

GEODESIGN INCORPORATED Geotechnical Engineers-Environmental Consultants-Construction Engineers										BORING LOG		Boring No.: B-31													
P.O. Box 699 Windsor, VT 05089 Phone: 802-674-2033 Fax: 802-674-5943										Project Name		Page No.: 1 of 1													
1233 Shelburne Rd, Suite 360 South Burlington, VT 05403 Phone: 802-652-5140										Knapp Airport		File No.: 965-03													
Boring Company: Specialty Drilling & Investigation										Berlin, Vermont		Checked By: KEW/AMH													
Foreman: Chris Aldrich		Geodesign Rep.: Dan Howey		Date Started: July 14, 2006		Date Finished: July 14, 2006		N. Coordinate:		E. Coordinate:		Ground Surface Elevation (feet):													
Type: H.S.A.		Sampler: SS		Date		Depth (ft)		Elev. (ft)		Notes		Groundwater Observations													
L.D.: 2.25 in.		I.D.: 1.38 in.		Hammer WL: NA		140 lbs		7/14/06, 0:00		None observed															
Hammer Fall: NA		30 in.		Rig Type: Simco 2800																					
Hammer Type: Safety Hammer																									
Sample Information										Strata Description		Sample Description													
Depth (ft)	Coring Interval (ft)	Number	Type	Penetration (lb/in)	Recovery (lb/in)	Blows / 6 inch Interval	0 - 6	6 - 12	12 - 18	18 - 24	Depth (ft)	Symbol	Classification System: Bernier												
0-3	3	1	SS	10	0.5	19	17	17			0-3	Pavement													
													Base Course Gravel & Sand												
											1-3	3	Subbase Sand (with Silt seam)												
													Dense, Top 5": light gray fine to coarse SAND and fine to coarse GRAVEL, trace Silt Bottom 9": light brown fine to medium SAND, trace Silt, (moist)												
											2	SS	24	17	2	17	30	23	32			4	Glacial Till	Very dense, brown fine to medium SAND, trace fine Gravel, trace Silt, with 3/4" Silt seam, (moist)	
											3	SS	24	16	4	17	14	20	26			5	5	Glacial Till	Dense, brown SILT, little (+) fine to coarse Sand, (moist)
											4	SS	24	17	6	25	26	25	31			5	5	5	Very dense, brown SILT, little (+) fine to coarse Sand, trace fine to coarse Gravel, (moist)
																						6	6	Bottom of Exploration of 8.0 ft	
Remarks																									

GEODESIGN INCORPORATED Geotechnical Engineers-Environmental Consultants-Construction Engineers										BORING LOG		Boring No.: B-32													
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Type: H.S.A.		Sampler: SS		Date		Depth (ft)		Elev. (ft)		Notes		Groundwater Observations													
L.D.: 2.25 in.		I.D.: 1.38 in.		Hammer WL: NA		140 lbs		7/14/06, 0:00		None observed															
Hammer Fall: NA		30 in.		Rig Type: Simco 2800																					
Hammer Type: Safety Hammer																									
Sample Information										Strata Description		Sample Description													
Depth (ft)	Coring Interval (ft)	Number	Type	Penetration (lb/in)	Recovery (lb/in)	Blows / 6 inch Interval	0 - 6	6 - 12	12 - 18	18 - 24	Depth (ft)	Symbol	Classification System: Bernier												
0-3	3	1	SS	10	0.5	20	22	19			0-3	Pavement													
													Base Course Gravel & Sand												
											1-3	3	Subbase Sand (with Silt seam)												
													Dense, Top 6": light gray fine to coarse SAND and fine to coarse GRAVEL, trace Silt Bottom 6": brown fine to medium SAND, little fine Gravel, trace Silt, (moist)												
											2	SS	24	17	2	23	34	41	46			4	4	Glacial Till	Very dense, brown fine to medium SAND, some Silt, trace (-) fine Gravel, with 1/2" thick Silt seam, (moist)
											3	SS	18	8	4	26	48	97				5	5	5	Very dense, brown SILT, some (-) fine to medium Sand, (moist)
																						5	5	5	Bottom of Exploration of 5.5 ft
Remarks																									

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Type: H.S.A.		Sampler: SS		Date		Depth (ft)		Elev. (ft)		Notes		Groundwater Observations													
L.D.: 2.25 in.		I.D.: 1.38 in.		Hammer WL: NA		140 lbs		7/14/06, 0:00		None observed															
Hammer Fall: NA		30 in.		Rig Type: Simco 2800																					
Hammer Type: Safety Hammer																									
Sample Information										Strata Description		Sample Description													
Depth (ft)	Coring Interval (ft)	Number	Type	Penetration (lb/in)	Recovery (lb/in)	Blows / 6 inch Interval	0 - 6	6 - 12	12 - 18	18 - 24	Depth (ft)	Symbol	Classification System: Bernier												
0-3	3	1	SS	10	0.5	19	35	37			0-3	Pavement													
													Base Course Gravel & Sand												
											1-3	3	Subbase Sand												
													Very dense, light brown fine to coarse SAND, some (+) fine to coarse Gravel, trace (-) Silt, (moist)												
											2	SS	24	18	2	28	46	61	64			4	4	Glacial Till	Very dense, light brown fine to medium SAND, trace (+) fine to coarse Gravel, trace Silt, (moist)
											3	SS	24	17	4	27	38	37	40			5	5	5	Very dense, brown SILT and fine Sand, trace fine Gravel, (moist)
											4	SS	24	16	6	41	51	58	55			10	10	10	Very dense, brown SILT, some fine to coarse Sand, little (-) fine to coarse Gravel, (moist), (TILL)
											5	SS	24	15	8	48	50	50	46			10	10	10	Very dense, brown SILT, some fine to coarse Sand, little (-) fine to coarse Gravel, (moist), (TILL)
																						10	10	10	Bottom of Exploration of 10.0 ft
Remarks																									

- Notes:
- Soil Samples screened in the field using a Thermal Environmental Systems Model 580S Photoionization Detector (unless otherwise noted in Remarks). The meter was calibrated relative to a benzene in air standard. N.D. = None Detected; N.R. = Not Recorded; N.A. = Not Applicable; O.R. = Out of Range
 - 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. A.C. = After coring; N.R. = Not Recorded.
 - Sample Type Coding: A = Auger; C = Core; D = Driven; G = Grab; PS = Piston Sample; SS = Split Barrel (Split Spoon); ST = Shelby Tube; V = Vane; WOR/H = Weight of Rod/Hammer
 - Proportions Used: Trace = 1-10%; Little = 10-20%; Some = 20-35%; And = 35-50%
 - Stratification lines represent approximate boundary between material types, transitions may be gradual.
 - Bedrock cores collected at locations c-1, c-2, and c-3 typically consist of gray, soft, moderately weathered phyllite bedrock of very poor to fair quality, the rock was fissile and crumbled with moderate finger pressure. Fractures were typically noted along the effusive planes between approximately 60 and 70 degrees (measures from the horizontal). Rock quality designation (RQD) values ranged between 0 and 55%. The rock type was consistent with mapping data published on the Centennial Geologic Map of Vermont (dott, 1961) and a rock outcrop located approximately 500 feet north of the site (along Airport Road).
 - Bedrock removal for this project can be accomplished using conventional mechanical equipment. Mechanical removal methods can include excavating, ripping, hoe-ramping and spilling. An alternative method of removal is blasting.
 - The effort and difficulty of rock removal will generally increase with the depth once the upper, more weathered rock has been penetrated (estimated up to between 5 and 10 feet deep).
 - Rock Reuse Potential - the type and condition of rock anticipated for removal will be poor aggregate for use in the base course below new pavements.

Hoyle, Tanner & Associates, Inc.

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PROJECT NAME: E. F. KNAPP STATE AIRPORT
A.I.P. 3-50-0001-011-2009
PROJECT NUMBER: BERLIN AIR 04-3216

FILE NAME: z05h378shf.br 1.dgn
PROJECT LEADER: S. FORTNEY
DESIGNED BY: S. BOUCHARD
BORING LOGS B31-B33

PLOT DATE: 11/22/2011
DRAWN BY: D. STANDISH
CHECKED BY: J. DOWNAR
SHEET 165 OF 173