

SECTION 11. SOILS

A, B. Soil Survey and Report; Soil survey intensity level by development type:

Per the decisions made by Jami MacNeil and Dr. John Hopeck at the Pre-Application Meeting, and because portions of the site are already developed, wastewater disposal is not subsurface, and substantial portions of the site are proposed to be developed at a low intensity, high intensity soils survey mapping has only been provided in the identified locations, as agreed upon at the Pre-Application meeting. This Mapping is included as part of this Section.

Medium intensity soils mapping is provided for the remaining portions of the project site and is included as part of this Section.

Additional test pits were also performed on site. The drawings show the test pit locations, and logs are attached to this section.

C. Geotechnical Investigation:

Geotechnical investigations will be performed for specific portions of the development, including lift foundations and multistory condominium buildings. However, existing development at the resort demonstrates that the soils and bedrock are very developable and geotechnical investigations will be performed for foundation recommendations at the time of development of construction level plans and designs.

D. Hydric Soils Mapping:

The limits of hydric soils were identified and area shown on the plans, typically aligning with forested wetlands.



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SUGARLOAF – WESTERN MOUNTAIN EXPANSION CLASS B & C HIGH INTENSITY SOIL SURVEY CARRABASSET VALLEY, MAINE

PROJECT OVERVIEW

A Class B & C High Intensity Soil Survey was completed for the project site. The project site is defined as an approximately 450-acre area located at Sugarloaf Ski Resort in Carrabassett Valley in Maine. The project site is generally bound by the Access Road, West Mountain Road, and West Mountain lift line.

The proposed West Mountain Expansion includes roughly 150 acres of new ski terrain, new chair lift, new parking lots totaling approximately 300 spaces, and a skier services building. In addition, real estate development will include 52 single family house lots, condominium buildings totaling roughly 80 to 120 units, and duplex townhomes totaling 40 units. A Class B High Intensity Soil Survey was conducted within areas of proposed condominiums and residential homes. All other areas, such as ski trails, were surveyed as Class C.

The soil survey was conducted to provide resource data for permit, planning, design, and construction for the proposed development. This information is submitted to Vanasse Hangen Brustlin (VHB) as part of their analysis of the proposed project design and permitting requirements.

RESOURCES AND METHODOLOGY

Preliminary Data

Data made available by the Maine Office of GIS was consulted to review the site prior to the soil survey field work. This data included National Wetlands Inventory (NWI) wetlands, USDA Natural Resource Conservation Soil Survey Maps, and digital aerial photography. Wetland data provided by VHB was utilized in the hydric soil mapping of this soil survey.

Standards for Soil Survey

Soil surveying methods were completed in accordance with the *Maine Association of Professional Soil Scientist Standards for Soil Surveys* (March 2009). The Class B High Intensity Soil Survey incorporates the following standards, among others:

1. *Map units will not contain dissimilar limiting individual inclusions larger than 5 acres. Dissimilar limiting inclusions may total more than 1 acre per map unit delineation, in the aggregate, if not contiguous.*
2. *A map scale of 1-inch equals 200 feet or larger.*
 - The scale for this project map is 1" = 200'

3. *Ground control- test pits for which detailed data is recorded are located by means of compass by chaining, pacing, or taping from known survey points; or other methods of equal or greater accuracy*
 - Test pit and boring locations were captured by a handheld Trimble GPS Unit with sub-meter accuracy.
4. *Base map with 5' contours.*
 - The base map used in this soil survey involves surveyed property boundaries and 2' contour LiDAR data provided by VHB. The soils map was drafted in AutoCAD 2020.

The Class C Medium Intensity Soil Survey incorporates the following standards, among others:

1. *Map units will not contain dissimilar limiting individual inclusions larger than 5 acres. Dissimilar limiting inclusions may total more than 5 acres per map unit delineation, in the aggregate, if not contiguous.*
2. *A map scale of 1-inch equals 500 feet or larger.*
 - The scale for this project map is 1" = 200'
3. *Ground control-as determined by the mapper*
 - Test pit and boring locations were captured by a handheld Trimble GPS Unit with sub-meter accuracy.
4. *Base map -as determined by the mapper.*
 - The base map used in this soil survey involves surveyed property boundaries and 2' contour LiDAR data provided by VHB. The soils map was drafted in AutoCAD 2020.

Mapping Process and Soil Boundary Placement

Soil investigations were completed using a medium-sized machine excavator and hand tools (shovel, probe, screw auger). Refusal that limited hand dug pit depth was assumed to be. All recorded test locations were marked with survey tape. Locations of test sites were focused on areas of proposed development, potential stormwater treatment BMP areas, and unique landforms.

Soil boundary line placement and map units were determined by slope classes, map units, vegetation, and landforms. Additional hand auger borings were completed to verify soils; these verification borings were recorded but not shown in the soils map or logs. Once these breaks in soil boundaries were determined, a soil map was drafted using AutoCAD 2020.

RESULTS

Attached to this report are summary logs of all test borings and pits presented on DEP Form F.

The following soils were interpreted on the property. Abbreviations shown for these soils are used to identify them on the associated soils map:



Lyman-Tunbridge Complex (LN)

Brayton Soils (By)

Brayton-Colonel Complex (BC)

Colonel Series (Co)

Peru Series (Pe)

Croghan Series (Cr)

Surplus Series (Sr)

The following represent slope classes:

A = 0-3%

B = 3-8%

C = 8-15%

D = 15-20%

E = >20%

Slope breaks were determined using an AutoCAD function that processes 2' LiDAR contour data and groups slopes into the above categories.

Soil Suitability ratings are based on NRCS provided ratings. See the map unit descriptions for details on specific soil limitations, NRCS ratings, and potential solutions to limitations.

CONCLUSION

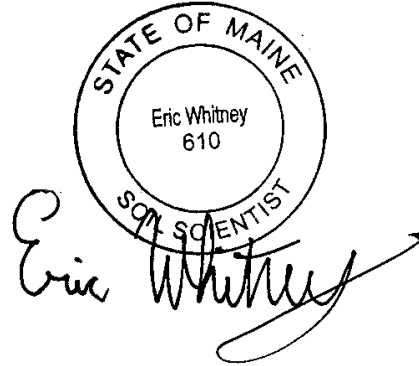
A Class B & C High Intensity Soil Survey was completed for the project site located at Sugarloaf Ski Resort in Carrabassett Valley. The proposed development entitled "West Mountain Expansion", consists of single-family house lots, condominiums, duplexes, ski trails, and associated infrastructure. This survey effort included field visits to gather soil mapping data, creation of a soil base map, and a narrative describing soil types and subsurface limitations. This soil survey consists of a soil map, test pit logs, site photos, and this report.

Soils in the project area are generally loamy basal glacial till and glacial fluvial soils ranging from poorly drained to moderately well-drained. Suitable soils for the proposed development exist within the subject property. Hydric soils, large boulders, shallow bedrock, shallow seasonal high-water tables, shrink/swell, and slopes greater than 20% are limitations for the proposed development. Soil test pit logs, soil map, and map unit descriptions are attached to this report.



SOIL SCIENTIST CERTIFICATION STATEMENT

The accompanying soil profile descriptions, soil survey map, and this soil narrative report was prepared by Eric R.T. Whitney S.S. #610. The soil survey was done in accordance with the standards adopted by the Maine Association of Professional Soil Scientist, March 2009. Eric Whitney certifies that the report meets the appropriate mapping standards for Class B & C Soil Surveys in Maine.



A circular professional seal for the State of Maine. The outer ring contains the text "STATE OF MAINE" at the top and "SOIL SCIENTIST" at the bottom. The inner circle contains the name "Eric Whitney" and the number "610". Below the seal is a handwritten signature in cursive that reads "Eric Whitney".



MAP UNIT DESCRIPTIONS

Brayton Series (By)	
<i>Loamy, mixed, active, nonacid, frigid, shallow Aeric Endoaquepts</i>	
<u>Setting</u>	
Parent Material:	Glacial Till
Landform:	Toe slopes and depressions
Slope Ranges:	0-3% (A) 3-8% (B)
Depth to Bedrock:	Very Deep (>40")

<u>Water Related Properties</u>	
Drainage Class:	Poorly drained to very poorly drained.
Hydrologic Soil Group:	D
Hydrologic Conductivity:	Moderate permeability in the surface layer and subsoil and very slow to moderately slow in the substratum
Flooding Frequency:	Possible during periods of high precipitation.

<u>Typical Profile Description</u>	
Surface:	Black highly decomposed organic material. Very granular structure.
Subsurface:	Gray, fine sandy loam. Sub angular blocky structure.
Subsoil:	Grayish brown, fine sandy loam. Sub angular blocky structure
Substratum:	Firm, gray fine sandy loam. Platy structure.

<u>Inclusions</u>	
Similar:	Peacham
Dissimilar:	Colonel, Peru, Tunbridge

<u>Soil Suitability and Limitations</u>	
<p>The Brayton series is rated as very limited for the proposed development. Due to shallow depths to groundwater, shallow depths to large boulders or bedrock, and seasonal ponding. The soils in this map unit are hydric soils that are associated with wetlands. These soils are not suitable for onsite wastewater disposal. Constructing artificial drainage and additions of coarse fill would be needed to develop in the Brayton series. On-site subsurface wastewater systems are not suitable in these soils.</p>	



Colonel Series (Co)	
<i>Loamy, isotic, frigid, shallow Aquic Haplorthods</i>	
Setting	
Parent Material:	Basal glacial till
Landform:	Hills and mountains of glaciated uplands
Slope Ranges:	8-15% (C) 15-20% (D) >20% (E)
Depth to Bedrock:	Very Deep (>40")

Water Related Properties	
Drainage Class:	Somewhat Poorly Drained
Hydrologic Soil Group:	D
Hydrologic Conductivity:	Moderately high or high in the solum, and low to moderately high in the dense substratum
Flooding Frequency:	None

Typical Profile Description	
Surface:	Black, moderately decomposed organic material.
Subsurface:	Dark brown, fine sandy loam. Granular structure.
Subsoil:	Fine sandy loam. Brown to olive brown in color. Sub angular blocky structure.
Substratum:	Firm, mottled, olive fine sandy loam

Inclusions	
Similar:	Peru, Tunbridge, Lyman, Naskeag
Dissimilar:	Abram, Brayton

Soil Suitability and Limitations	
<p>The Colonel soil series is rated as very limited for the proposed development. Shallow depths to groundwater and shallow depths to large boulders cause limitations during development. Colonel soils are suitable for onsite wastewater disposal. To overcome limitations in this soil type artificial drainage should be constructed to address the shallow depths to ground water. Large boulders should be moved with a machine excavator. On-site subsurface wastewater systems will require an 18" vertical separation from the bottom of the disposal field to the seasonal high-water table and a soils sizing factor of 3.3.</p>	

Brayton - Colonel Complex (BC) <i>Coarse-loamy, isotic, frigid Aquic Haplorthods</i>	
Setting	
Parent Material:	Basal glacial till
Landform:	Hills and mountains of glaciated uplands
Slope Ranges:	3-8% (B) 15-20% (D)
Depth to Bedrock:	Very Deep (>40")

Water Related Properties	
Drainage Class:	Moderately Well Drained
Hydrologic Soil Group:	D
Hydrologic Conductivity:	Moderately high or high in the solum, and low to moderately high in the dense substratum
Flooding Frequency:	Possible during periods of high precipitation.

Typical Profile Description	
Surface:	Black, moderately decomposed organic material.
Subsurface:	Dark brown, fine sandy loam. Granular structure.
Subsoil:	Fine sandy loam. Brown to olive brown in color. Sub angular blocky structure.
Substratum:	Firm, mottled, olive fine sandy loam

Inclusions	
Similar:	Naskeag
Dissimilar:	Peru, Tunbridge, Waumbek

Soil Suitability and Limitations	
<p>The Brayton-Colonel complex is rated as very limited for the proposed development. Shallow depths to groundwater and shallow depths to large boulders cause limitations during development. Refer to the Colonel and Brayton map unit descriptions for further details.</p>	



Peru Series (Pe) <i>Coarse-loamy, isotic, frigid Aquic Haplorthods</i>	
Setting	
Parent Material:	Basal glacial till
Landform:	Hills and mountains of glaciated uplands
Slope Ranges:	3-8% (B) 15-20% (D)
Depth to Bedrock:	Very Deep (>40")

Water Related Properties	
Drainage Class:	Moderately Well Drained
Hydrologic Soil Group:	C
Hydrologic Conductivity:	Moderately high or high in the solum, and moderately low or moderately high in the dense substratum
Flooding Frequency:	None

Typical Profile Description	
Surface:	Black, moderately decomposed organic material.
Subsurface:	Dark brown, fine sandy loam. Granular structure.
Subsoil:	Fine sandy loam. Brown to olive brown in color. Sub angular blocky structure.
Substratum:	Firm, mottled, olive fine sandy loam

Inclusions	
Similar:	Tunbridge, Waumbek
Dissimilar:	Abram, Lyman, Brayton

Soil Suitability and Limitations	
<p>Soils in the Peru series are suitable for the proposed development but have potential limitations. Shallow depths to groundwater and shallow depths to large boulders cause limitations during development. Peru soils are suitable for onsite wastewater disposal. To overcome limitations in this soil type artificial drainage should be constructed to address the shallow depths to ground water. Large boulders should be moved with a machine excavator. On-site subsurface wastewater systems will require a 12" vertical separation from the bottom of the disposal field to the seasonal high-water table and a soils sizing factor of 3.3.</p>	



<p>Tunbridge-Lyman Complex (TLC) <i>50% Coarse-loamy, isotic, frigid Typic Haplorthods</i> <i>50% Loamy, isotic, frigid Lithic Haplorthods</i></p>

Setting	
Parent Material:	Basal Glacial Till
Landform:	Mountains and hills
Slope Ranges:	8-15% (C)
Depth to Bedrock:	Shallow (10"-20") to Moderately deep (20"-40")

Water Related Properties	
Drainage Class:	Somewhat excessively drained to well drained
Hydrologic Soil Group:	D
Hydrologic Conductivity:	Moderately high or high throughout the mineral soil
Flooding Frequency:	None, flooding is not probable

Typical Profile Description	
Surface:	Dark reddish brown to black moderately decomposed organic material.
Subsurface:	Brown, fine sandy loam. Friable consistency granular structure.
Subsoil:	Olive, fine sandy loam. Friable consistency granular structure.
Substratum:	Bedrock

Inclusions	
Similar:	Peru, Colonel
Dissimilar:	Abram, Bedrock Outcrop

<p>Soil Suitability and Limitations</p> <p>The Tunbridge-Lyman Complex is rated as very limited for the proposed development. Tunbridge-Lyman soils have shallow depths to bedrock. To overcome limitations in this soil type blasting of bedrock may be required. On-site subsurface wastewater systems will require a 24" vertical separation from the bottom of the disposal field to bedrock and a soil sizing factor of 3.3.</p>



Croghan Series (Cr) <i>Sandy, isotic, frigid Aquic Haplorthods</i>	
Setting	
Parent Material:	Glaciofluvial deposits
Landform:	Terraces and sand plains.
Slope Ranges:	8-15% (C)
Depth to Bedrock:	Very Deep (>40")

Water Related Properties	
Drainage Class:	Moderately Well Drained
Hydrologic Soil Group:	C
Hydrologic Conductivity:	High or very high in throughout the mineral soil
Flooding Frequency:	None, flooding is not probable

Typical Profile Description	
Surface:	Dark reddish brown to black moderately decomposed organic material.
Subsurface:	Dark grayish brown to gray, fine sand. Very friable consistency and granular structure.
Subsoil:	Brown, fine sand. Friable consistency and granular to blocky structure.
Substratum:	Pale brown to grayish brown sand. Loose consistency and massive structure.

Inclusions	
Similar:	Waumbek
Dissimilar:	Colonel, Brayton

Soil Suitability and Limitations	
Croghan soils are suitable for the proposed development. On-site subsurface wastewater systems will require a 24" vertical separation from the bottom of the disposal field to bedrock and a soil sizing factor of 2.6.	



Surplus Series (Cr) <i>Coarse-loamy, isotic Aquic Haplocryods</i>	
Setting	
Parent Material:	Basal Glacial Till
Landform:	Mountain side slopes
Slope Ranges:	15-20% (D)
Depth to Bedrock:	Very Deep (>40")

Water Related Properties	
Drainage Class:	Moderately Well Drained to Somewhat Poorly Drained
Hydrologic Soil Group:	D
Hydrologic Conductivity:	Moderately high or high in the organic surface layer and the mineral solum, and low to moderately high in the substratum
Flooding Frequency:	None, flooding is not probable

Typical Profile Description	
Surface:	Dark reddish brown to black moderately decomposed organic material.
Subsurface:	Dark grayish brown to brown, very stony fine sandy loam. Friable consistency and granular structure.
Subsoil:	Yellowish brown very stony fine sandy loam. Friable and moderate thin platy structure.
Substratum:	Light olive brown very stony, sandy loam. Friable consistency and platy structure.

Inclusions	
Similar:	Sisk, Saddleback,
Dissimilar:	Brayton, Waumbek

Soil Suitability and Limitations	
<p>Soils in the Surplus map unit are suitable for the proposed development but have some limitations. These soils have numerous boulders, a large machine excavator will be required. These soils are located at the higher elevations of the proposed development. Steep slopes may require large amounts of fill and earth work to level the grading for development. On-site subsurface wastewater systems will require a 12" vertical separation from the bottom of a disposal field to ground water and a soil sizing factor of 3.3.</p>	



SOIL CONDITIONS SUMMARY TABLE

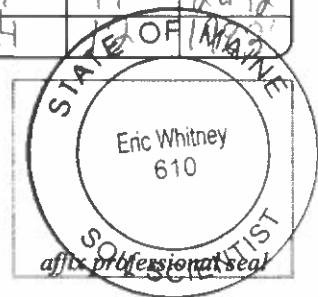
SUMMARY LOG OF SUBSURFACE EXPLORATIONS AT PROJECT SITES

Project Name: BOYNE RESORTS WEST MOUNTAIN EXPANSION Applicant Name: VANASSE HAGEN BRUSTLIN, INC Project Location (municipality): WEST MOUNTAIN RD, SUGARLOAF SKI RESORT

Lot No.	Exploration Symbol (TP 1, B 2, etc.)	if at SSWD Field	Description of subsurface materials by: ● Soil profile/condition (if by S.E.), ● Soil series name (if by C.S.S.), or by ● Geologic unit (if by C.G.)	Depths to (inches):				Ground Surface Slope (%)	Ground Surface Elevation
				Redoximorphic Features	Bedrock	Hydraulically Restrictive Layer	Limit of Exploration		
	TPA-2	<input type="checkbox"/>	Peru	18	—	18	48	8	1725'
	TPA-3	<input type="checkbox"/>	Peru	28	—	28	120	16	1725'
	TPA-4	<input type="checkbox"/>	Peru	18	—	24	48	8	1924'
	TPA-5	<input type="checkbox"/>	Peru	18	—	24	48	25	2000'
	TPA-6	<input type="checkbox"/>	Brayton	7	—	18	48	11	2040'
	TPA-7	<input type="checkbox"/>	Peru	18	—	24	48	12	2070'
	TPA-8	<input type="checkbox"/>	Naskeag	22	—	—	48	15	2143'
	TPA-10	<input type="checkbox"/>	Colonel	8	—	24	40	10	2208'
	TPA-12	<input type="checkbox"/>	Colonel	12	—	24	126	17	1770
	TPA-13	<input type="checkbox"/>	Peru	20	—	38	132	18	1850'
	TPA-14	<input type="checkbox"/>	Colonel	12	—	28	144	20	1898'
	TPB-1	<input type="checkbox"/>	Peru	16	—	22	144	13	1554'
	TPB-2	<input type="checkbox"/>	Croghan	20	—	—	144	11	1585'
	TPB-3	<input type="checkbox"/>	Colonel	12	—	30	144	10	1533'
	TPB-4	<input type="checkbox"/>	Colonel	10	—	12	90	10	1497'
	TPB-5	<input type="checkbox"/>	Colonel	14	—	24	120	8	1475'
	TB-1	<input type="checkbox"/>	Colonel	11	—	24	24	16	2063'
	TB-2	<input type="checkbox"/>	Colonel	12	—	20	20	7	1560
	TPC-1	<input type="checkbox"/>	Colonel	13	—	24	132	16	1782'
	TPC-2	<input type="checkbox"/>	Colonel	12	—	23	120	9	1687'
	TPC-3	<input type="checkbox"/>	Peru	20	—	20	90	8	1737'
	TPC-4	<input type="checkbox"/>	Peru	24	72	24	72	13	2008'
	TPC-5	<input type="checkbox"/>	Colonel	15	—	25	132	20	1686'
	TPC-6	<input type="checkbox"/>	Peru	16	—	24	144	10	1554'
	TPC-7	<input type="checkbox"/>	Brayton	0	—	22	24	3	2070'
	TBA-1	<input type="checkbox"/>	Colonel	8	—	20	24	15	1815'
	TPC-8	<input type="checkbox"/>	Peru	18	—	22	22	18	1890'
	TPD-1	<input type="checkbox"/>	Surplus	18	—	13	60	20	2938'
	TPD-2	<input type="checkbox"/>	Colonel	12	—	27	144	15	2130'
	TBD-1	<input type="checkbox"/>	Peru	18	—	22	22	13	2200'
	TBD-3	<input type="checkbox"/>	Brayton	6	—	22	24	11	2042'
	TBD-5	<input type="checkbox"/>	Colonel	8	—	22	24	—	—

INVESTIGATOR INFORMATION AND SIGNATURE

Signature	<u>Eric Whitney</u>	Date	4/26/2021
Name Printed	ERIC R.T. WHITNEY	Cert/Lic/Reg. #	61055
Qualification	<input type="checkbox"/> Licensed Site Evaluator <input type="checkbox"/> Certified Geologist	<input checked="" type="checkbox"/> Certified Soil Scientist <input type="checkbox"/> Other:	



SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: **BOYNE RESORTS WEST MOUNTAIN EXPANSION** Applicant Name: **VANASSE HAGEN BRUSTLIN, INC** Project Location (municipality): **WEST MOUNTAIN RD, SUGARLOAF SKI RESORT**

Exploration Symbol # TPA-2 Test Pit Boring Probe
3 " Organic horizon thickness Ground surface elev. 1725'
48 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0		Friable	10YR 3/3	None
10	Fine Sandy Loam		7.5 YR 5/6 10YR 6/2	↓
20		Firm	2.5Y 5/3	Common, Distinct
30			5Y 4/2	

Soil Classification: Peru Slope: 8 Limiting Factor: 18 Groundwater Restrictive Layer Bedrock
 Profile: _____ Condition: _____ Percent: _____ Depth: _____
 Soil Series/Phase Name: Peru Hydric Non-hydric Hydrologic: C Soil Group: C

Exploration Symbol # TPA-3 Test Pit Boring Probe
3 " Organic horizon thickness Ground surface elev. 1725'
120 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0		Friable	7.5 YR 3/4	None
10	Fine Sandy Loam		10YR 6/2	↓
20			2.5Y 5/3	
30	Stony Loamy Sand	Firm	5Y 4/3	Common, Distinct

Soil Classification: Peru Slope: 16 Limiting Factor: 28 Groundwater Restrictive Layer Bedrock
 Profile: _____ Condition: _____ Percent: _____ Depth: _____
 Soil Series/Phase Name: Peru Hydric Non-hydric Hydrologic: C Soil Group: C

Exploration Symbol # TPA-4 Test Pit Boring Probe
3 " Organic horizon thickness Ground surface elev. 1924'
48 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0		Friable	7.5 YR 3/4	
10	Fine Sandy Loam		10YR 5/3	
20			2.5Y 5/3	Common, Distinct
30	Fine Sandy Loam with coarse sand lens	Firm	5Y 4/3	Many, Distinct

Soil Classification: Peru Slope: 8 Limiting Factor: 18 Groundwater Restrictive Layer Bedrock
 Profile: _____ Condition: _____ Percent: _____ Depth: _____
 Soil Series/Phase Name: Peru Hydric Non-hydric Hydrologic: C Soil Group: C

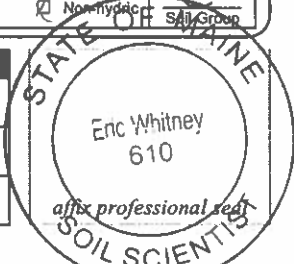
Exploration Symbol # TPA-5 Test Pit Boring Probe
3 " Organic horizon thickness Ground surface elev. 2000'
48 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0		Friable	7.5 YR 3/4	
10	Fine Sandy Loam		10YR 5/3	
20			2.5Y 5/3	Common, Distinct
30	FSL w/ coarse sand	Firm	5Y 4/3	Many, Distinct

Soil Classification: Peru Slope: 25 Limiting Factor: 18 Groundwater Restrictive Layer Bedrock
 Profile: _____ Condition: _____ Percent: _____ Depth: _____
 Soil Series/Phase Name: Peru Hydric Non-hydric Hydrologic: C Soil Group: C

INVESTIGATOR INFORMATION AND SIGNATURE

Signature: Eric Whitney Date: 4/26/2021
 Name Printed: ERIC R.T. WHITNEY Cert/Lic/Reg. #: 619
 Title: Licensed Site Evaluator Certified Soil Scientist Certified Geologist Professional Engineer



SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: BOYNE RESORTS WEST MOUNTAIN EXPANSION Applicant Name: VANASSE HAGEN BRUSTLIN, INC Project Location (municipality): WEST MOUNTAIN RD, SUGARLOAF SKI RESORT

Exploration Symbol # TPA-6 Test Pit Boring Probe
5 " Organic horizon thickness Ground surface elev. 2010'
48 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine Sandy Loam	Friable	10YR 2/1 2.5Y 5/3	None
10				Faint, Few
20		Firm	2.5Y 6/1	Many, Prominent
30				
40				
50				
60				

Soil Details by S.E. Soil Classification: Profile Condition Slope 11 Percent Limiting Factor 7 Depth " Groundwater Restrictive Layer Bedrock S.S. Soil Series/Phase Name: Brayton Hydric Non-hydric Hydrologic Soil Group D

Exploration Symbol # TPA-7 Test Pit Boring Probe
3 " Organic horizon thickness Ground surface elev. 2070'
48 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0		Friable	10YR 3/3	None
10	Fine Sandy Loam		10YR 5/3 2.5Y 5/4	
20			2.5Y 6/1	Common, Faint
30		Firm		
40				
50				
60				

Soil Details by S.E. Soil Classification: Profile Condition Slope 12 Percent Limiting Factor 18 Depth " Groundwater Restrictive Layer Bedrock S.S. Soil Series/Phase Name: Peru Hydric Non-hydric Hydrologic Soil Group C

Exploration Symbol # TPA-8 Test Pit Boring Probe
3 " Organic horizon thickness Ground surface elev. 2143'
48 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Sandy Loam	Friable	10YR 3/3	
10			10YR 4/3	
20				Common, Faint
30				
40	Loamy Sand	Very Friable	5Y 5/2	Ground Water
50				
60				

Soil Details by S.E. Soil Classification: Profile Condition Slope 15 Percent Limiting Factor 22 Depth " Groundwater Restrictive Layer Bedrock S.S. Soil Series/Phase Name: Nas Keag Hydric Non-hydric Hydrologic Soil Group C

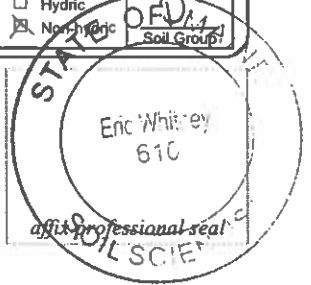
Exploration Symbol # TPA-10 Test Pit Boring Probe
3 " Organic horizon thickness Ground surface elev. 2208'
24 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine Sandy Loam	Friable	10YR 3/3	
10			5Y 5/3	Ground water
20			10YR 5/1	
30				
40				
50				
60				

Soil Details by S.E. Soil Classification: Profile Condition Slope 10 Percent Limiting Factor 8 Depth " Groundwater Restrictive Layer Bedrock S.S. Soil Series/Phase Name: Colanel Hydric Non-hydric Hydrologic Soil Group OFU

INVESTIGATOR INFORMATION AND SIGNATURE

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 Name Printed: ERIC R.T. WHITNEY Cert/Lic/Reg. #: 610
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SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: BOYNE RESORTS WEST MOUNTAIN EXPANSION Applicant Name: VANASSE HAGEN BRUSTLIN, INC Project Location (municipality): WEST MOUNTAIN RD, SUGARLOAF SKI RESORT

Exploration Symbol # TPA-12 Test Pit Boring Probe
4 " Organic horizon thickness Ground surface elev. 1770
126 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine Sandy Loam	Friable	10YR 2/1	None
10			10YR 7/1	
10			7.5 YR 5/3	Few, Distinct
20				
20		Firm	10YR 5/2	Common, Distinct
30				
40				
50			10YR 7/1	
90		Very Firm		
140		Bedrock		

Soil Classification: Colone1 Slope: 17 Percent Limiting Factor: 12 Depth: " Groundwater Restrictive Layer Bedrock
 Profile: Condition: Soil Series/Phase Name: Colone1 Hydric Non-hydric Hydrologic Soil Group: 0

Exploration Symbol # TPA-13 Test Pit Boring Probe
3 " Organic horizon thickness Ground surface elev. 1850
132 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine Sandy Loam	Friable	10YR 2/1 to 7/1	
10			7.5 YR 5/6	
20			7.5 YR 5/3	
20			2.5 Y 5/2	Few, Distinct
30				
40		Firm	2.5 Y 6/1	Many, Prom
50				
90				
140	Boundary FSL	Very Firm		

Soil Classification: Peru Slope: 18 Percent Limiting Factor: 20 Depth: " Groundwater Restrictive Layer Bedrock
 Profile: Condition: Soil Series/Phase Name: Peru Hydric Non-hydric Hydrologic Soil Group: C

Exploration Symbol # TPA-14 Test Pit Boring Probe
3 " Organic horizon thickness Ground surface elev. 1896
144 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine Sandy Loam	Friable	10YR 2/1	
10			7.5 YR 5/6	
10			2.5 Y 5/2	Few, Distinct
20				
20		Firm	2.5 Y 6/1	Many, Prom
30				
40				
50				
90	Boundary FSL	Very Firm		

Soil Classification: Colone1 Slope: 20 Percent Limiting Factor: 12 Depth: " Groundwater Restrictive Layer Bedrock
 Profile: Condition: Soil Series/Phase Name: Colone1 Hydric Non-hydric Hydrologic Soil Group: 0

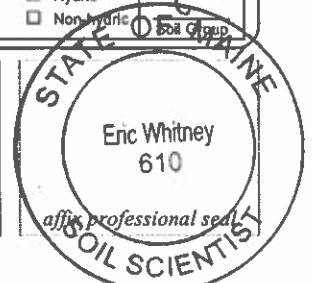
Exploration Symbol # TPB-1 Test Pit Boring Probe
3 " Organic horizon thickness Ground surface elev. 1554
144 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine Sandy Loam	Friable	10YR 3/3	
10			10YR 5/3	
20				Few, Distinct
20		Firm	2.5 Y 5/3	Many, Prom
30				
40				
50				
90				
90	Stony Loamy Sand			Groundwater

Soil Classification: Peru Slope: 13 Percent Limiting Factor: 16 Depth: " Groundwater Restrictive Layer Bedrock
 Profile: Condition: Soil Series/Phase Name: Peru Hydric Non-hydric Hydrologic Soil Group: 0

INVESTIGATOR INFORMATION AND SIGNATURE

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SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: BOYNE RESORTS WEST MOUNTAIN EXPANSION Applicant Name: VANASSE HAGEN BRUSTLIN, INC Project Location (municipality): WEST MOUNTAIN RD, SUGARLOAF SKI RESORT

Exploration Symbol # TPB-2 Test Pit Boring Probe
3 " Organic horizon thickness Ground surface elev. 1585
144 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine Sand	Very Friable	10YR 2/1	
10		Friable	5Y4/3	
20	Loamy Sand		5Y4/1	Many Dis
30			2.5Y5/2	Few, Dis
40				
50				
60				
70	Fine Sandy Loam	Friable		
80				
90				
100				
110				
120				
130				
140				
150				

Soil Classification: Croghan Slope: 11 Percent Limiting Factor: 20 Depth: 20 " Groundwater Restrictive Layer Bedrock
 Profile: Condition: Soil Series/Phase Name: Croghan Hydric Non-hydric Hydrologic Soil Group: B

Exploration Symbol # TPB-3 Test Pit Boring Probe
2 " Organic horizon thickness Ground surface elev. 1533
144 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0		Friable	10YR 3/3	
10	Fine Sandy Loam		10YR 5/3	Few, Distinct
20				
30		Firm	5Y4/2	Common, Prom
40				
50				
60				
70		Very Firm		
80				
90	Loamy Sand	Very Friable		
100				
110				
120				
130				
140				
150				

Soil Classification: Colonel Slope: 10 Percent Limiting Factor: 12 Depth: 12 " Groundwater Restrictive Layer Bedrock
 Profile: Condition: Soil Series/Phase Name: Colonel Hydric Non-hydric Hydrologic Soil Group: D

Exploration Symbol # TPB-4 Test Pit Boring Probe
2 " Organic horizon thickness Ground surface elev. 1497
96 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0		Friable	10YR 3/3	
10	Fine Sandy Loam		7.5YR4/3	Few, Distinct
20			2.5Y5/2	
30		Firm	5Y5/2	Many, Prom
40				
50				
60				
70				
80	Bouldery	Very Firm		
90	Fine Sandy Loam	Firm		
100				
110				
120				
130				
140				
150				

Soil Classification: Colonel Slope: 10 Percent Limiting Factor: 12 Depth: 12 " Groundwater Restrictive Layer Bedrock
 Profile: Condition: Soil Series/Phase Name: Colonel Hydric Non-hydric Hydrologic Soil Group: D

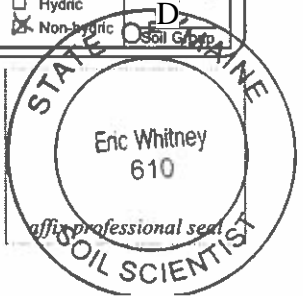
Exploration Symbol # TPB-5 Test Pit Boring Probe
2 " Organic horizon thickness Ground surface elev. 1475
120 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine Sandy Loam	Friable	10YR 3/3	
10			7.5YR 4/3	
20			2.5Y 5/2	Few, Faint
30	Loamy Sand	Firm	5Y4/1	Common, Distinct
40				
50				
60				
70				
80				
90				
100				
110				
120	Sand			
130				
140				
150				

Soil Classification: Colonel Slope: 8 Percent Limiting Factor: 14 Depth: 14 " Groundwater Restrictive Layer Bedrock
 Profile: Condition: Soil Series/Phase Name: Colonel Hydric Non-hydric Hydrologic Soil Group: D₂

INVESTIGATOR INFORMATION AND SIGNATURE

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SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: **BOYNE RESORTS WEST MOUNTAIN EXPANSION** Applicant Name: **VANASSE HAGEN BRUSTLIN, INC** Project Location (municipality): **WEST MOUNTAIN RD, SUGARLOAF SKI RESORT**

Exploration Symbol # TB-1 Test Pit Boring Probe
3 " Organic horizon thickness Ground surface elev. 2063
24 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0		Frable	10YR 3/3	
10	Fine Sandy Loam		5Y 4/3	
20			5Y 4/1	Few Faint
30		Firm		

Soil Classification: Colonel Slope: 16 Percent Limiting Factor: 11 " Depth: 11 " Groundwater Restrictive Layer Bedrock Hydric Non-hydric Hydrologic Soil Group: D

Exploration Symbol # TB-2 Test Pit Boring Probe
1 " Organic horizon thickness Ground surface elev. 1560
20 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0			10YR 3/3	
10	Fine Sandy Loam		10YR 5/3	
20	Stony FSL	Firm	5Y 4/1	Saturation

Soil Classification: Colonel Slope: 7 Percent Limiting Factor: 12 " Depth: 12 " Groundwater Restrictive Layer Bedrock Hydric Non-hydric Hydrologic Soil Group: D

Exploration Symbol # TPC-1 Test Pit Boring Probe
2 " Organic horizon thickness Ground surface elev. 1782
132 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0			10YR 5/3	
10	Fine Sandy Loam			
20		Frable	2.5Y 5/2	Saturation, Few, Distinct
30		Firm		Common, Prom
40				
50			2.5Y 6/1	

Soil Classification: Colonel Slope: 16 Percent Limiting Factor: 13 " Depth: 13 " Groundwater Restrictive Layer Bedrock Hydric Non-hydric Hydrologic Soil Group: D

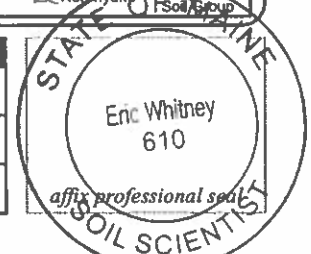
Exploration Symbol # TPC-2 Test Pit Boring Probe
2 " Organic horizon thickness Ground surface elev. 1687
120 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0			10YR 8/1 to 10YR 3/2	
10	Fine Sandy Loam	Frable		
20			2.5Y 6/2	Few, Faint
30		Firm	2.5Y 6/1	Common, Distinct

Soil Classification: Colonel Slope: 9 Percent Limiting Factor: 12 " Depth: 12 " Groundwater Restrictive Layer Bedrock Hydric Non-hydric Hydrologic Soil Group: D

INVESTIGATOR INFORMATION AND SIGNATURE

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SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: BOYNE RESORTS WEST MOUNTAIN EXPANSION Applicant Name: VANASSE HAGEN BRUSTLIN, INC Project Location (municipality): WEST MOUNTAIN RD, SUGARLOAF SKI RESORT

Exploration Symbol # TPC-3 Test Pit Boring Probe
2 " Organic horizon thickness Ground surface elev. 1737
90 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Bouldery	Friable	10YR	
10	Fine Sandy		5Y3	
20	Loam	Firm		Few, Distinct
30				
40				
50			5Y5/2	
60				

Soil Details by S.E. Soil Classification: Peru Slope: 8 Percent Limiting Factor: 20 Depth Groundwater Restrictive Layer Bedrock
 S.S. Soil Series/Phase Name: Peru Hydric Non-hydric Hydrologic Soil Group: C

Exploration Symbol # TPC-4 Test Pit Boring Probe
3 " Organic horizon thickness Ground surface elev. 2008
72 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine Sandy	Friable	10YR 3/3	
10	Loam		5YR 3/4	
20			2.5Y 5/2	
30	Loamy Sand	Firm	5Y 6/2	Faint, Few
40				
50	Fine Sandy Loam			Common, Prominent
60	BEDROCK AT 72"			

Soil Details by S.E. Soil Classification: Peru Slope: 13 Percent Limiting Factor: 24 Depth Groundwater Restrictive Layer Bedrock
 S.S. Soil Series/Phase Name: Peru Hydric Non-hydric Hydrologic Soil Group: C

Exploration Symbol # TPC-5 Test Pit Boring Probe
2 " Organic horizon thickness Ground surface elev. 1676
132 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine Sandy	Friable	10YR 3/3	
10	Loam		7.5YR 5/3	
20			2.5Y 5/2	Saturation Common, Distinct
30		Firm	5Y 5/1	Many, Prominent
40				
50				
60				Standing water

Soil Details by S.E. Soil Classification: Colony Slope: 20 Percent Limiting Factor: 15 Depth Groundwater Restrictive Layer Bedrock
 S.S. Soil Series/Phase Name: Colony Hydric Non-hydric Hydrologic Soil Group: D

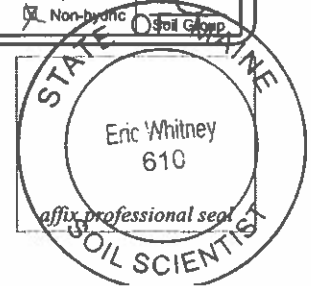
Exploration Symbol # TPC-6 Test Pit Boring Probe
2 " Organic horizon thickness Ground surface elev. 1554
144 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine Sandy	Friable	10YR 3/3	
10	Loam		7.5YR 5/3	
20			2.5Y 5/2	Few, Faint
30		Firm	5Y 5/1	Common, Prominent
40				
50				
60				

Soil Details by S.E. Soil Classification: Peru Slope: 10 Percent Limiting Factor: 16 Depth Groundwater Restrictive Layer Bedrock
 S.S. Soil Series/Phase Name: Peru Hydric Non-hydric Hydrologic Soil Group: C

INVESTIGATOR INFORMATION AND SIGNATURE

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SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: BOYNE RESORTS WEST MOUNTAIN EXPANSION Applicant Name: VANASSE HAGEN BRUSTLIN, INC Project Location (municipality): WEST MOUNTAIN RD, SUGARLOAF SKI RESORT

Exploration Symbol # TPC-7 Test Pit Boring Probe
5 " Organic horizon thickness Ground surface elev. 2070
24 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine	Friable	10YR 2/1	Ground Water
10	Sandy Loam		2.5Y 5/1	
20		Firm		

Soil Classification: Brayton Slope: 3 Limiting Factor: 0 Groundwater Restrictive Layer Bedrock
 Soil Series/Phase Name: Brayton Hydric Non-hydric Hydrologic: D Soil Group: D

Exploration Symbol # TBA-1 Test Pit Boring Probe
2 " Organic horizon thickness Ground surface elev. 1815
24 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine	Friable	10YR 3/3	
10	Sandy Loam		5Y 5/3	Few, Faint
20		Firm	5Y 5/1	Common, Distinct

Soil Classification: Colanel Slope: 15 Limiting Factor: 8 Groundwater Restrictive Layer Bedrock
 Soil Series/Phase Name: Colanel Hydric Non-hydric Hydrologic: D Soil Group: D

Exploration Symbol # TPC-8 Test Pit Boring Probe
3 " Organic horizon thickness Ground surface elev. 1890
22 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine	Friable	10YR 2/1	
10	Sandy Loam		10YR 3/3	
20		Firm	7.5YR 5/6	Few, Distinct
30			2.5Y 5/2	

Soil Classification: Peru Slope: 18 Limiting Factor: 18 Groundwater Restrictive Layer Bedrock
 Soil Series/Phase Name: Peru Hydric Non-hydric Hydrologic: C Soil Group: C

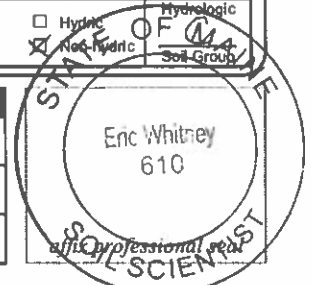
Exploration Symbol # TPD-1 Test Pit Boring Probe
2 " Organic horizon thickness Ground surface elev. 2938
60 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Stony	Friable	7.5YR	
10	Fine Sandy Loam	Firm	3/3	
20	Bouldery Fine Sandy Loam		2.5Y 5/4	Faint, Few
30			2.5Y 5/2	

Soil Classification: Surplus Slope: 20 Limiting Factor: 18 Groundwater Restrictive Layer Bedrock
 Soil Series/Phase Name: Surplus Hydric Non-hydric Hydrologic: OF Soil Group: OF

INVESTIGATOR INFORMATION AND SIGNATURE

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SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: BOYNE RESORTS WEST MOUNTAIN EXPANSION Applicant Name: VANASSE HAGEN BRUSTLIN, INC Project Location (municipality): WEST MOUNTAIN RD, SUGARLOAF SKI RESORT

Exploration Symbol # TPO-2 Test Pit Boring Probe
2 " Organic horizon thickness Ground surface elev. 2130
144 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine	Friable	10YR 3/3	
5	Sandy		3/3	
10	Loam		2.5Y 5/3	Few, Faint
20				Common, Distinct
30		Firm	2.5Y 4/2	

Soil Classification: Colonel Slope: 15 Limiting Factor: 12 Groundwater Restrictive Layer Bedrock
 Profile: Condition: Percent: Depth:
 Soil Series/Phase Name: Hydric Non-hydric Hydrologic Soil Group:

Exploration Symbol # TBD-1 Test Pit Boring Probe
3 " Organic horizon thickness Ground surface elev. 2200
22 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine	Friable	10YR 3/3	
5	Sandy		2.5Y 4/4	
10	Loam			
20	Loamy Sand	Firm	2.5Y 5/2	Few, Distinct

Soil Classification: Perry Slope: 13 Limiting Factor: 18 Groundwater Restrictive Layer Bedrock
 Profile: Condition: Percent: Depth:
 Soil Series/Phase Name: Hydric Non-hydric Hydrologic Soil Group:

Exploration Symbol # TBD-3 Test Pit Boring Probe
2 " Organic horizon thickness Ground surface elev. 2042
24 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine	Friable	10YR 3/3	
5	Sandy		7.5YR 5/1	Saturation
10	Loam		2.5Y 5/2	Few, Distinct
20				
30	Loamy Sand	Firm	2.5Y 5/1	Common, Prominent

Soil Classification: Brayton Slope: 11 Limiting Factor: 6 Groundwater Restrictive Layer Bedrock
 Profile: Condition: Percent: Depth:
 Soil Series/Phase Name: Hydric Non-hydric Hydrologic Soil Group:

Exploration Symbol # TBD-5 Test Pit Boring Probe
3 " Organic horizon thickness Ground surface elev. 1983
24 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine	Friable	10YR 2/1 to 2.5Y 7/1	
5	Sandy		2.5Y 7/1	
10	Loam		2.5Y 5/2	Few, Faint
20				
30		Firm	5Y 5/1	Common, Distinct

Soil Classification: Colonel Slope: 12 Limiting Factor: 8 Groundwater Restrictive Layer Bedrock
 Profile: Condition: Percent: Depth:
 Soil Series/Phase Name: Hydric Non-hydric Hydrologic Soil Group:

INVESTIGATOR INFORMATION AND SIGNATURE

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SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: BOYNE RESORTS WEST MOUNTAIN EXPANSION Applicant Name: VANASSE HAGEN BRUSTLIN, INC Project Location (municipality): WEST MOUNTAIN RD, SUGARLOAF SKI RESORT

Exploration Symbol # TBD-6 Test Pit Boring Probe
2 " Organic horizon thickness Ground surface elev. 1894
24 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine	Friable	10YR 3/3	
10	Sandy Loam		2.5Y 6/3	
20			2.5Y 5/2	Faint, Few
30		Firm		

Soil Details by S.E. Soil Classification: Peru Slope: 13 Percent Limiting Factor: 16 Depth: 16 " Groundwater Restrictive Layer Bedrock
 S.S. Soil Series/Phase Name: Peru Hydric Non-hydric Hydrologic Soil Group: C

Exploration Symbol # TBD-7 Test Pit Boring Probe
3 " Organic horizon thickness Ground surface elev. 1896
22 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine	Friable	10YR 3/3	
10	Sandy Loam		2.5Y 6/3	
20			2.5Y 5/2	Faint, Few
30		Firm		

Soil Details by S.E. Soil Classification: Colonel Slope: 12 Percent Limiting Factor: 13 Depth: 13 " Groundwater Restrictive Layer Bedrock
 S.S. Soil Series/Phase Name: Colonel Hydric Non-hydric Hydrologic Soil Group: D

Exploration Symbol # TBD-8 Test Pit Boring Probe
3 " Organic horizon thickness Ground surface elev. 1798
20 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine	Friable	10YR 3/3	
10	Sandy Loam		7.5YR 5/6	
20			10YR 5/2	Few, Faint
30		Firm		

Soil Details by S.E. Soil Classification: Colonel Slope: 10 Percent Limiting Factor: 13 Depth: 13 " Groundwater Restrictive Layer Bedrock
 S.S. Soil Series/Phase Name: Colonel Hydric Non-hydric Hydrologic Soil Group: D

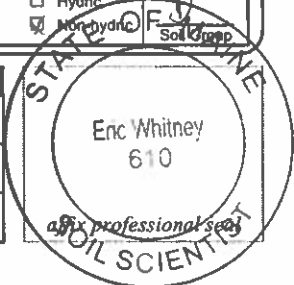
Exploration Symbol # TBD-9 Test Pit Boring Probe
3 " Organic horizon thickness Ground surface elev. 1811
24 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine	Friable	10YR 2/2	
10	Sandy Loam		7.5YR 5/6	
20			10YR 5/3	Few, Faint
30		Firm	2.5Y 5/2	

Soil Details by S.E. Soil Classification: Colonel Slope: 13 Percent Limiting Factor: 12 Depth: 12 " Groundwater Restrictive Layer Bedrock
 S.S. Soil Series/Phase Name: Colonel Hydric Non-hydric Hydrologic Soil Group: F

INVESTIGATOR INFORMATION AND SIGNATURE

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SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: BOYNE RESORTS WEST MOUNTAIN EXPANSION Applicant Name: VANASSE HAGEN BRUSTLIN, INC Project Location (municipality): WEST MOUNTAIN RD, SUGARLOAF SKI RESORT

Exploration Symbol # TBD-10 Test Pit Boring Probe
2 " Organic horizon thickness Ground surface elev. 1814
24 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine	Friable	10YR 3/3	
10	Sandy Loam		7.5YR 5/6	
20			10YR 5/2	Few, faint
30		Firm	2.5Y 5/1	
40				
50				
60				

Soil Details by S.E. Soil Classification: _____ Slope: 17 Limiting Factor: 12 " Groundwater Restrictive Layer Bedrock
 Profile: _____ Condition: _____ Percent: _____ Depth: _____
 S.S. Soil Series/Phase Name: Colonel Hydric Non-hydric Hydrologic: D Soil Group: _____

Exploration Symbol # TBD-11 Test Pit Boring Probe
3 " Organic horizon thickness Ground surface elev. _____
20 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine	Friable	10YR 3/3	
10	Sandy Loam		7.5YR 5/6	
20			2.5Y 5/1	Faint, Few
30		Firm		
40				
50				
60				

Soil Details by S.E. Soil Classification: _____ Slope: 13 Limiting Factor: 12 " Groundwater Restrictive Layer Bedrock
 Profile: _____ Condition: _____ Percent: _____ Depth: _____
 S.S. Soil Series/Phase Name: Colonel Hydric Non-hydric Hydrologic: D Soil Group: _____

Exploration Symbol # TBD-13 Test Pit Boring Probe
1 " Organic horizon thickness Ground surface elev. 1787
32 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine	Friable	10YR 5/3	
10	Sandy Loam		7.5YR 6/3	
20			2.5Y 6/2	Few, faint
30				Common, Distinct
40		Firm		
50				
60				

Soil Details by S.E. Soil Classification: _____ Slope: 10 Limiting Factor: 14 " Groundwater Restrictive Layer Bedrock
 Profile: _____ Condition: _____ Percent: _____ Depth: _____
 S.S. Soil Series/Phase Name: Colonel Hydric Non-hydric Hydrologic: D Soil Group: _____

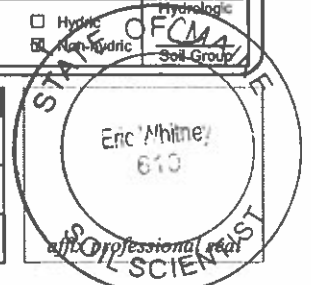
Exploration Symbol # TBD-14 Test Pit Boring Probe
2 " Organic horizon thickness Ground surface elev. 1796
28 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine	Friable	10YR 3/3	
10	Sandy Loam		10YR 4/3	
20			2.5Y 5/2	Few, faint
30		Firm		
40				
50				
60				

Soil Details by S.E. Soil Classification: _____ Slope: 20 Limiting Factor: 17 " Groundwater Restrictive Layer Bedrock
 Profile: _____ Condition: _____ Percent: _____ Depth: _____
 S.S. Soil Series/Phase Name: Peru Hydric Non-hydric Hydrologic: OFCM4 Soil Group: _____

INVESTIGATOR INFORMATION AND SIGNATURE

Signature: Eric R.T. Whitney Date: 4/26/2021
 Name Printed: ERIC R.T. WHITNEY Cert/Lic/Reg. #: 610
 Title: Licensed Site Evaluator Certified Soil Scientist Certified Geologist Professional Engineer



SOIL PROFILE / CLASSIFICATION INFORMATION

DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS AT PROJECT SITES

Project Name: BOYNE RESORTS WEST MOUNTAIN EXPANSION Applicant Name: VANASSE HAGEN BRUSTLIN, INC Project Location (municipality): WEST MOUNTAIN RD, SUGARLOAF SKI RESORT

Exploration Symbol # TBD-15 Test Pit Boring Probe
4 " Organic horizon thickness Ground surface elev. 1796
20 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine	Friable	10YR2/1	
10	Sandy		2.5Y4/3	Faint, few
20	Loam			
30		Firm	2.5Y6/1	Common

Soil Details by S.E. Soil Classification: _____ Slope: 12 Limiting Factor: 7 Groundwater Restrictive Layer Bedrock
 Profile: _____ Condition: _____ Percent: _____ Depth: _____
 S.S. Soil Series/Phase Name: Brayton Hydric Non-hydric Hydrologic: D Soil Group: _____

Exploration Symbol # TBD-16 Test Pit Boring Probe
2 " Organic horizon thickness Ground surface elev. 1779
24 " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0	Fine	Friable	10YR2/1	
10	Sandy		2.5Y4/3	Faint, few
20	Loam			
30		Firm	2.5Y6/1	

Soil Details by S.E. Soil Classification: _____ Slope: 13 Limiting Factor: 6 Groundwater Restrictive Layer Bedrock
 Profile: _____ Condition: _____ Percent: _____ Depth: _____
 S.S. Soil Series/Phase Name: Brayton Hydric Non-hydric Hydrologic: D Soil Group: _____

Exploration Symbol # _____ Test Pit Boring Probe
 _____ " Organic horizon thickness Ground surface elev. _____
 _____ " Depth of exploration or to refusal

Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0				
10				
20				
30				
40				
50				
60				

Soil Details by S.E. Soil Classification: _____ Slope: _____ Limiting Factor: _____ Groundwater Restrictive Layer Bedrock
 Profile: _____ Condition: _____ Percent: _____ Depth: _____
 S.S. Soil Series/Phase Name: _____ Hydric Non-hydric Hydrologic: _____ Soil Group: _____

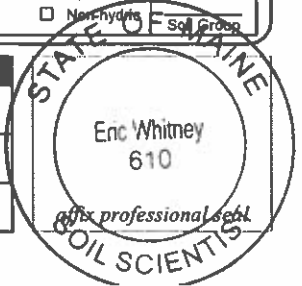
Exploration Symbol # _____ Test Pit Boring Probe
 _____ " Organic horizon thickness Ground surface elev. _____
 _____ " Depth of exploration or to refusal

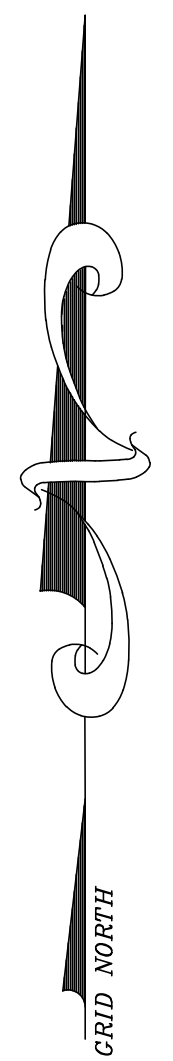
Depth below mineral soil surface (inches)	Texture	Consistency	Color	Redox Features
0				
10				
20				
30				
40				
50				
60				

Soil Details by S.E. Soil Classification: _____ Slope: _____ Limiting Factor: _____ Groundwater Restrictive Layer Bedrock
 Profile: _____ Condition: _____ Percent: _____ Depth: _____
 S.S. Soil Series/Phase Name: _____ Hydric Non-hydric Hydrologic: _____ Soil Group: _____

INVESTIGATOR INFORMATION AND SIGNATURE

Signature: Eric Whitney Date: 4/26/2021
 Name Printed: ERIC R.T. WHITNEY Cert/Lic/Reg. #: 6619
 Title: Licensed Site Evaluator Certified Soil Scientist Certified Geologist Professional Engineer





SLOPE CLASSIFICATION

- A** 0%-3% SLOPES
- B** 3%-8% SLOPES
- C** 8%-15% SLOPES
- D** 15%-20% SLOPES
- E** >20% SLOPES

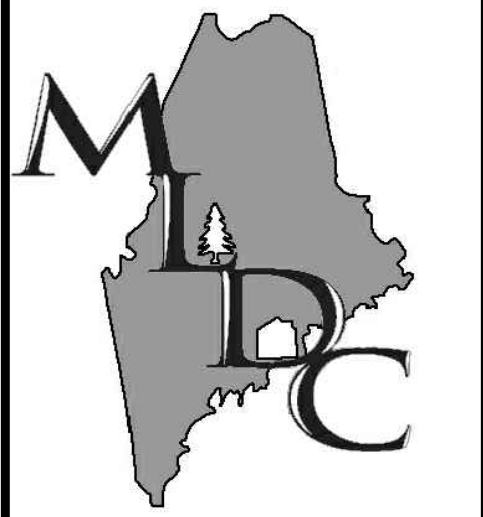
NOTES

1. SEE ASSOCIATED SOILS REPORT TITLED "SUGARLOAF- WEST MOUNTAIN EXPANSION" FOR FURTHER DETAILS.

LEGEND

- LN** LYMAN TUNBRIDGE COMPLEX
- By** BRAYTON SERIES
- Co** COLONEL SERIES
- Pe** PERU SERIES
- Cr** CROGHAN SERIES

- HYDRIC SOILS (WETLAND AREAS)
- SOILS BOUNDARY
- STREAM (CENTERLINE)
- EDGE OF CLASS B SOIL SURVEY
- MAJOR CONTOUR LINE
- MINOR CONTOUR LINE
- SOIL TEST BORING
- SOIL TEST PIT



MAIN-LAND
DEVELOPMENT
CONSULTANTS, INC.

69 MAIN ST. LIVERMORE FALLS, MAINE
367 US ROUTE 1 FALMOUTH, MAINE
PH: (207) 897-6752 FAX: (207) 897-5404
WWW.MAIN-LANDDC.COM

PROJECT
BOYNE RESORTS
WEST MOUNTAIN
EXPANSION

NEAR WEST MOUNTAIN ROAD,
SUGARLOAF SKI RESORT

OWNER OF RECORD
BOYNE RESORTS

5092 ACCESS ROAD,
CARRABASSETT VALLEY, MAINE

MADE FOR
VANASSE HANGEN
BRUSTLIN, INC.

40 IDX DRIVE, BUILDING 100, SUITE
200, SOUTH BURLINGTON, VT

DRAWING SCALE:
200 0 100 200

(IN FEET)
1 INCH = 200 FT

SUBMISSION NOTES:
SUBMISSION 1: 2021-09-13 E.J.H.
REVISION FOR CLIENT REVIEW
SUBMISSION 2: 2021-09-24 E.J.H.
FOR PERMITTING

PROJ. MGR: RWD
DRAWN BY: ERTW & E.J.H.
CHECKED BY: ERTW
SUBMISSION NO. 2
SURVEY DATE: N/A
SUBMISSION DATE: 2021-09-24
SUBMITTED FOR: REVIEW

NOT FOR CONSTRUCTION
CLASS B & C
HIGH INTENSITY
SOIL SURVEY

SEAL:

Eric Whitney
ERIC R.T. WHITNEY S.S. #610

DRAWING NO.
E1.1
MLDC NO. 20-237 1 OF 2

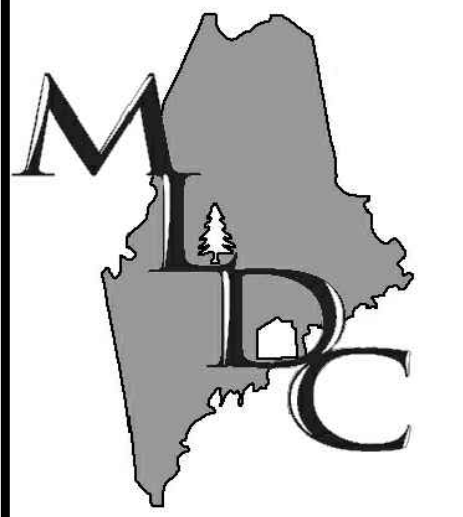
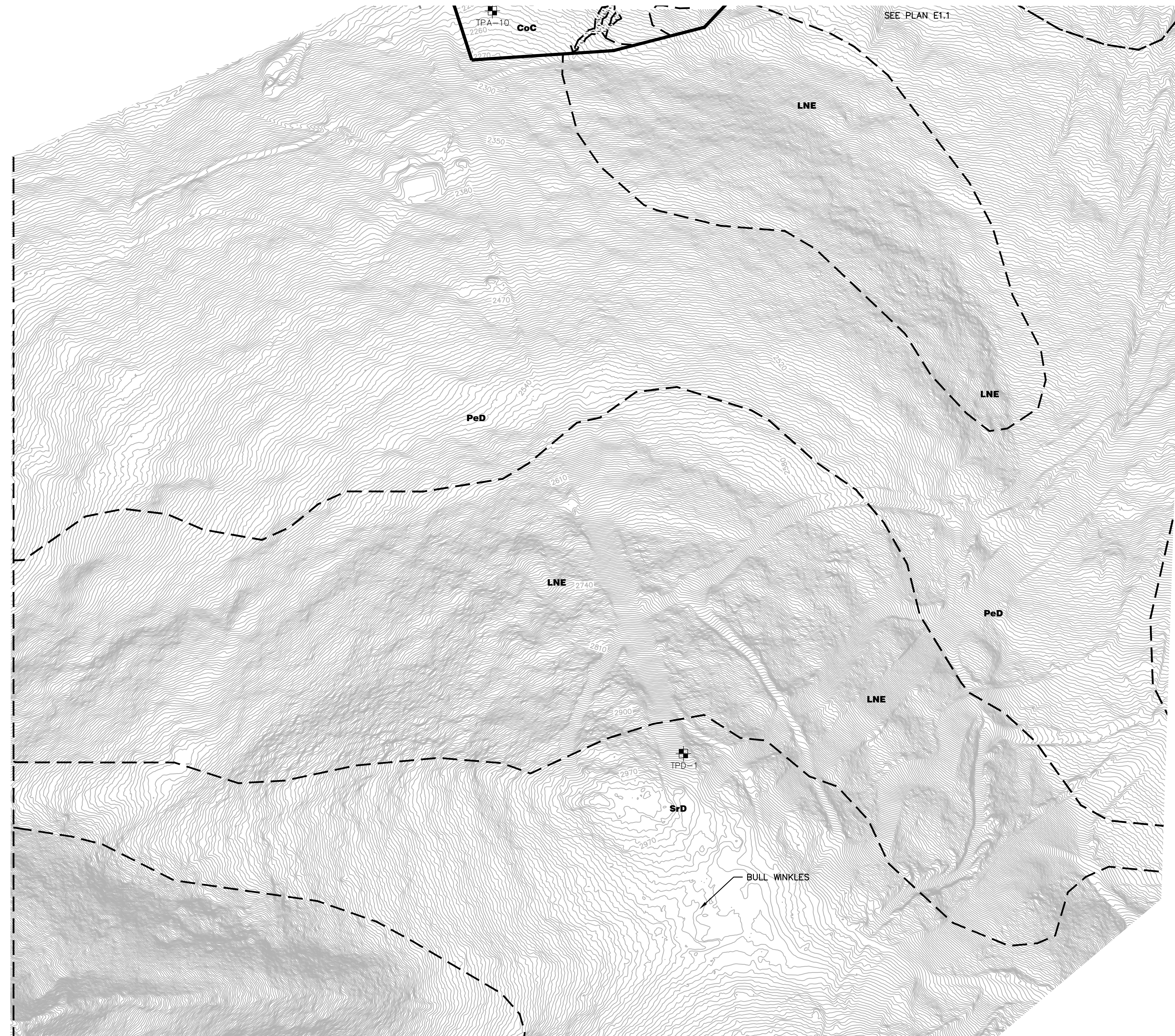


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LEGEND

- LN** LYMAN-TUNBRIDGE
- Sr** SURPLUS SERIES
- Pe** PERU SERIES
- HYDRIC SOILS (WETLAND AREAS)
- SOILS BOUNDARY
- STREAM (CENTERLINE)
- EDGE OF CLASS B SOIL SURVEY
- MAJOR CONTOUR LINE
- MINOR CONTOUR LINE
- SOIL TEST BORING
- SOIL TEST PIT



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PROJECT

**BOYNE RESORTS
WEST MOUNTAIN
EXPANSION**

NEAR WEST MOUNTAIN ROAD,
SUGARLOAF SKI RESORT

OWNER OF RECORD

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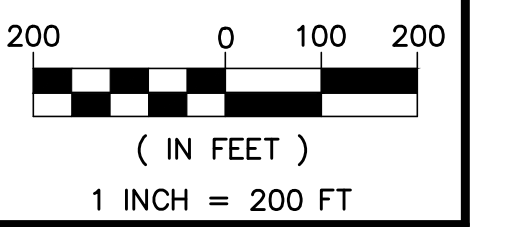
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SUBMISSION NOTES:

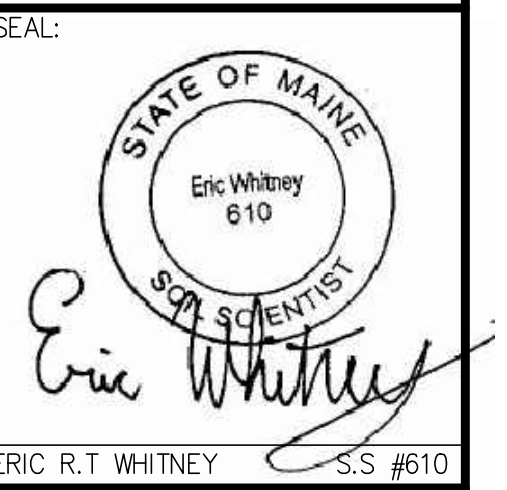
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NOT FOR CONSTRUCTION

**CLASS B & C
HIGH INTENSITY
SOIL SURVEY**



ERIC R.T. WHITNEY S.S. #610

DRAWING NO.

E1.2