

David Garrett & Associates

Engineering and Geology



January 26, 2011

Permit No.	Date	Document ID No.
41-17	January 26, 2011	12795

Mr. Ming Chou, PE
NC DENR Solid Waste Section
1646 Mail Service Center
Raleigh, NC 27699-1646

RECEIVED
January 26, 2011 via an e-mail
Solid Waste Section
Raleigh Central Office

RE: Subgrade Inspection Follow Up
A-1 Sandrock, Inc. CDLF Phase 1B PTO
Guilford County, NC (Permit #41-17)

Dear Mr. Chou:

On behalf of A-1 Sandrock, I am pleased to present the following information, pursuant to your comments sent via e-mail on January 18, 2011. Your concern pertains to verification of the soil types in the base grades for Phase 1B. In a subsequent telephone conversation, we discussed the prospects of my forthcoming submittal of follow up information – this document – taken from the original site studies conducted ca. 2002, which show the consistency and continuity of the soil in and around Phase 1B. Said documentation is considered (by me) to be sufficient for demonstrating that the upper two feet soil subgrade within Phase 1B, which is entirely within a cut section, meets the soil-type requirements of Rule 15A NCAC 13B.0540(2)(b), which stipulates the soil types SC, SM, ML, CL, MH or CH.

Please find attached a table summary showing the soil types based on original laboratory data, correlated to the relative subgrade elevations at various test borings. Based on the lab data, the soils expected to be found at subgrade were classified as silty sand (SM) mixed with slightly clayey and sandy silt (ML). Please also find attached a map showing the boring locations, original ground surface and approved subgrade contours, along with copies of the relevant test borings to demonstrate the continuity of these soil types.

Please contact me if you have questions or require further clarification.

Sincerely,

G. David Garrett, P.G., P.E.
Consulting Engineer

cc: Ronnie Petty – A-1 Sandrock, Inc.

Summary of Laboratory Testing and Test Borings
A-1 Sandrock CDLF Phase 1B Subgrade Evaluation
NC Solid Waste Permit #41-17

Test Boring	Sample No.	Sample Elev.	Subgrade Elev. ¹	USCS Classification
B-11	S3	786.5	788	SM
B-21	S4	789	781	SM-ML
B-22	B3 ²	773	776	SM
B-23	--	--	766 ³	Silty sand (visual)
B-26	--	--	781.5	Silty sand (visual)

¹Approved grades from 2006 PTC, rounded to the nearest half-foot

²Bulk sample collected surface to 20 feet

³Subgrade left 2 feet higher than approved in this area

Please refer to following laboratory data and test boring records

**Table 2
Geotechnical Laboratory Data**

Sample Types: S = Split spoon sample
B = Bulk sample
U = Undisturbed (Shelby tube)

Grain Size Distribution and Soil Classification

Boring Number	Sample Number	Sample Depth, ft.	% >3" >75 mm	% Gravel	% Sand	% Silt	% Clay	Liquid Limit	Plasticity Limit	Plasticity Index	USCS Class.	Natural Moisture	% Passing #200 Sieve	Hydrogeologic Description****
				75 mm>	4.5 mm>	0.075 mm>	0.005 mm>							
				> #4	#4 - #200	#200 >						%		
B-13	B1	0.0 - 50.0	0	3.0	68.0	21.0	8.0	NP	NP	NP	SM-ML	5.1	29.0	Gray-Brown Silty Fine to Med SAND
B-21	B2	0.0 -20.0	0	0.0	87.5	6.5	6.0	23	18	5	SM		12.5	Tan Silty Coarse to Fine SAND
B-22	B3	0.0 - 20.0	0	0.0	75.7	19.3	5.0	NP	NP	NP	SM	2.3	24.3	Gray Silty Fine to Medium SAND
B-11	S1	3.5 - 5.0	0	0.0	10.1	58.9	31.0	49	28	21	CL-ML	38.3	89.9	Orange Silty CLAY
B-11	S3	13.5 - 15.0	0	6.5	68.0	24.0	8.0	NP	NP	NP	SM	10.7	32.0	Gray-Tan Silty Fine to Medium SAND
B-12	S2	8.5 - 10.0	0	0.0	86.4	9.6	4.0	NP	NP	NP	SM	4.5	13.6	White-Brown Silty F - C SAND
B-19	S3	13.5 - 15.0	0	0.0	83.4	16.6	0.0	NP	NP	NP	SM		16.6	Silty Fine to Medium SAND
B-21	S1	3.5 - 5.0	0	0.0	39.5	43.5	17.0	33	24	9	SM-ML		60.5	Tan Fine Sandy SILT
B-21	S2	8.5 - 10.0	0	0.0	40.7	41.3	18.0	41	28	13	SM-ML		59.3	Fine Sandy SILT
B-21	S3	13.5 - 15.0	0	0.0	55.8	38.2	6.0	28	23	5	SM-ML		44.2	Silty Fine SAND
B-21	S4	18.5 - 20.0	0	0.0	54.0	38.0	8.0	NP	NP	NP	SM-ML		46.0	Silty Fine SAND

Notes to Above:

Moisture Contents are Dry Unit Weight Based

Moisture data for bulk samples acquired from individual jar samples collected with the bulk sample. Samples were oven-dried. These data are considered representative of in-situ moisture conditions for earth work considerations.

Samples tested by Geotechnologies, Inc., Raleigh, NC

**Table 2 - Continued
Geotechnical Laboratory Data**

Compaction Data Bulk Samples

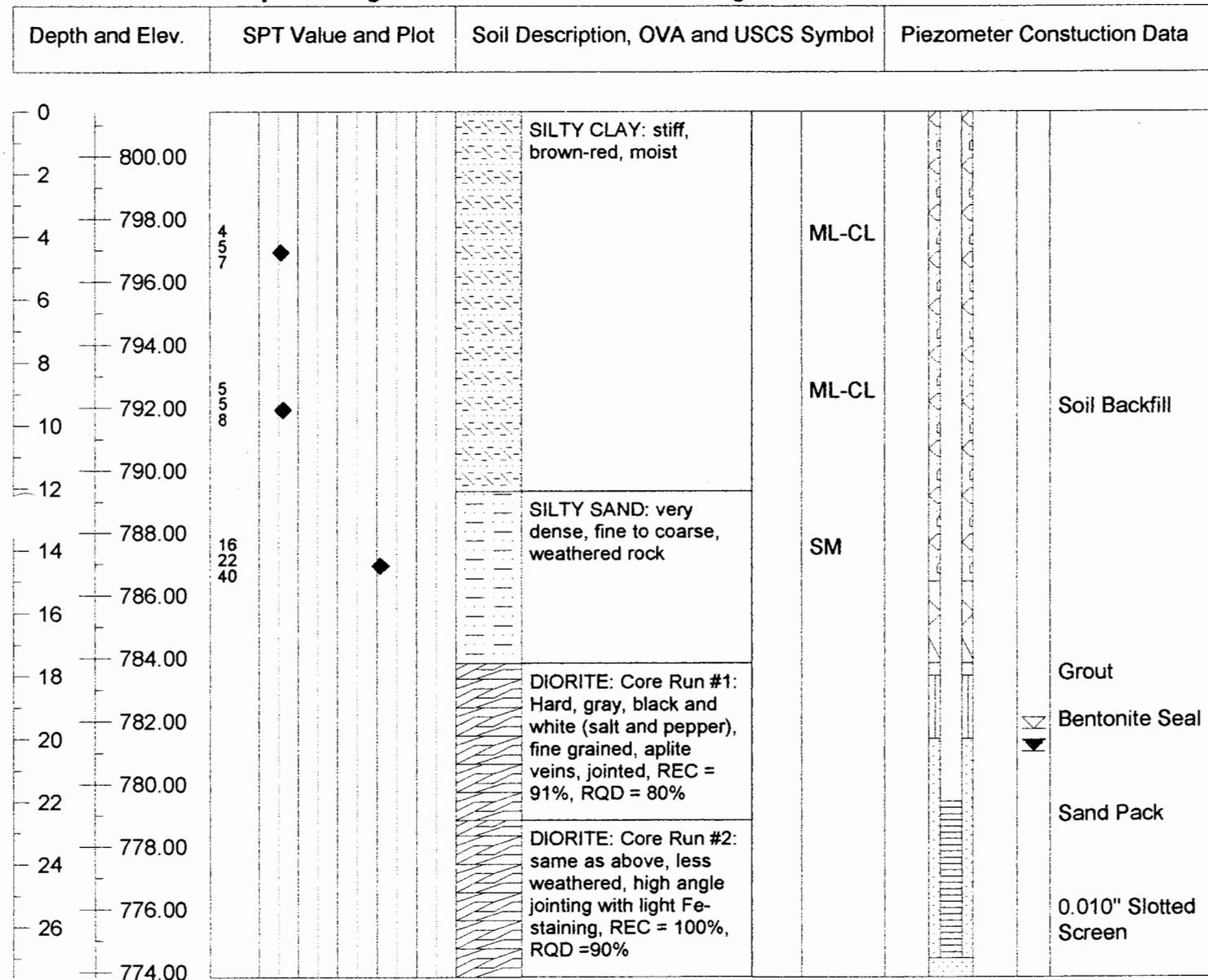
Boring Number	Sample Number	Sample Depth, ft.	Max. Dry Density, pcf	Optimum Moisture, %
B-13	B1	0.0-50.0	125.5	12.0%
B-21	B2	0.0-50.0	128.7	9.8%
B-22	B3	0.0-20.0	127.8	11.1%

Hydraulic Conductivity Data Bulk Samples

Boring Number	Sample Number	Sample Depth, ft.	Compaction % MDD	Tested Moisture, %	K cm/sec	Porosity %
B-13	B1	0.0-50.0	92.0%	16.3%	1.11E-05	30.2%
B-21	B2	0.0-50.0	99.8%	13.7%	3.66E-07	22.4%
B-22	B3	0.0-20.0	90.2%	15.5%	5.02E-06	31.6%

Client and Project	A-1 Sandrock CDLF (Guilford County)		Collar Elevation	801.44		
Equipment	Dietrich D50 ATV	Drilling Method	HSA/NQWL core	Water Level, TOB	19.7 \times	
Date Started	5/7/02	Date Ended	5/7/02	Water Level, 24 Hr.	20.4	
Drilling Firm	Bore & Core (Seiler)	Logged by	David Garrett	Stabilized Level	20.4 \times	
Comments	Cleared access road through woods		Total Depth	27.6	Date of Observation	5/28/02

All depths are given in feet and referenced b.g.s.



Client and Project **A-1 Sandrock CDLF (Guilford County)** Collar Elevation **807.94**
 Equipment **Dietrich D50 ATV** Drilling Method **HSA** Water Level, TOB **51.1** 
 Date Started **4/30/02** Date Ended **4/30/02** Water Level, 24 Hr. **42.1**
 Drilling Firm **Bore & Core (Seiler)** Logged by **David Garrett** Stabilized Level **42.0** 
 Comments **Cleared access road through woods** Total Depth **60.4** Date of Observation **5/28/02**
All depths are given in feet and referenced b.g.s.

Depth and Elev.	SPT Value and Plot	Soil Description, OVA and USCS Symbol	Piezometer Construction Data
0			
2 — 806.00		SILTY SAND: Very dense, tan-yellow, gravelly	
4 — 804.00	27 41 50/4	SILT: Hard, tan-yellow, hard "slatey" layers, weathered granite	SM
6 — 802.00			
8 — 800.00			
10 — 798.00	11 15 25		SM
12 — 796.00			
14 — 794.00	50/4		SM
16 — 792.00			
18 — 790.00			
20 — 788.00	28 50/3	SILTY SAND: Dense, tan, fine to coarse, quartz stringers	SM
22 — 786.00			
24 — 784.00	50/4		SM
26 — 782.00			
28 — 780.00	50/2		SM
30 — 778.00			
32 — 776.00			
34 — 774.00	50/3	PWR: Very dense, weathered granite with numerous hard layers	SM
36 — 772.00			

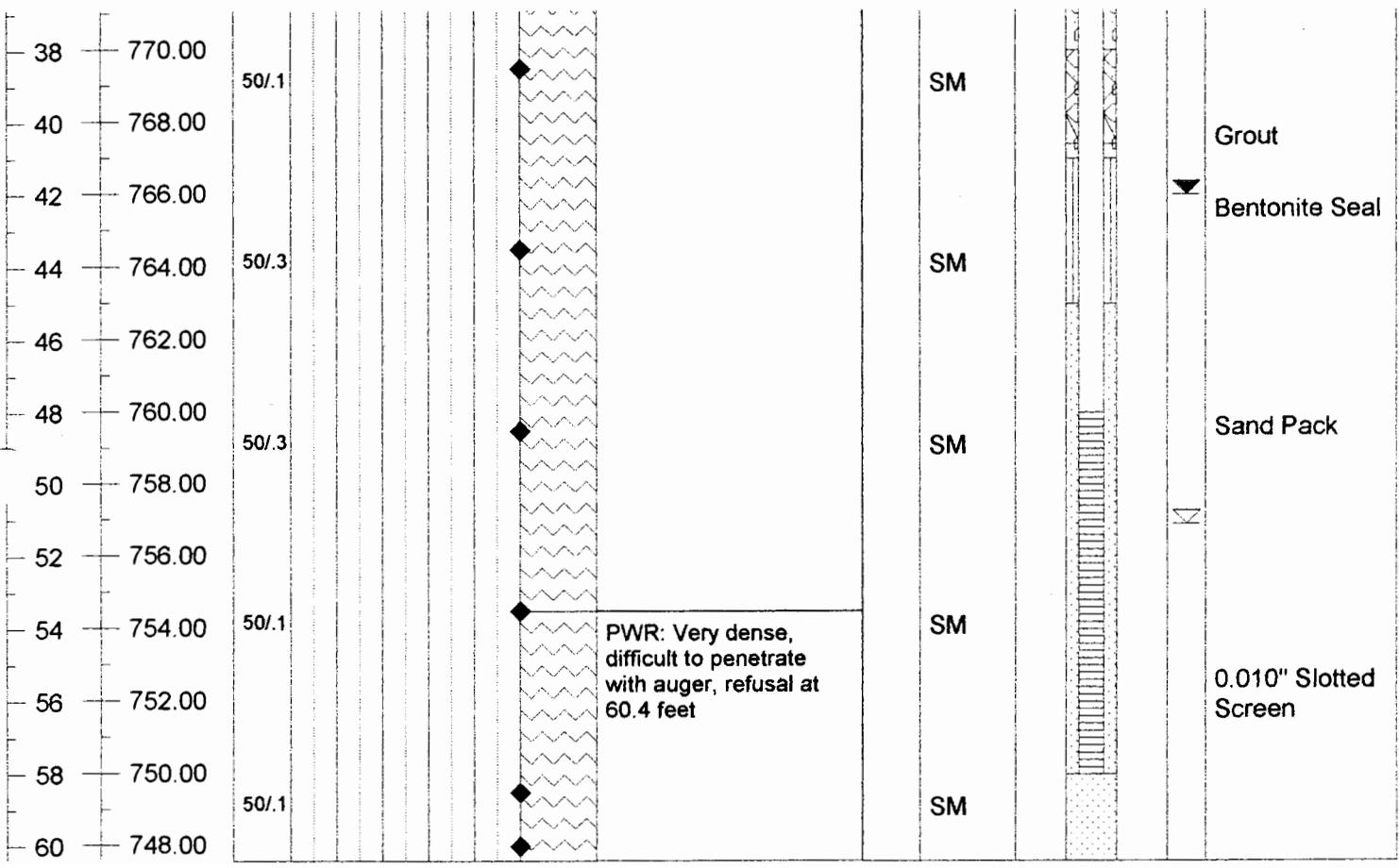
Soil Backfill

Soil Backfill

Client and Project **A-1 Sandrock CDLF (Guilford County)**
 Equipment **Dietrich D50 ATV** Drilling Method **HSA**
 Date Started **4/30/02** Date Ended **4/30/02**
 Drilling Firm **Bore & Core (Seiler)** Logged by **David Garrett**
 Comments **Cleared access road through woods** Total Depth **60.4**
All depths are given in feet and referenced b.g.s.

Collar Elevation **807.94**
 Water Level, TOB **51.1** 
 Water Level, 24 Hr. **42.1**
 Stabilized Level **42.0** 
 Date of Observation **5/28/02**

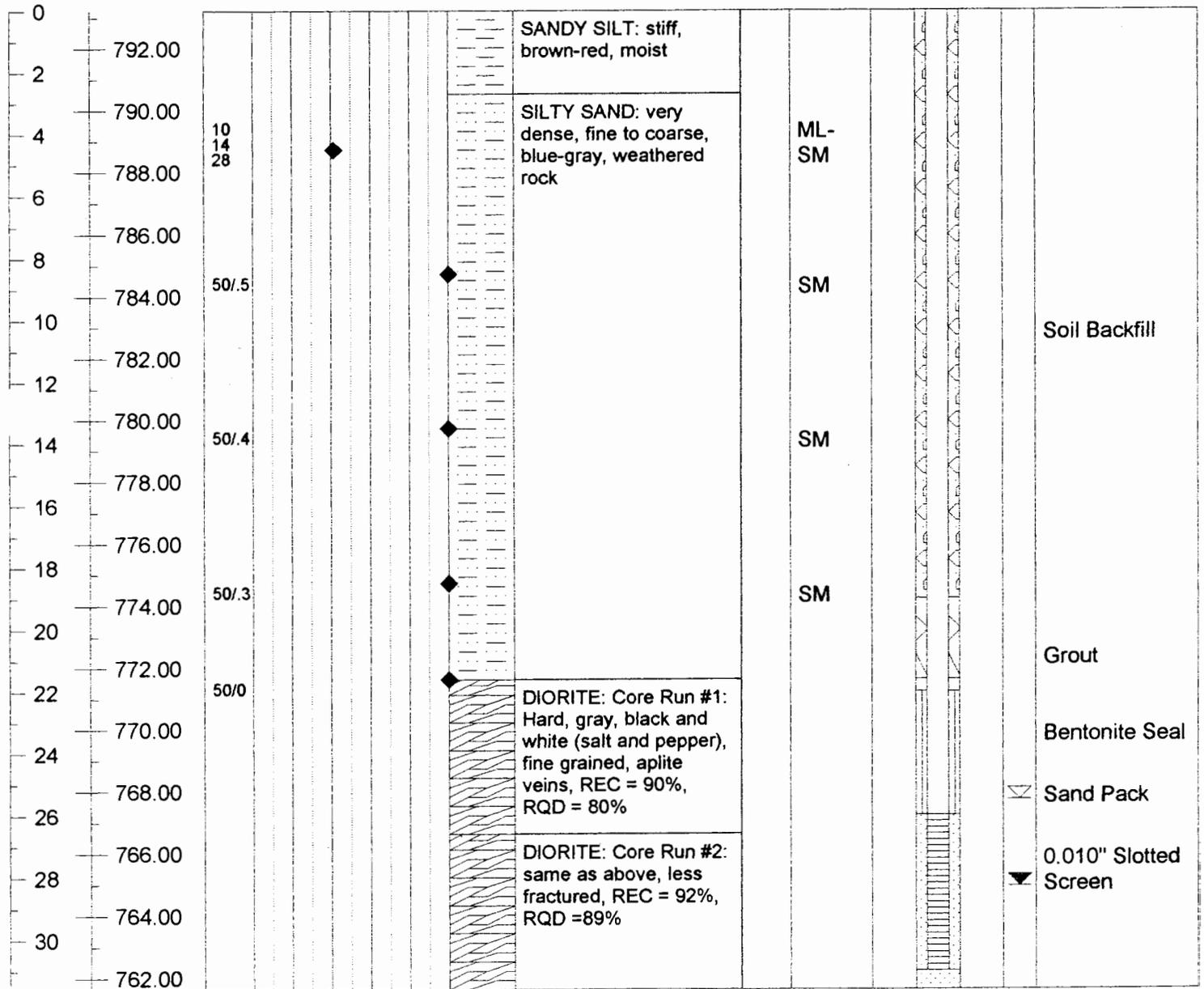
Depth and Elev.	SPT Value and Plot	Soil Description, OVA and USCS Symbol	Piezometer Constuction Data
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Client and Project **A-1 Sandrock CDLF (Guilford County)**
 Equipment **Dietrich D50 ATV** Drilling Method **HSA/NQWL core**
 Date Started **5/6/02** Date Ended **5/6/02**
 Drilling Firm **Bore & Core (Seiler)** Logged by **David Garrett**
 Comments **Cleared access road through woods** Total Depth **31.6**
All depths are given in feet and referenced b.g.s.

Collar Elevation **793.23**
 Water Level, TOB **25.5** ∇
 Water Level, 24 Hr. **26.7**
 Stabilized Level **28.3** ∇
 Date of Observation **5/28/02**

Depth and Elev.	SPT Value and Plot	Soil Description, OVA and USCS Symbol	Piezometer Constuction Data
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Client and Project	A-1 Sandrock CDLF (Guilford County)		Collar Elevation	780.11		
Equipment	Dietrich D50 ATV	Drilling Method	HSA	Water Level, TOB	Dry ∞	
Date Started	5/20/02	Date Ended	5/20/02	Water Level, 24 Hr.	Dry	
Drilling Firm	Bore & Core (Seiler)	Logged by	David Garrett	Stabilized Level	Dry ∞	
Comments	Cleared access road through woods		Total Depth	12.5	Date of Observation	5/28/02

All depths are given in feet and referenced b.g.s.

Depth and Elev.	SPT Value and Plot	Soil Description, OVA and USCS Symbol	Piezometer Constuction Data
0 — 780.00		 <p>SILTY SAND: Dense, tan</p> <p>PWR: Dense, blue-green, auger refusal at 12.5 feet, offset boring refused at 13 feet</p>	
2 — 778.00			
4 — 776.00			
6 — 774.00			
8 — 772.00			
10 — 770.00			
12 — 768.00			

Client and Project **A-1 Sandrock CDLF (Guilford County)**

Collar Elevation **789.50**

Equipment **Dietrich D50 ATV** Drilling Method **HSA**

Water Level, TOB **Dry** \sphericalangle

Date Started **5/22/02** Date Ended **5/22/02**

Water Level, 24 Hr. **Dry**

Drilling Firm **Bore & Core (Seiler)** Logged by **David Garrett**

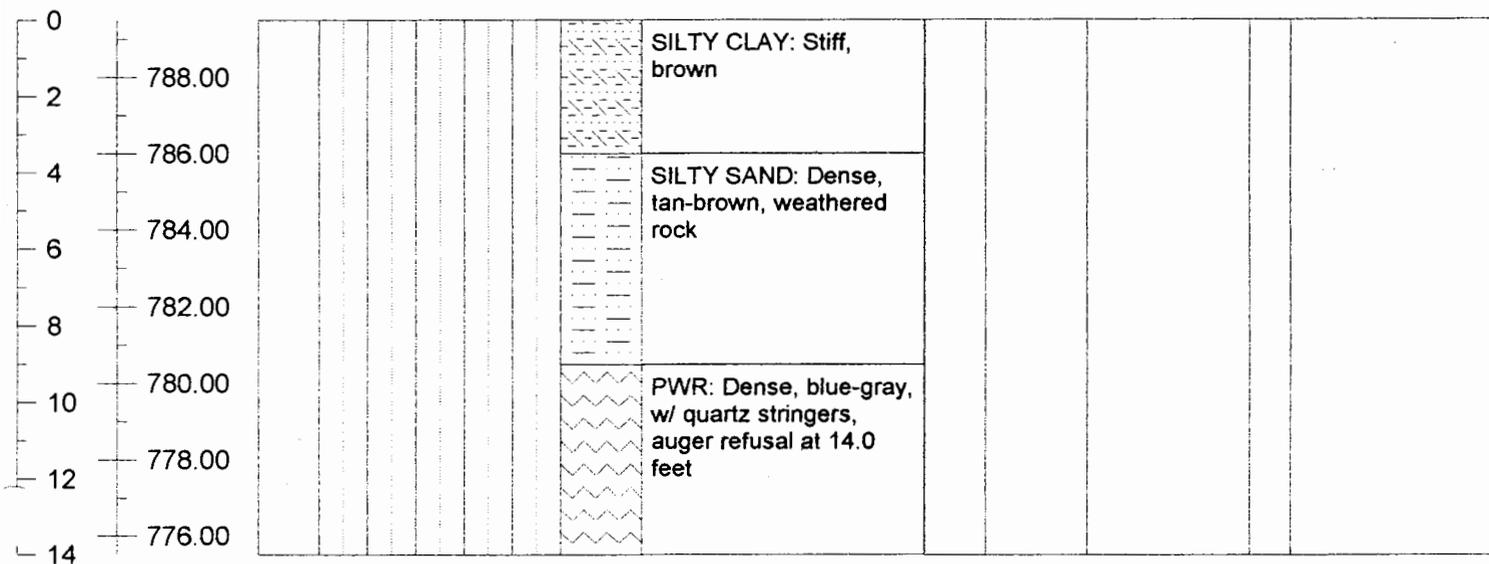
Stabilized Level **Dry** \sphericalangle

Comments **Cleared access road through woods** Total Depth **15.0**

Date of Observation **5/28/02**

All depths are given in feet and referenced b.g.s.

Depth and Elev.	SPT Value and Plot	Soil Description, OVA and USCS Symbol	Piezometer Constuction Data
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Chao, Ming-tai

From: David Garrett, P.G., P.E. [davidgarrettpgpe@mindspring.com]
Sent: Wednesday, January 26, 2011 1:39 PM
To: Chao, Ming-tai
Cc: Ronnie Petty; Mike McFeeley
Subject: Re: Phase 1, Cell B CQA Report, A-1 Sandrock C&DLF, Permit # 41-17
Attachments: Subgrade Inspection Follow Up.pdf

Please see the attached documentation of subgrade conditions in Phase 1B, per our telephone conversation. Thank you. David

-----Original Message-----

>From: "Chao, Ming-tai" <ming.chao@ncdenr.gov>
>Sent: Jan 18, 2011 4:15 PM
>To: "David Garrett, P.G., P.E." <davidgarrettpgpe@mindspring.com>
>Cc: "Mussler, Ed" <ed.mussler@ncdenr.gov>
>Subject: Phase 1, Cell B CQA Report, A-1 Sandrock C&DLF, Permit # 41-17
>
>David:
>After completing a review of the 1/14/2011 responses to my comment dated 11/30/2010, I have one concern of the response to the Comment No. 3 iii regarding the CQA testing results on the in-situ soils making up the upper two feet of the bottom (subgrade) of Phase 1, Cell B. The Table 4A of the approved CQA Plan (on Page 33) specified two approaches to identify if the upper two feet soil consisting the soil types - SC, SM, ML, CL, MH or CH met the requirements stated in Rule 15A NCAC 13B.0540(2)(b).
>The Record Test from Table 4A is summarized below:
>Property
>
>Test Method
>
>Min. Test Frequency
>
>Subgrade Consistency within upper 24 inches
>
>Visual
>
>4 tests per acre
>
>Subgrade Consistency within upper 24 inches
>
>ASTM D 422, ASTM D 4318
>
>I test per acre
>
>
>The Note 4 of the Table 4A indicated that all testing locations, testing types, and test results shall be recorded on a site map and made part of the construction record. Please provide the construction record to demonstrate that the Rule required soil types exist in the top of two feet of the of the bottom of Phase 1, Cell B. Thanks.
>Ming-Tai Chao, P.E.
>Environmental Engineer II
>Permitting Branch, Solid Waste Section
>Division of Waste Management
>1646 Mail Service Center

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