Belleayre Mountain Ski Center UMP-DEIS

Appendix H
ATL Soil Boring Report

January, 2007

Prepared for:

New York State Department of Environmental Conservation
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Albany, New York 12233-5252

Prepared by:

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SUBSURFACE INVESTIGATION
AND
GEOTECHNICAL EVALUATION

PROPOSED MAINTENANCE CENTER
BELLEAYRE MOUNTAIN SKI CENTER
TOWN OF SHANDAKEN, NEW YORK

NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

PREPARED FOR: **NYSDEC**
Bureau of Design and Construction
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Albany, New York 12233

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ATL Report No. CD2653E-01-01-07

January 10, 2007

SUBSURFACE INVESTIGATION
AND
GEOTECHNICAL EVALUATION

PROPOSED MAINTENANCE CENTER
BELLEAYRE MOUNTAIN SKI CENTER
TOWN OF SHANDAKEN, NEW YORK

NEW YORK SATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

Introduction

At the request of Mr. Andrew J. Niles, New York Department of Environmental Conservation (NYSDEC) in accordance with our proposal (ATL File No. CD998-335-09-06, dated September 6, 2006) Atlantic Testing Laboratories, Limited (ATL) performed a subsurface investigation and geotechnical evaluation for the referenced project. The subsurface investigation was performed on December 1 through December 7, 2006.

The purpose of the investigation was to ascertain the subsurface soil and groundwater conditions at the site, to evaluate the engineering significance of these findings, and to provide recommendations related to foundation design and construction.

The proposed maintenance center will be located at the Belleayre Mountain Ski Center on Old School House Road in Pine Hill, New York. The project coordinates are N 42°08'37" latitude and W 74°29'41" longitude. A **Site Location Plan** is included in **Appendix A**. All dimensions and elevations are in units of feet, unless otherwise noted.

Project Description

The proposed project includes the construction of a new maintenance center that will be approximately 75 by 150 feet in planed dimension. The building will be a single story slab-on-grade structure with an assumed finish floor elevation of about 1940.

Subsurface Investigation & Sampling Methodology

The boring locations were selected by the NYSDEC. The borings were staked and the elevations were obtained by representatives of Thew Associates PE/LS, PLLC. A **Boring Location Plan** is included in **Appendix B**.

The borings were advanced utilizing 3¼ inch inside diameter hollow stem augers. Soil sampling and standard penetration testing was performed utilizing a 2-inch outside diameter split spoon sampler in accordance with ASTM D 1586. Soil sampling was performed continuously to a depth of 12 feet below the surface and at 5-foot intervals thereafter. The laboratory classifications and the standard penetration test results are presented on the **Subsurface Investigation Log** included in **Appendix C**.

The soil samples were classified in the laboratory by an engineering technician using the Burmister Soil Classification System. The split spoon sampler does not recover material larger than 1⅜ inch in nominal dimension; therefore, may not be representative of the entire soil matrix.

The boreholes were backfilled with on-site soils upon completion. It is important that the backfilled borings be monitored for settlement or subsidence. This will be the responsibility of the NYSDEC and/or their client. ATL assumes no liability for loss or damage resulting from borehole settlement.

Laboratory Analysis

Selected soil samples were submitted to ATL's geotechnical laboratory for physical analyses. Water Content Determination of Soil (ASTM D 2216) was performed on nine soil samples and the results are tabulated below. Particle Size Distribution Analysis without Hydrometer (ASTM D422) was also performed on nine samples to classify soils in accordance with the Burmister Soil Classification System. Particle size distribution curves are included in **Laboratory Test Results, Appendix D.** Atterberg Limit tests were not performed due to the granular nature of the soils.

Table of Natural Moisture Content

Boring	Sample	Depth (ft)	Natural Moisture Content (%)
B-1	S-2	2-4	7.5
	S-6	10-12	7.0
	S-8	20-21	2.7
B-2	S-2	2-4	6.1
	S-6	10-12	4.9
	S-8	20-20.7	5.3
B-3	S-2	2-3.1	8.9
	S-6	10-12	6.6
	S-8	20-20.7	2.3

Site Surface Conditions

The site of the proposed maintenance building is located off the Ulster & Delaware Turnpike in the south east corner of an open field. An existing 30 by 45 foot concrete slab is located in the northwest corner of the proposed building. The area of the proposed building was generally flat.

Site Subsurface Condition

The following description of subsurface conditions is based on the soils encountered during this subsurface investigation. Actual subsurface conditions may vary across the site in both the horizontal and vertical dimensions. Detailed subsurface descriptions are provided on the Subsurface Investigation Logs.

The borings generally encountered a loose (N values 4 to 10) to medium compact (N values 10 to 30) gravely sand with varying portions of silt, that extended to approximately 2 feet below the surface where the consistency becomes very compact (N values greater than 50) to boring termination depths ranging from 26 to 31 feet.

Groundwater Conditions

Groundwater measurements were performed during the subsurface investigation and the soil samples were classified for coloration and moisture conditions. Based on groundwater measurements and soil moisture content it does not appear that the groundwater table was encountered. Perched water may exist at a high elevation during the wetter periods of the year due to the impervious nature of the very compact in-situ gravelly sand.

Fluctuations in water levels may occur due to seasonal and climatic variations, changes in surface runoff patterns, construction activity, and subsequent development of the site along with other interrelated factors.

Geotechnical Engineering Discussion

The Geotechnical Engineering Discussion is based on information provided by NYSDEC and the subsurface conditions outlined in this report.

The finish floor elevation for the proposed building is 1940. Minor cuts or fills (less than 1.5 feet) will be required to achieve subgrade elevation of 1938.8 (assuming a 6 inch slab-on-grade and 8 inches of engineered structural fill). The subgrade soils must be compacted with a minimum of a 5-ton vibratory roller to densities in excess of 95% of the maximum dry density as determined by ASTM D 1557, or as directed by the geotechnical

engineer. The on-site soil may be utilized as fill provided it is compacted in accordance with recommendation number 14 and 15.

The exterior foundation excavations should be advanced to elevation 1935 or 4.5 feet below final exterior grade. The footing subgrade soils must be compacted to densities in excess of 95% of the maximum dry density as determined by ASTM D 1557, or as directed by the geotechnical engineer.

If the water is encountered the footing subgrade should be undercut 6 inches and replaced with a 6-inch layer of NYSDOT Number 2 crushed stone placed and compacted on the footing subgrade. The number 2, crushed stone must be compacted with vibratory compaction, the compactive effort will be supplied by a minimum of four passes of a dual-drum walk-behind vibratory roller; a Wacker DPU 6055 vibrating plate tamper; or equivalent. The crushed stone will provide a stable work surface and dewatering media.

Foundations founded, at or below elevation 1935, on compacted in situ soil and/or crushed stone may be designed utilizing a safe allowable soil bearing capacity of 6000 psf provided the recommendations presented in this report are followed.

As a minimum, the slab-on-grade should be supported on at least 8 inches of engineered structural fill placed and compacted in accordance with recommendation numbers 14 and 15.

The on-site soils may be utilized as foundation backfill provided organic material is removed. If sufficient on-site material is not available the fill should consist of Granular Fill. All fill must be placed and compacted in accordance with recommendation number 14 and 15.

The contractor should be advised that excavations may encounter water during the wetter periods of the year. If water enters the excavation it should be easily controlled by pumping from sumps installed around the perimeter of the foundation excavation.

The following empirical soil properties may be utilized in the design of foundation walls:

Table of In-Situ Soil Properties

Soil Property	Loose to Medium Compact Gravely Sand	Very Compact Gravely Sand
Angle of Internal Friction (°)	28	30
Active Earth Coefficient (K_a)	0.36	0.33
At Rest Earth Coefficient (K_o)	0.53	0.50
Passive Earth Coefficient (K_p)	2.77	3.00
Wet Unit Weight (pcf)	115-135	125-145
Lateral Sliding Coefficient	0.53	0.58

Geotechnical Engineering Recommendations

The following recommendations are presented as the minimum requirements for the design, planning, and construction of the foundation system.

1. The concepts and geotechnical engineering considerations presented in the preceding sections must be considered in foundation design and construction.

Site Work

2. In planning excavations adjacent to existing structures and utilities, care must be taken to locate them and maintain their stability. Foundation systems should be designed to minimize disturbance to existing structures and utilities.

3. The concrete slab must be removed. The subgrade must be compacted to 95% of the maximum dry density, as determined by ASTM D 1557, or as directed by the geotechnical engineer prior to placing fill, to achieve the final subgrade elevation beneath the slab-on-grade.

4. It will be the contractor's responsibility to maintain adequate water control at all times. Project specifications should clearly indicate that standing water and/or saturated, unstable soil conditions will not be tolerated in areas to receive the foundations or utilities. The project specifications should state that the contractor will not be reimbursed for extras related to the control of water.

5. Site surface grading should be designed to convey surface drainage away from the structures.

6. The contractor must follow excavation safety practices as mandated by 29 CFR Part 1926 (OSHA) and by applicable state regulations.

Foundations and Footings

7. The footings, founded on compacted in-situ soil and/or NYSDOT Number 2 crushed stone at or below elevation 1935, may be designed using a safe allowable soil bearing capacity of 6000 psf, provided the recommendations presented in this report are followed.

8. The footings should be constructed a minimum of 4.5 feet below finish grade to provide adequate frost protection.

Slabs-On-Grade

9. A minimum of 8 inches of Engineered Structural Fill conforming to recommendation number 13 should be placed to support the concrete slab-on-

grade. All material should be placed and compacted in accordance with recommendations numbers 14 and 15.

10. Site surface grading should be designed to convey surface drainage away from the structure.

Seismic

11. The maximum considered earthquake spectral response acceleration for short periods, S_{MS}, is 29.1 and at 1-second period, S_{M1}, is 14.3 as determined from the International Building Code, 2000. These values have been corrected to Site Classification C. Seismic exposure should be considered in the design of the structure.

Backfill and Compaction

12. **Granular Fill** should consist of a clean, screened, crushed, or bank-run gravel conforming to the following gradation:

Sieve Size	Percent Passing
4"	100
¼	35-65
#200	0 - 10

13. **Engineered Structural Fill** should consist of a screened, crushed gravel or crushed ledge rock conforming to the following gradation:

Sieve Size	Percent Passing
3"	100
1"	80 - 95
½"	45 - 75
#4	30 - 60
#40	10 - 40
#200	0 - 7

14. All fill and backfill should be placed and compacted in lifts not exceeding eight inches in loose thickness, at a moisture content of ± 2% of the Optimum Moisture Content, and to densities in excess of 95%, as determined by ASTM D1557.

15. Compaction should be performed with vibratory rollers unless there is concern for damage to adjacent structures or underground utilities.

Testing and Inspection

16. Foundation installations should be continuously observed by an experienced Geotechnical Engineer familiar with the subsurface conditions and analysis described in this report. The engineer will be required to assess any unusual conditions, ensure that adequate bearing capacities and proper foundation installation requirements are achieved.

17. All backfilling, placement of fill, compaction of in-situ soils, and concrete construction must be inspected by an Independent Testing Laboratory, which conforms to ASTM E-329, "The Standard Practice for use in the Evaluation of Testing and Inspection Agencies as Used in Construction". It should be the Independent Testing Laboratory's responsibility to monitor construction practices to determine if they are in accordance with the project documents.

18. The final foundation plans and project specifications should be reviewed by our office to ensure that there has not been a misinterpretation of this report.

Summary

The subsurface investigation logs and this report in its entirety should be provided to the contractors for information and interpretation. The subsurface investigation logs and test data are not represented as a complete description of the site subsurface condition, but only what was found at the individual test locations at the time the investigation was made. The subsurface and groundwater conditions may be different from those described on the subsurface investigation logs.

This report was prepared to present the findings of our subsurface investigation and geotechnical engineering evaluation, and to outline concepts to be utilized in foundation design and construction. These concepts may require alterations to meet the specific design and economic considerations for this project.

Prepared by:

Timothy J. Gavin
Engineer

Reviewed by:

Spencer F. Thew, P.E./L.S.
Principal

TJG/SFT/tjg

APPENDIX A

SITE LOCATION PLAN

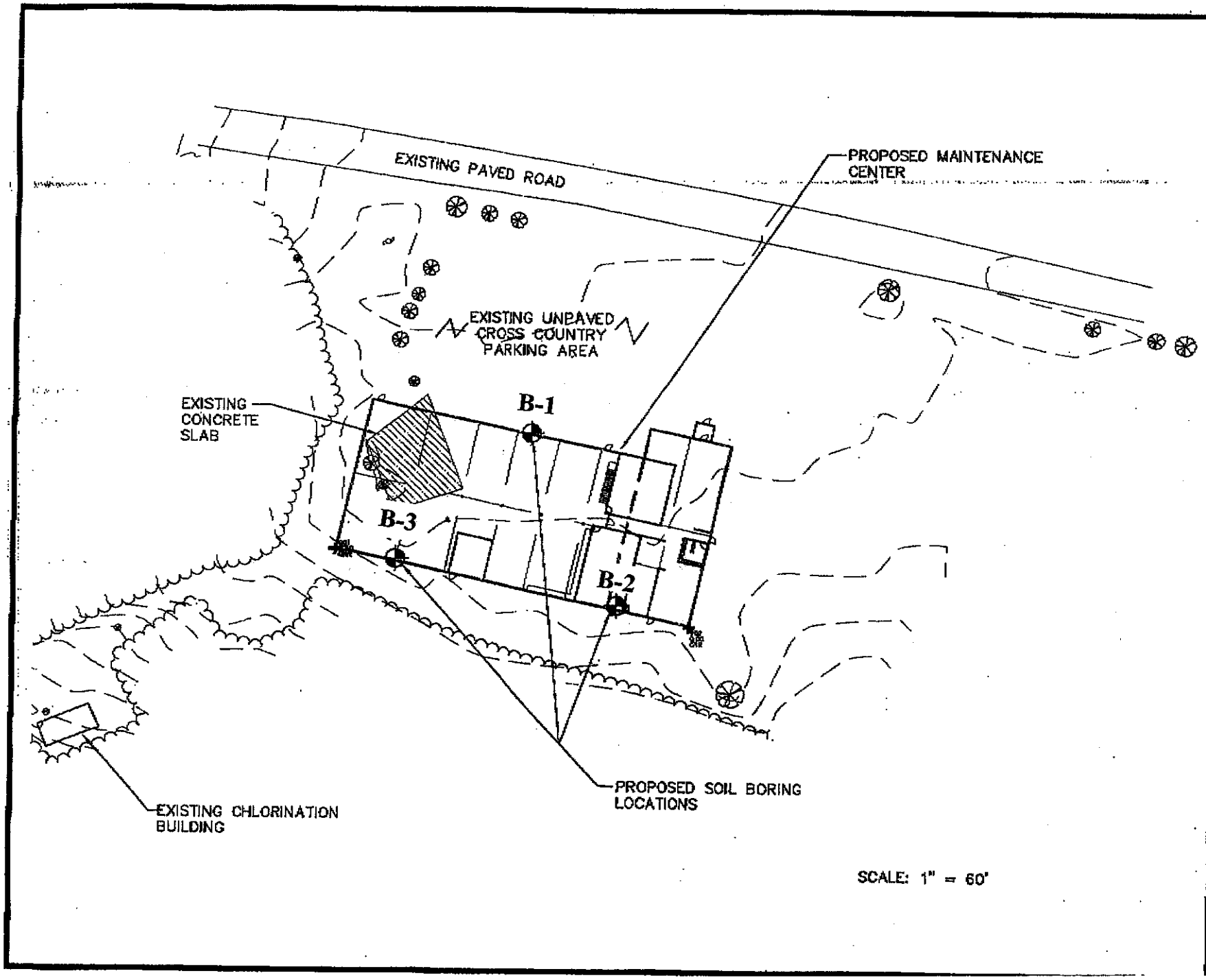
MN (13.3° W)

0 800 1600 2400 3200 4000 ft

Data Zoom 13-0

APPENDIX B

BORING LOCATION PLAN



STATE OF NEW YORK
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF OPERATIONS
BUREAU OF DESIGN & CONSTRUCTION

REVISIONS

PROJECT DESCRIPTION
BELLEAYRE MTN.
MAINTENANCE CENTER

SOIL BORING LOCATION PLAN

CONTRACT NO.	0073
PROJECT NO.	61585
DATE	AUG., 2006
SCALE	AS NOTED
DRAWING NO.	2

APPENDIX C

SUBSURFACE INVESTIGATION LOGS

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: CD2653E-01-12-06

Client: NYS DEC

Boring Location: See Boring Location Plan

Project: Subsurface Investigation
Proposed Maintenance Center
Shandaken, New York

Start Date: 12/1/2006 Finish Date: 12/4/2006

Boring No.: B-1 Sheet 1 of 2

Groundwater Observations

Date	Time	Depth	Casing
12/1/2006	PM	DRY	10.0'
12/4/2006	PM	DRY	30.0'
12/4/2006	PM	16.9'	TOW @ 17'
12/7/2006	AM	DRY	TOW @ 17'

Casing Hammer
Weight: _____ lbs.
Fall: _____ in.

Sampler Hammer
Weight: 140 lbs.
Fall: 30 in.

Ground Elev.: 1939.7

Boring Advance By: 3 1/4" Auger

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL (f - fine, m - medium, c - coarse; and - 35-50%, some - 20-35%, little - 10-20%, trace - 0-10%)	Recovery (Inches)
1	AUGER	1	0.0	2.0	SS	8 10 13 14	2.0	Brown cmf SAND; and cmf GRAVEL; little SILT (moist, non-plastic)	15
2		2	2.0	4.0	SS	18 20 35 32		Brown cmf+ SAND; some SILT; little f GRAVEL (moist, non-plastic) w=7.5%	10
4		3	4.0	6.0	SS	21 23 28 45		Similar Soil	14
6		4	6.0	8.0	SS	18 21 23 27		Brown mf SAND; some cmf GRAVEL; little SILT (moist, non-plastic)	13
8		5	8.0	10.0	SS	21 29 37 47		Brown cmf SAND; some cmf GRAVEL; little SILT (moist, non-plastic)	10
10		6	10.0	12.0	SS	40 38 46 52		Brown cmf SAND; little f GRAVEL; little SILT (moist, non-plastic) w=7.0%	13
14								Cobbles encountered from 14.5 to 23.0 feet.	
15		7	15.0	15.8	SS	32 100/3"		Brown cmf SAND; some cmf GRAVEL; little SILT (moist, non-plastic)	7
20		8	20.0	21.0	SS	94 103		Brown cmf GRAVEL; some cmf SAND; little SILT (moist, non-plastic) w=2.7%	9
25									

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: Neil Kenny; Paul McAloon

Inspector: _____

ATL-LOG1 CD2653.GPJ ATL-WELL.GDT 1/10/07

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: B-1 Report No.: CD2653E-01-12-06 Sheet 2 of 2

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL	RECOVERY (inches)
								f - fine; m - medium; c - course; and - 35-50%; some - 20-35%; little - 10-20%; trace - 0-10%	
26		9	25.0	27.0	SS	20 23 24 31		▼ Brown cmf SAND; some mf GRAVEL; little SILT (wet, non-plastic)	14
27									
28									
29									
30									
31		10	30.0	31.0	SS	84 109	31.0	Brown cmf SAND; and cmf GRAVEL; little SILT (wet, non-plastic)	7
32								Boring terminated at 31 feet.	
33									
34								Note:	
35								1. A temporary observation well was installed to a depth of 17 feet.	
36									
37									
38									
39									
40									
41									
42									
43									
44									
45									
46									
47									
48									
49									
50									
51									
52									
53									
54									
55									
56									
57									
58									
59									
60									
61									
62									

ATL-LOG1 CD2653.GPJ ATL-WELL.GDT 1/10/07

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: CD2653E-01-12-06

Client: NYS DEC

Boring Location: See Boring Location Plan

Project: Subsurface Investigation
Proposed Maintenance Center
Shandaken, New York

Start Date: 12/4/2006 Finish Date: 12/5/2006

Boring No.: B-2 Sheet 1 of 2

Groundwater Observations

Date	Time	Depth	Casing
12/4/2006	PM	DRY	15.0'
12/5/2006	PM	DRY	29.0'
12/5/2006	PM	DRY	OUT
12/6/2006	AM	DRY	OUT

Casing Hammer
Weight: _____ lbs.
Fall: _____ in.

Sampler Hammer
Weight: 140 lbs.
Fall: 30 in.

Ground Elev.: 1938.8

Boring Advance By: 3 1/4" Auger

Borehole caved at 14.0 feet.

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL (f - fine, m - medium, c - coarse; and - 35-50%, some - 20-35%, little - 10-20%, trace - 0-10%)	Recovery (Inches)
1	AUGER	1	0.0	2.0	SS	3 4 3 10	2.0	Brown cmf SAND; little f GRAVEL; little SILT; trace ORGANIC MATERIAL (roots) (wet, non-plastic)	9
3		2	2.0	4.0	SS	30 40 36 41		Brown cmf+ SAND; some mf GRAVEL; some SILT (moist, non-plastic)	14
5		3	4.0	6.0	SS	15 19 39 37		Brown cmf SAND; some cmf GRAVEL; little SILT (moist, non-plastic) w=6.1%	10
7		4	6.0	7.0	SS	56 101		Similar Soil	9
9		5	8.0	10.0	SS	31 53 29 28		Brown cmf SAND; and cmf GRAVEL; little SILT (moist, non-plastic)	10
11		6	10.0	12.0	SS	44 30 27 36		Brown cmf GRAVEL; and cmf+ SAND; little SILT (moist, non-plastic) w=4.9%	12
17		7	15.0	17.0	SS	61 31 29 33		Brown cmf SAND; some SILT; little mf GRAVEL (moist, non-plastic)	13
21		8	20.0	20.7	SS	67 100/2"		Brown cmf+ SAND; and f GRAVEL; little SILT (moist, non-plastic) w=5.3%	6

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: Neil Kenny; Paul McAloon

Inspector: _____

ATL-LOG1 CD2653.GPJ ATL-WELL.GDT 1/10/07

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: B-2 Report No.: CD2653E-01-12-06 Sheet 2 of 2

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL (f - fine, m - medium, c - course; and - 35-50%, some - 20-35%, little - 10-20%, trace - 0-10%)	RECOVERY (inches)
		9	25.0	27.0	SS	71 62 30 55		Brown cmf SAND; little mf GRAVEL; little SILT (moist, non-plastic)	13
26									
27								Cobbles and boulders encountered from 26.5 to 29.0 feet.	
28									
29		10	29.0	29.5	SS	109	29.0 29.5	Reddish-Brown SILT; some mf SAND; little mf GRAVEL (moist, non-plastic)	3
30								Boring terminated at 29.5 feet.	
31									
32								Note:	
33								1. Borehole backfilled with on-site soils.	
34									
35									
36									
37									
38									
39									
40									
41									
42									
43									
44									
45									
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60									
61									
62									

ATL-LOG1 CD2653.GPJ ATL-WELL.GDT 1/10/07

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Report No.: CD2653E-01-12-06

Client: NYS DEC

Boring Location: See Boring Location Plan

Project: Subsurface Investigation
Proposed Maintenance Center
Shandaken, New York

Start Date: 12/5/2006 Finish Date: 12/6/2006

Boring No.: B-3 Sheet 1 of 2

Groundwater Observations

Date	Time	Depth	Casing
12/5/2006	PM	DRY	25.0'
12/6/2006	AM	24.8'	25.0'
12/6/2006	AM	DRY	OUT

Casing Hammer Weight: _____ lbs. Fall: _____ in.

Sampler Hammer Weight: 140 lbs. Fall: 30 in.

Ground Elev.: 1937.3

Boring Advance By: 3 1/4" Auger

Borehole caved at 13.0 feet.

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL (f - fine, m - medium, c - coarse; and - 35-50%, some - 20-35%, little - 10-20%, trace - 0-10%)	Recovery (Inches)
0	AUGER	1	0.0	2.0	SS	2 2 4 7		Brown cmf SAND; some SILT; some mf GRAVEL; trace CLAY (wet, non-plastic)	15
2							2.0		
2		2	2.0	3.1	SS	17 49 100/1"		Brown cmf+ SAND; and SILT; little f GRAVEL (moist, non-plastic) w=8.9%	8
4		3	4.0	6.0	SS	9 24 34 31	4.5		10
5								Brown cmf SAND; and mf GRAVEL; little SILT (moist, non-plastic)	
6		4	6.0	8.0	SS	27 32 32 30		Brown cmf SAND; some mf GRAVEL; little SILT (moist, non-plastic)	13
8		5	8.0	10.0	SS	19 33 40 31		Similar Soil	9
10		6	10.0	12.0	SS	21 34 28 36		Brown cmf+ SAND; some SILT; little f GRAVEL (moist, non-plastic) w=6.6%	11
15		7	15.0	16.3	SS	18 43 100/3"		Brown cmf GRAVEL; and cmf SAND; little SILT (moist, non-plastic)	9
								Cobbles and boulders from 14.5 to 17.5 feet.	
20		8	20.0	20.7	SS	62 100/2"		Greyish-Brown cmf GRAVEL; some cmf SAND; little SILT (moist, non-plastic) w=2.3%	6
25									

SS Split Spoon Sample
NX Rock Core
SH Undisturbed Sample (Shelby Tube)
Estimated Groundwater

Drillers: Neil Kenny; Paul McAloon

Inspector: _____

ATL-LOG1 CD2653.GPJ ATL-WELL.GDT 1/10/07

ATLANTIC TESTING LABORATORIES, Limited

Subsurface Investigation

Boring No.: B-3 Report No.: CD2653E-01-12-06 Sheet 2 of 2

DEPTH	METHOD OF ADVANCE	SAMPLE NO.	DEPTH OF SAMPLE From	DEPTH OF SAMPLE To	SAMPLE TYPE	BLOWS ON SAMPLER PER 6" 2" O.D. SAMPLER	DEPTH OF CHANGE	CLASSIFICATION OF MATERIAL (f - fine, m - medium, c - course; and - 35-50%, some - 20-35%, little - 10-20%, trace - 0-10%)	RECOVERY (inches)
		9	25.0	26.0	SS	78 102	26.0	Several Pieces of ROCK	3
26								Boring terminated at 26 feet.	
27									
28								Note:	
29								1. Borehole backfilled with on-site soils.	
30									
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									
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58									
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60									
61									
62									

ATL-LOG1 CD2653.GPJ ATL-WELL.GDT 1/10/07

APPENDIX D

LABORATORY TEST RESULTS

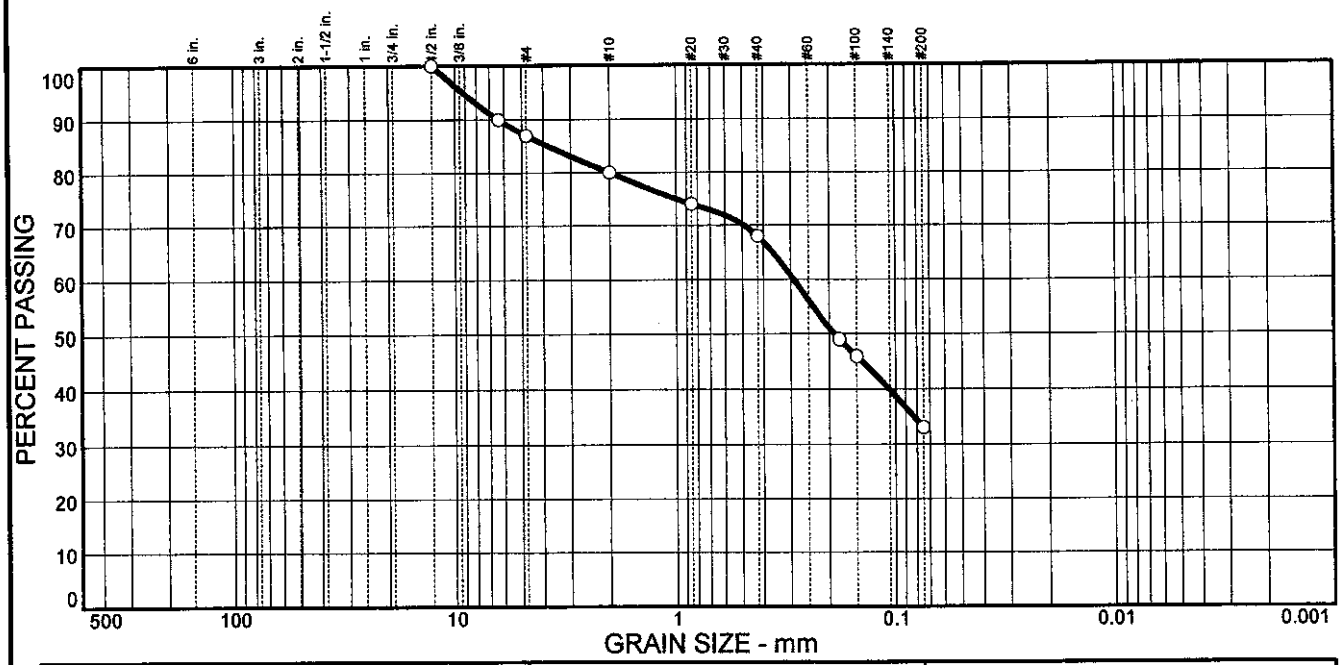
Particle Size Distribution Report

Project: Maintenance Building **Report No.:** CD2653SL-01-12-06

Client: NYS DEC **Date:** 12/20/06

Sample No: B-1, S2 **Source of Sample:** Borings

Location: Belleayre MT. Ski Center, Shandaken, NY **Elev./Depth:** 2.0 - 4.0'



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0	0	13	7	12	35	33	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1/2 in.	100		
1/4 in.	90		
#4	87		
#10	80		
#20	74		
#40	68		
#80	49		
#100	46		
#200	33		

Soil Description

Brown cmf+ SAND; some SILT; little f GRAVEL

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 3.79 D_{60}= 0.292 D_{50}= 0.190

D_{30}= D_{15}= D_{10}=

C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Natural moisture= 7.5%

* (no specification provided)

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 12/21/06

Particle Size Distribution Report

Project: Maintenance Building

Report No.: CD2653SL-01-12-06

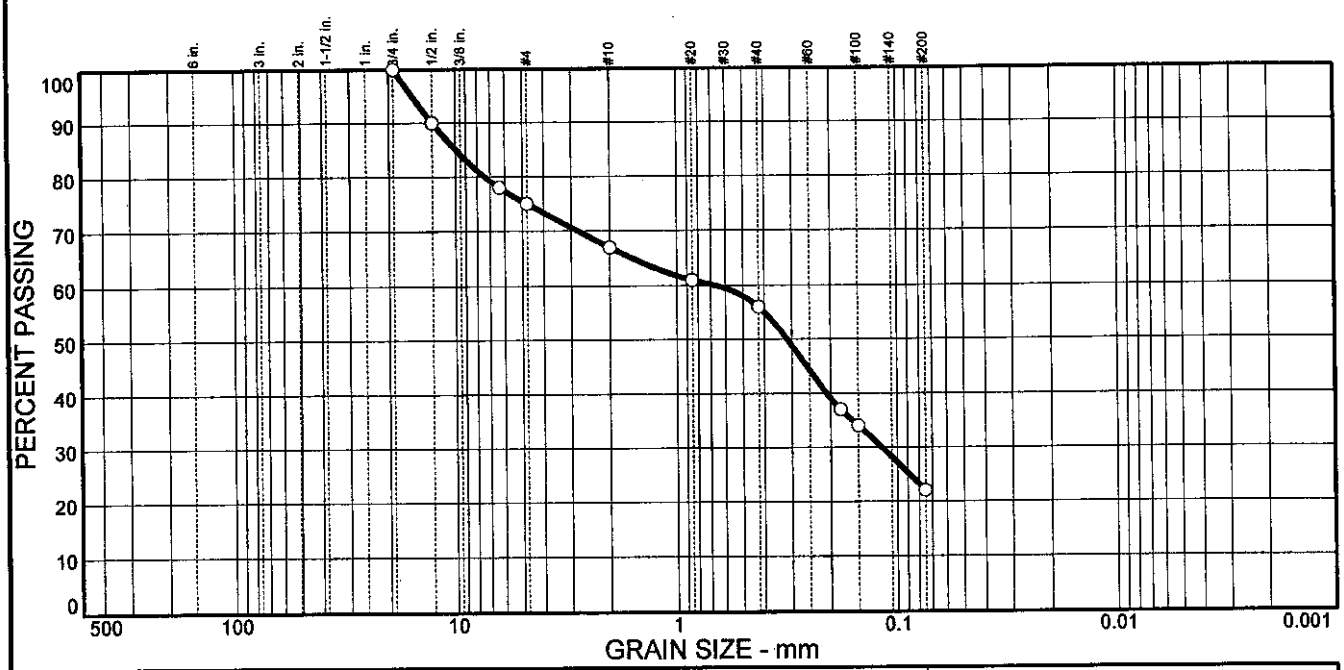
Client: NYS DEC

Date: 12/20/06

Sample No: B-1, S6 **Source of Sample:** Borings

Location: Belleayre Mt. Ski Center, Shandaken, NY

Elev./Depth: 10.0 - 12.0'



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0	0	25	8	11	34	22	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
3/4 in.	100		
1/2 in.	90		
1/4 in.	78		
#4	75		
#10	67		
#20	61		
#40	56		
#80	37		
#100	34		
#200	22		

Soil Description

Brown cmf SAND; little f GRAVEL; little SILT

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 9.99 D_{60}= 0.669 D_{50}= 0.316

D_{30}= 0.118 D_{15}= D_{10}=

C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Natural moisture= 7.0%

* (no specification provided)

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 12/21/06

Particle Size Distribution Report

Project: Maintenance Building

Report No.: CD2653SL-01-12-06

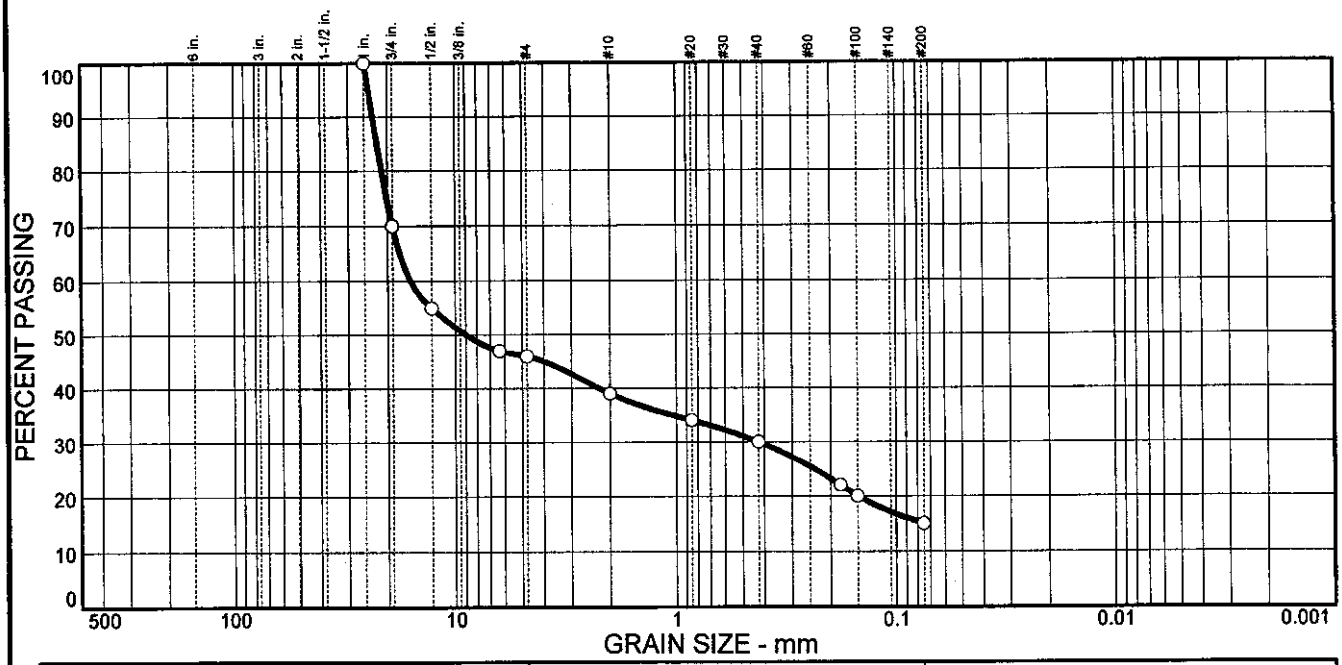
Client: NYS DEC

Date: 12/20/06

Sample No: B-1, S8 **Source of Sample:** Borings

Location: Belleayre Mt. Ski Center, Shandaken, NY

Elev./Depth: 20.0 - 21.0'



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0	30	24	7	9	15	15	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1 in.	100		
3/4 in.	70		
1/2 in.	55		
1/4 in.	47		
#4	46		
#10	39		
#20	34		
#40	30		
#80	22		
#100	20		
#200	15		

* (no specification provided)

Soil Description

Brown cmf GRAVEL; some cmf SAND; little SILT

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 22.3 D_{60}= 15.8 D_{50}= 8.97

D_{30}= 0.425 D_{15}= 0.0750 D_{10}=

C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Natural moisture= 2.7%

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 12/21/06

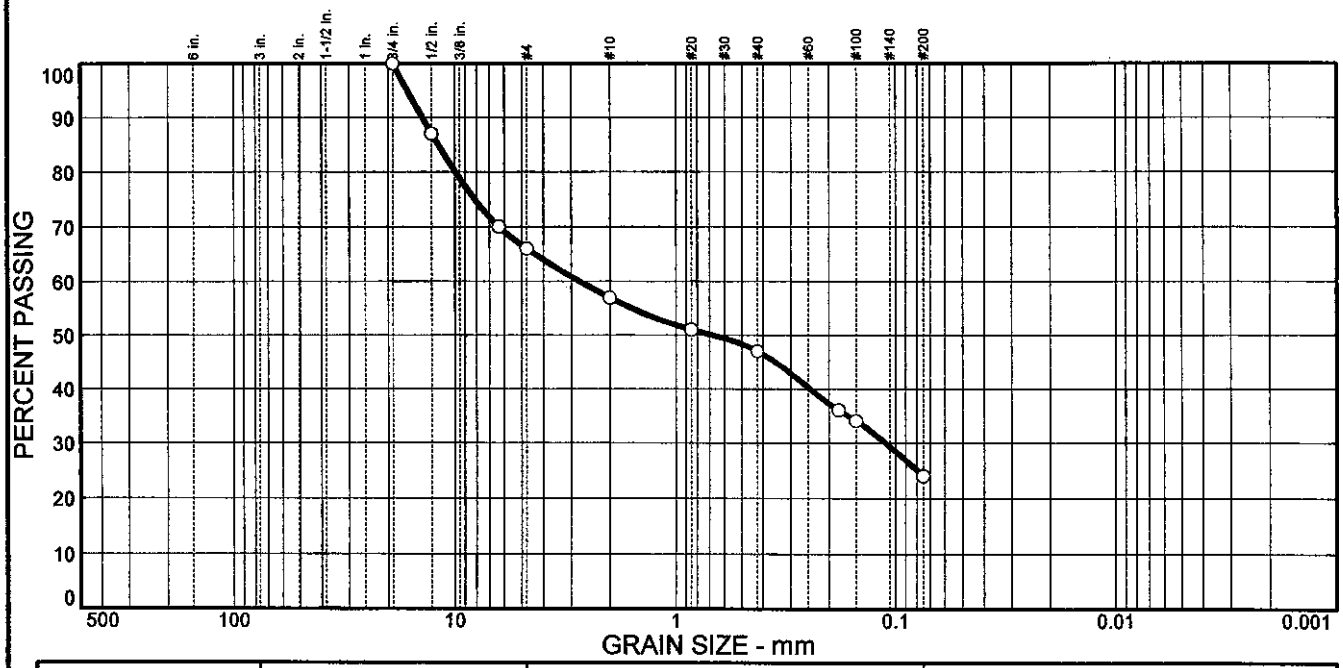
Particle Size Distribution Report

Project: Maintenance Building **Report No.:** CD2653SL-01-12-06

Client: NYS DEC **Date:** 12/20/06

Sample No: B-2, S2 **Source of Sample:** Borings

Location: Belleayre Mt. Ski Center, Shandaken, NY **Elev./Depth:** 2.0 - 4.0'



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0	0	34	9	10	23	24	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
3/4 in.	100		
1/2 in.	87		
1/4 in.	70		
#4	66		
#10	57		
#20	51		
#40	47		
#80	36		
#100	34		
#200	24		

Soil Description

Brown cmf+ SAND; some mf GRAVEL; some SILT

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 11.9 D_{60}= 2.75 D_{50}= 0.683

D_{30}= 0.110 D_{15}= D_{10}=

C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Natural moisture= 6.1%

* (no specification provided)

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 1/8/06

Particle Size Distribution Report

Project: Maintenance Building

Report No.: CD2653SL-01-12-06

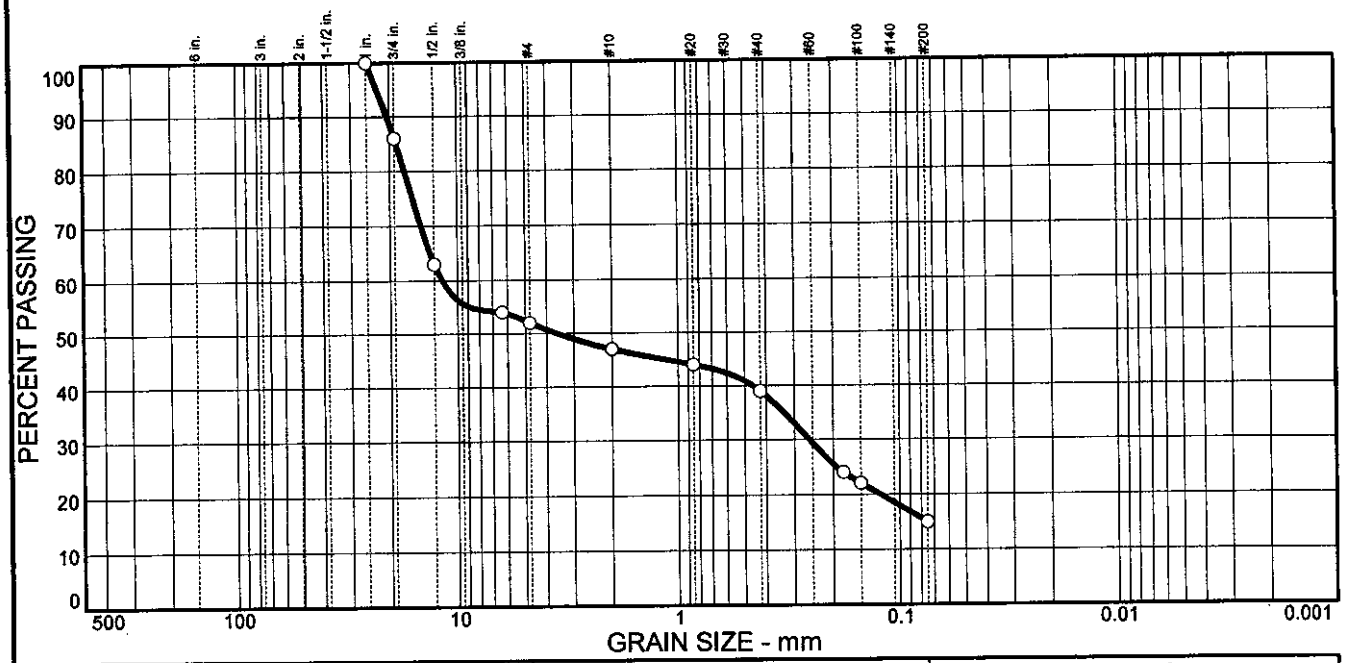
Client: NYS DEC

Date: 12/20/06

Sample No: B-2, S6 **Source of Sample:** Borings

Location: Belleayre Mt. Ski Center, Shandaken, NY

Elev./Depth: 10.0 - 12.0'



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0	14	34	5	8	24	15	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1 in.	100		
3/4 in.	86		
1/2 in.	63		
1/4 in.	54		
#4	52		
#10	47		
#20	44		
#40	39		
#80	24		
#100	22		
#200	15		

Soil Description

Brown cmf GRAVEL; and cmf+ SAND; little SILT

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 18.7 D_{60}= 11.7 D_{50}= 3.59

D_{30}= 0.258 D_{15}= 0.0750 D_{10}=

C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Natural moisture= 4.9%

* (no specification provided)

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 12/21/06

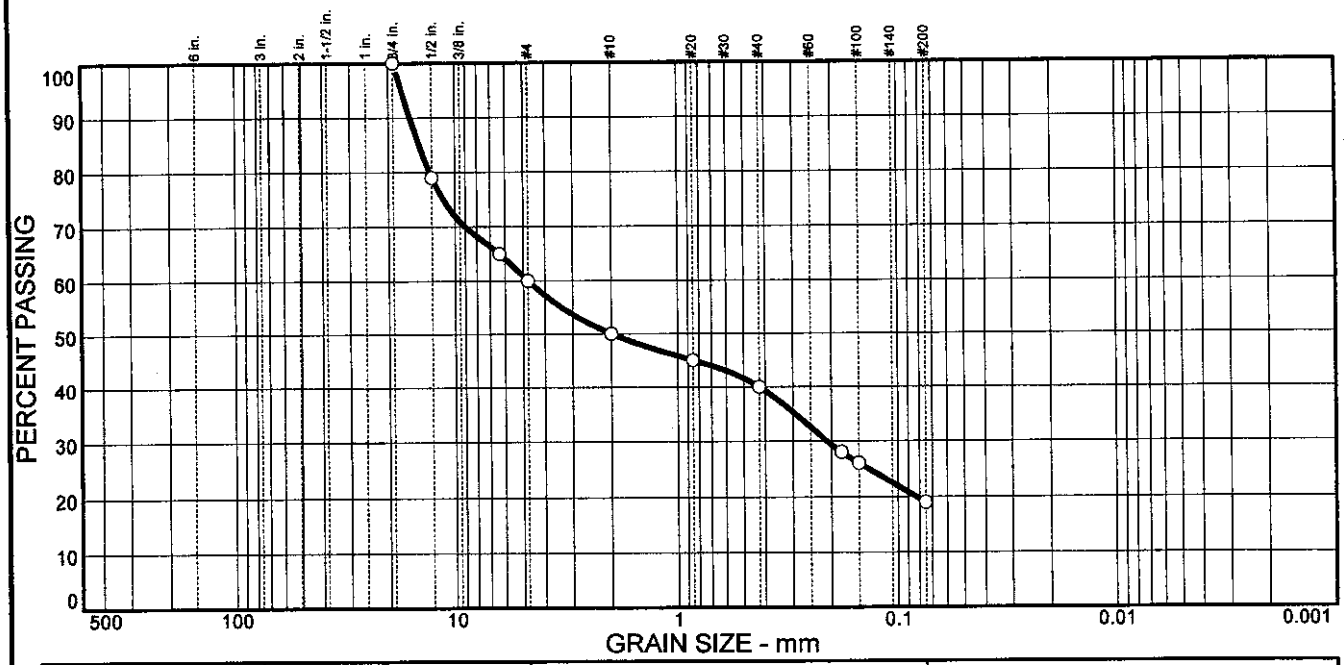
Particle Size Distribution Report

Project: Maintenance Building **Report No.:** CD2653SL-01-12-06

Client: NYS DEC **Date:** 12/20/06

Sample No: B-2, S8 **Source of Sample:** Borings

Location: Belleayre Mt. Ski Center, Shandaken, NY **Elev./Depth:** 20.0 - 20'8"



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0	0	40	10	10	21	19	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
3/4 in.	100		
1/2 in.	79		
1/4 in.	65		
#4	60		
#10	50		
#20	45		
#40	40		
#80	28		
#100	26		
#200	19		

Soil Description

Brown cmf+ SAND; and f GRAVEL; little SILT

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 14.5 D_{60}= 4.75 D_{50}= 2.00

D_{30}= 0.210 D_{15}= D_{10}=

C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Natural moisture= 5.3%

* (no specification provided)

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 12/21/06

Particle Size Distribution Report

Project: Maintenance Building

Report No.: CD2653SL-01-12-06

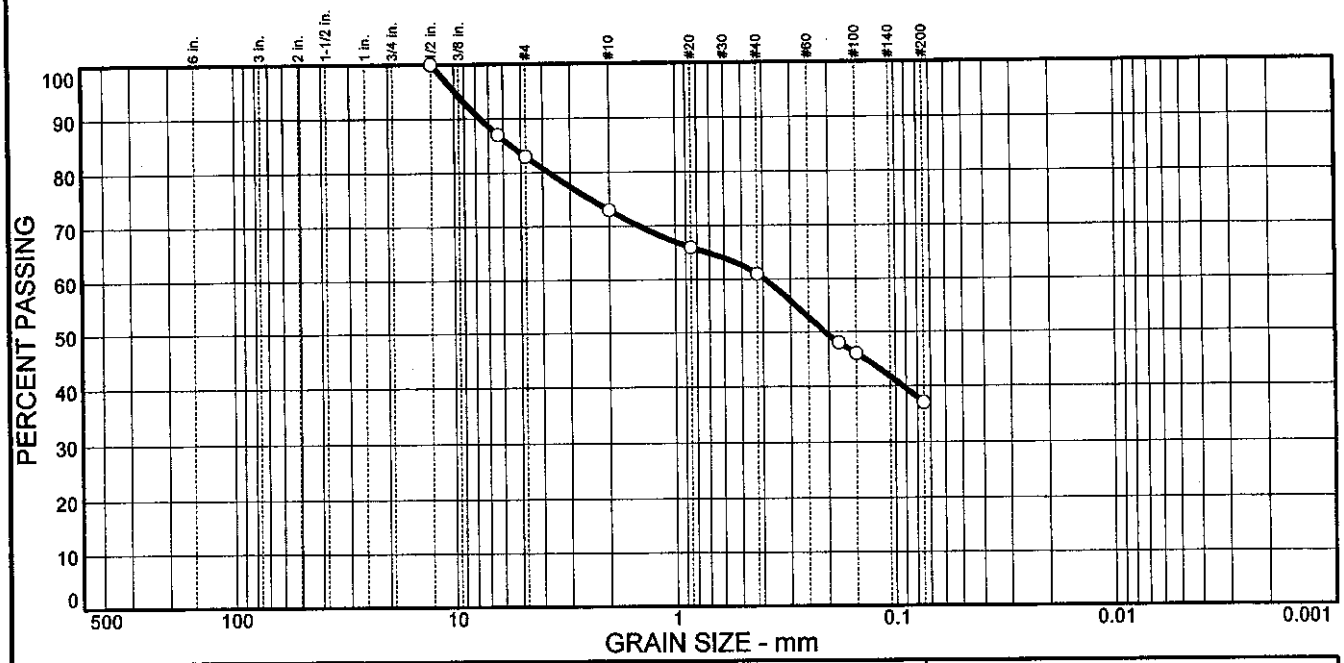
Client: NYS DEC

Date: 12/20/06

Sample No: B-3, S2 **Source of Sample:** Borings

Location: Belleayre Mt. Ski Center, Shandaken, NY

Elev./Depth: 2.0 - 3'1"



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0	0	17	10	12	24	37	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1/2 in.	100		
1/4 in.	87		
#4	83		
#10	73		
#20	66		
#40	61		
#80	48		
#100	46		
#200	37		

Soil Description

Brown cmf+ SAND; and SILT; little f GRAVEL

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 5.53 D_{60}= 0.393 D_{50}= 0.209

D_{30}= D_{15}= D_{10}=

C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Natural moisture= 8.9%

* (no specification provided)

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 12/21/06

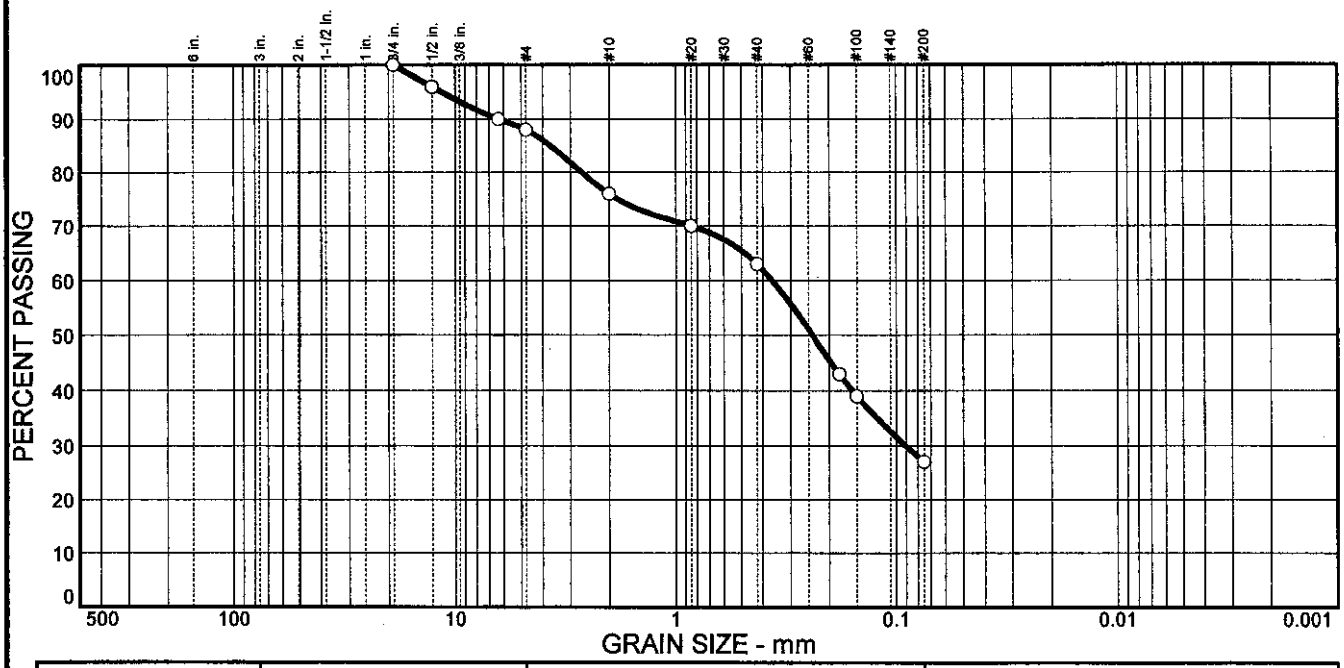
Particle Size Distribution Report

Project: Maintenance Building **Report No.:** CD2653SL-01-12-06

Client: NYS DEC **Date:** 12/20/06

Sample No: B-3, S6 **Source of Sample:** Borings

Location: Belleayre Mt. Ski Center, Shandaken, NY **Elev./Depth:** 10.0 - 12.0'



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0	0	12	12	13	36	27	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
3/4 in.	100		
1/2 in.	96		
1/4 in.	90		
#4	88		
#10	76		
#20	70		
#40	63		
#80	43		
#100	39		
#200	27		

Soil Description

Brown cmf+ SAND; some SILT; little f GRAVEL

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 3.69 D_{60}= 0.364 D_{50}= 0.239

D_{30}= 0.0907 D_{15}= D_{10}=

C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Natural moisture= 6.6%

* (no specification provided)

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 12/21/06

Particle Size Distribution Report

Project: Maintenance Building

Report No.: CD2653SL-01-12-06

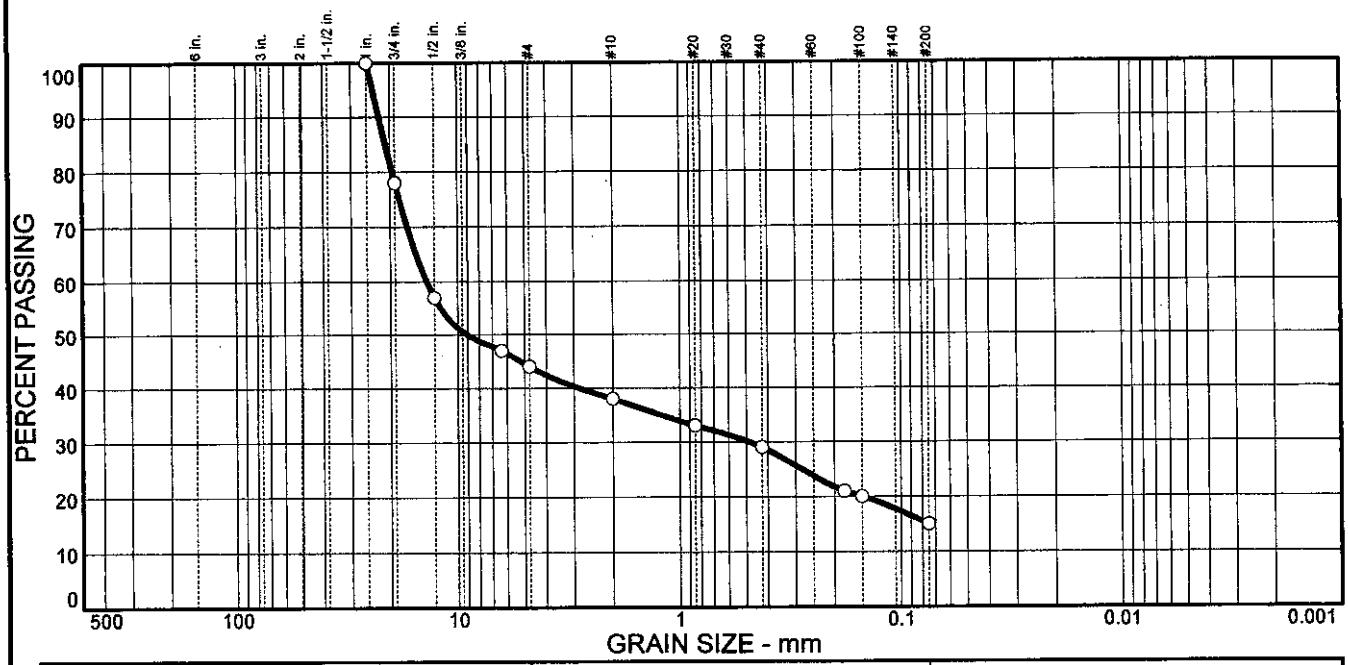
Client: NYS DEC

Date: 12/20/06

Sample No: B-3, S8 **Source of Sample:** Borings

Location: Belleayre Mt. Ski Center, Shandaken, NY

Elev./Depth: 20.0 - 20'8"



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0	22	34	6	9	14	15	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
1 in.	100		
3/4 in.	78		
1/2 in.	57		
1/4 in.	47		
#4	44		
#10	38		
#20	33		
#40	29		
#80	21		
#100	20		
#200	15		

Soil Description

Gray/Brown cmf GRAVEL; some cmf SAND; little SILT

Atterberg Limits

PL= -- LL= -- PI= --

Coefficients

D_{85}= 21.0 D_{60}= 13.8 D_{50}= 9.11

D_{30}= 0.486 D_{15}= 0.0750 D_{10}=

C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Natural moisture= 2.3%

* (no specification provided)

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 12/21/06