0.08		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.30"
2.8	150	0.0330	0.91		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
6.2	183	0.0050	0.49		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
18.6	377	Total			

Summary for Subcatchment 2.0S:

Runoff = 2.8 cfs @ 12.08 hrs, Volume= 10,196 cf, Depth= 3.71"
Routed to Pond 2.0P : USDF-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
21,170	98	Paved parking, HSG A
11,799	39	>75% Grass cover, Good, HSG A
32,969		Weighted Average
11,799		35.79% Pervious Area
21,170		64.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	16	0.0200	0.97		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 3.30"
0.6	118	0.0280	3.40		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
5.1					**Direct Entry, Direct Entry**
6.0	134	Total			

Summary for Subcatchment 2.1S:

Runoff = 3.5 cfs @ 12.22 hrs, Volume= 19,455 cf, Depth= 0.39"
Routed to Pond 2.1P : Existing Wetlands

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
28,189	98	Paved parking, HSG A
553,667	30	Woods, Good, HSG A
150	39	>75% Grass cover, Good, HSG A
4,966	30	Meadow, non-grazed, HSG A
8,875	96	Gravel surface, HSG A
595,847		Weighted Average
567,658		95.27% Pervious Area
28,189		4.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.8	57	0.0440	0.10		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.30"
6.8	266	0.0170	0.65		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.0	118	0.1700	2.06		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
17.6	441	Total			

Summary for Subcatchment 3.0S:

Runoff = 0.8 cfs @ 12.22 hrs, Volume= 6,642 cf, Depth= 0.13"
Routed to Link POA-3 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
8,821	96	Gravel surface, HSG A
622,914	30	Woods, Good, HSG A
631,735		Weighted Average
631,735		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0	52	0.0280	0.08		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.30"
6.0	474	0.0700	1.32		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
17.0	526	Total			

Summary for Subcatchment 4.0S:

Runoff = 0.0 cfs @ 16.88 hrs, Volume= 174 cf, Depth= 0.05"
Routed to Link POA-4 :

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
39,795	30	Woods, Good, HSG A
39,795		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	44	0.0280	0.08		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.30"
0.7	109	0.2900	2.69		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
10.3	153	Total			

Summary for Pond 2.0P: USDF-1

Inflow Area = 32,969 sf, 64.21% Impervious, Inflow Depth = 3.71" for 25-YR event
Inflow = 2.8 cfs @ 12.08 hrs, Volume= 10,196 cf
Outflow = 0.1 cfs @ 14.38 hrs, Volume= 10,196 cf, Atten= 95%, Lag= 138.0 min
Primary = 0.1 cfs @ 14.38 hrs, Volume= 10,196 cf
Routed to Pond 2.1P : Existing Wetlands
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond 2.1P : Existing Wetlands

Routing by Dyn-Stor-Ind method, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Peak Elev= 314.55' @ 14.38 hrs Surf.Area= 4,801 sf Storage= 6,230 cf
Flood Elev= 317.50' Surf.Area= 6,968 sf Storage= 20,572 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 1,026.5 min (1,780.5 - 754.0)

Volume	Invert	Avail.Storage	Storage Description
#1	310.83'	20,572 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
310.83	3,000	0.0	0	0
312.99	3,000	0.0	0	0
313.00	3,000	100.0	30	30
314.00	4,348	100.0	3,674	3,704
315.00	5,168	100.0	4,758	8,462
316.00	6,042	100.0	5,605	14,067
317.00	6,968	100.0	6,505	20,572

Device	Routing	Invert	Outlet Devices
#1	Primary	310.73'	**12.0" Round Outlet Pipe** L= 82.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 310.73' / 310.30' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	310.83'	**1.0" Vert. UD Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 2	310.83'	**2.410 in/hr Infiltration over Surface area** Phase-In= 0.01'
#4	Device 1	314.50'	**1.0" W x 7.0" H Vert. Beehive Grate X 29.00** C= 0.600 Limited to weir flow at low heads
#5	Secondary	316.50'	**14.0' long x 9.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.46 2.55 2.70 2.69 2.68 2.68 2.67 2.64 2.64 2.64 2.65 2.64 2.65 2.65 2.66 2.67 2.69

Primary OutFlow Max=0.1 cfs @ 14.38 hrs HW=314.55' TW=294.13' (Dynamic Tailwater)
- **1=Outlet Pipe** (Passes 0.1 cfs of 5.4 cfs potential flow)
  - **2=UD Orifice** (Orifice Controls 0.1 cfs @ 9.24 fps)
    - **3=Infiltration** (Passes 0.1 cfs of 0.3 cfs potential flow)
  - **4=Beehive Grate** (Orifice Controls 0.1 cfs @ 0.73 fps)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=310.83' TW=294.00' (Dynamic Tailwater)
- **5=Broad-Crested Rectangular Weir**(Controls 0.0 cfs)

Summary for Pond 2.1P: Existing Wetlands

Inflow Area = 628,816 sf, 7.85% Impervious, Inflow Depth = 0.57" for 25-YR event
Inflow = 3.5 cfs @ 12.22 hrs, Volume= 29,651 cf
Outflow = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link POA-2 : POA-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Peak Elev= 294.23' @ 60.20 hrs Surf.Area= 159,574 sf Storage= 29,651 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	294.00'	593,193 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
294.00	100,545	0	0
295.00	359,460	230,003	230,003
296.00	366,921	363,191	593,193

Device	Routing	Invert	Outlet Devices
#1	Primary	295.50'	**15.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=294.00' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Link POA-1:

Inflow Area = 370,188 sf, 3.24% Impervious, Inflow Depth = 0.37" for 25-YR event
Inflow = 1.8 cfs @ 12.30 hrs, Volume= 11,277 cf
Primary = 1.8 cfs @ 12.30 hrs, Volume= 11,277 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs

Summary for Link POA-2: POA-2

Inflow Area = 628,816 sf, 7.85% Impervious, Inflow Depth = 0.00" for 25-YR event
Inflow = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs

Summary for Link POA-3:

Inflow Area = 631,735 sf, 0.00% Impervious, Inflow Depth = 0.13" for 25-YR event
Inflow = 0.8 cfs @ 12.22 hrs, Volume= 6,642 cf
Primary = 0.8 cfs @ 12.22 hrs, Volume= 6,642 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs

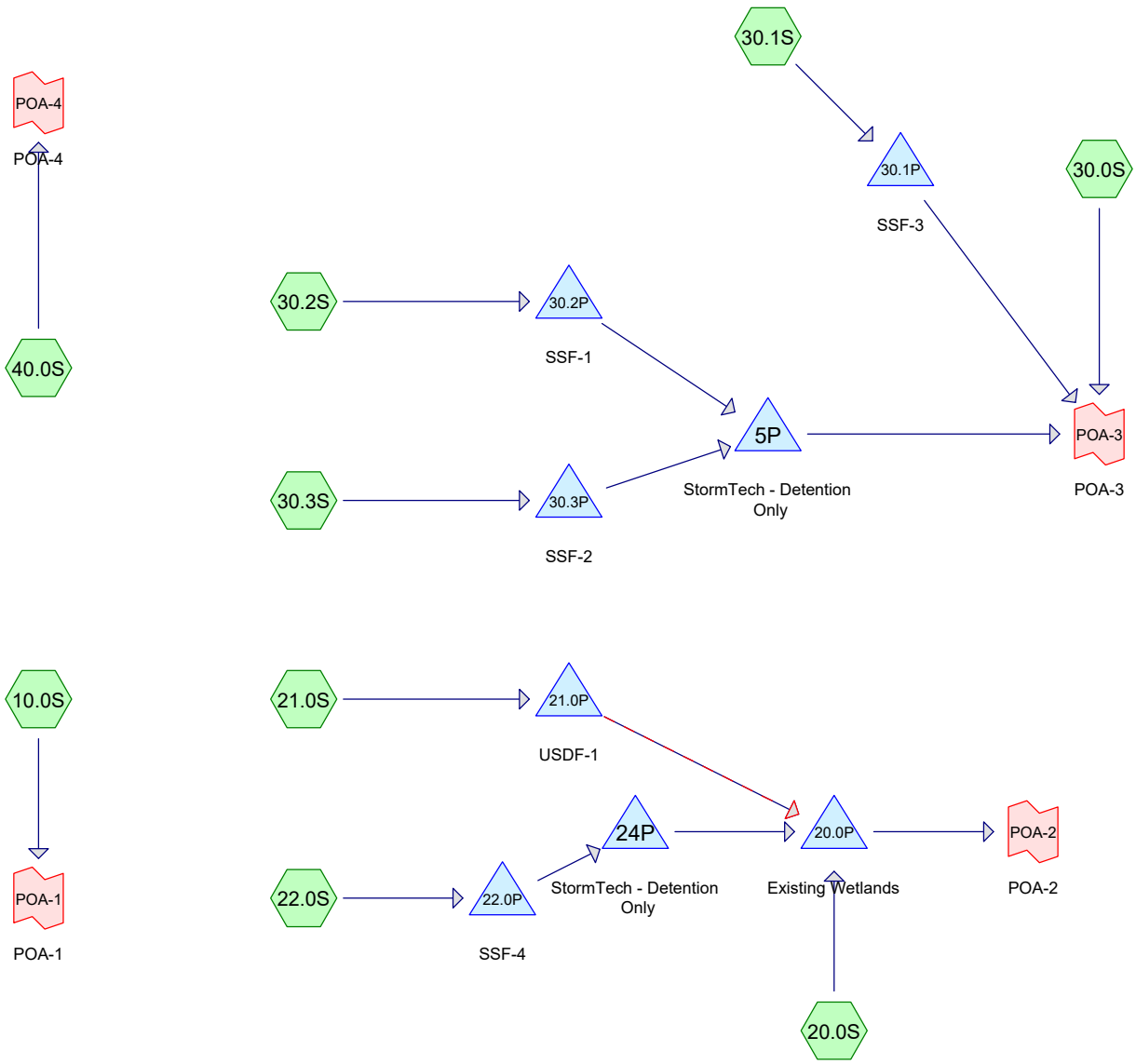
Summary for Link POA-4:

Inflow Area = 39,795 sf, 0.00% Impervious, Inflow Depth = 0.05" for 25-YR event
Inflow = 0.0 cfs @ 16.88 hrs, Volume= 174 cf
Primary = 0.0 cfs @ 16.88 hrs, Volume= 174 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs

Appendix 2B

Proposed Conditions
HydroCAD Summary



Subcat Reach Pond Link

Routing Diagram for 230411-01 Post Conditions
Prepared by Sebago Technics, Printed 7/17/2025

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
168,276	39	>75% Grass cover, Good, HSG A (10.0S, 20.0S, 21.0S, 22.0S, 30.0S, 30.1S, 30.2S, 30.3S, 40.0S)
22,237	96	Gravel surface, HSG A (10.0S, 20.0S, 30.0S)
248,614	30	Meadow, non-grazed, HSG A (10.0S, 20.0S, 30.0S)
302,969	98	Paved parking, HSG A (10.0S, 20.0S, 21.0S, 22.0S, 30.1S, 30.2S, 30.3S)
75,490	98	Roofs, HSG A (21.0S, 22.0S, 30.1S, 30.2S, 30.3S)
852,948	30	Woods, Good, HSG A (10.0S, 20.0S, 30.0S, 40.0S)
1,670,534	**47**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
1,670,534	HSG A	10.0S, 20.0S, 21.0S, 22.0S, 30.0S, 30.1S, 30.2S, 30.3S, 40.0S
0	HSG B	
0	HSG C	
0	HSG D	
0	Other	
1,670,534		**TOTAL AREA**

Time span=0.00-75.00 hrs, dt=0.01 hrs, 7501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment10.0S: Runoff Area=207,220 sf 5.79% Impervious Runoff Depth=0.22"
Flow Length=490' Tc=23.4 min CN=WQ Runoff=0.7 cfs 3,730 cf

Subcatchment20.0S: Runoff Area=496,893 sf 5.67% Impervious Runoff Depth=0.24"
Flow Length=274' Tc=8.7 min CN=WQ Runoff=2.6 cfs 9,901 cf

Subcatchment21.0S: Runoff Area=50,218 sf 56.01% Impervious Runoff Depth=1.61"
Flow Length=134' Tc=6.0 min CN=WQ Runoff=1.9 cfs 6,722 cf

Subcatchment22.0S: Runoff Area=120,447 sf 77.21% Impervious Runoff Depth=2.21"
Flow Length=150' Tc=6.0 min CN=WQ Runoff=6.4 cfs 22,224 cf

Subcatchment30.0S: Runoff Area=516,831 sf 0.00% Impervious Runoff Depth=0.02"
Flow Length=515' Tc=21.2 min CN=WQ Runoff=0.2 cfs 885 cf

Subcatchment30.1S: Runoff Area=52,105 sf 81.85% Impervious Runoff Depth=2.35"
Flow Length=182' Tc=6.0 min CN=WQ Runoff=2.9 cfs 10,193 cf

Subcatchment30.2S: Runoff Area=131,790 sf 87.60% Impervious Runoff Depth=2.51"
Flow Length=100' Slope=0.0220 '/' Tc=6.0 min CN=WQ Runoff=8.0 cfs 27,591 cf

Subcatchment30.3S: Runoff Area=67,415 sf 87.60% Impervious Runoff Depth=2.51"
Flow Length=105' Slope=0.0204 '/' Tc=6.0 min CN=WQ Runoff=4.1 cfs 14,113 cf

Subcatchment40.0S: Runoff Area=27,615 sf 0.00% Impervious Runoff Depth=0.00"
Flow Length=75' Slope=0.5000 '/' Tc=6.0 min CN=WQ Runoff=0.0 cfs 0 cf

Pond 5P: StormTech - Detention Only Peak Elev=311.29' Storage=39 cf Inflow=2.3 cfs 41,708 cf
Discarded=2.3 cfs 41,708 cf Primary=0.0 cfs 0 cf Outflow=2.3 cfs 41,708 cf

Pond 20.0P: Existing Wetlands Peak Elev=294.14' Storage=16,623 cf Inflow=2.7 cfs 16,623 cf
Outflow=0.0 cfs 0 cf

Pond 21.0P: USDF-1 Peak Elev=314.12' Storage=4,215 cf Inflow=1.9 cfs 6,722 cf
Primary=0.1 cfs 6,722 cf Secondary=0.0 cfs 0 cf Outflow=0.1 cfs 6,722 cf

Pond 22.0P: SSF-4 Peak Elev=316.80' Storage=10,484 cf Inflow=6.4 cfs 22,224 cf
Outflow=1.0 cfs 22,224 cf

Pond 24P: StormTech - Detention Only Peak Elev=311.26' Storage=17 cf Inflow=1.0 cfs 22,224 cf
Discarded=1.0 cfs 22,224 cf Primary=0.0 cfs 0 cf Outflow=1.0 cfs 22,224 cf

Pond 30.1P: SSF-3 Peak Elev=309.70' Storage=5,809 cf Inflow=2.9 cfs 10,193 cf
Outflow=0.1 cfs 10,194 cf

Pond 30.2P: SSF-1 Peak Elev=317.73' Storage=11,913 cf Inflow=8.0 cfs 27,591 cf
Outflow=2.1 cfs 27,594 cf

Pond 30.3P: SSF-2 Peak Elev=316.81' Storage=7,205 cf Inflow=4.1 cfs 14,113 cf
Outflow=0.3 cfs 14,115 cf

Link POA-1: POA-1 Inflow=0.7 cfs 3,730 cf
Primary=0.7 cfs 3,730 cf

Link POA-2: POA-2 Inflow=0.0 cfs 0 cf
Primary=0.0 cfs 0 cf

Link POA-3: POA-3 Inflow=0.3 cfs 11,079 cf
Primary=0.3 cfs 11,079 cf

Link POA-4: POA-4 Inflow=0.0 cfs 0 cf
Primary=0.0 cfs 0 cf

Total Runoff Area = 1,670,534 sf Runoff Volume = 95,359 cf Average Runoff Depth = 0.68"
77.35% Pervious = 1,292,075 sf 22.65% Impervious = 378,459 sf

Time span=0.00-75.00 hrs, dt=0.01 hrs, 7501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment10.0S: Runoff Area=207,220 sf 5.79% Impervious Runoff Depth=0.35"
Flow Length=490' Tc=23.4 min CN=WQ Runoff=1.0 cfs 6,001 cf

Subcatchment20.0S: Runoff Area=496,893 sf 5.67% Impervious Runoff Depth=0.38"
Flow Length=274' Tc=8.7 min CN=WQ Runoff=4.0 cfs 15,540 cf

Subcatchment21.0S: Runoff Area=50,218 sf 56.01% Impervious Runoff Depth=2.50"
Flow Length=134' Tc=6.0 min CN=WQ Runoff=2.9 cfs 10,462 cf

Subcatchment22.0S: Runoff Area=120,447 sf 77.21% Impervious Runoff Depth=3.40"
Flow Length=150' Tc=6.0 min CN=WQ Runoff=9.6 cfs 34,107 cf

Subcatchment30.0S: Runoff Area=516,831 sf 0.00% Impervious Runoff Depth=0.04"
Flow Length=515' Tc=21.2 min CN=WQ Runoff=0.3 cfs 1,548 cf

Subcatchment30.1S: Runoff Area=52,105 sf 81.85% Impervious Runoff Depth=3.59"
Flow Length=182' Tc=6.0 min CN=WQ Runoff=4.4 cfs 15,609 cf

Subcatchment30.2S: Runoff Area=131,790 sf 87.60% Impervious Runoff Depth=3.84"
Flow Length=100' Slope=0.0220 '/' Tc=6.0 min CN=WQ Runoff=11.9 cfs 42,155 cf

Subcatchment30.3S: Runoff Area=67,415 sf 87.60% Impervious Runoff Depth=3.84"
Flow Length=105' Slope=0.0204 '/' Tc=6.0 min CN=WQ Runoff=6.1 cfs 21,564 cf

Subcatchment40.0S: Runoff Area=27,615 sf 0.00% Impervious Runoff Depth=0.04"
Flow Length=75' Slope=0.5000 '/' Tc=6.0 min CN=WQ Runoff=0.0 cfs 81 cf

Pond 5P: StormTech - Detention Only Peak Elev=312.29' Storage=7,888 cf Inflow=11.7 cfs 63,721 cf
Discarded=3.5 cfs 63,721 cf Primary=0.0 cfs 0 cf Outflow=3.5 cfs 63,721 cf

Pond 20.0P: Existing Wetlands Peak Elev=294.20' Storage=26,002 cf Inflow=4.0 cfs 26,002 cf
Outflow=0.0 cfs 0 cf

Pond 21.0P: USDF-1 Peak Elev=314.70' Storage=6,931 cf Inflow=2.9 cfs 10,462 cf
Primary=0.1 cfs 10,462 cf Secondary=0.0 cfs 0 cf Outflow=0.1 cfs 10,462 cf

Pond 22.0P: SSF-4 Peak Elev=317.14' Storage=12,114 cf Inflow=9.6 cfs 34,107 cf
Outflow=5.9 cfs 34,108 cf

Pond 24P: StormTech - Detention Only Peak Elev=312.63' Storage=4,937 cf Inflow=5.9 cfs 34,108 cf
Discarded=1.4 cfs 34,108 cf Primary=0.0 cfs 0 cf Outflow=1.4 cfs 34,108 cf

Pond 30.1P: SSF-3 Peak Elev=310.50' Storage=9,747 cf Inflow=4.4 cfs 15,609 cf
Outflow=0.1 cfs 15,610 cf

Pond 30.2P: SSF-1 Peak Elev=318.10' Storage=13,787 cf Inflow=11.9 cfs 42,155 cf
Outflow=8.8 cfs 42,156 cf

Pond 30.3P: SSF-2 Peak Elev=317.08' Storage=8,150 cf Inflow=6.1 cfs 21,564 cf
Outflow=3.2 cfs 21,565 cf

Link POA-1: POA-1 Inflow=1.0 cfs 6,001 cf
Primary=1.0 cfs 6,001 cf

Link POA-2: POA-2 Inflow=0.0 cfs 0 cf
Primary=0.0 cfs 0 cf

Link POA-3: POA-3 Inflow=0.4 cfs 17,159 cf
Primary=0.4 cfs 17,159 cf

Link POA-4: POA-4 Inflow=0.0 cfs 81 cf
Primary=0.0 cfs 81 cf

Total Runoff Area = 1,670,534 sf Runoff Volume = 147,066 cf Average Runoff Depth = 1.06"
77.35% Pervious = 1,292,075 sf 22.65% Impervious = 378,459 sf

Time span=0.00-75.00 hrs, dt=0.01 hrs, 7501 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment10.0S: Runoff Area=207,220 sf 5.79% Impervious Runoff Depth=0.52"
Flow Length=490' Tc=23.4 min CN=WQ Runoff=1.3 cfs 8,910 cf

Subcatchment20.0S: Runoff Area=496,893 sf 5.67% Impervious Runoff Depth=0.54"
Flow Length=274' Tc=8.7 min CN=WQ Runoff=5.1 cfs 22,354 cf

Subcatchment21.0S: Runoff Area=50,218 sf 56.01% Impervious Runoff Depth=3.29"
Flow Length=134' Tc=6.0 min CN=WQ Runoff=3.7 cfs 13,755 cf

Subcatchment22.0S: Runoff Area=120,447 sf 77.21% Impervious Runoff Depth=4.38"
Flow Length=150' Tc=6.0 min CN=WQ Runoff=12.1 cfs 43,994 cf

Subcatchment30.0S: Runoff Area=516,831 sf 0.00% Impervious Runoff Depth=0.10"
Flow Length=515' Tc=21.2 min CN=WQ Runoff=0.4 cfs 4,469 cf

Subcatchment30.1S: Runoff Area=52,105 sf 81.85% Impervious Runoff Depth=4.62"
Flow Length=182' Tc=6.0 min CN=WQ Runoff=5.6 cfs 20,075 cf

Subcatchment30.2S: Runoff Area=131,790 sf 87.60% Impervious Runoff Depth=4.92"
Flow Length=100' Slope=0.0220 '/' Tc=6.0 min CN=WQ Runoff=15.1 cfs 54,041 cf

Subcatchment30.3S: Runoff Area=67,415 sf 87.60% Impervious Runoff Depth=4.92"
Flow Length=105' Slope=0.0204 '/' Tc=6.0 min CN=WQ Runoff=7.7 cfs 27,644 cf

Subcatchment40.0S: Runoff Area=27,615 sf 0.00% Impervious Runoff Depth=0.15"
Flow Length=75' Slope=0.5000 '/' Tc=6.0 min CN=WQ Runoff=0.0 cfs 336 cf

Pond 5P: StormTech - Detention Only Peak Elev=313.02' Storage=17,080 cf Inflow=19.6 cfs 81,688 cf
Discarded=3.5 cfs 81,688 cf Primary=0.0 cfs 0 cf Outflow=3.5 cfs 81,688 cf

Pond 20.0P: Existing Wetlands Peak Elev=294.27' Storage=36,109 cf Inflow=5.1 cfs 36,109 cf
Outflow=0.0 cfs 0 cf

Pond 21.0P: USDF-1 Peak Elev=315.08' Storage=8,897 cf Inflow=3.7 cfs 13,755 cf
Primary=0.1 cfs 13,755 cf Secondary=0.0 cfs 0 cf Outflow=0.1 cfs 13,755 cf

Pond 22.0P: SSF-4 Peak Elev=317.33' Storage=13,000 cf Inflow=12.1 cfs 43,994 cf
Outflow=10.4 cfs 43,995 cf

Pond 24P: StormTech - Detention Only Peak Elev=313.88' Storage=10,438 cf Inflow=10.4 cfs 43,995 cf
Discarded=1.4 cfs 43,995 cf Primary=0.0 cfs 0 cf Outflow=1.4 cfs 43,995 cf

Pond 30.1P: SSF-3 Peak Elev=311.03' Storage=12,053 cf Inflow=5.6 cfs 20,075 cf
Outflow=0.3 cfs 20,076 cf

Pond 30.2P: SSF-1 Peak Elev=318.27' Storage=14,596 cf Inflow=15.1 cfs 54,041 cf
Outflow=13.1 cfs 54,043 cf

Pond 30.3P: SSF-2 Peak Elev=317.26' Storage=8,760 cf Inflow=7.7 cfs 27,644 cf
Outflow=6.5 cfs 27,645 cf

Link POA-1: POA-1 Inflow=1.3 cfs 8,910 cf
Primary=1.3 cfs 8,910 cf

Link POA-2: POA-2 Inflow=0.0 cfs 0 cf
Primary=0.0 cfs 0 cf

Link POA-3: POA-3 Inflow=0.5 cfs 24,545 cf
Primary=0.5 cfs 24,545 cf

Link POA-4: POA-4 Inflow=0.0 cfs 336 cf
Primary=0.0 cfs 336 cf

Total Runoff Area = 1,670,534 sf Runoff Volume = 195,578 cf Average Runoff Depth = 1.40"
77.35% Pervious = 1,292,075 sf 22.65% Impervious = 378,459 sf

Summary for Subcatchment 10.0S:

Runoff = 1.3 cfs @ 12.30 hrs, Volume= 8,910 cf, Depth= 0.52"
Routed to Link POA-1 : POA-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
12,000	98	Paved parking, HSG A
3,903	96	Gravel surface, HSG A
27,671	39	>75% Grass cover, Good, HSG A
14,320	30	Woods, Good, HSG A
149,326	30	Meadow, non-grazed, HSG A
207,220		Weighted Average
195,220		94.21% Pervious Area
12,000		5.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.3	50	0.0300	0.08		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.30"
12.8	385	0.0100	0.50		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.3	55	0.2000	3.13		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
23.4	490	Total			

Summary for Subcatchment 20.0S:

Runoff = 5.1 cfs @ 12.12 hrs, Volume= 22,354 cf, Depth= 0.54"
Routed to Pond 20.0P : Existing Wetlands

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
327,093	30	Woods, Good, HSG A
33,398	39	>75% Grass cover, Good, HSG A
93,887	30	Meadow, non-grazed, HSG A
28,189	98	Paved parking, HSG A
14,326	96	Gravel surface, HSG A
496,893		Weighted Average
468,704		94.33% Pervious Area
28,189		5.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	41	0.1400	0.14		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.30"
2.9	115	0.0170	0.65		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
1.0	118	0.1700	2.06		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
8.7	274	Total			

Summary for Subcatchment 21.0S:

Runoff = 3.7 cfs @ 12.08 hrs, Volume= 13,755 cf, Depth= 3.29"
Routed to Pond 21.0P : USDF-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
24,154	98	Paved parking, HSG A
22,091	39	>75% Grass cover, Good, HSG A
3,973	98	Roofs, HSG A
50,218		Weighted Average
22,091		43.99% Pervious Area
28,127		56.01% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	16	0.0200	0.97		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 3.30"
0.6	118	0.0280	3.40		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
5.1					**Direct Entry, Direct Entry**
6.0	134	Total			

Summary for Subcatchment 22.0S:

Runoff = 12.1 cfs @ 12.08 hrs, Volume= 43,994 cf, Depth= 4.38"
Routed to Pond 22.0P : SSF-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
73,452	98	Paved parking, HSG A
27,455	39	>75% Grass cover, Good, HSG A
19,540	98	Roofs, HSG A
120,447		Weighted Average
27,455		22.79% Pervious Area
92,992		77.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	50	0.3400	0.32		**Sheet Flow,** Grass: Dense n= 0.240 P2= 3.30"
1.1	100	0.1000	1.58		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.3					**Direct Entry, Direct Entry**
6.0	150	Total			

Summary for Subcatchment 30.0S:

Runoff = 0.4 cfs @ 12.29 hrs, Volume= 4,469 cf, Depth= 0.10"
Routed to Link POA-3 : POA-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
15,855	39	>75% Grass cover, Good, HSG A
491,567	30	Woods, Good, HSG A
4,008	96	Gravel surface, HSG A
5,401	30	Meadow, non-grazed, HSG A
516,831		Weighted Average
516,831		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	50	0.0500	0.06		**Sheet Flow, A** Woods: Dense underbrush n= 0.800 P2= 3.30"
4.0	360	0.0900	1.50		**Shallow Concentrated Flow, B** Woodland Kv= 5.0 fps
2.5	105	0.0200	0.71		**Shallow Concentrated Flow, C** Woodland Kv= 5.0 fps
21.2	515	Total			

Summary for Subcatchment 30.1S:

Runoff = 5.6 cfs @ 12.08 hrs, Volume= 20,075 cf, Depth= 4.62"
Routed to Pond 30.1P : SSF-3

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
30,432	98	Paved parking, HSG A
9,456	39	>75% Grass cover, Good, HSG A
12,217	98	Roofs, HSG A
52,105		Weighted Average
9,456		18.15% Pervious Area
42,649		81.85% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.4	110	0.0044	0.78		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 3.30"
0.3	72	0.0436	4.24		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
3.3					**Direct Entry,**
6.0	182	Total			

Summary for Subcatchment 30.2S:

Runoff = 15.1 cfs @ 12.08 hrs, Volume= 54,041 cf, Depth= 4.92"
Routed to Pond 30.2P : SSF-1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
93,699	98	Paved parking, HSG A
21,748	98	Roofs, HSG A
16,343	39	>75% Grass cover, Good, HSG A
131,790		Weighted Average
16,343		12.40% Pervious Area
115,447		87.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	65	0.0220	1.33		**Sheet Flow, A-B** Smooth surfaces n= 0.011 P2= 3.30"
0.2	35	0.0220	3.01		**Shallow Concentrated Flow, B-C** Paved Kv= 20.3 fps
5.0					**Direct Entry,**
6.0	100	Total			

Summary for Subcatchment 30.3S:

Runoff = 7.7 cfs @ 12.08 hrs, Volume= 27,644 cf, Depth= 4.92"
Routed to Pond 30.3P : SSF-2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
41,043	98	Paved parking, HSG A
18,012	98	Roofs, HSG A
8,360	39	>75% Grass cover, Good, HSG A
67,415		Weighted Average
8,360		12.40% Pervious Area
59,055		87.60% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	105	0.0204	1.42		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.30"
4.8					**Direct Entry,**
6.0	105	Total			

Summary for Subcatchment 40.0S:

Runoff = 0.0 cfs @ 12.37 hrs, Volume= 336 cf, Depth= 0.15"
Routed to Link POA-4 : POA-4

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-YR Rainfall=5.80"

Area (sf)	CN	Description
0	98	Paved parking, HSG A
7,647	39	>75% Grass cover, Good, HSG A
19,968	30	Woods, Good, HSG A
27,615		Weighted Average
27,615		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	30	0.5000	0.34		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.30"
0.2	45	0.5000	3.54		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
4.3					**Direct Entry,**
6.0	75	Total			

Summary for Pond 5P: StormTech - Detention Only

Inflow Area = 199,205 sf, 87.60% Impervious, Inflow Depth = 4.92" for 25-YR event
Inflow = 19.6 cfs @ 12.13 hrs, Volume= 81,688 cf
Outflow = 3.5 cfs @ 11.99 hrs, Volume= 81,688 cf, Atten= 82%, Lag= 0.0 min
Discarded = 3.5 cfs @ 11.99 hrs, Volume= 81,688 cf
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link POA-3 : POA-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Peak Elev= 313.02' @ 12.69 hrs Surf.Area= 15,181 sf Storage= 17,080 cf

Plug-Flow detention time= 23.5 min calculated for 81,677 cf (100% of inflow)
Center-of-Mass det. time= 23.5 min (1,019.4 - 995.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	311.28'	14,743 cf	**87.00'W x 174.50'L x 3.75'H Field A** 56,930 cf Overall - 20,071 cf Embedded = 36,859 cf x 40.0% Voids
#2A	312.03'	20,071 cf	**ADS_StormTech DC-780 b +Cap**x 432 Inside #1 Effective Size= 45.4"W x 30.0"H => 6.49 sf x 7.12'L = 46.2 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 432 Chambers in 18 Rows Cap Storage= 2.7 cf x 2 x 18 rows = 95.6 cf
		34,814 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	311.93'	**24.0" Round Culvert** L= 325.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 311.93' / 306.00' S= 0.0182 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Discarded	311.28'	**10.000 in/hr Infiltration over Surface area** Phase-In= 0.01'
#3	Device 1	314.03'	**6.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=3.5 cfs @ 11.99 hrs HW=311.32' (Free Discharge)
↑—**2=Infiltration** (Exfiltration Controls 3.5 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=311.28' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Controls 0.0 cfs)
↑—**3=Broad-Crested Rectangular Weir**(Controls 0.0 cfs)

Pond 5P: StormTech - Detention Only - Chamber Wizard Field A

Chamber Model = ADS_StormTechDC-780 b +Cap (ADS StormTech®DC-780 with cap storage)
Effective Size= 45.4"W x 30.0"H => 6.49 sf x 7.12'L = 46.2 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
Cap Storage= 2.7 cf x 2 x 18 rows = 95.6 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

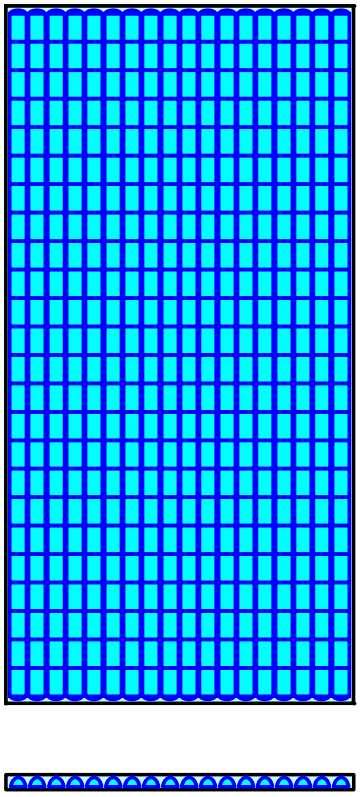
24 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 172.50' Row Length +12.0" End Stone x 2 = 174.50' Base Length
18 Rows x 51.0" Wide + 6.0" Spacing x 17 + 12.0" Side Stone x 2 = 87.00' Base Width
9.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.75' Field Height

432 Chambers x 46.2 cf + 2.7 cf Cap Volume x 2 x 18 Rows = 20,070.9 cf Chamber Storage

56,929.5 cf Field - 20,070.9 cf Chambers = 36,858.7 cf Stone x 40.0% Voids = 14,743.5 cf Stone Storage

Chamber Storage + Stone Storage = 34,814.3 cf = 0.799 af
Overall Storage Efficiency = 61.2%
Overall System Size = 174.50' x 87.00' x 3.75'

432 Chambers
2,108.5 cy Field
1,365.1 cy Stone



Summary for Pond 20.0P: Existing Wetlands

Inflow Area = 667,558 sf, 22.37% Impervious, Inflow Depth = 0.65" for 25-YR event
Inflow = 5.1 cfs @ 12.12 hrs, Volume= 36,109 cf
Outflow = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Link POA-2 : POA-2

Routing by Dyn-Stor-Ind method, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Peak Elev= 294.27' @ 65.89 hrs Surf.Area= 169,728 sf Storage= 36,109 cf

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	294.00'	593,193 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
294.00	100,545	0	0
295.00	359,460	230,003	230,003
296.00	366,921	363,191	593,193

Device	Routing	Invert	Outlet Devices
#1	Primary	295.50'	**15.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=294.00' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Summary for Pond 21.0P: USDF-1

Inflow Area = 50,218 sf, 56.01% Impervious, Inflow Depth = 3.29" for 25-YR event
Inflow = 3.7 cfs @ 12.08 hrs, Volume= 13,755 cf
Outflow = 0.1 cfs @ 15.81 hrs, Volume= 13,755 cf, Atten= 97%, Lag= 223.9 min
Primary = 0.1 cfs @ 15.81 hrs, Volume= 13,755 cf
Routed to Pond 20.0P : Existing Wetlands
Secondary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond 20.0P : Existing Wetlands

Routing by Dyn-Stor-Ind method, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Peak Elev= 315.08' @ 15.81 hrs Surf.Area= 5,241 sf Storage= 8,897 cf
Flood Elev= 317.50' Surf.Area= 6,968 sf Storage= 20,572 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 1,053.6 min (1,810.8 - 757.2)

Volume	Invert	Avail.Storage	Storage Description
#1	310.83'	20,572 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
310.83	3,000	0.0	0	0
312.99	3,000	0.0	0	0
313.00	3,000	100.0	30	30
314.00	4,348	100.0	3,674	3,704
315.00	5,168	100.0	4,758	8,462
316.00	6,042	100.0	5,605	14,067
317.00	6,968	100.0	6,505	20,572

Device	Routing	Invert	Outlet Devices
#1	Primary	310.73'	**12.0" Round Outlet Pipe** L= 82.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 310.73' / 310.30' S= 0.0052 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	310.83'	**1.2" Vert. UD Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 2	310.83'	**0.500 in/hr Infiltration over Surface area** Phase-In= 0.01'
#4	Device 1	314.50'	**1.0" W x 3.0" H Vert. WQV Orifice** C= 0.600 Limited to weir flow at low heads
#5	Device 1	316.00'	**1.0" W x 7.0" H Vert. Beehive Grate X 29.00** C= 0.600 Limited to weir flow at low heads
#6	Secondary	316.50'	**14.0' long x 9.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.46 2.55 2.70 2.69 2.68 2.68 2.67 2.64 2.64 2.64 2.65 2.64 2.65 2.65 2.66 2.67 2.69

Primary OutFlow Max=0.1 cfs @ 15.81 hrs HW=315.08' TW=294.17' (Dynamic Tailwater)
- **1=Outlet Pipe** (Passes 0.1 cfs of 5.8 cfs potential flow)
  - **2=UD Orifice** (Passes 0.1 cfs of 0.1 cfs potential flow)
    - **3=Infiltration** (Exfiltration Controls 0.1 cfs)
  - **4=WQV Orifice** (Orifice Controls 0.1 cfs @ 3.25 fps)
  - **5=Beehive Grate** (Controls 0.0 cfs)

Secondary OutFlow Max=0.0 cfs @ 0.00 hrs HW=310.83' TW=294.00' (Dynamic Tailwater)
- **6=Broad-Crested Rectangular Weir**(Controls 0.0 cfs)

Summary for Pond 22.0P: SSF-4

Inflow Area = 120,447 sf, 77.21% Impervious, Inflow Depth = 4.38" for 25-YR event
Inflow = 12.1 cfs @ 12.08 hrs, Volume= 43,994 cf
Outflow = 10.4 cfs @ 12.13 hrs, Volume= 43,995 cf, Atten= 14%, Lag= 2.9 min
Primary = 10.4 cfs @ 12.13 hrs, Volume= 43,995 cf
Routed to Pond 24P : StormTech - Detention Only

Routing by Dyn-Stor-Ind method, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Peak Elev= 317.33' @ 12.13 hrs Surf.Area= 14,558 sf Storage= 13,000 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 258.7 min (1,008.9 - 750.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	314.67'	6,520 cf	**72.75'W x 96.28'L x 3.75'H Field A** 26,267 cf Overall - 9,968 cf Embedded = 16,299 cf x 40.0% Voids
#2A	315.17'	9,968 cf	**ADS_StormTech SC-800 +Cap** x 195 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 195 Chambers in 15 Rows Cap Storage= 3.4 cf x 2 x 15 rows = 102.6 cf
#3	312.50'	0 cf	**Build up to UD (Prismatic)** Listed below (Recalc) 16,390 cf Overall x 0.0% Voids
		16,488 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
312.50	7,553	0	0
314.67	7,553	16,390	16,390

Device	Routing	Invert	Outlet Devices
#1	Primary	312.40'	**24.0" Round Culvert** L= 80.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 312.40' / 312.00' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	312.50'	**2.0" Vert. UD cap for bleeder** C= 0.600 Limited to weir flow at low heads
#3	Device 1	316.67'	**6.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 3	315.37'	**24.0" Round Overflow to OCS** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 315.37' / 315.31' S= 0.0100 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=10.4 cfs @ 12.13 hrs HW=317.33' TW=312.23' (Dynamic Tailwater)
└─**1=Culvert** (Passes 10.4 cfs of 29.1 cfs potential flow)
  ├─**2=UD cap for bleeder** (Orifice Controls 0.2 cfs @ 10.49 fps)
  └─**3=Broad-Crested Rectangular Weir** (Weir Controls 10.2 cfs @ 2.56 fps)
    └─**4=Overflow to OCS** (Passes 10.2 cfs of 11.8 cfs potential flow)

Pond 22.0P: SSF-4 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-800 +Cap (ADS StormTech®SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 15 rows = 102.6 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

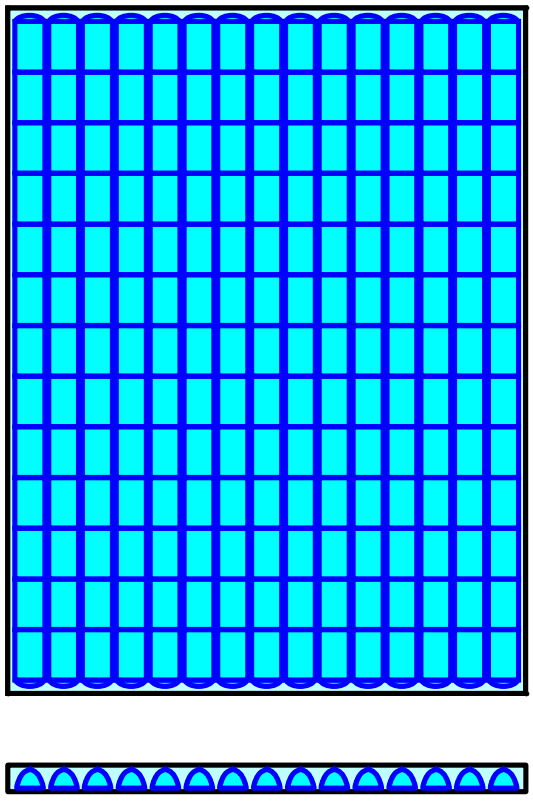
13 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 94.28' Row Length +12.0" End Stone x 2 = 96.28' Base Length
15 Rows x 51.0" Wide + 6.0" Spacing x 14 + 12.0" Side Stone x 2 = 72.75' Base Width
6.0" Stone Base + 33.0" Chamber Height + 6.0" Stone Cover = 3.75' Field Height

195 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 15 Rows = 9,968.1 cf Chamber Storage

26,267.3 cf Field - 9,968.1 cf Chambers = 16,299.2 cf Stone x 40.0% Voids = 6,519.7 cf Stone Storage

Chamber Storage + Stone Storage = 16,487.8 cf = 0.379 af
Overall Storage Efficiency = 62.8%
Overall System Size = 96.28' x 72.75' x 3.75'

195 Chambers
972.9 cy Field
603.7 cy Stone



Summary for Pond 24P: StormTech - Detention Only

Inflow Area = 120,447 sf, 77.21% Impervious, Inflow Depth = 4.38" for 25-YR event
Inflow = 10.4 cfs @ 12.13 hrs, Volume= 43,995 cf
Outflow = 1.4 cfs @ 11.99 hrs, Volume= 43,995 cf, Atten= 87%, Lag= 0.0 min
Discarded = 1.4 cfs @ 11.99 hrs, Volume= 43,995 cf
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Routed to Pond 20.0P : Existing Wetlands

Routing by Dyn-Stor-Ind method, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Peak Elev= 313.88' @ 12.90 hrs Surf.Area= 5,961 sf Storage= 10,438 cf

Plug-Flow detention time= 41.5 min calculated for 43,989 cf (100% of inflow)
Center-of-Mass det. time= 41.5 min (1,050.4 - 1,008.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	311.25'	5,858 cf	**72.75'W x 81.94'L x 3.75'H Field A** 22,353 cf Overall - 7,709 cf Embedded = 14,644 cf x 40.0% Voids
#2A	312.00'	7,709 cf	**ADS_StormTech DC-780 b +Cap**x 165 Inside #1 Effective Size= 45.4"W x 30.0"H => 6.49 sf x 7.12'L = 46.2 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 165 Chambers in 15 Rows Cap Storage= 2.7 cf x 2 x 15 rows = 79.6 cf
		13,567 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	311.90'	**24.0" Round Culvert** L= 26.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 311.90' / 311.77' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Discarded	311.25'	**10.000 in/hr Infiltration over Surface area** Phase-In= 0.01'
#3	Device 1	314.00'	**6.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Discarded OutFlow Max=1.4 cfs @ 11.99 hrs HW=311.29' (Free Discharge)
└**2=Infiltration** (Exfiltration Controls 1.4 cfs)

Primary OutFlow Max=0.0 cfs @ 0.00 hrs HW=311.25' TW=294.00' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.0 cfs)
└**3=Broad-Crested Rectangular Weir** (Controls 0.0 cfs)

Pond 24P: StormTech - Detention Only - Chamber Wizard Field A

Chamber Model = ADS_StormTechDC-780 b +Cap (ADS StormTech®DC-780 with cap storage)
Effective Size= 45.4"W x 30.0"H => 6.49 sf x 7.12'L = 46.2 cf
Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap
Cap Storage= 2.7 cf x 2 x 15 rows = 79.6 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

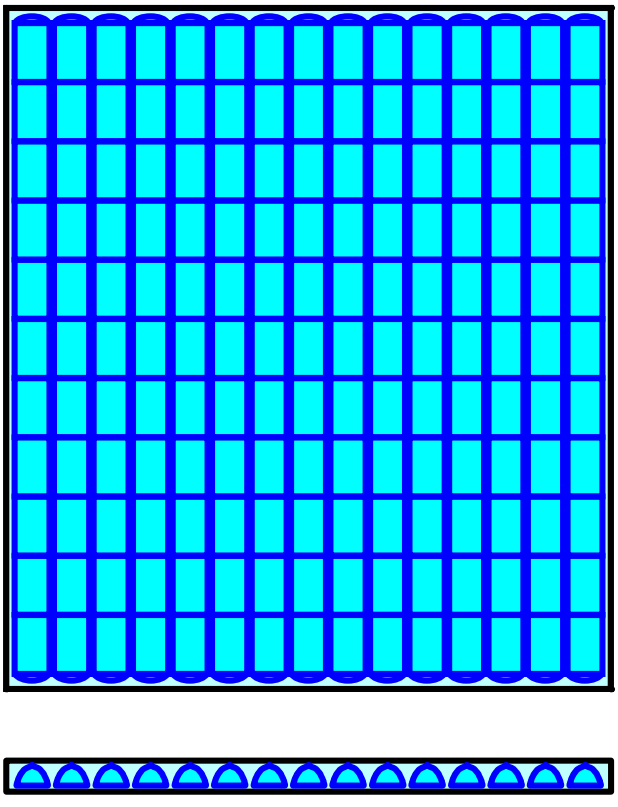
11 Chambers/Row x 7.12' Long +0.81' Cap Length x 2 = 79.94' Row Length +12.0" End Stone x 2 = 81.94' Base Length
15 Rows x 51.0" Wide + 6.0" Spacing x 14 + 12.0" Side Stone x 2 = 72.75' Base Width
9.0" Stone Base + 30.0" Chamber Height + 6.0" Stone Cover = 3.75' Field Height

165 Chambers x 46.2 cf + 2.7 cf Cap Volume x 2 x 15 Rows = 7,709.1 cf Chamber Storage

22,353.3 cf Field - 7,709.1 cf Chambers = 14,644.3 cf Stone x 40.0% Voids = 5,857.7 cf Stone Storage

Chamber Storage + Stone Storage = 13,566.8 cf = 0.311 af
Overall Storage Efficiency = 60.7%
Overall System Size = 81.94' x 72.75' x 3.75'

165 Chambers
827.9 cy Field
542.4 cy Stone



Summary for Pond 30.1P: SSF-3

Inflow Area = 52,105 sf, 81.85% Impervious, Inflow Depth = 4.62" for 25-YR event
Inflow = 5.6 cfs @ 12.08 hrs, Volume= 20,075 cf
Outflow = 0.3 cfs @ 14.14 hrs, Volume= 20,076 cf, Atten= 95%, Lag= 123.4 min
Primary = 0.3 cfs @ 14.14 hrs, Volume= 20,076 cf
Routed to Link POA-3 : POA-3

Routing by Dyn-Stor-Ind method, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Peak Elev= 311.03' @ 14.14 hrs Surf.Area= 8,922 sf Storage= 12,053 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 811.8 min (1,560.9 - 749.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	308.35'	6,022 cf	**49.00'W x 131.87'L x 3.75'H Field A** 24,231 cf Overall - 9,175 cf Embedded = 15,055 cf x 40.0% Voids
#2A	308.85'	9,175 cf	**ADS_StormTech SC-800 +Cap** x 180 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 180 Chambers in 10 Rows Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf
#3	306.18'	0 cf	**Build up to UD (Prismatic)** Listed below (Recalc) 5,340 cf Overall x 0.0% Voids
		15,197 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
306.18	2,461	0	0
308.35	2,461	5,340	5,340

Device	Routing	Invert	Outlet Devices
#1	Primary	306.08'	**24.0" Round Culvert** L= 112.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 306.08' / 301.50' S= 0.0409 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	306.18'	**1.4" Vert. UD cap for bleeder** C= 0.600 Limited to weir flow at low heads
#3	Device 5	309.05'	**24.0" Round Overflow to OCS** L= 6.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 309.05' / 308.93' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#4	Device 1	310.35'	**2.0" Vert. WQV Orifice** C= 0.600 Limited to weir flow at low heads
#5	Device 1	311.00'	**6.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.3 cfs @ 14.14 hrs HW=311.03' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.3 cfs of 23.7 cfs potential flow)
  - **2=UD cap for bleeder** (Orifice Controls 0.1 cfs @ 10.54 fps)
  - **4=WQV Orifice** (Orifice Controls 0.1 cfs @ 3.72 fps)
  - **5=Broad-Crested Rectangular Weir** (Weir Controls 0.1 cfs @ 0.50 fps)
    - **3=Overflow to OCS** (Passes 0.1 cfs of 2.7 cfs potential flow)

Pond 30.1P: SSF-3 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-800 +Cap (ADS StormTech®SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 10 rows = 68.4 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

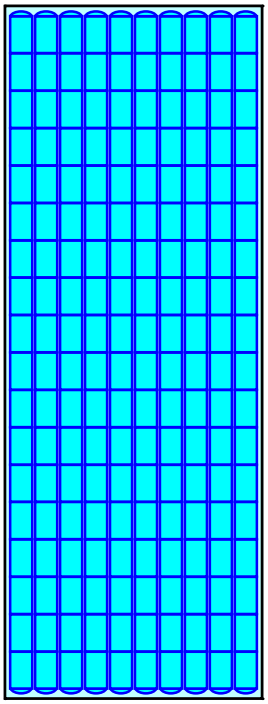
18 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 129.87' Row Length +12.0" End Stone x 2 = 131.87' Base Length
10 Rows x 51.0" Wide + 6.0" Spacing x 9 + 12.0" Side Stone x 2 = 49.00' Base Width
6.0" Stone Base + 33.0" Chamber Height + 6.0" Stone Cover = 3.75' Field Height

180 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 10 Rows = 9,175.0 cf Chamber Storage

24,230.5 cf Field - 9,175.0 cf Chambers = 15,055.5 cf Stone x 40.0% Voids = 6,022.2 cf Stone Storage

Chamber Storage + Stone Storage = 15,197.2 cf = 0.349 af
Overall Storage Efficiency = 62.7%
Overall System Size = 131.87' x 49.00' x 3.75'

180 Chambers
897.4 cy Field
557.6 cy Stone



Summary for Pond 30.2P: SSF-1

Inflow Area = 131,790 sf, 87.60% Impervious, Inflow Depth = 4.92" for 25-YR event
Inflow = 15.1 cfs @ 12.08 hrs, Volume= 54,041 cf
Outflow = 13.1 cfs @ 12.13 hrs, Volume= 54,043 cf, Atten= 13%, Lag= 2.7 min
Primary = 13.1 cfs @ 12.13 hrs, Volume= 54,043 cf
Routed to Pond 5P : StormTech - Detention Only

Routing by Dyn-Stor-Ind method, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Peak Elev= 318.27' @ 12.13 hrs Surf.Area= 15,177 sf Storage= 14,596 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 222.3 min (970.1 - 747.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	315.50'	6,826 cf	**82.25'W x 89.17'L x 3.75'H Field A** 27,502 cf Overall - 10,437 cf Embedded = 17,065 cf x 40.0% Voids
#2A	316.00'	10,437 cf	**ADS_StormTech SC-800 +Cap** x 204 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 204 Chambers in 17 Rows Cap Storage= 3.4 cf x 2 x 17 rows = 116.3 cf
#3B	315.50'	311 cf	**6.25'W x 46.47'L x 3.75'H Field B** 1,089 cf Overall - 310 cf Embedded = 779 cf x 40.0% Voids
#4B	316.00'	310 cf	**ADS_StormTech SC-800 +Cap** x 6 Inside #3 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap Cap Storage= 3.4 cf x 2 x 1 rows = 6.8 cf
#5	313.33'	0 cf	**Build up to UD (Prismatic)** Listed below (Recalc) 16,390 cf Overall x 0.0% Voids
		17,885 cf	Total Available Storage

Storage Group A created with Chamber Wizard
Storage Group B created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
313.33	7,553	0	0
315.50	7,553	16,390	16,390

Device	Routing	Invert	Outlet Devices
#1	Primary	313.23'	**24.0" Round Culvert** L= 46.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 313.23' / 312.05' S= 0.0257 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	313.33'	**2.2" Vert. UD cap for bleeder** C= 0.600 Limited to weir flow at low heads
#3	Device 1	317.50'	**6.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 3	316.20'	**24.0" Round Overflow to OCS**

L= 6.0' CPP, square edge headwall, Ke= 0.500
Inlet / Outlet Invert= 316.20' / 316.14' S= 0.0100 '/' Cc= 0.900
n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=13.1 cfs @ 12.13 hrs HW=318.27' TW=312.09' (Dynamic Tailwater)
- **1=Culvert** (Passes 13.1 cfs of 30.4 cfs potential flow)
  - **2=UD cap for bleeder** (Orifice Controls 0.3 cfs @ 10.61 fps)
  - **3=Broad-Crested Rectangular Weir** (Passes 12.8 cfs of 13.3 cfs potential flow)
    - **4=Overflow to OCS** (Barrel Controls 12.8 cfs @ 4.89 fps)

Pond 30.2P: SSF-1 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-800 +Cap (ADS StormTech®SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 17 rows = 116.3 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

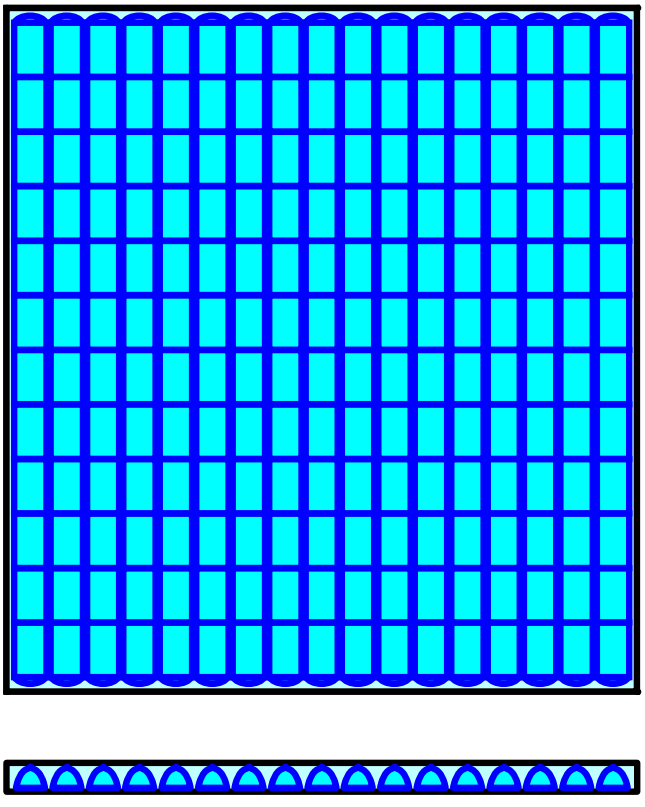
12 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 87.17' Row Length +12.0" End Stone x 2 = 89.17' Base Length
17 Rows x 51.0" Wide + 6.0" Spacing x 16 + 12.0" Side Stone x 2 = 82.25' Base Width
6.0" Stone Base + 33.0" Chamber Height + 6.0" Stone Cover = 3.75' Field Height

204 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 17 Rows = 10,437.1 cf Chamber Storage

27,502.3 cf Field - 10,437.1 cf Chambers = 17,065.2 cf Stone x 40.0% Voids = 6,826.1 cf Stone Storage

Chamber Storage + Stone Storage = 17,263.2 cf = 0.396 af
Overall Storage Efficiency = 62.8%
Overall System Size = 89.17' x 82.25' x 3.75'

204 Chambers
1,018.6 cy Field
632.0 cy Stone



Pond 30.2P: SSF-1 - Chamber Wizard Field B

Chamber Model = ADS_StormTechSC-800 +Cap (ADS StormTech®SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 1 rows = 6.8 cf

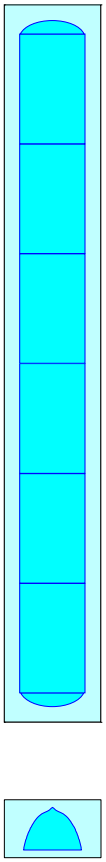
6 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 44.47' Row Length +12.0" End Stone x 2 = 46.47' Base Length
1 Rows x 51.0" Wide + 12.0" Side Stone x 2 = 6.25' Base Width
6.0" Stone Base + 33.0" Chamber Height + 6.0" Stone Cover = 3.75' Field Height

6 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 1 Rows = 310.4 cf Chamber Storage

1,089.1 cf Field - 310.4 cf Chambers = 778.7 cf Stone x 40.0% Voids = 311.5 cf Stone Storage

Chamber Storage + Stone Storage = 621.9 cf = 0.014 af
Overall Storage Efficiency = 57.1%
Overall System Size = 46.47' x 6.25' x 3.75'

6 Chambers
40.3 cy Field
28.8 cy Stone



Summary for Pond 30.3P: SSF-2

Inflow Area = 67,415 sf, 87.60% Impervious, Inflow Depth = 4.92" for 25-YR event
Inflow = 7.7 cfs @ 12.08 hrs, Volume= 27,644 cf
Outflow = 6.5 cfs @ 12.13 hrs, Volume= 27,645 cf, Atten= 15%, Lag= 3.0 min
Primary = 6.5 cfs @ 12.13 hrs, Volume= 27,645 cf
Routed to Pond 5P : StormTech - Detention Only

Routing by Dyn-Stor-Ind method, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs
Peak Elev= 317.26' @ 12.13 hrs Surf.Area= 8,744 sf Storage= 8,760 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 298.5 min (1,046.3 - 747.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	314.76'	4,865 cf	**40.50'W x 125.75'L x 3.75'H Field A** 19,098 cf Overall - 6,935 cf Embedded = 12,163 cf x 40.0% Voids
#2A	315.26'	6,935 cf	**ADS_StormTech SC-800 +Cap** x 136 Inside #1 Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap 136 Chambers in 8 Rows Cap Storage= 3.4 cf x 2 x 8 rows = 54.7 cf
#3	312.59'	0 cf	**Build up to UD (Prismatic)** Listed below (Recalc) 7,923 cf Overall x 0.0% Voids
		11,800 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
312.59	3,651	0	0
314.76	3,651	7,923	7,923

Device	Routing	Invert	Outlet Devices
#1	Primary	312.49'	**24.0" Round Culvert** L= 35.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 312.49' / 312.03' S= 0.0131 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#2	Device 1	312.59'	**1.6" Vert. UD cap for bleeder** C= 0.600 Limited to weir flow at low heads
#3	Device 1	316.76'	**6.0' long x 0.5' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 3	315.46'	**24.0" Round Overflow to OCS** L= 6.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 315.46' / 315.34' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf

Primary OutFlow Max=6.5 cfs @ 12.13 hrs HW=317.26' TW=312.11' (Dynamic Tailwater)
└─**1=Culvert** (Passes 6.5 cfs of 29.4 cfs potential flow)
  ├─**2=UD cap for bleeder** (Orifice Controls 0.1 cfs @ 10.33 fps)
  └─**3=Broad-Crested Rectangular Weir** (Weir Controls 6.4 cfs @ 2.12 fps)
    └─**4=Overflow to OCS** (Passes 6.4 cfs of 10.1 cfs potential flow)

Pond 30.3P: SSF-2 - Chamber Wizard Field A

Chamber Model = ADS_StormTechSC-800 +Cap (ADS StormTech®SC-800 with cap volume)
Effective Size= 45.0"W x 33.0"H => 7.11 sf x 7.12'L = 50.6 cf
Overall Size= 51.0"W x 33.0"H x 7.55'L with 0.43' Overlap
Cap Storage= 3.4 cf x 2 x 8 rows = 54.7 cf

51.0" Wide + 6.0" Spacing = 57.0" C-C Row Spacing

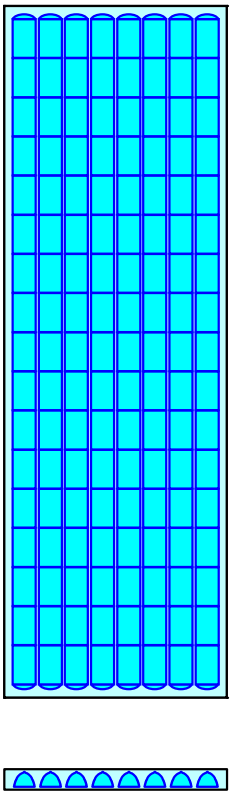
17 Chambers/Row x 7.12' Long +0.88' Cap Length x 2 = 122.75' Row Length +18.0" End Stone x 2 = 125.75' Base Length
8 Rows x 51.0" Wide + 6.0" Spacing x 7 + 18.0" Side Stone x 2 = 40.50' Base Width
6.0" Stone Base + 33.0" Chamber Height + 6.0" Stone Cover = 3.75' Field Height

136 Chambers x 50.6 cf + 3.4 cf Cap Volume x 2 x 8 Rows = 6,935.3 cf Chamber Storage

19,098.3 cf Field - 6,935.3 cf Chambers = 12,163.0 cf Stone x 40.0% Voids = 4,865.2 cf Stone Storage

Chamber Storage + Stone Storage = 11,800.5 cf = 0.271 af
Overall Storage Efficiency = 61.8%
Overall System Size = 125.75' x 40.50' x 3.75'

136 Chambers
707.3 cy Field
450.5 cy Stone



Summary for Link POA-1: POA-1

Inflow Area = 207,220 sf, 5.79% Impervious, Inflow Depth = 0.52" for 25-YR event
Inflow = 1.3 cfs @ 12.30 hrs, Volume= 8,910 cf
Primary = 1.3 cfs @ 12.30 hrs, Volume= 8,910 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs

Summary for Link POA-2: POA-2

Inflow Area = 667,558 sf, 22.37% Impervious, Inflow Depth = 0.00" for 25-YR event
Inflow = 0.0 cfs @ 0.00 hrs, Volume= 0 cf
Primary = 0.0 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs

Summary for Link POA-3: POA-3

Inflow Area = 768,141 sf, 28.27% Impervious, Inflow Depth = 0.38" for 25-YR event
Inflow = 0.5 cfs @ 12.34 hrs, Volume= 24,545 cf
Primary = 0.5 cfs @ 12.34 hrs, Volume= 24,545 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs

Summary for Link POA-4: POA-4

Inflow Area = 27,615 sf, 0.00% Impervious, Inflow Depth = 0.15" for 25-YR event
Inflow = 0.0 cfs @ 12.37 hrs, Volume= 336 cf
Primary = 0.0 cfs @ 12.37 hrs, Volume= 336 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-75.00 hrs, dt= 0.01 hrs

Appendix 3

Inspection, Maintenance and Housekeeping Plan

INSPECTION, MAINTENANCE, AND HOUSEKEEPING PLAN

For:
Franklin Drive Subdivision
Multi-Family Development &
Commercial Development
Windham, ME

By:
Sebago Technics, Inc.
75 John Roberts Road, Suite 4A
South Portland, Maine

Introduction

The following plan outlines the anticipated inspection and maintenance procedures for the erosion and sedimentation control measures as well as stormwater management facilities for the project. This plan also outlines several housekeeping requirements that shall be followed during and after construction. These procedures shall be followed in order to ensure the intended function of the designed measures and to prevent unreasonably adverse impacts to the surrounding environment.

The procedures outlined in this Inspection, Maintenance and Housekeeping Plan are provided as an overview of the anticipated practices to be used on this site. In some instances, additional measures may be required due to unexpected conditions. For additional detail on any of the erosion and sedimentation control measures or stormwater management devices to be utilized on this project, refer to the most recently revised edition of the "Maine Erosion and Sedimentation Control BMP" manual and/or the "Stormwater Management for Maine: Best Management Practices" manual as published by the Maine Department of Environmental Protection (MDEP).

During Construction

1. **Inspection:** During the construction process, it is the Contractor's responsibility to comply with the inspection and maintenance procedures outlined in this section. These responsibilities include inspecting disturbed and impervious areas, erosion control measures, materials storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. These areas shall be inspected at least once a week as well as before and after a storm event (0.5" of rainfall), and prior to completing permanent stabilization measures. A person with knowledge of erosion and stormwater control, including the standards and conditions in any applicable permits, shall conduct the inspections.

2. **Maintenance:** All measures shall be maintained in an effective operating condition until areas are permanently stabilized. If Best Management Practices (BMPs) need to be maintained or modified, additional BMPs are necessary, or other corrective action is needed, implementation must be completed within 7 calendar days and prior to any storm event (0.5" of rainfall).

3. **Documentation:** A log summarizing the inspections and any corrective action taken must be maintained on-site. The log must include the name(s) and qualifications of the person making the inspections, the date(s) of the inspections, and major observations about the operation and

maintenance of erosion and sedimentation controls, material storage areas, and vehicle access points to the site. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and locations where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken. The log must be made accessible to the appropriate regulatory agency upon request. The permittee shall retain a copy of the log for a period of at least three years from the completion of permanent stabilization.

4. **Specific Inspection and Maintenance Tasks:** The following is a list of erosion control and stormwater management measures and the specific inspection and maintenance tasks to be performed during construction.

A. Sediment Barriers:

- Hay bale barriers, silt fences, and filter berms shall be inspected immediately after each rainfall and at least daily during prolonged rainfall.
- If the fabric on a silt fence or filter barrier should decompose or become ineffective prior to the end of the expected usable life, and the barrier is still necessary, it shall be replaced.
- Sediment deposits should be removed after each storm event (0.5" of rainfall). They must be removed before deposits reach approximately one-half the height of the barrier.
- Filter berms shall be reshaped as needed.
- Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required should be dressed to conform to the existing grade, prepared, and seeded.

B. Riprap Materials:

- Once a riprap installation has been completed, it should require very little maintenance. It shall, however, be inspected periodically to determine if high flows have caused scour beneath the riprap or dislodged any of the stone.

C. Erosion Control Blankets:

- Inspect these reinforced areas semi-annually and after significant rainfall events for slumping, sliding, seepage, and scour. Pay close attention to unreinforced areas adjacent to the erosion control blankets, which may experience accelerated erosion.
- Review all applicable inspection and maintenance procedures recommended by the specific blanket manufacturer. These tasks shall be included in addition to the requirements of this plan.

D. Stabilized Construction Entrances/Exits:

- The exit shall be maintained in a condition that will prevent tracking of sediment onto public rights-of-way.
- When the control pad becomes ineffective, the stone shall be removed along with the collected soil material. The entrance should then be reconstructed.

- Areas that have received mud-tracking or sediment deposits shall be swept or washed. Washing shall be done on an area stabilized with aggregate, which drains into an approved sediment-trapping device (not into storm drains, ditches, or waterways).

E. Temporary Seed and Mulch:

- Mulched areas should be inspected after rain events to check for rill erosion.
- If less than 90% of the soil surface is covered by mulch, additional mulch shall be applied in bare areas.
- In applications where seeding and mulch have been applied in conjunction with erosion control blankets, the blankets must be inspected after rain events for dislocation or undercutting.
- Mulch shall continue to be reapplied until 95% of the soil surface has established temporary vegetative cover.

F. Stabilized Temporary Drainage Swales:

- Sediment accumulation in the swale shall be removed once the cross-section of the swale is reduced by 25%.
- The swales shall be inspected after rainfall events. Any evidence of sloughing of the side slopes or channel erosion shall be repaired, and corrective action should be taken to prevent the reoccurrence of the problem.
- In addition to the stabilized lining of the channel (i.e., erosion control blankets), stone check dams may be needed to further reduce channel velocity.

5. **Housekeeping:** The following general performance standards apply to the proposed project.

A. Spill prevention: Controls must be used to prevent pollutants from being discharged from materials on-site, including storage practices to minimize exposure of the materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation.

B. Groundwater protection: During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that, by design or as a result of soils, topography, and other relevant factors, accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials.

C. Fugitive sediment and dust: Actions must be taken to ensure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control.

D. Debris and other materials: Litter, construction debris, and chemicals exposed to stormwater must be prevented from becoming a pollutant source.

E. Trench or foundation dewatering: Trench dewatering is the removal of water from

trenches, foundations, cofferdams, ponds, and other areas within the construction area that retain water after excavation. In most cases, the collected water is heavily silted and hinders correct and safe construction practices. The collected water must be removed from the ponded area, either through gravity or pumping, and must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved.

Post-Construction

1. **Inspection:** After construction, it is the responsibility of the owner or assigned heirs to comply with the inspection and maintenance procedures outlined in this section. All measures must be maintained in an effective operating condition. The owner shall inspect and maintain the BMPs, including but not limited to any parking areas, catch basins, drainage swales, detention basins and ponds, pipes and related structures, in accordance with all municipal and state inspection, cleaning, and maintenance requirements of the approved post-construction stormwater management plan.

2. **Specific Inspection and Maintenance Tasks:** The following is a list of permanent erosion control and stormwater management measures and the inspection and maintenance tasks to be performed after construction. If the BMP requires maintenance, repair or replacement to function as intended by the approved post-construction stormwater management plan, the owner or operator of the BMP shall take corrective action(s) to address the deficiency or deficiencies as soon as possible after the deficiency is discovered and shall provide a record of the deficiency and corrective action(s) to the local municipality in the annual report.

   A. Vegetated Areas:

   - Inspect vegetated areas, particularly slopes and embankments, early in the growing season or after heavy rains (>0.5”) to identify active or potential erosion problems.
   - Replant bare areas or areas with sparse growth. Where rill erosion is evident, armor the area with an appropriate lining or divert the erosive flows to on-site areas able to withstand the concentrated flows.

   B. Ditches, Swales, and Other Open Channels:

   - Inspect ditches, swales, level spreaders, and other open stormwater channels in the spring, in the late fall, and after heavy rains to remove any obstructions to flow. Remove accumulated sediments and debris, remove woody vegetative growth that could obstruct flow, and repair any erosion of the ditch lining.
   - Vegetated ditches must be mowed at least annually or otherwise maintained to control the growth of woody vegetation and maintain flow capacity.
   - Any woody vegetation growing through riprap linings must also be removed. Repair any slumping side slopes as soon as practicable.
   - If the ditch has a riprap lining, replace riprap in areas where any underlying filter fabric or underdrain gravel is showing through the stone or where stones have dislodged.

C. Culverts:

- Inspect culverts in the spring, in the late fall, and after heavy rains (>0.5") to remove any obstructions to flow.
- Remove accumulated sediments and debris at the inlet, at the outlet, and within the conduit.
- Inspect and repair any erosion damage at the culvert's inlet and outlet.

D. Removal of Winter Sand:

- Clear accumulations of winter sand in parking lots and along roadways at least once a year, preferably in the spring.
- Accumulations on pavement may be removed by pavement sweeping.
- Accumulations of sand along road shoulders may be removed by grading excess sand to the pavement edge and removing it manually or by a front-end loader or other acceptable method.

E. Underdrained Soil Filters:

- The basin should be inspected semi-annually and following major storm events. Debris and sediment buildup should be removed from the forebay and basin as needed. Any bare area or erosion rills should be repaired with new filter media, seeded, and mulched.
- A legal entity should be established with responsibility for inspecting and maintaining any underdrained filter. The legal agreement establishing the entity should list specific maintenance responsibilities (including timetables) and provide for the funding to cover long-term inspection and maintenance.
- The filter should drain within 24 to 48 hours following a one-inch storm or greater. If the system drains too fast, an orifice may need to be added on the underdrain outlet or may need to be modified if already present.
- Sediment and plant debris should be removed from the pretreatment structure at least annually.
- If mowing is desired, only hand-held string trimmers or push-mowers are allowed on the filter (no tractor), and the grass bed should be mowed no more than 2 times per growing season to maintain grass heights of no less than 6 inches.
- Fertilization of the underdrained filter area should be avoided unless necessary to establish vegetation.
- Harvesting and pruning of excessive growth should be done occasionally. Weeding to control unwanted or invasive plants may also be necessary.
- Maintaining a healthy cover of grass will minimize clogging with fine sediments. If ponding exceeds 48 hours, the top of the filter bed should be rototilled to reestablish the soil's filtration capacity.
- The top several inches of the filter can be replaced with fresh material if water is ponding for more than 72 hours, or the basin can be rototilled, seeded, and mulched. Once the filter is mature, adding new material (a 1-inch to 2-inch cover of mature compost) can compensate for subsidence.
- Inspect the underdrain outlet orifice within the outlet control structure for any sediment that may clog the orifice. Remove any sediment to prevent clogging.

F. Subsurface Sand Filter Chamber System:

- Inspect the site monthly for the first few months after construction. Then, inspections can occur on an annual basis, preferably after rain events when clogging will be obvious.
- Make any repairs necessary to ensure the measure is operating properly.
- Regular maintenance is necessary to remove surface sediment, trash, debris, and leaf litter.
- Outlets and chambers need to be cleaned/repaired when drawdown times in the filter exceeds 36 hours.
- In certain cases, layers of sand may need to be replaced every 3 to 5 years.
- Inspect the underdrain outlet orifice within the outlet control structure for any sediment that may clog the orifice. Remove any sediment to prevent clogging.

3. Documentation:

A. The owner or operator of a BMP or a qualified post-construction stormwater inspector hired by that person, shall, as required by the local municipality, provide a completed and signed certification on a form provided by the local municipality, certifying that the person has inspected the BMP(s) and that they are adequately maintained and functioning as intended by the approved post-construction stormwater management plan, or that they required maintenance or repair, including the record of the deficiency and corrective action(s) taken.

B. A log summarizing the inspections and any corrective action taken must be maintained. The log must include the name(s) and qualifications of the person making the inspections, the date(s) of the inspections, and major observations about the operation and maintenance of controls. Major observations must include BMPs that need maintenance, BMPs that failed to operate as designed or proved inadequate for a particular location, and locations where additional BMPs are needed. For each BMP requiring maintenance, BMP needing replacement, and location needing additional BMPs, note in the log the corrective action taken and when it was taken. The log must be made accessible to the appropriate regulatory agency upon request. A sample "Stormwater Inspection and Maintenance Form" has been included as Attachment 1 of this Inspection, Maintenance, and Housekeeping Plan.

4. Duration of Maintenance: Perform maintenance as described and required for any associated permits unless and until the system is formally accepted by a municipality or quasi-municipal district, or is placed under the jurisdiction of a legally created association that will be responsible for the maintenance of the system. If a municipality or quasi-municipal district chooses to accept a stormwater management system, or a component of a stormwater system, it must provide a letter to the MDEP stating that it assumes responsibility for the system. The letter must specify the components of the system for which the municipality or district will assume responsibility, and that the municipality or district agrees to maintain those components of the system in compliance with MDEP standards. Upon such assumption of responsibility and approval by the MDEP, the municipality, quasi-municipal district, or association becomes a co-permittee for this purpose only and must comply with all terms and conditions of the permit.

ATTACHMENT 1 – STORMWATER INSPECTION AND MAINTENANCE LOG

Franklin Drive Subdivision
Multi-Family Development &
Commercial Development
20 Franklin Drive
Windham, Maine

This log is intended to accompany the Inspection, Maintenance, and Housekeeping Plan for the multi-family development located along Franklin Drive in Windham, Maine. The following items shall be checked, cleaned, and maintained on a regular basis as specified in the Maintenance Plan and as described in the sections below. This log shall be kept on file for a minimum of five (5) years and shall be available for review by the Town of Windham and the Maine DEP. Qualified personnel familiar with the drainage systems and soils shall perform all inspections. A copy of the construction and post-construction maintenance logs is provided.

INSPECTION MAINTENANCE AND HOUSEKEEPING FORM			
General Information			
Project Name:		**Inspection Date:**	
Project Location:		**Current Weather:**	
		Date / Amount Last Precip:	
BMP Owner:		**Company conducting inspection:**	
Owner Mailing Address:		**Company Mailing Address**	
Owner Phone #:		**Company Phone #:**	
Owner Email:		**Inspector Name:**	
		Inspector Email:	
Site Element	**Suggested Maintenance (recm'd frequency)**	**Observations**	**Inspection Notes/Recommended Action**
Vegetated Areas	Inspect Slopes/Embankments for erosion (annually)		
	Replant bare areas or areas of sparse growth (annually)		
Ditches/Swales	Remove obstructions/debris/sediment (monthly)		
	Inspect for erosion/repair as needed (annually)		
	Remove woody vegetation (annually)		
	Mow vegetated ditches (annually)		
Catch Basins	Remove sediment/debris from sump (annually)		
	Remove accumulated debris from inlet grate		
Culverts	Remove sediment/debris from inlet/outlet aprons (annually)		
	Inspect inlet/outlet aprons for erosion, repair as needed (annually)		
	Inspect, repair as needed, riprap aprons for dislodged/sparse coverage (annually)		
Pipe Outlets	Remove sediment/debris from outlet aprons (annually)		
	Inspect outlet aprons for erosion, repair as needed (annually)		
	Inspect, repair as needed, riprap aprons for dislodged/sparse coverage (annually)		
Additional Notes/Observations:			

Underdrain Soil Filter

INSPECTION MAINTENANCE AND HOUSEKEEPING FORM			
General Information			
Project Name:		**Inspection Date:**	
Project Location:		**Current Weather:**	
		Date / Amount Last Precip:	
BMP Owner:		**Company conducting inspection:**	
Owner Mailing Address:		**Company Mailing Address**	
Owner Phone #:		**Company Phone #:**	
Owner Email:		**Inspector Name:**	
		Inspector Email:	

BMP Element	Suggested Maintenance (recm'd frequency)	Observations	Inspection Notes/Recommended Action
Forebay/Pretreatment	Sediment/Debris Removal (Annually)		
	Inspect for bare areas or rill erosion (Annually)		
Outlet Control Structure	Sediment Depth (Annually)		
	Floatables/Debris (Annually)		
	Inspect the underdrain outlet orifice within the outlet control structure (Annually)		
Discharge Pipe	Ground Stabilized (>1" rain, Annually)		
Emergency Spillway	Review for signs of erosion (Twice Annually)		
	Review for signs of discharge (>1" rain, twice annually)		
Embankments	Review for signs of erosion (Twice Annually)		
Filter Bed	Trim overgrown vegetation with string trimmer (annually)		
	Review basin for evidence of vehicular traffic or storage of snow within footprint (annually)		
	Confirm pond drains in 24-48 hours for water quality volume (annually)		

Additional Notes/Observations:

Subsurface Sand Filter

INSPECTION MAINTENANCE AND HOUSEKEEPING FORM			
General Information			
Project Name:		**Inspection Date:**	
Project Location:		**Current Weather:**	
		Date / Amount Last Precip:	
BMP Owner:		**Company conducting inspection:**	
Owner Mailing Address:		**Company Mailing Address**	
Owner Phone #:		**Company Phone #:**	
Owner Email:		**Inspector Name:**	
		Inspector Email:	

BMP Element	Suggested Maintenance	Observations	Inspection Notes/Recommended Action
Pretreatment			
	Sediment Depth/Removal (Annually)		
Outlet Control Structure			
	Sediment Depth (Annually)		
	Floatables/Debris (Annually)		
	Inspect the underdrain outlet orifice within the outlet control structure (Annually)		
Discharge Pipe			
	Ground Stabilized (>1" rain, Annually)		
Subsurface Chambers			
	Sediment Depth/Removal (Annually)		

Additional Notes/Observations:

Appendix 4

Subsurface Investigations

Custom Soil Resource Report
Soil Map

Map Scale: 1:4,150 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Cumberland County and Part of Oxford County, Maine
Survey Area Data: Version 20, Sep 5, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 22, 2021—Oct 7, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
DeB	Deerfield loamy fine sand, 3 to 8 percent slopes	1.5	4.0%
HgB	Hermon sandy loam, 3 to 8 percent slopes	6.1	15.8%
HhC	Hermon sandy loam, 8 to 15 percent slopes, very stony	2.1	5.4%
HlB	Hinckley loamy sand, 3 to 8 percent slopes	12.0	31.2%
Sp	Sebago mucky peat	8.6	22.2%
Wa	Walpole fine sandy loam	8.3	21.4%
Totals for Area of Interest		**38.6**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it

was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Cumberland County and Part of Oxford County, Maine

DeB—Deerfield loamy fine sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2xfg9
Elevation: 0 to 1,190 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Deerfield and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Deerfield

Setting

Landform: Outwash deltas, outwash terraces, outwash plains, kame terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Parent material: Sandy outwash derived from granite, gneiss, and/or quartzite

Typical profile

Ap - 0 to 9 inches: loamy fine sand
Bw - 9 to 25 inches: loamy fine sand
BC - 25 to 33 inches: fine sand
Cg - 33 to 60 inches: sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: About 15 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Sodium adsorption ratio, maximum: 11.0
Available water supply, 0 to 60 inches: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: A
Ecological site: F144AY027MA - Moist Sandy Outwash
Hydric soil rating: No

HgB—Hermon sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2w9r8
Elevation: 0 to 950 feet
Mean annual precipitation: 31 to 65 inches
Mean annual air temperature: 36 to 52 degrees F
Frost-free period: 90 to 160 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hermon and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hermon

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountainbase, interfluve, base slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy and gravelly supraglacial meltout till derived from granite and gneiss

Typical profile

Ap - 0 to 9 inches: sandy loam
Bs1 - 9 to 16 inches: very gravelly sandy loam
Bs2 - 16 to 32 inches: extremely gravelly loamy sand
C - 32 to 65 inches: very gravelly coarse sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (1.42 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: A
Ecological site: F144BY601ME - Dry Sand
Hydric soil rating: No

HhC—Hermon sandy loam, 8 to 15 percent slopes, very stony

Map Unit Setting

National map unit symbol: 2w9rd
Elevation: 0 to 1,080 feet
Mean annual precipitation: 31 to 65 inches
Mean annual air temperature: 36 to 52 degrees F
Frost-free period: 90 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Hermon, very stony, and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hermon, Very Stony

Setting

Landform: Mountains, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Mountainbase, mountainflank, side slope, nose slope, interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy and gravelly supraglacial meltout till derived from granite and gneiss

Typical profile

Oa - 0 to 2 inches: highly decomposed plant material
E - 2 to 3 inches: sandy loam
Bhs - 3 to 9 inches: sandy loam
Bs1 - 9 to 16 inches: very gravelly sandy loam
Bs2 - 16 to 32 inches: extremely gravelly loamy sand
C - 32 to 65 inches: very gravelly coarse sand

Properties and qualities

Slope: 8 to 15 percent
Surface area covered with cobbles, stones or boulders: 1.1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (1.42 to 14.03 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A

Ecological site: F144BY601ME - Dry Sand
Hydric soil rating: No

HlB—Hinckley loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2svm8
Elevation: 0 to 1,430 feet
Mean annual precipitation: 36 to 53 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hinckley and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hinckley

Setting

Landform: Outwash deltas, outwash terraces, kames, kame terraces, moraines, eskers, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Nose slope, side slope, base slope, crest, riser, tread
Down-slope shape: Concave, convex, linear
Across-slope shape: Convex, linear, concave
Parent material: Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 8 inches: loamy sand
Bw1 - 8 to 11 inches: gravelly loamy sand
Bw2 - 11 to 16 inches: gravelly loamy sand
BC - 16 to 19 inches: very gravelly loamy sand
C - 19 to 65 inches: very gravelly sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Sp—Sebago mucky peat

Map Unit Setting

National map unit symbol: blk0
Elevation: 10 to 2,100 feet
Mean annual precipitation: 34 to 48 inches
Mean annual air temperature: 37 to 46 degrees F
Frost-free period: 80 to 160 days
Farmland classification: Not prime farmland

Map Unit Composition

Sebago and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sebago

Setting

Landform: Bogs
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Organic material

Typical profile

Oe - 0 to 36 inches: mucky peat
Oi - 36 to 65 inches: mucky peat

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (1.42 to 6.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 18.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: A/D
Ecological site: F144BY230ME - Acidic Peat Wetland Complex
Hydric soil rating: Yes

Wa—Walpole fine sandy loam

Map Unit Setting

National map unit symbol: blk7
Elevation: 0 to 540 feet
Mean annual precipitation: 48 to 49 inches
Mean annual air temperature: 45 to 46 degrees F
Frost-free period: 145 to 165 days
Farmland classification: Not prime farmland

Map Unit Composition

Walpole and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Walpole

Setting

Landform: Outwash plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy glaciofluvial deposits

Typical profile

H1 - 0 to 8 inches: fine sandy loam
H2 - 8 to 20 inches: fine sandy loam
H3 - 20 to 65 inches: gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A/D
Ecological site: F144BY303ME - Acidic Swamp
Hydric soil rating: Yes

FORM F 230411

SOIL PROFILE/CLASSIFICATION INFORMATION

Detailed Description of Subsurface Conditions at Project Sites

Project Name:	Applicant Name:	Project Location (municipality):
FRANKLIN DRIVE SUBDIVISION	NEWGEN ESTATES, LLC	WINDHAM

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: TP-1 ■ Test Pit ☐ Boring

1-2 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (Inches)

Texture	Consistence	Color	Redox
		10YR 4/6	
SANDY			
LOAM		DARK YELLOWISH	
		BROWN	
	FRIABLE		
			NONE
			OBSERVED
		2.5Y 5/3	
LOAMY			
SAND		LIGHT OLIVE	
		BROWN	
GRAVELLY	LOOSE	2.5Y 5/2	
COARSE SAND		GRAYISH BROWN	
LIMIT OF EXCAVATION = 90"			

hydric / non-hydric	Slope %	Limiting factor	ground water / restrictive layer / bedrock
non-hydric	0-3	>90"	

L.S.S. Soil Series / phase name: COLTON | Drainage Class: ED | Hydrologic Group: A

L.S.E. Soil Classification: Profile | Drainage Condition

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: TP-2 ■ Test Pit ☐ Boring

0-1 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (Inches)

Texture	Consistence	Color	Redox
		5Y 4/2	
FINE SANDY		OLIVE GRAY	NONE
LOAM FILL	FRIABLE		OBSERVED
		2.5Y 3/2	
		VERY DARK	
		GRAYISH BROWN	
	FRIABLE	2.5Y 5/2	
GRAVELLY			NONE
COARSE SAND		GRAYISH BROWN	OBSERVED
	LOOSE		
LIMIT OF EXCAVATION = 108"			

hydric / non-hydric	Slope %	Limiting factor	ground water / restrictive layer / bedrock
non-hydric	0-3	>108"	

L.S.S. Soil Series / phase name: COLTON | Drainage Class: ED | Hydrologic Group: A

L.S.E. Soil Classification: Profile | Drainage Condition

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: ☐ Test Pit ☐ Boring

" Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (Inches)

Texture	Consistence	Color	Redox

hydric / non-hydric	Slope %	Limiting factor	ground water / restrictive layer / bedrock

L.S.S. Soil Series / phase name: | Drainage Class | Hydrologic Group

L.S.E. Soil Classification: Profile | Drainage Condition

SOIL DESCRIPTION AND CLASSIFICATION

Exploration Symbol: ☐ Test Pit ☐ Boring

" Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (Inches)

Texture	Consistence	Color	Redox

hydric / non-hydric	Slope %	Limiting factor	ground water / restrictive layer / bedrock

L.S.S. Soil Series / phase name: | Drainage Class | Hydrologic Group

L.S.E. Soil Classification: Profile | Drainage Condition

Professional Endorsements *(as applicable)*

L.S.S.

signature: 

Date: 4/28/25

name printed/typed: Gary M. Fullerton

Lic.#: 462

L.S.E.

signature:

Date:

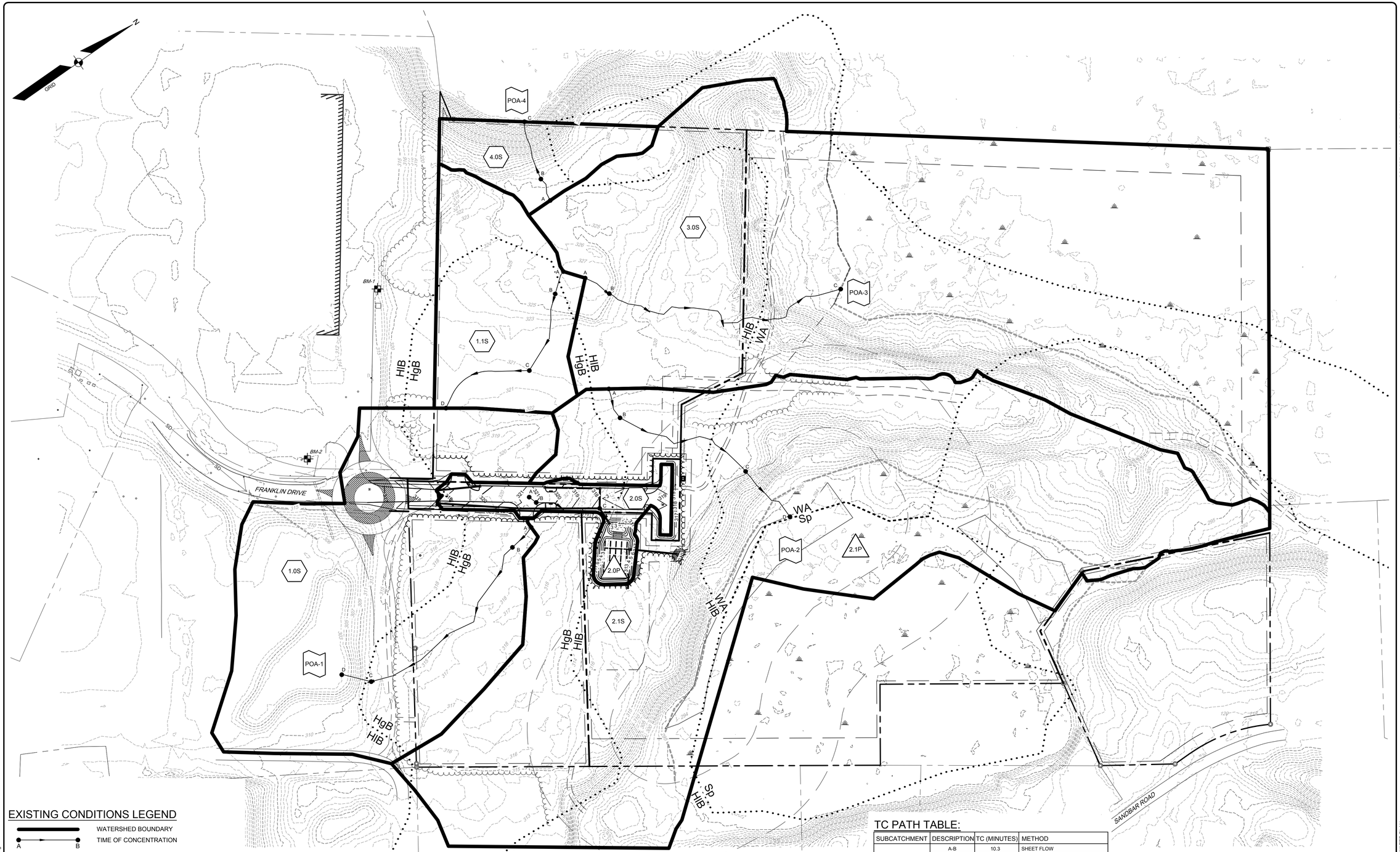
name printed/typed:

Lic.#:

affix professional seal

Appendix 5

Stormwater Management Plans



EXISTING CONDITIONS LEGEND

- WATERSHED BOUNDARY
- TIME OF CONCENTRATION (A — B)
- REACH
- 10.0S — SUBCATCHMENT LABEL
- 10R — REACH
- POA-1 — POINT OF ANALYSIS
- 10P — STORMWATER TREATMENT/DETENTION POND
- HSG # / HSG # — SOILS BOUNDARY

SOIL LEGEND

SYMBOL	SOIL SERIES	PHASE	SLOPE	HSG	DRAINAGE CLASS
Hgb	HERMON	SANDY LOAM	3–8%	A	SOMEWHAT EXCESSIVELY DRAINED
HIB	HINKLEY	LOAMY SAND	3–8%	A	EXCESSIVELY DRAINED
Sp	SEBAGO	MUCKY PEAT	0–1%	A/D	VERY POORLY DRAINED
Wa	WALPOLE	FINE SANDY LOAM	0–3%	A/D	POORLY DRAINED

TC PATH TABLE:

SUBCATCHMENT	DESCRIPTION	TC (MINUTES)	METHOD
1.0S	A-B	10.3	SHEET FLOW
	B-C	12.8	SHALLOW CONCENTRATED FLOW
	C-D	0.3	SHALLOW CONCENTRATED FLOW
1.1S	A-B	9.6	SHEET FLOW
	B-C	2.8	SHALLOW CONCENTRATED FLOW
	C-D	6.2	SHALLOW CONCENTRATED FLOW
2.0S	A-B	0.3	SHEET FLOW
	B-C	0.6	SHALLOW CONCENTRATED FLOW
	-	5.1	DIRECT ENTRY
2.1S	A-B	9.8	SHEET FLOW
	B-C	6.8	SHALLOW CONCENTRATED FLOW
	C-D	1.0	SHALLOW CONCENTRATED FLOW
3.0S	A-B	11.0	SHEET FLOW
	B-C	6.0	SHALLOW CONCENTRATED FLOW
4.0S	A-B	9.6	SHEET FLOW
	B-C	0.7	SHALLOW CONCENTRATED FLOW

GRAPHIC SCALE
0 20 40 80 160
(IN FEET)
1 INCH = 80 FT.

PROGRESS PRINT

ROBERT A. MCSORLEY PE 8588

STATE OF MAINE · ROBERT A. MCSORLEY · 8588 · REGISTERED PROFESSIONAL ENGINEER

REV	BY	DATE	
A	RAM	06/23/2025	LOCAL SUBMISSION TO THE TOWN OF WINDHAM
B	RAM	07/21/2025	SUBMISSION TO MDEP

SEBAGO TECHNICS
SEBAGOTECHNICS.COM
75 JOHN ROBERTS ROAD, SUITE 4A
South Portland, ME 04106
207-200-2100
South Portland, Bridgton, Sanford and Bath

EXISTING CONDITIONS STORMWATER PLAN

OF:
FRANKLIN DRIVE SUBDIVISION
20 FRANKLIN DRIVE
WINDHAM, ME 04062

FOR:
NEW GEN ESTATES, LLC
50 MAINE MALL ROAD
SOUTH PORTLAND, ME 04106

DESIGNED	KPW
DRAWN	EPR
CHECKED	RAM
DATE	02/13/2025
SCALE	1" = 80'
PROJECT	230411-01

SHEET 1 OF 2

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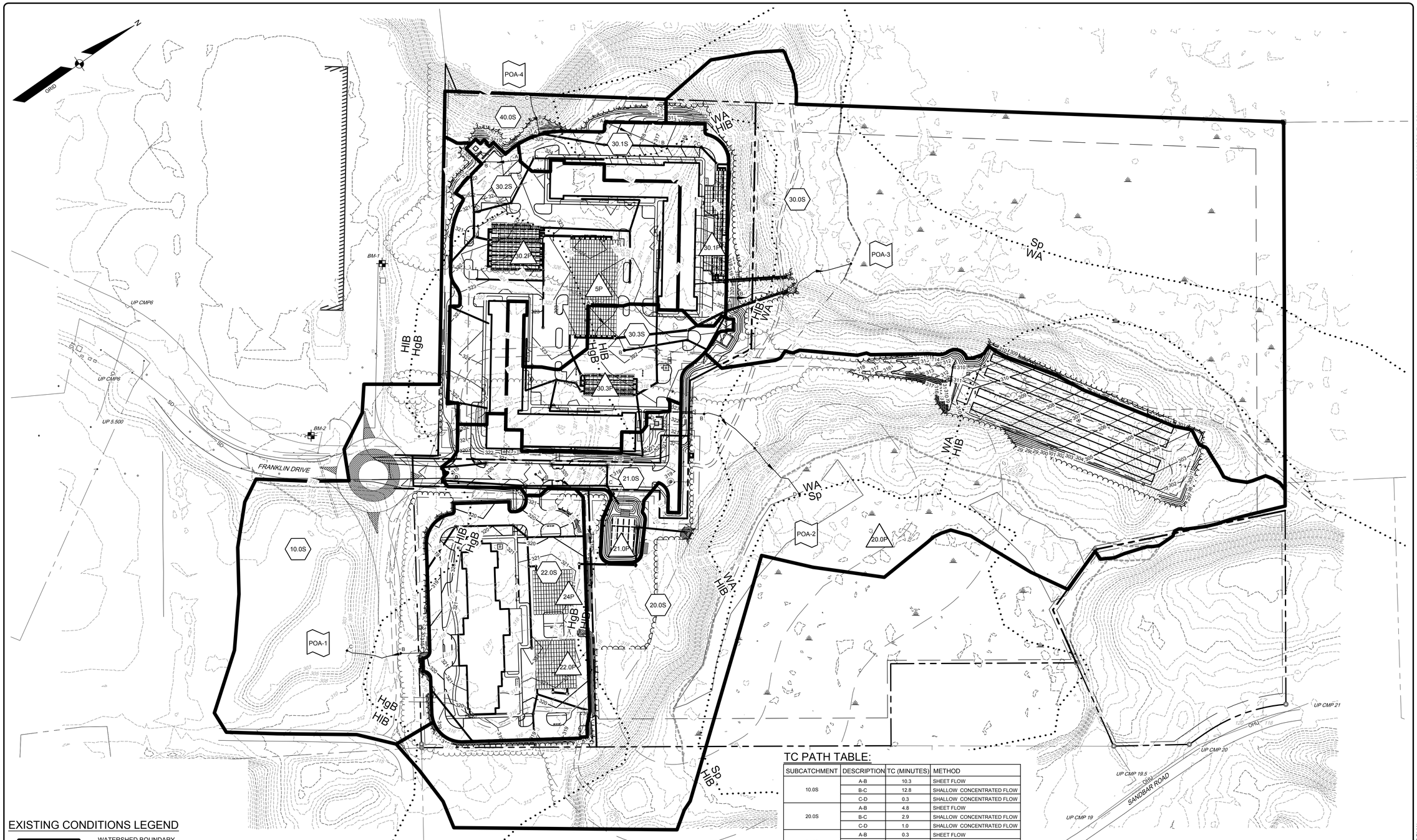
230411-01 PRE SWP.dwg, TAB:EXISTING CONDITIONS STORMWATER PLAN



EXISTING CONDITIONS LEGEND

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- HSG # / HSG # — SOILS BOUNDARY

SOIL LEGEND

SYMBOL	SOIL SERIES	PHASE	SLOPE	HSG	DRAINAGE CLASS
Hgb	HERMON	SANDY LOAM	3–8%	A	SOMEWHAT EXCESSIVELY DRAINED
HIB	HINKLEY	LOAMY SAND	3–8%	A	EXCESSIVELY DRAINED
Sp	SEBAGO	MUCKY PEAT	0–1%	A/D	VERY POORLY DRAINED
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TC PATH TABLE:

SUBCATCHMENT	DESCRIPTION	TC (MINUTES)	METHOD
10.0S	A-B	10.3	SHEET FLOW
	B-C	12.8	SHALLOW CONCENTRATED FLOW
	C-D	0.3	SHALLOW CONCENTRATED FLOW
20.0S	A-B	4.8	SHEET FLOW
	B-C	2.9	SHALLOW CONCENTRATED FLOW
	C-D	1.0	SHALLOW CONCENTRATED FLOW
21.0S	A-B	0.3	SHEET FLOW
	B-C	0.6	SHALLOW CONCENTRATED FLOW
	-	5.1	DIRECT ENTRY
22.0S	A-B	2.6	SHEET FLOW
	B-C	1.1	SHALLOW CONCENTRATED FLOW
	-	2.3	DIRECT ENTRY
30.0S	A-B	14.7	SHEET FLOW
	B-C	4.0	SHALLOW CONCENTRATED FLOW
	C-D	2.5	SHALLOW CONCENTRATED FLOW
30.1S	A-B	2.4	SHEET FLOW
	B-C	0.3	SHALLOW CONCENTRATED FLOW
	-	3.3	DIRECT ENTRY
30.2S	A-B	0.8	SHEET FLOW
	B-C	0.2	SHALLOW CONCENTRATED FLOW
	-	5.0	DIRECT ENTRY
30.3S	A-B	1.2	SHEET FLOW
	-	4.8	DIRECT ENTRY
40.0S	A-B	1.5	SHEET FLOW
	B-C	0.2	SHALLOW CONCENTRATED FLOW
	-	4.3	DIRECT ENTRY

GRAPHIC SCALE
80 0 40 80 160
(IN FEET)
1 INCH = 80 FT.

PROGRESS PRINT

STATE OF MAINE — ROBERT A. MCSORLEY — 10788 — REGISTERED PROFESSIONAL ENGINEER

ROBERT A. MCSORLEY PE 8588

REV.	BY	DATE:	STATUS
B	RAM	07/21/2025	SUBMISSION TO MDEP
A	RAM	06/23/2025	LOCAL SUBMISSION TO THE TOWN OF WINDHAM

SEBAGO TECHNICS
SEBAGOTECHNICS.COM
75 JOHN ROBERTS ROAD
South Portland, ME 04106
207-200-2100
South Portland, Bridgton, Sanford and Bath

PROPOSED CONDITIONS STORMWATER PLAN

OF:
FRANKLIN DRIVE SUBDIVISION
20 FRANKLIN DRIVE
WINDHAM, ME 04062

FOR:
NEW GEN ESTATES, LLC
50 MAINE MALL ROAD
SOUTH PORTLAND, ME 04106

DESIGNED	KPW
DRAWN	DEPR N
CHECKED	RAM
DATE	02/13/2025
SCALE	1" = 80'
PROJECT	230411-01

SHEET 2 OF 2

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230411-01 POST SWP.dwg, TAB:PROPOSED CONDITIONS STORMWATER PLAN

Appendix 6

S.W. Cole Report on Site Infiltration

REPORT

24-1227 S

June 24, 2025

Explorations and Geotechnical Engineering Services

Proposed Multi-Unit Housing Development
Franklin Drive
Windham, Maine

Prepared For:
New Gen Hospitality Mangement LLC
Attention: Suresh Gali
50 Maine Mall Road
South Portland, ME 04106

Prepared By:
S. W. Cole Engineering, Inc.
286 Portland Road
Gray, ME 04039
T: 207-657-2866

TABLE OF CONTENTS

24-1227 S

June 24, 2025

New Gen Hospitality Management LLC
Attention: Suresh Gali
50 Maine Mall Road
South Portland, ME 04106

Subject: Explorations and Geotechnical Engineering Services
Proposed Housing Development
Franklin Drive
Windham

Dear Suresh:

In accordance with our Revised Proposal, dated January 2, 2025, we have performed subsurface explorations for the subject project. This report summarizes our findings and geotechnical recommendations and its contents are subject to the limitations set forth in Appendix A.

1.0 INTRODUCTION

1.1 Scope and Purpose

The purpose of our services was to obtain subsurface information at the site in order to develop geotechnical recommendations relative to foundations, earthwork, and pavement associated with the proposed construction. Our scope of services included test boring and test pit explorations, soils laboratory testing, a geotechnical analysis of the subsurface findings, and preparation of this report.

1.2 Site and Proposed Construction

The site is located on the northerly side of the Franklin Drive cul-de-sac in Windham, Maine and is comprised of a combination of undeveloped cleared and wooded areas. We understand the existing cleared portion of the site were previously used as an aircraft landing strip. Existing grades are relatively flat across the site, ranging from approximately elevation 318 to 327 feet (project datum). Beyond the relatively flat

areas, the site slopes down steeply to the north and northeast toward an adjacent low laying wet area at approximately elevation 300 feet.

We understand development plans include two new L-shaped, four-story, on-grade housing buildings. We anticipate the buildings will be relatively lightweight wood-framed or light-gauge steel construction. We understand the buildings will have finish floor elevations of 325 feet, requiring tapered grade-raise fills approaching 8 feet and tapered cuts approaching 1 foot. Paved parking and access drive areas are proposed around the buildings. We understand a subsurface stormwater infiltration system is proposed between the buildings, underlying a paved parking area.

Proposed and existing site features are shown on the "Exploration Location Plan" attached in Appendix B.

2.0 EXPLORATION AND TESTING

2.1 Explorations

Eight test borings (B-101 through B-108) and three test pits (TP-102 through TP-103) were made at the site on April 23 through 28, 2025 by Seaboard Drilling, LLC working under subcontract to S. W. Cole Engineering, Inc. (S.W.COLE). Cone Penetration Testing was planned as part of the subsurface exploration program but were changed to test borings due to the relatively dense granular soils encountered at the site.

The test boring and test pit locations were selected by S.W.COLE. The location of test pit TP-101 was selected by Sebago Technics, Inc. The explorations were established in the field by S. W. Cole Engineering, Inc. (S.W.COLE) using GPS methods. The approximate exploration locations are shown on the "Exploration Location Plan" attached in Appendix B. Logs of the explorations and a key to the notes and symbols used on the logs are attached in Appendix C. The elevations shown on the logs were estimated based on topographic information shown on the "Exploration Location Plan".

2.2 Field Testing

The test borings were drilled using a combination of hollow stem auger and cased wash-boring techniques. The soils were sampled at 2 to 5 foot intervals using a split

spoon sampler and Standard Penetration Testing (SPT) methods. SPT blow counts are shown on the logs.

Field infiltration testing was performed using a Guelph Permeameter in test pit TP-101. These test results are shown on the attached test pit log.

2.3 Laboratory Testing

Soil samples obtained from the explorations were returned to our laboratory for further classification and testing. Moisture content test results are noted on the logs. The results of two grain size analyses are attached in Appendix D.

3.0 SUBSURFACE CONDITIONS

3.1 Soil and Bedrock

Underlying a surficial layer of forest duff, topsoil, and organics, the explorations encountered a soils profile generally consisting of uncontrolled fill overlying native glacial outwash sands. The principal soils encountered at the explorations are summarized below. Not all of the strata were encountered at each exploration; refer to the attached boring logs for more detailed subsurface information.

Uncontrolled Fill: Underlying a surficial layer of organics, borings B-106 and B-107 and test pits TP-101, TP-102, and TP-103 encountered uncontrolled fill extending to a depth of up to about 2 feet below existing ground surface (bgs). The uncontrolled fill consisted of loose dark brown and gray-brown silt sand or silt and sand with organics.

Glacial Outwash: Underlying a surficial layer of organics and the uncontrolled fill, where encountered, the explorations encountered native glacial outwash deposits generally consisting of an upper layer of medium dense to very dense sand with varying portions of silt, gravel, cobbles, and boulders, transitioning to underlying layers of loose to medium dense sand with varying portions of silt and gravel and silt with varying portions of sand. The borings were terminated in the glacial outwash deposits at depths ranging from 22 to 62 feet bgs

Bedrock: Bedrock was not encountered within the depths explored in the explorations.

3.2 Groundwater

Saturated soils were encountered in some of the borings at depths ranging from about 20 to 35 feet bgs. Long term groundwater information is not available. It should be anticipated that groundwater levels will fluctuate, particularly in response to periods of snowmelt and precipitation, changes in site use, and the water level of the adjacent low laying wet area.

4.0 EVALUATION AND RECOMMENDATIONS

4.1 General Findings

Based on the subsurface findings, the proposed construction appears feasible from a geotechnical standpoint. The principle geotechnical considerations include:

- Uncontrolled fills with organics were encountered to depths of up to about 2 feet bgs within the proposed building footprints and paved areas. Considering prior airstrip development at the site and prior developments adjacent to the site, we anticipate other areas of uncontrolled fill and debris may be present across the site which may not become evident until construction. We recommend all existing organics, debris, fill, and loose and disturbed soils be removed from beneath the proposed building and paved areas to expose the underlying undisturbed, non-organic, native sand. Overexcavations should be backfilled with compacted Granular Borrow.

- Following removal and replacement of unsuitable soils, spread footing foundations and a slab-on-grade floors bearing on properly prepared subgrades appear suitable for the proposed building. Footings should bear on 3-inches of compacted Crushed Stone overlying undisturbed native non-organic soils. On-grade floor slabs should bear on at least 12-inches of properly compacted Structural Fill overlying properly prepared subgrades.

- Subgrades across the site will consist of sands with varying portions of silt, gravel, cobbles, and boulders.. Earthwork and grading activities should occur during drier, non-freezing weather of Spring, Summer and Fall. Excavation of bearing surfaces should be completed with a smooth-edged bucket to lessen subgrade disturbance.

- The contractor should anticipate encountering frequent cobbles and boulders during excavation which may require premium handling and disposal.

4.2 Site and Subgrade Preparation

We recommend that site preparation begin with the construction of an erosion control system to protect adjacent drainage ways and areas outside the construction limits. Surficial organics, roots and topsoil should be completely removed from areas of proposed fill and construction. As much vegetation as possible should remain outside the construction areas to lessen the potential for erosion and site disturbance.

As discussed, uncontrolled fill was encountered in borings B-106 and B-107 and test pits TP-101, TP-102, and TP-103. We anticipate the uncontrolled fill extends below the cleared portion of the site, where the prior airstrip was located. Considering the prior development at and adjacent to the site, we anticipate other areas of uncontrolled fill may be present across the site which may not become evident until construction. We recommend existing organics, debris, uncontrolled fills, and loose and disturbed soils be entirely removed from beneath the proposed building footprints and paved areas to expose the underlying undisturbed, non-organic, native sand. The extent of removal should extend 1 foot laterally outward from outside edge of perimeter footings and edge of paved areas for every 1-foot of excavation depth (1H:1V bearing splay). Overexcavations should be backfilled with compacted Granular Borrow.

Beneath paved areas, subgrades should be proof-compacted with several passes of a 10-ton vibratory roller compactor. Areas that become soft our yielding after proof-compaction should be removed and replaced with compacted Granular Borrow.

We recommend that footings be excavated using a smooth-edged bucket and that footings be underlain by at least 3 inches of Crushed Stone overlying undisturbed non-organic native soils, or overlying compacted Granular Borrow use to raise grades above undisturbed non-organic native soils. We recommend floor slabs be underlain by at least 12 inches of compacted Structural Fill overlying properly prepared subgrades. Boulders which extend above foundation subgrade should be remove and backfilled with compacted Granular Borrow.

4.3 Excavation and Dewatering

Excavation work will generally encounter areas of uncontrolled fill overlying native deposits of gravelly sand with cobbles and boulders. Care must be exercised during construction to limit disturbance of the bearing soils. Earthwork and grading activities should occur during drier, non-freezing weather of Spring, Summer and Fall. Final cuts to subgrade should be performed with a smooth-edged bucket to help reduce strength loss from soil disturbance.

Frequent cobbles and boulders may be encountered during excavation which will require special handling and disposal of. Large boulders may need to be processed down with hydraulic hoe-ramming.

Vibrations from construction should be controlled below threshold limits of 0.5 in/sec for structures, water supply wells and infrastructure within 500 feet of the project site. More restrictive vibration limits may be warranted in specific cases with sensitive equipment, historic structures or artifacts on-site or within close proximity.

Sumping and pumping dewatering techniques should be adequate to control groundwater in shallow excavations. Controlling the water levels to at least one foot below planned excavation depths will help stabilize subgrades during construction. Excavations must be properly shored or sloped in accordance with OSHA Regulations to prevent sloughing and caving of the sidewalls during construction. Care must be taken to preclude undermining adjacent structures, utilities and roadways. The design and planning of excavations, excavation support systems, and dewatering is the responsibility of the contractor.

4.4 Foundations

We recommend the proposed building be supported on spread footings founded on at least 3-inches of compacted Crushed Stone overlying undisturbed, non-organic, native soils, or overlying compacted Granular Borrow used to raise grades above non-organic native soils. For foundations bearing on properly prepared subgrades, we recommend the following geotechnical parameters for design consideration:

Geotechnical Parameters for Spread Footings and Foundation Walls	
Design Frost Depth (100 year AFI)	4.5 feet
Net Allowable Soil Bearing Pressure	3.0 ksf
Base Friction Factor	0.35
Total Unit Weight of Backfill	125 pcf
At-Rest Lateral Earth Pressure Coefficient	0.5
Internal Friction Angle of Backfill	30°
Seismic Soil Site Class	D (IBC 2021)
Estimated Total Settlement	1-inch
Differential Settlement	½-inch

4.5 Foundation Drainage

The subsurface explorations encountered free-draining granular soils and a relatively deep groundwater level. Considering the subsurface findings, a perimeter building foundation underdrain is not required from a geotechnical standpoint.

4.6 Slab-On-Grade

On-grade floor slabs in heated areas may be designed using a subgrade reaction modulus of 100 pci (pounds per cubic inch) provided the slab is underlain by at least 12-inches of compacted Structural Fill placed over properly prepared subgrades. The structural engineer or concrete consultant must design steel reinforcing and joint spacing appropriate to slab thickness and function, as well as cracking and curling.

We recommend a sub-slab vapor retarder particularly in areas of the building where the concrete slab will be covered with an impermeable surface treatment or floor covering that may be sensitive to moisture vapors. The vapor retarder must have a permeance that is less than the floor cover or surface treatment that is applied to the slab. The vapor retarder must have sufficient durability to withstand direct contact with the sub-slab base material and construction activity. The vapor retarder material should be placed according to the manufacturer's recommended method, including the taping and lapping of all joints and wall connections. The architect and/or flooring consultant should select the vapor retarder products compatible with flooring and adhesive materials.

The floor slab should be appropriately cured using moisture retention methods after casting. Typical floor slab curing methods should be used for at least 7 days. The architect or flooring consultant should assign curing methods consistent with current

applicable American Concrete Institute (ACI) procedures with consideration of curing method compatibility to proposed surface treatments, flooring and adhesive materials.

4.7 Entrance Slabs and Sidewalks

Entrance slabs and sidewalks adjacent to the building must be designed to reduce the effects of differential frost action between adjacent pavement, doorways, and entrances. We recommend that non-frost susceptible Structural Fill be provided to a depth of at least 4.5 feet below the top of entrance slabs. This thickness of Structural Fill should extend the full footprint of the entrance slab, thereafter transitioning up to the bottom of the adjacent sidewalk or pavement gravels at a 3H:1V or flatter slope. General details of this frost transition zone are shown on the "Foundation Detail Sketch" attached in Appendix B.

4.8 Fill, Backfill and Compaction

We recommend the following fill and backfill materials: recycled products must also be tested in accordance with applicable environmental regulations and approved by a qualified environmental consultant.

Common Borrow: Fill to raise grades in landscape areas should be non-organic compactable earth meeting the requirements of 2020 MaineDOT Standard Specification 703.18 Common Borrow.

Granular Borrow: Fill to raise grades in building and paved areas, as well as to repair soft areas, should be sand meeting the requirements of 2020 MaineDOT Standard Specification 703.19 Granular Borrow.

Structural Fill: Backfill for foundations, slab base material, and material below exterior entrances slabs should be clean, non-frost susceptible sand and gravel meeting the gradation requirements for Structural Fill as given below:

Structural Fill	
Sieve Size	**Percent Finer by Weight**
4 inch	100
3 inch	90 to 100
¼ inch	25 to 90
No. 40	0 to 30
No. 200	0 to 6

Crushed Stone: Crushed Stone, used beneath foundations, should be washed ¾-inch crushed stone meeting the requirements of 2020 MaineDOT Standard Specification 703.13 Crushed Stone ¾-Inch.

Reuse of Site Soils: The on-site native sand and gravel soils appear suitable for reuse as Granular Borrow provided they are free of organics and deleterious materials, particles larger than 12-inches are culled out, and they are a compactable moisture content at the time of reuse. We anticipate screening out of oversized particles would be required for reuse.

Placement and Compaction: Fill should be placed in horizontal lifts and compacted such that the desired density is achieved throughout the lift thickness with 3 to 5 passes of the compaction equipment. Loose lift thicknesses for grading, fill and backfill activities should not exceed 12 inches. We recommend that fill and backfill in building and paved areas be compacted to at least 95 percent of its maximum dry density as determined by ASTM D-1557. Crushed Stone should be compacted with 3 to 5 passes of a vibratory plate compactor having a static weight of at least 500 pounds.

4.9 Weather Considerations

Construction activity should be limited during wet and freezing weather and the site soils may require drying or thawing before construction activities may continue. The contractor should anticipate the need for water to temper fills in order to facilitate compaction during dry weather. If construction takes place during cold weather, subgrades, foundations and floor slabs must be protected during freezing conditions. Concrete and fill must not be placed on frozen soil; and once placed, the concrete and soil beneath the structure must be protected from freezing.

4.10 Paved Areas

We anticipate paved areas will be subjected primarily to passenger vehicle and light delivery truck traffic with occasional heavy delivery truck traffic. Considering the site soils, and proposed usage, we offer the following pavement section for consideration.

FLEXIBLE (HMA) PAVEMENT SECTION – 2020 MaineDOT Standard Specs	
Pavement Layer	**Material Thickness**
MaineDOT 9.5 mm Hot Mix Asphalt	1 ½ inches
MaineDOT 19.0 mm Hot Mix Asphalt	2 ½ inches
MaineDOT 703.06 Aggregate Base Type A	3 inches
MaineDOT 703.06 Aggregate Subbase Type D	15 inches

The base and subbase materials should be compacted to at least 95 percent of their maximum dry density as determined by ASTM D-1557. Hot mix asphalt pavement should be compacted to 92 to 97 percent of its theoretical maximum density as determined by ASTM D-2041. A tack coat should be used between successive lifts of bituminous pavement.

It should be understood that frost penetration can be on the order of 4.5 feet in this area. In the absence of full depth excavation of frost susceptible soils below paved areas and subsequent replacement with non-frost susceptible compacted fill, frost penetration into the subgrade will occur and some heaving and distress of pavement must be anticipated.

4.11 Design Review and Construction Testing

S.W.COLE should be retained to review the construction documents prior to bidding to determine that our earthwork, foundation and pavement recommendations have been properly interpreted and implemented.

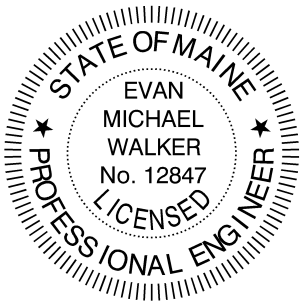
A construction materials testing and quality assurance program should be implemented during construction to observe compliance with the design concepts, plans, and specifications. S.W.COLE is available to observe earthwork activities, the preparation of foundation bearing surfaces and pavement subgrades, as well as to provide testing and IBC Special Inspection services for soils, concrete, steel, spray-applied fireproofing, fire-stopping, structural masonry, and asphalt construction materials.

5.0 CLOSURE

It has been a pleasure to be of assistance to you with this phase of your project. We look forward to working with you during the construction phase of the project.

Sincerely,

S. W. Cole Engineering, Inc.



Evan M. Walker, P.E.
Senior Geotechnical Engineer

EMW:tjb

APPENDIX A

Limitations

This report has been prepared for the exclusive use of New Gen Hospitality Management LLC for specific application to the proposed Multi-Unit Housing Development on Franklin Drive in Windham, Maine. S. W. Cole Engineering, Inc. (S.W.COLE) has endeavored to conduct our services in accordance with generally accepted soil and foundation engineering practices. No warranty, expressed or implied, is made.

The soil profiles described in the report are intended to convey general trends in subsurface conditions. The boundaries between strata are approximate and are based upon interpretation of exploration data and samples.

The analyses performed during this investigation and recommendations presented in this report are based in part upon the data obtained from subsurface explorations made at the site. Variations in subsurface conditions may occur between explorations and may not become evident until construction. If variations in subsurface conditions become evident after submission of this report, it will be necessary to evaluate their nature and to review the recommendations of this report.

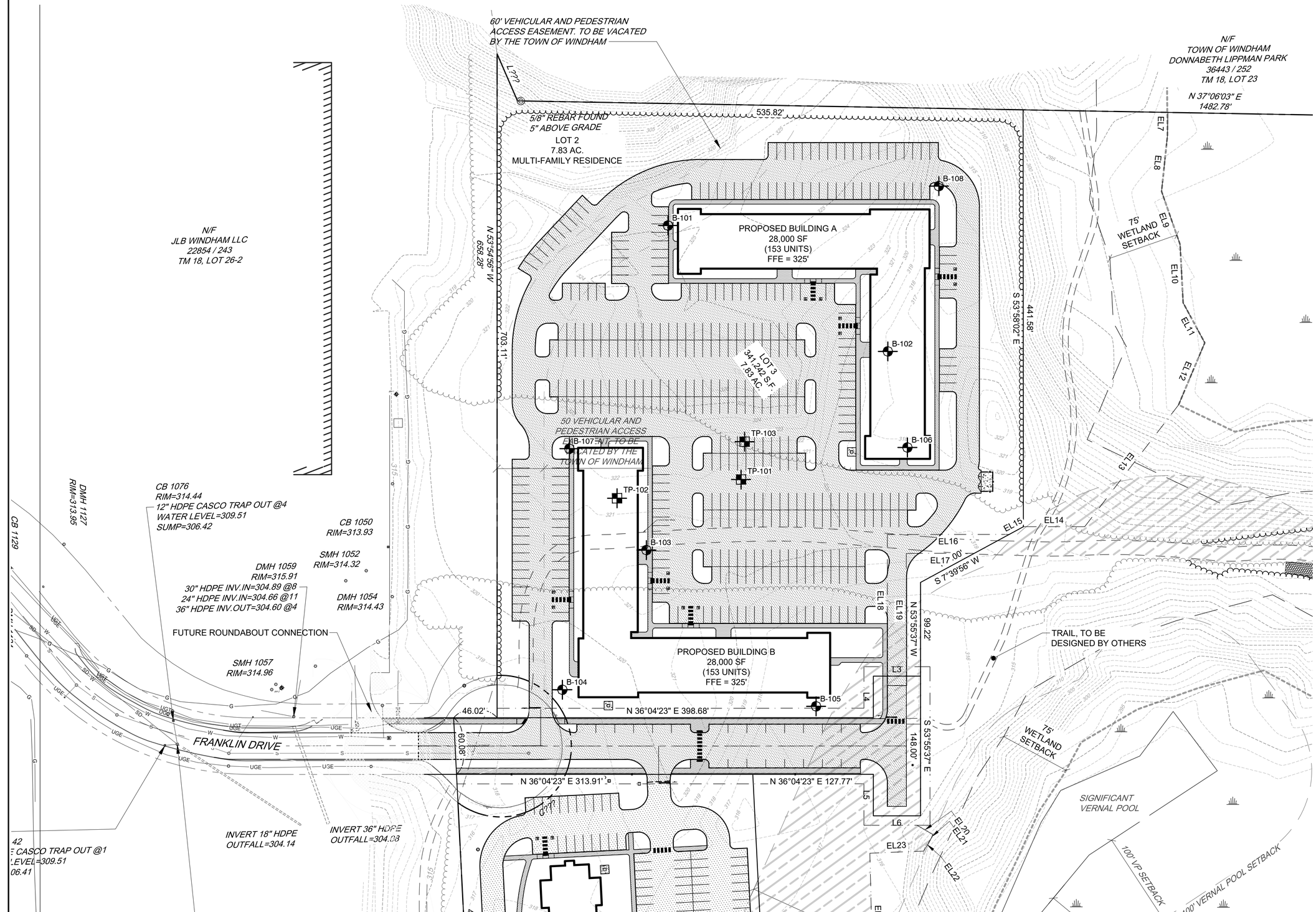
Observations have been made during exploration work to assess site groundwater levels. Fluctuations in water levels will occur due to variations in rainfall, temperature, and other factors.

S.W.COLE's scope of services has not included the investigation, detection, or prevention of any Biological Pollutants at the project site or in any existing or proposed structure at the site. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and the byproducts of any such biological organisms.

Recommendations contained in this report are based substantially upon information provided by others regarding the proposed project. In the event that any changes are made in the design, nature, or location of the proposed project, S.W.COLE should review such changes as they relate to analyses associated with this report. Recommendations contained in this report shall not be considered valid unless the changes are reviewed by S.W.COLE.

APPENDIX B

Figures



LEGEND:

- APPROXIMATE BORING LOCATION
- APPROXIMATE TEST PIT LOCATION

NOTES:

1. EXPLORATION LOCATION PLAN WAS PREPARED FROM A A 1"=80' SCALE PLAN OF THE SITE ENTITLED "CONCEPTUAL MASTER PLAN," PREPARED BY SEBAGO TECHNICS, DATED 01/23/2025.
2. THE BORINGS AND TEST PITS WERE LOCATED IN THE FIELD BY S. W. COLE ENGINEERING, INC. USING A MAPPING GRADE GNSS RECEIVER.
3. THIS PLAN SHOULD BE USED IN CONJUNCTION WITH THE ASSOCIATED S. W. COLE ENGINEERING, INC. GEOTECHNICAL REPORT.
4. THE PURPOSE OF THIS PLAN IS ONLY TO DEPICT THE LOCATION OF THE EXPLORATIONS IN RELATION TO THE EXISTING CONDITIONS AND PROPOSED CONSTRUCTION AND IS NOT TO BE USED FOR CONSTRUCTION.

0 50 100 Feet

NO.	DATE	DESCRIPTION	BY
1	06/23/2025	FINAL REPORT SUBMISSION	CEM
0	05/08/2025	DRAFT SUBMITTAL	CEM

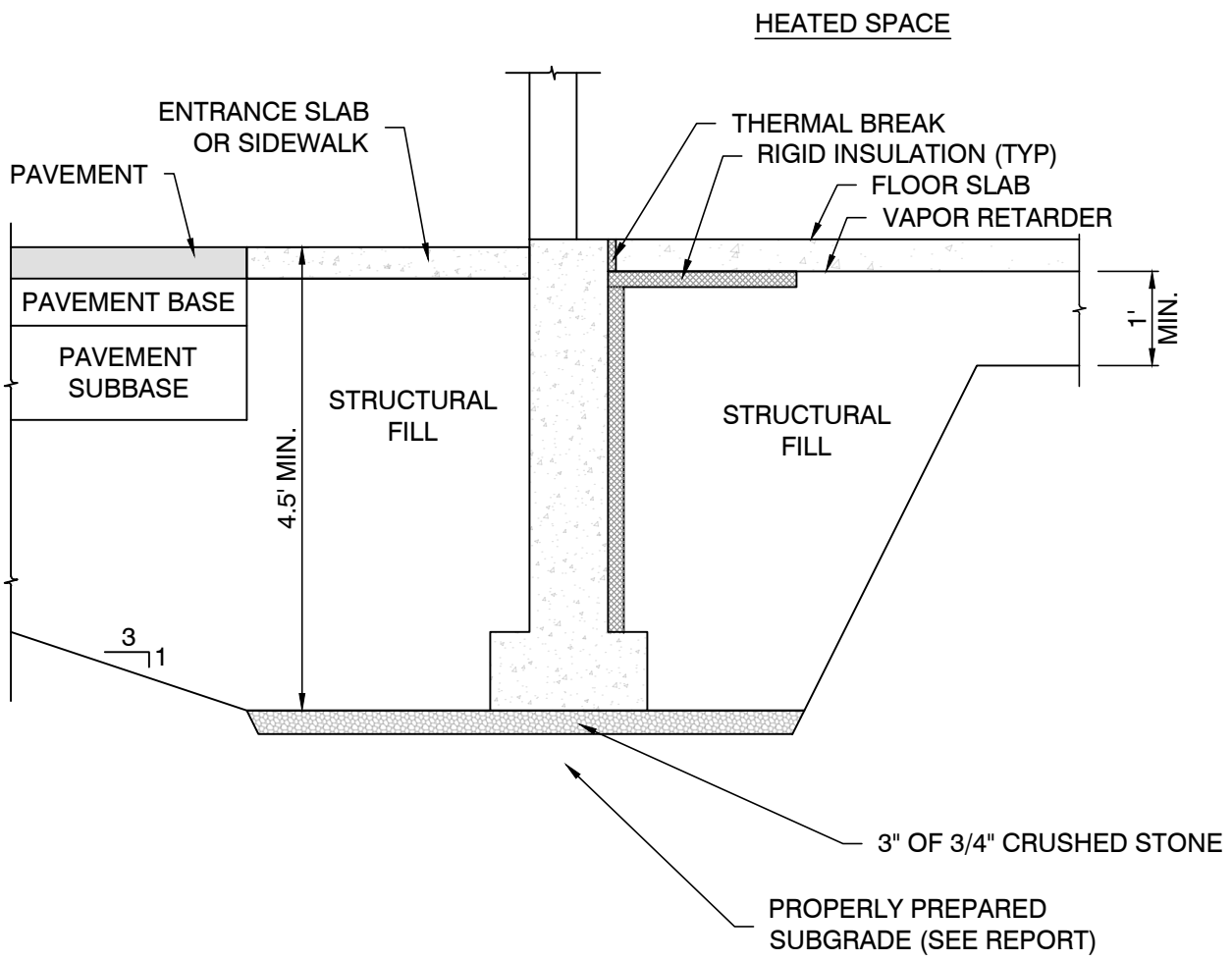
S.W.COLE ENGINEERING, INC.

NEW GEN HOSPITALITY MANAGEMENT LLC

EXPLORATION LOCATION PLAN

PROPOSED MULTI-UNIT HOUSING DEVELOPMENT
FRANKLIN DRIVE
WINDHAM, MAINE

Job No.: 24-1227 Scale: 1" = 50'
Date : 05/08/2025 Sheet: 1



NOTE:

1. UNDERDRAIN INSTALLATION AND MATERIAL GRADATION RECOMMENDATIONS ARE CONTAINED WITHIN THIS REPORT.
2. DETAIL IS PROVIDED FOR ILLUSTRATIVE PURPOSES ONLY, NOT FOR CONSTRUCTION.

S.W.COLE ENGINEERING, INC.

NEW GEN HOSPITALITY MANAGEMENT LLC

FOUNDATION DETAIL SKETCH

PROPOSED MULTI-UNIT HOUSING DEVELOPMENT
FRANKLIN DRIVE
WINDHAM, MAINE

Job No.:	24-1227	Scale:	Not to Scale
Date :	06/23/2025	Sheet:	2

APPENDIX C

Exploration Logs and Key

BORING LOG

BORING NO.: B-101
SHEET: 1 of 1
PROJECT NO. 24-1227
DATE START: 4/23/2025
DATE FINISH: 4/23/2025

CLIENT: New Gen Hospitality Management LLC
PROJECT: Proposed Milti-Unit Housing Development
LOCATION: Franklin Drive, Windham, Maine

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 325' +/- | **TOTAL DEPTH (FT):** 40.0 | **LOGGED BY:** Kyle Kaserman
DRILLING CO.: Seaboard Drilling | **DRILLER:** Ryan Hackett | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Track Mounted Diedrich D-50 | **AUGER ID/OD:** 2 1/4 in / 5 5/8 in | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic | **HAMMER WEIGHT (lbs):** 140 | **CASING ID/OD:** N/A /N/A | **CORE BARREL:**
HAMMER CORRECTION FACTOR: | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): ▽ 35 ft Soils Saturated Below 35' +/-
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
			1D		0-2	24/6	4-8-11-7			0.3 Vegetation/forest duff		
			2D		2-4	24/14	8-28-17-13	w =1.4 %		Medium dense, light brown, gravelly SAND, trace silt, with frequent cobbles 2.0 Dense, light brown, gravelly SAND, some silt, with frequent cobbles		
320	5		3D		5-7	24/20	26-32-29-31			5.0 Very dense, light brown, gravelly SAND, some silt		
315	10		4D		10-12	24/16	8-16-17-13			10.0 Dense, light brown, gravelly SAND, trace silt, with frequent cobbles		
310	15		5D		15-17	24/10	39-35-26-30			15.0 Very dense, light brown, SAND, some silt, some gravel, with frequent cobbles		
305	20		6D		20-22	24/10	12-13-15-15			20.0 Medium dense, light brown, gravelly SAND, trace silt, with occasional cobbles		
300	25		7D		25-27	24/12	6-6-7-7					
295	30		8D		30-32	24/14	5-6-7-8			30.0 Medium dense, light brown, SAND, some silt, trace gravel		
290	35		9D		35-37	24/16	12-11-4-4			35.0 Medium dense to dense, brown, coarse SAND, trace silt, trace gravel	▽	
			10D		38-40	24/24	5-12-23-16					

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Bottom of Exploration at 40.0 feet

BORING NO.: B-101

BORING LOG

BORING NO.: B-102
SHEET: 1 of 1
PROJECT NO. 24-1227
DATE START: 4/23/2025
DATE FINISH: 4/23/2025

CLIENT: New Gen Hospitality Management LLC
PROJECT: Proposed Milti-Unit Housing Development
LOCATION: Franklin Drive, Windham, Maine

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 319' +/- | **TOTAL DEPTH (FT):** 27.0 | **LOGGED BY:** Kyle Kaserman
DRILLING CO.: Seaboard Drilling | **DRILLER:** Ryan Hackett | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Track Mounted Diedrich D-50 | **AUGER ID/OD:** 2 1/4 in / 5 5/8 in | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic | **HAMMER WEIGHT (lbs):** 140 | **CASING ID/OD:** N/A /N/A | **CORE BARREL:**
HAMMER CORRECTION FACTOR: | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): ▽ 25 ft Soils Saturated Below 25' +/-
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
			1D		0-2	24/16	3-3-4-4			0.3 Vegetation/forest duff		
			2D		2-4	24/14	8-25-43-25			Loose, brown, SAND, some silt, trace gravel, with organics 2.0		
315										Very dense, light brown, gravelly SAND, some silt, with frequent cobbles		
	5		3D		5-7	24/20	5-7-11-18			5.0 Medium dense, gray-brown, silty SAND, with trace organics		
310												
	10		4D		10-10.9	11/10	41-50/5"			10.0 Very dense, gray-brown, gravelly SAND, trace silt, with frequent cobbles		
305												
	15		5D		15-17	24/12	3-5-6-5			15.0 Medium dense, light brown-gray, gravelly SAND, trace silt		
300												
	20		6D		20-22	24/12	5-5-6-7			20.0 Medium dense, light brown-gray, gravelly SAND, trace silt, with occasional cobbles		
295												
	25		7D		25-27	24/16	7-5-7-7			25.0 Medium dense, light brown, gravelly SAND, some silt	▽	

Bottom of Exploration at 27.0 feet

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING LOG

BORING NO.: B-103
SHEET: 1 of 1
PROJECT NO. 24-1227
DATE START: 4/23/2025
DATE FINISH: 4/23/2025

CLIENT: New Gen Hospitality Management LLC
PROJECT: Proposed Milti-Unit Housing Development
LOCATION: Franklin Drive, Windham, Maine

Drilling Information

LOCATION: See Exploration Location Plan **ELEVATION (FT):** 321' +/- **TOTAL DEPTH (FT):** 22.0 **LOGGED BY:** Kyle Kaserman
DRILLING CO.: Seaboard Drilling **DRILLER:** Ryan Hackett **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Track Mounted Diedrich D-50 **AUGER ID/OD:** 2 1/4 in / 5 5/8 in **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic **HAMMER WEIGHT (lbs):** 140 **CASING ID/OD:** N/A /N/A **CORE BARREL:**
HAMMER CORRECTION FACTOR: **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): No Free Water Observed
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
320			1D		0-1.5	18/5	3-8-30/6"			1.0 Medium dense, dark gray / brown, SILT AND SAND, with organics (FILL)		
			2D		2-2.1	1/1	50/1"			2.0 Dense, brown, sandy GRAVEL, trace silt, with frequent cobbles		
										Very dense, brown, SAND, some silt, some gravel		
	5		3D		5-5.5	6/4	50			5.0 Very dense, light brown, coarse SAND, some gravel, some silt		
315												
	10		4D		10-12	24/14	20-35-17-10			10.0 Very dense, light brown, silty SAND, trace gravel		
310										11.0 Very dense, gray-light brown, gravelly SAND, trace silt, with occasional cobbles		
	15		5D		15-17	24/14	5-6-9-12			15.0 Medium dense, light brown, coarse SAND, some silt, trace gravel		
305												
	20		6D		20-22	24/14	9-10-10-10					
300												

Bottom of Exploration at 22.0 feet

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING LOG

BORING NO.:	**B-104**
SHEET:	1 of 1
PROJECT NO.	24-1227
DATE START:	4/23/2025
DATE FINISH:	4/23/2025

CLIENT: New Gen Hospitality Management LLC
PROJECT: Proposed Milti-Unit Housing Development
LOCATION: Franklin Drive, Windham, Maine

Drilling Information

LOCATION: See Exploration Location Plan **ELEVATION (FT):** 319' +/- **TOTAL DEPTH (FT):** 22.0 **LOGGED BY:** Kyle Kaserman
DRILLING CO.: Seaboard Drilling **DRILLER:** Ryan Hackett **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Track Mounted Diedrich D-50 **AUGER ID/OD:** 2 1/4 in / 5 5/8 in **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic **HAMMER WEIGHT (lbs):** 140 **CASING ID/OD:** N/A /N/A **CORE BARREL:**
HAMMER CORRECTION FACTOR: **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): No Free Water Observed
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_2O Depth	Remarks
			1D		0-2	24/12	1-5-8-11			Vegetation/forest duff (0.8)		
			2D		2-4	24/18	24-33-31-30			Medium dense, brown, gravelly SAND, some silt, with occasional cobbles (2.0)		
315										Very dense, light brown-white, gravelly SAND, some silt, with frequent cobbles		
	5		3D		5-7	24/16	9-10-17-46			(5.0)		
310										Medium dense, light brown, gravelly SAND, trace silt		
	10		4D		10-12	24/14	5-5-6-5			(10.0)		
305										Loose to medium dense, light brown, SAND, some silt, trace gravel		
	15		5D		15-17	24/16	3-3-5-5					
300												
	20		6D		20-22	24/12	5-6-8-8					

Bottom of Exploration at 22.0 feet

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING LOG

BORING NO.:	**B-105**
SHEET:	1 of 1
PROJECT NO.	24-1227
DATE START:	4/25/2025
DATE FINISH:	4/25/2025

CLIENT: New Gen Hospitality Management LLC
PROJECT: Proposed Milti-Unit Housing Development
LOCATION: Franklin Drive, Windham, Maine

Drilling Information

LOCATION: See Exploration Location Plan **ELEVATION (FT):** 317' +/- **TOTAL DEPTH (FT):** 27.0 **LOGGED BY:** Kyle Kaserman
DRILLING CO.: Seaboard Drilling **DRILLER:** Ryan Hackett **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Track Mounted Diedrich D-50 **AUGER ID/OD:** 2 1/4 in / 5 5/8 in **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic **HAMMER WEIGHT (lbs):** 140 **CASING ID/OD:** N/A /N/A **CORE BARREL:**
HAMMER CORRECTION FACTOR: **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): ▽ 25 ft Soils Saturated Below 25' +/-
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
315			1D		0-2	24/6	2-3-9-20			0.3 Vegetation/forest duff Medium dense, brown, sandy GRAVEL, some silt, with frequent cobbles		
310	5		2D		5-6	12/10	26-50/6"			5.0 Very dense, white-light brown, GRAVEL AND SAND, trace silt, with frequent cobbles		
305	10		3D		10-12	24/14	4-5-3-4			10.0 Loose, light brown, SAND, trace silt, trace gravel		
300	15		4D		15-17	24/12	3-3-4-4			15.0 Loose to medium dense, light brown, SAND, some silt		
295	20		5D		20-22	24/20	5-5-6-5					
290	25		6D		25-27	24/18	7-6-8-7			25.0 Medium dense, light brown, SAND, some silt, trace gravel	▽	

Bottom of Exploration at 27.0 feet

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING LOG

CLIENT: New Gen Hospitality Management LLC
PROJECT: Proposed Milti-Unit Housing Development
LOCATION: Franklin Drive, Windham, Maine

BORING NO.: B-106
SHEET: 1 of 1
PROJECT NO. 24-1227
DATE START: 4/25/2025
DATE FINISH: 4/25/2025

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 318' +/- | **TOTAL DEPTH (FT):** 27.0 | **LOGGED BY:** Kyle Kaserman
DRILLING CO.: Seaboard Drilling | **DRILLER:** Ryan Hackett | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Track Mounted Diedrich D-50 | **AUGER ID/OD:** 2 1/4 in / 5 5/8 in | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic | **HAMMER WEIGHT (lbs):** 140 | **CASING ID/OD:** N/A /N/A | **CORE BARREL:**
HAMMER CORRECTION FACTOR: | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): ▽ 26 ft Soils Saturated Below 26' +/-
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
			1D		0-2	24/6	4-3-3-7			Loose, brown, silty SAND, with roots and organics (FILL)		
315			2D		2-3.5	18/6	14-16-50/6"			2.0 Very dense, white-brown, gravelly SAND, some silt, with frequent cobbles		
	5		3D		5-6.5	18/10	8-21-50/6"			5.0 Very dense, light brown, gravelly SAND, trace silt, with occasional cobbles		
310												
	10		4D		10-12	24/14	6-6-8-9			10.0 Medium dense, light brown, coarse SAND, trace gravel, trace silt		
305												
	15		5D		15-17	24/16	5-7-9-9			15.0 Medium dense, light brown, SAND, trace silt, trace gravel		
300												
	20		6D		20-22	24/12	4-5-6-5			20.0 Medium dense, light brown, SAND, trace silt		
295												
	25		7D		25-27	24/12	9-7-7-6			25.0 Medium dense, light brown, gravelly SAND, trace silt, with occasional cobbles	▽	

Bottom of Exploration at 27.0 feet

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING LOG

CLIENT: New Gen Hospitality Management LLC
PROJECT: Proposed Milti-Unit Housing Development
LOCATION: Franklin Drive, Windham, Maine

BORING NO.: B-107
SHEET: 1 of 1
PROJECT NO. 24-1227
DATE START: 4/25/2025
DATE FINISH: 4/25/2025

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 322' +/- | **TOTAL DEPTH (FT):** 27.0 | **LOGGED BY:** Kyle Kaserman
DRILLING CO.: Seaboard Drilling | **DRILLER:** Ryan Hackett | **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Track Mounted Diedrich D-50 | **AUGER ID/OD:** 2 1/4 in / 5 5/8 in | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic | **HAMMER WEIGHT (lbs):** 140 | **CASING ID/OD:** N/A /N/A | **CORE BARREL:**
HAMMER CORRECTION FACTOR: | **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): No Free Water Observed
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_2O Depth	Remarks
			1D		0-2	24/18	3-27-27-26			1.0 Loose to medium dense, gray-brown, SILT AND SAND, with organics (FILL)		
320			2D		2-3.6	20/16	19-37-41-50/2"			Very dense to dense, light brown, gravelly SAND, some silt, with frequent cobbles		
	5		3D		5-7	24/0	21-25-23-19					
315												
	10		4D		10-12	24/14	12-18-21-18					
310												
	15		5D		15-17	24/14	7-7-10-12			15.0 Medium dense, light brown, SAND, some gravel, trace silt, with occasional cobbles		
305												
	20		6D		20-22	24/12	6-8-7-7			20.0 Medium dense, light brown, coarse SAND, some gravel, trace silt, with occasional cobbles		
300												
	25		7D		25-27	24/14	6-5-7-7			25.0 Medium dense, SAND, trace gravel, trace silt		
295										Bottom of Exploration at 27.0 feet		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING LOG

BORING NO.: B-108
SHEET: 1 of 2
PROJECT NO. 24-1227
DATE START: 4/25/2025
DATE FINISH: 4/28/2025

CLIENT: New Gen Hospitality Management LLC
PROJECT: Proposed Milti-Unit Housing Development
LOCATION: Franklin Drive, Windham, Maine

Drilling Information

LOCATION: See Exploration Location Plan | **ELEVATION (FT):** 318' +/- | **TOTAL DEPTH (FT):** 62.0 | **LOGGED BY:** Kyle Kaserman
DRILLING CO.: Seaboard Drilling | **DRILLER:** Ryan Hackett | **DRILLING METHOD:** Cased Boring
RIG TYPE: Track Mounted Diedrich D-50 | **AUGER ID/OD:** N/A / N/A | **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic / Automatic | **HAMMER WEIGHT (lbs):** 140 / 140 | **CASING ID/OD:** 4 in / 4 1/2 in | **CORE BARREL:**
HAMMER CORRECTION FACTOR: | **HAMMER DROP (inch):** 30 / 30
WATER LEVEL DEPTHS (ft): ▽ 20 ft Soils Saturated Below 20' +/-
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
			1D		0-2	24/6	2-9-30-9			0.2 Vegetation/forest duff Dense, brown, SAND, some silt, trace gravel, with occasional cobbles		
315	5		2D		5-6.8	22/10	12-19-30-50/4"			5.0 Dense, brown, gravelly SAND, trace silt, with frequent cobbles		
310	10		3D		10-12	24/14	21-40-35-28			10.0 Very dense, light brown-white, gravelly SAND, trace silt, with frequent cobbles		
305	15		4D		15-17	24/10	5-10-9-9			15.0 Medium dense, light brown-white, gravelly SAND, trace silt, with occasional cobbles		
300	20		5D		20-22	24/6	13-11-16-15			20.0 Medium dense, gray-brown, SAND AND GRAVEL, trace silt	▽	
295	25		6D		25-27	24/8	5-5-6-6			25.0 Medium dense, gray-brown, gravelly SAND, trace silt		
290	30		7D		30-32	24/8	6-7-6-7			30.0 Medium dense, gray-brown, gravelly SAND, trace silt, with occasional cobbles		
285	35		8D		35-37	24/6	6-5-8-8			35.0 Medium dense, gray-brown, SAND AND GRAVEL, trace silt, with occasional cobbles		
280												

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

(Continued Next Page)

BORING LOG

CLIENT: New Gen Hospitality Management LLC
PROJECT: Proposed Milti-Unit Housing Development
LOCATION: Franklin Drive, Windham, Maine

BORING NO.: B-108
SHEET: 2 of 2
PROJECT NO. 24-1227
DATE START: 4/25/2025
DATE FINISH: 4/28/2025

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
			9D		40-42	24/10	6-18-8-8			40.0 Medium dense, gray-brown, gravelly SAND, trace silt, with occasional cobbles		
275												
	45		10D		45-47	24/10	8-10-14-14			45.0 Medium dense, light brown, gravelly SAND, trace silt		
270												
	50		11D		50-52	24/3	8-6-13-20					
265												
	55		12D		55-57	24/12	11-12-9-8			55.0 Medium dense, light brown-gray, SAND, some silt, trace gravel 56.0 Medium dense, light brown-gray, SILT, some sand		
260												
	60		13D		60-62	24/14	12-12-14-13			60.0 Medium dense, light brown-gray, SILT AND SAND, with layers of sandy silt		

Bottom of Exploration at 62.0 feet

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

TEST PIT LOGS

CLIENT: New Gen Hospitality Management LLC
PROJECT: Proposed Milti-Unit Housing Development
LOCATION: Franklin Drive, Windham, Maine

PROJECT NO.: 24-1227
LOGGED BY: Evan Walker
CONTRACTOR: Seaboard Drilling
EQUIPMENT:

TEST PIT TP-101

DATE: 4/28/2025 **LOCATION:** See Exploration Location Plan **SURFACE ELEVATION (FT):** 321' +/- **COMPLETION DEPTH (FT):** 9.0
WATER LEVEL DEPTHS (FT): No Free Water Observed **REMARKS:**

Depth (feet)	Graphic Log	Stratum Description	H_20 Depth	Sample No.	Type	Sample Depth (ft)	Field / Lab Test Data
		Vegetation / Dark gray-brown sandy silt with organics (FILL)					
		1.0 Brown, SAND AND GRAVEL, trace silt, with frequent cobbles					
5		Guelph Permeameter Test @ 6': Unsaturated Infiltration Rate = 18.7 in / hr					w =6.4 %

Bottom of Exploration at 9.0 feet

TEST PIT TP-102

DATE: 4/28/2025 **LOCATION:** See Exploration Location Plan **SURFACE ELEVATION (FT):** 321' +/- **COMPLETION DEPTH (FT):** 3.0
WATER LEVEL DEPTHS (FT): No Free Water Observed **REMARKS:**

Depth (feet)	Graphic Log	Stratum Description	H_20 Depth	Sample No.	Type	Sample Depth (ft)	Field / Lab Test Data
		Vegetation / Dark brown silty SAND, with organics (FILL)					
		1.0 Brown, sandy GRAVEL, trace silt, with frequent cobbles					

Bottom of Exploration at 3.0 feet

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

KEY TO NOTES AND SYMBOLS:

Water Level
▽ At time of Digging
▼ At Completion of Digging
▼ After Digging

q_p = Pocket Penetrometer Strength, kips/sq.ft.

TEST PIT LOGS

CLIENT: New Gen Hospitality Management LLC
PROJECT: Proposed Milti-Unit Housing Development
LOCATION: Franklin Drive, Windham, Maine

PROJECT NO.: 24-1227
LOGGED BY: Evan Walker
CONTRACTOR: Seaboard Drilling
EQUIPMENT:

TEST PIT TP-103

DATE: 4/28/2025 **LOCATION:** See Exploration Location Plan **SURFACE ELEVATION (FT):** 323' +/- **COMPLETION DEPTH (FT):** 4.0
WATER LEVEL DEPTHS (FT): No Free Water Observed **REMARKS:**

Depth (feet)	Graphic Log	Stratum Description	H_20 Depth	Sample No.	Type	Sample Depth (ft)	Field / Lab Test Data
		Forest Duff / Dark brown silty SAND, with organics (FILL)					
		2.0 Brown, SAND AND GRAVEL, trace silt, with frequent cobbles					

Bottom of Exploration at 4.0 feet

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

KEY TO NOTES AND SYMBOLS:

Water Level
▽ At time of Digging
▼ At Completion of Digging
▼ After Digging

q_p = Pocket Penetrometer Strength, kips/sq.ft.

TEST PIT 24-1227.GPJ SWCE TEMPLATE.GDT 5/27/25

KEY TO NOTES & SYMBOLS

Test Boring and Test Pit Explorations

Stratification lines represent the approximate boundary between soil types and the transition may be gradual.

Key to Symbols Used:

w	-	water content, percent (dry weight basis)
q_u	-	unconfined compressive strength, kips/sq. ft. - laboratory test
S_v	-	field vane shear strength, kips/sq. ft.
L_v	-	lab vane shear strength, kips/sq. ft.
q_p	-	unconfined compressive strength, kips/sq. ft. – pocket penetrometer test
O	-	organic content, percent (dry weight basis)
W_L	-	liquid limit - Atterberg test
W_P	-	plastic limit - Atterberg test
WOH	-	advance by weight of hammer
WOM	-	advance by weight of man
WOR	-	advance by weight of rods
HYD	-	advance by force of hydraulic piston on drill
RQD	-	Rock Quality Designator - an index of the quality of a rock mass.
γ_T	-	total soil weight
γ_B	-	buoyant soil weight

Description of Proportions:

Trace:	0 to 5%
Some:	5 to 12%
"Y"	12 to 35%
And	35+%
With	Undifferentiated

Description of Stratified Soils

Parting:	0 to 1/16" thickness
Seam:	1/16" to 1/2" thickness
Layer:	½" to 12" thickness
Varved:	Alternating seams or layers
Occasional:	one or less per foot of thickness
Frequent:	more than one per foot of thickness

REFUSAL: **Test Boring Explorations** - Refusal depth indicates that depth at which, in the drill foreman's opinion, sufficient resistance to the advance of the casing, auger, probe rod or sampler was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

REFUSAL: **Test Pit Explorations** - Refusal depth indicates that depth at which sufficient resistance to the advance of the backhoe bucket was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

Although refusal may indicate the encountering of the bedrock surface, it may indicate the striking of large cobbles, boulders, very dense or cemented soil, or other buried natural or man-made objects or it may indicate the encountering of a harder zone after penetrating a considerable depth through a weathered or disintegrated zone of the bedrock.

APPENDIX D

Laboratory Test Results

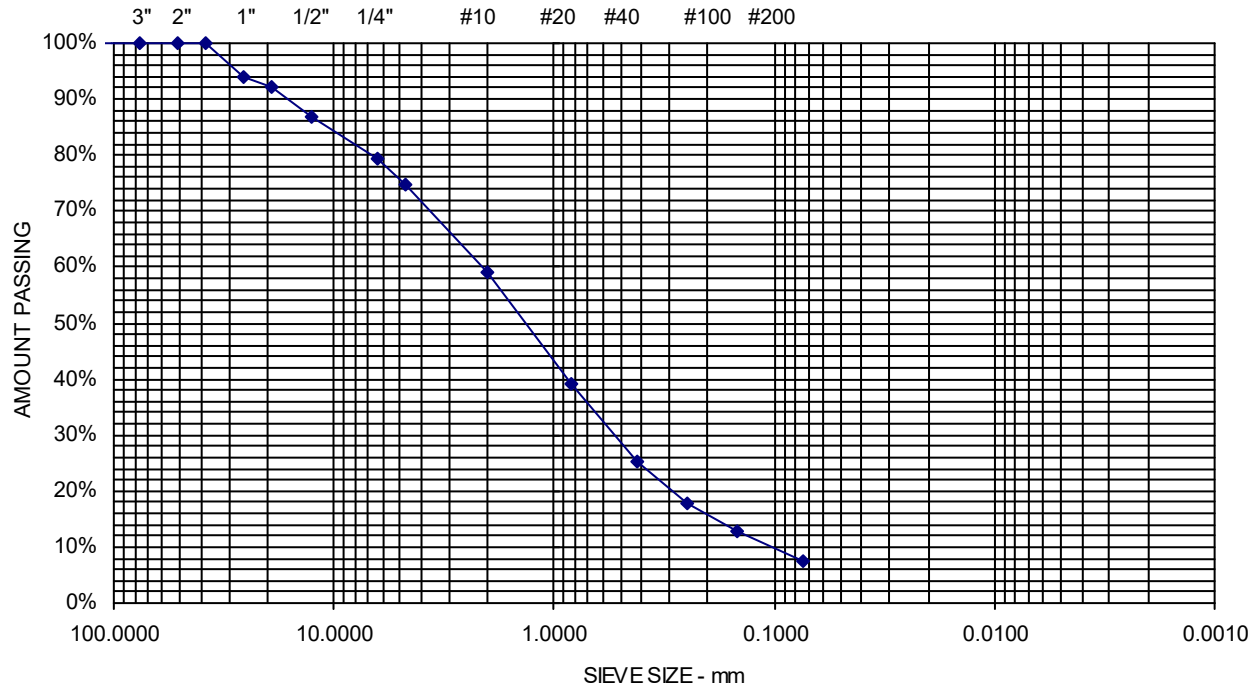
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	WINDHAM ME - PROPOSED MULTI-UNIT HOUSING DEVELOPMENT - PRELIMINARY GEOTECHNICAL ENGINEERING	Project Number	24-1227
Client	NEW GEN HOSPITALITY MANAGEMENT, LLC	Lab ID	32988G
		Date Received	5/1/2025
		Date Completed	5/5/2025
Material Source	**B-101, 2D, 2-4**	Tested By	NAOMI MCMILLEN

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**100**	
38.1 mm	**1-1/2"**	**100**	
25.0 mm	**1"**	**94**	
19.0 mm	**3/4"**	**92**	
12.5 mm	**1/2"**	**87**	
6.3 mm	**1/4"**	**79**	
4.75 mm	**No. 4**	**75**	25.3% Gravel
2.00 mm	**No. 10**	**59**	
850 um	**No. 20**	**39**	
425 um	**No. 40**	**25**	67% Sand
250 um	**No. 60**	**18**	
150 um	**No. 100**	**13**	
75 um	**No. 200**	**7.6**	7.6% Fines



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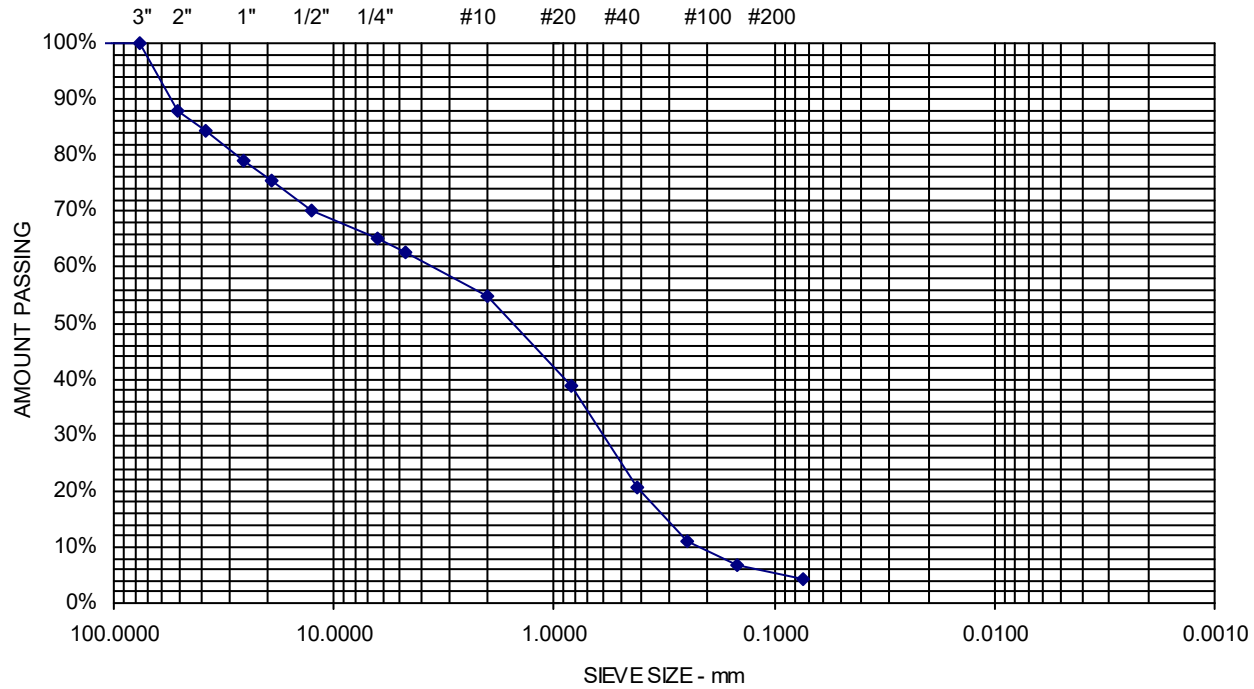
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	WINDHAM ME - PROPOSED MULTI-UNIT HOUSING DEVELOPMENT - PRELIMINARY GEOTECHNICAL ENGINEERING	Project Number	24-1227
Client	NEW GEN HOSPITALITY MANAGEMENT, LLC	Lab ID	32989G
		Date Received	5/1/2025
		Date Completed	5/7/2025
Material Source	**TP-101, 6-7**	Tested By	LEAH YOUNGE

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	**6"**	**100**	
125 mm	**5"**	**100**	
100 mm	**4"**	**100**	
75 mm	**3"**	**100**	
50 mm	**2"**	**88**	
38.1 mm	**1-1/2"**	**84**	
25.0 mm	**1"**	**79**	
19.0 mm	**3/4"**	**75**	
12.5 mm	**1/2"**	**70**	
6.3 mm	**1/4"**	**65**	
4.75 mm	**No. 4**	**63**	37.4% Gravel
2.00 mm	**No. 10**	**55**	
850 um	**No. 20**	**39**	
425 um	**No. 40**	**21**	58.3% Sand
250 um	**No. 60**	**11**	
150 um	**No. 100**	**7**	
75 um	**No. 200**	**4.3**	4.3% Fines



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