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Johnston  
S & HW

September 30, 1981

Mr. Harold Blizzard  
Office of County Planner  
P. O. Box 1052  
Smithfield, NC 27577

Dear Harold:

On September 18, 1981, you and I made an inspection of the old closed out portion of the Johnston County Landfill - specifically Phases I and II. This inspection was made in reference to closing out of this completed portion of property.

As discussed with you at the site, this area is now in excellent condition. The soil depth was checked and found to be of proper depth, the surface is properly sloped, and the surface has been properly prepared and seeded. No evidence of leachate is present since the surface has been prepared. In my opinion, this area, Phases I and II, is officially closed out and not subject to inspection. An occasional check of the area might be made periodically for any needed maintenance.

If I can be of further assistance, please so advise.

Sincerely,

Larry D. Perry, District Sanitarian  
Solid & Hazardous Waste Management Branch  
Environmental Health Section

LDP:ns  
cc: Terry F. Dover

*Johnston  
Swire*

Permit

August 31, 1981

Mr. D. Franklin Stephenson, P.E.  
Ragsdale Engineers, P.A.  
P. O. Box 1740  
Smithfield, NC 27577

Re: Johnston County Landfill - Phase III Revision

Dear Mr. Stephenson:

The revision plans received by this office on August 10, 1981, are approved as submitted. The lower excavation depths should be initially utilized to, and care should be exercised in staking out the excavations.

If any problems arise with this plan, they should be brought to the immediate attention of the Division of Health Services.

If you have any questions, please so advise.

Respectfully,

J. Gordon Layton, Environmental Engineer  
Solid & Hazardous Waste Management Branch  
Environmental Health Section

JGL:ns  
Enclosure  
cc: Larry D. Perry  
Harold Blizzard



# RAGSDALE ENGINEERS, P.A.

310 E. JOHNSTON STREET - P.O. BOX 1749 - SMITHFIELD, N.C. 27577

TELEPHONE (919) 934-7154 / 934-0511

August 6, 1981

Mr. O. W. Strickland, Department Head  
Solid and Hazardous Waste Management  
Environmental Health Section  
Department of Human Resources  
Division of Health Services  
P. O. Box 2091  
Raleigh, North Carolina 27602



Ref: County of Johnston, North Carolina  
Solid Waste Disposal-Phase III (Revised)

Dear Mr. Strickland:

On behalf of the County of Johnston, we are submitting four (4) sets of revised plans along with four (4) copies of the soils engineering report (as supporting technical information) for the referenced project.

The County is requesting that the Solid Waste Management Branch grant approval for the revision of the grading excavation plan by lowering the excavation limits as shown on the enclosed drawing no. 4. The enclosed soils engineering report supports established ground water levels and the proposed excavation limits. The revised limits of excavation will add approximately 6 to 9 months of life to Phase III of the landfill operational plan.

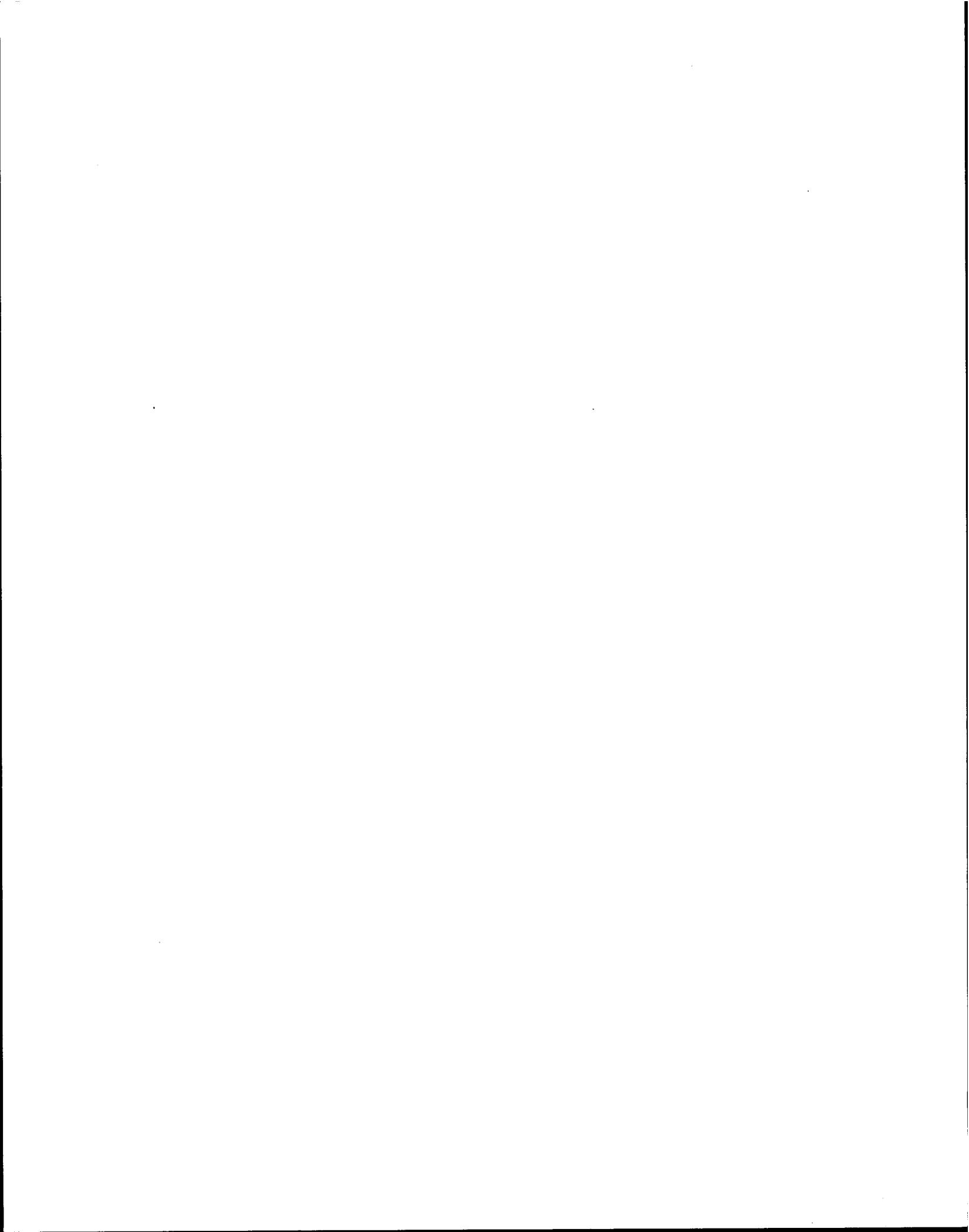
Your review and approval of the enclosed report and plans is respectfully requested. If we can be of further assistance in obtaining prompt approval, please let us know.

Very truly yours,

RAGSDALE ENGINEERS, P. A.

D. Franklin Stephenson, P. E.

DFS/sg  
cc: Mr. Harold Blizzard, County Planner  
Enclosures



-Booklet-



**SOIL & MATERIAL ENGINEERS INC.**

GROUNDWATER STUDY  
JOHNSTON COUNTY LANDFILL  
SMITHFIELD, NORTH CAROLINA  
S&ME JOB NO. RS-1670

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<b>OHIO</b>	<b>TENNESSEE</b>	<b>NORTH CAROLINA</b>	<b>SOUTH CAROLINA</b>	<b>GEORGIA</b>	<b>ALABAMA</b>
Cincinnati	Tri-Cities Knoxville	Raleigh Greensboro Wilmington	Spartanburg Columbia Charleston	Atlanta Albany	Montgomery



**SOIL & MATERIAL ENGINEERS INC. ENGINEERING-TESTING-INSPECTION**

3109 Spring Forest Road, Box 58069, Raleigh, N.C. 27658 Phone (919) 872-2660

July 15, 1981

Johnston County Planning Department  
205 South Second Street  
P. O. Box 1052  
Smithfield, North Carolina 27577

Attention: Mr. Harold Blizzard, Planning Director

Reference: Groundwater Study  
Johnston County Landfill  
Smithfield, North Carolina  
S&ME Job No. RS-1670

Gentlemen:

Soil & Material Engineers, Inc. has completed a groundwater monitoring program at the existing Johnston County Landfill located off N.C. Highway 210 near Smithfield, North Carolina. The purpose of the study was to monitor groundwater levels for use in revising maximum depths of excavation for landfilling.

Soil & Material Engineers, Inc. performed the original soil borings and geotechnical study for this landfill in 1974. The results of those widely spaced borings were used in setting maximum limits of excavation. Since observations during operation of the landfill indicated that the groundwater may be significantly lower than was originally indicated, we were asked to determine groundwater levels in the upper portion of the landfill and explore the possibility of permanently lowering groundwater levels for the purpose of increasing allowable depths of excavation.

During the first phase of the study, four temporary groundwater monitoring wells were installed at the site. The wells consist of two inch diameter schedule 80 PVC pipe with a five-foot section of PVC well screen at the bottom. The annular space around the well screen was backfilled with fine gravel. The remainder of the borehole around the pipe was backfilled with soil, with the upper three feet being a soil/bentonite mixture, mounded around the top of the pipe. Because additional data was required and the initial wells were not correctly located, a series of eight test pits were excavated with a front end loader by Johnston County personnel at locations suggested by us. Also, two more wells were installed to obtain additional data. The locations, ground surface elevations and observed water levels of the wells and test pits are included in the Appendix.

The wells were installed by a truck mounted drill rig which used continuous flight hollow stem augers to advance the boreholes. Soil samples were obtained at five-foot intervals by the split barrel sampling procedure (ASTM D-1586). The locations and elevations of the wells and test pits, and the water levels in the test pits were provided by Johnston County.

The soils encountered by the test borings for the monitoring wells are similar to those encountered by the previous borings and consist primarily of sands and clayey sands of the Coastal Plain province. At depth, these soils are underlain by silty to clayey residual soils and weathered rock of the Piedmont Province.

Based on the observed water levels in the monitoring wells and test pits, it appears that the groundwater is lower than anticipated, eliminating the need for trenching or other methods of permanently lowering the groundwater. The apparent stable water levels observed are indicated on Table I and on the attached Location Plan. Since rainfall has been below average levels for some time, there is a possibility that the water table may be somewhat higher than these recorded levels during very wet seasons. However, we observed no soil mottling or other evidence to indicate significant fluctuations of the groundwater levels. The data recorded during the present study is relatively consistent but is somewhat lower than measurements taken during the 1974 study. A combination of low rainfall levels and better site drainage may account for these variations.

It is our opinion that the available data and observations at the landfill site are adequate to support a lowering of the allowable excavation elevations at this site. Based on the available data, it appears that groundwater in the area west of the base line is generally within approximately 5 to 7 feet of the existing ground surface. To account for possible upward fluctuations of the groundwater table during periods of more normal precipitation, landfilling in this area should be restricted to area-fill techniques using the present grade as the lowest excavation limit. In the area to the east of the base line, groundwater depths range from approximately 12 feet to in excess of 25 feet at boring W-5. Thus, significant excavations could be made in this area without encroaching upon the groundwater table. The regulations of the Department of Human Resources call for maintaining the lowest excavations approximately 4 feet above the high water level. However, data supplied by the Department of Natural Resources and Community Development on wells in the surrounding area indicates that the water level is approximately 4 feet lower than usual for this area. Therefore, we would recommend that excavation grades be maintained at least 8 feet above the measured water table values, or depths of wells and test pit excavation where water was not encountered. Using these criteria, it appears that a significant increase in landfill volume is available. However, this volume increase cannot be accurately estimated until the new landfill grades have been established.



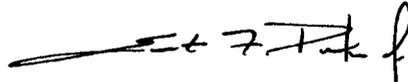
We understand that Ragsdale Engineers, P.A. will revise their drawings for submittal to the North Carolina Department of Human Resources, Solid and Hazardous Waste Management Branch. If we can be of further assistance to you in your application for a revision of excavation limits, please contact us.

We have applied to the North Carolina Department of Natural Resources and Community Development for a variance from water well regulations for the wells installed at this site. Since these wells penetrate into the groundwater table and most will eventually be beneath the landfill, they represent a potential conduit for contamination of the groundwater. Therefore, the wells must be sealed and grouted prior to beginning landfilling over these areas, or a maximum of six months after their installation. We will be pleased to perform this grouting for you or advise you as to methods for accomplishing this.

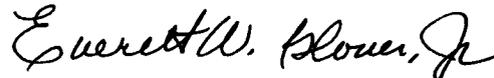
Please contact us if we can be of further service to you or if you have any questions.

Very truly yours,

SOIL & MATERIAL ENGINEERS, INC.



Ernest F. Parker, Jr., P.E.  
Registered, North Carolina 7950



Everett W. Glover, Jr., P.E.  
Registered, North Carolina 8641

EFP/EWG/cmb

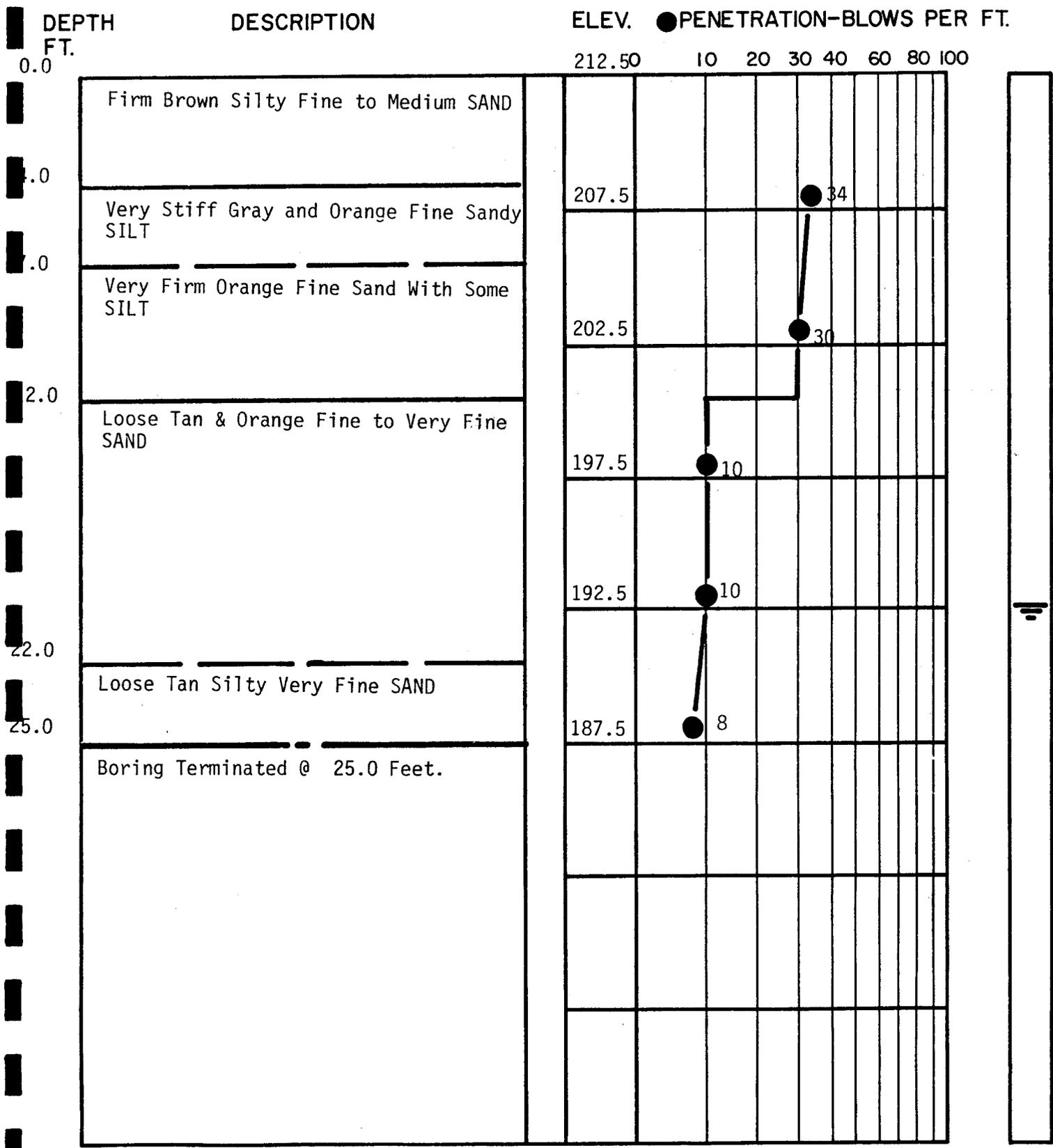
Attachment(s)



GROUNDWATER STUDY  
JOHNSTON COUNTY LANDFILL  
SMITHFIELD, NORTH CAROLINA  
SME JOB NO. RS-1670

TABLE I  
GROUNDWATER LEVEL DATA

<u>LOCATION</u>	<u>SURFACE ELEV.</u>	<u>WATER ELEV. AT 0 HR.</u>	<u>STABILIZED WATER ELEV.</u>
Well W-1	212.5	No Water To Elev. 187.5	192.5
Well W-2	210.8	No Water To Elev. 185.8	No Water To Elev. 185.8
Well W-3	202.4	184.4	183.4
Well W-4	193.83	180.8	181.8
Well W-5	207.51	No Water To Elev. 182.5	No Water To Elev. 182.5
Well W-6	189.67	171.5	172.2
Test Pit 1	170.52	164.26	164.51
Test Pit 2	173.81	No Water To Elev. 163.92	No Water To Elev. 163.92
Test Pit 3	176.41	171.17	171.42
Test Pit 4	179.30	173.61	173.81
Test Pit 5	188.00	No Water To Elev. 176.80	No Water To Elev. 176.80
Test Pit 6	182.80	174.65	175.15
Test Pit 7	167.95 (HUB)	No Water To Elev. 155.20	No Water To Elev. 155.20
Test Pit 8	191.01 (HUB)	No Water To Elev. 176.01	No Water To Elev. 176.01
<u>(1974 DATA)</u>			
Boring B-21	189	175	174
Boring B-22	182	173	179.5
Boring B-23	196	174	185.5
Boring B-24	182	166	175



BORING AND SAMPLING MEETS ASTM D-1586  
 CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
 FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE     
 WATER TABLE 24HR.  
 50% ROCK CORE RECOVERY     
 WATER TABLE-1HR.  
 LOSS OF DRILLING WATER

### TEST BORING RECORD

BORING NO. W-1  
 DATE DRILLED 6-9-81  
 JOB NO. RS-1670

SOIL & MATERIAL ENGINEERS, INC.

DEPTH  
FT.

DESCRIPTION

ELEV. ● PENETRATION-BLOWS PER FT.

0.0

210.80 10 20 30 40 60 80 100

Very Firm Tan to Orange Silty Fine SAND

205.8

31 ●

200.8

31 ●

14.0

Very Firm to Firm Tan Fine SAND, Trace SILT

195.8

27 ●

190.8

15 ●

22.0

Loose Tan to Yellow Fine to Medium SAND, Trace SILT

185.8

8 ●

25.0

Boring Terminated At 25.0 Feet

Note: No Water Encountered

### TEST BORING RECORD

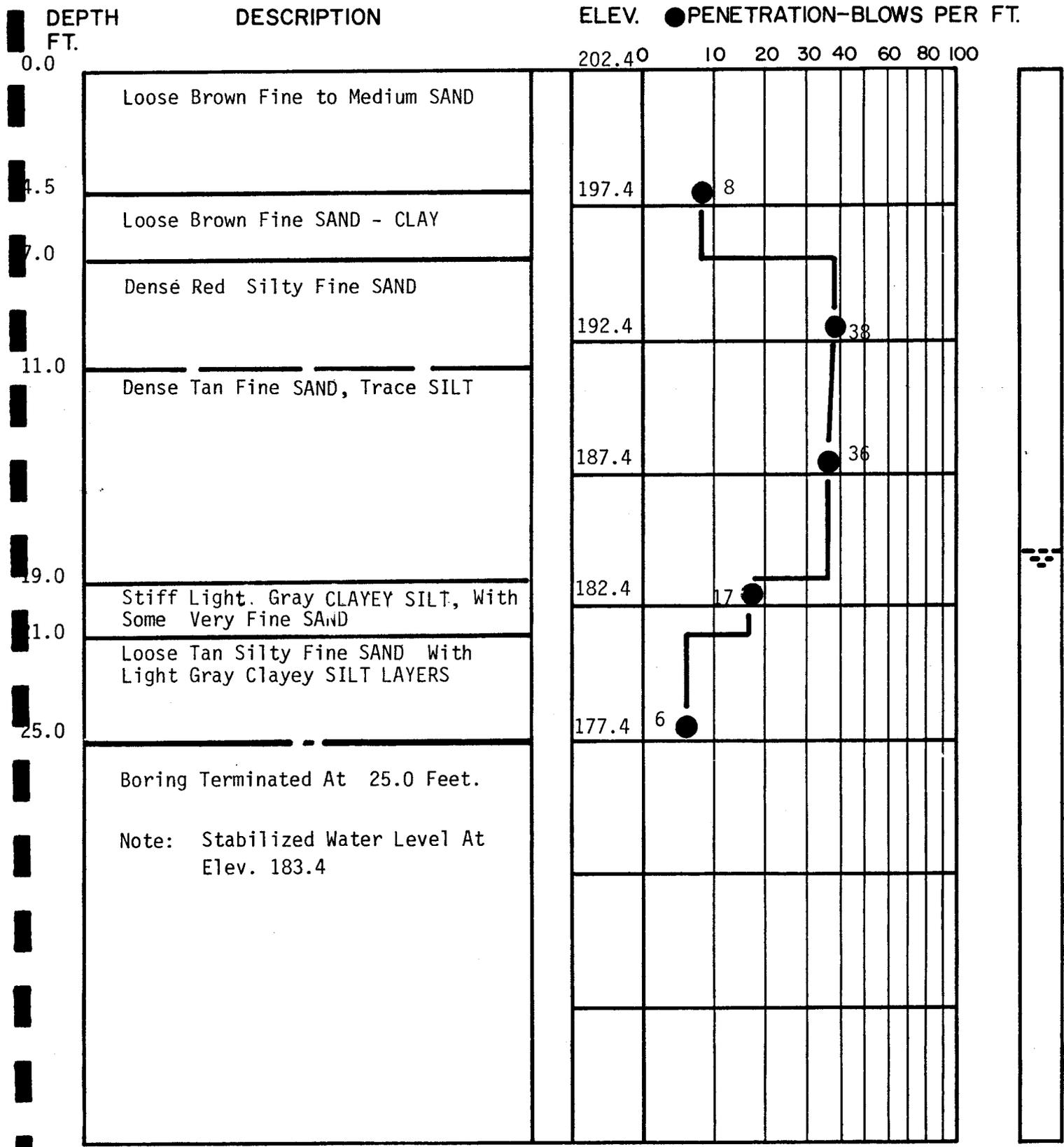
BORING AND SAMPLING MEETS ASTM D-1586  
CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. W-2  
DATE DRILLED 6-9-81  
JOB NO. RS-1670

-  UNDISTURBED SAMPLE
-  WATER TABLE 24HR.
-  WATER TABLE-1HR.
-  50% ROCK CORE RECOVERY
-  LOSS OF DRILLING WATER

SOIL & MATERIAL ENGINEERS, INC.



**TEST BORING RECORD**

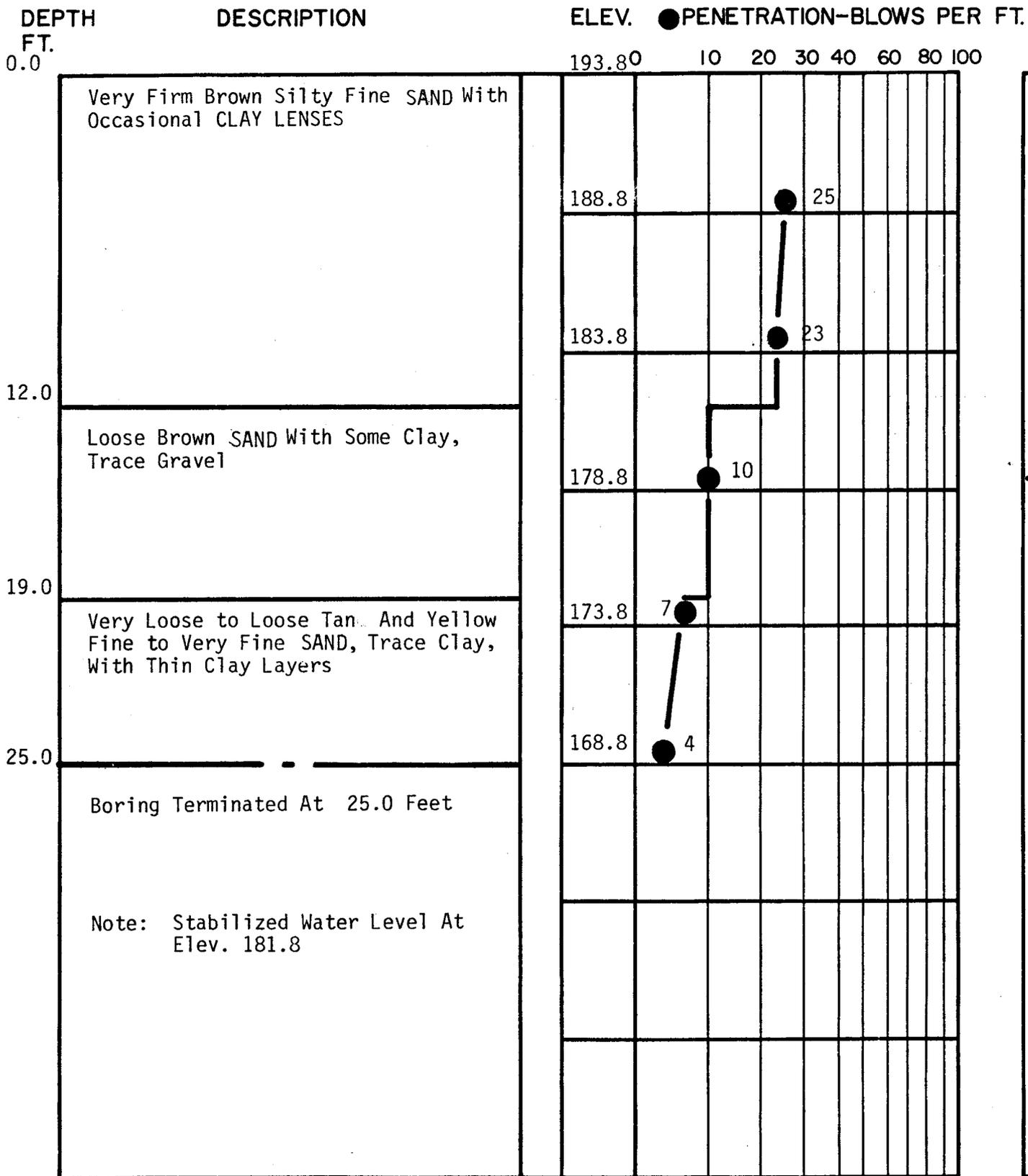
BORING AND SAMPLING MEETS ASTM D-1586  
 CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
 FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. W-3  
 DATE DRILLED 6-10-81  
 JOB NO. RS-1670

- UNDISTURBED SAMPLE
- ▬ WATER TABLE-24HR.
- ▬ WATER TABLE-1HR.
- 50% ROCK CORE RECOVERY
- ◀ LOSS OF DRILLING WATER

**SOIL & MATERIAL ENGINEERS, INC.**



BORING AND SAMPLING MEETS ASTM D-1586  
 CORE DRILLING MEETS ASTM D-2113

PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

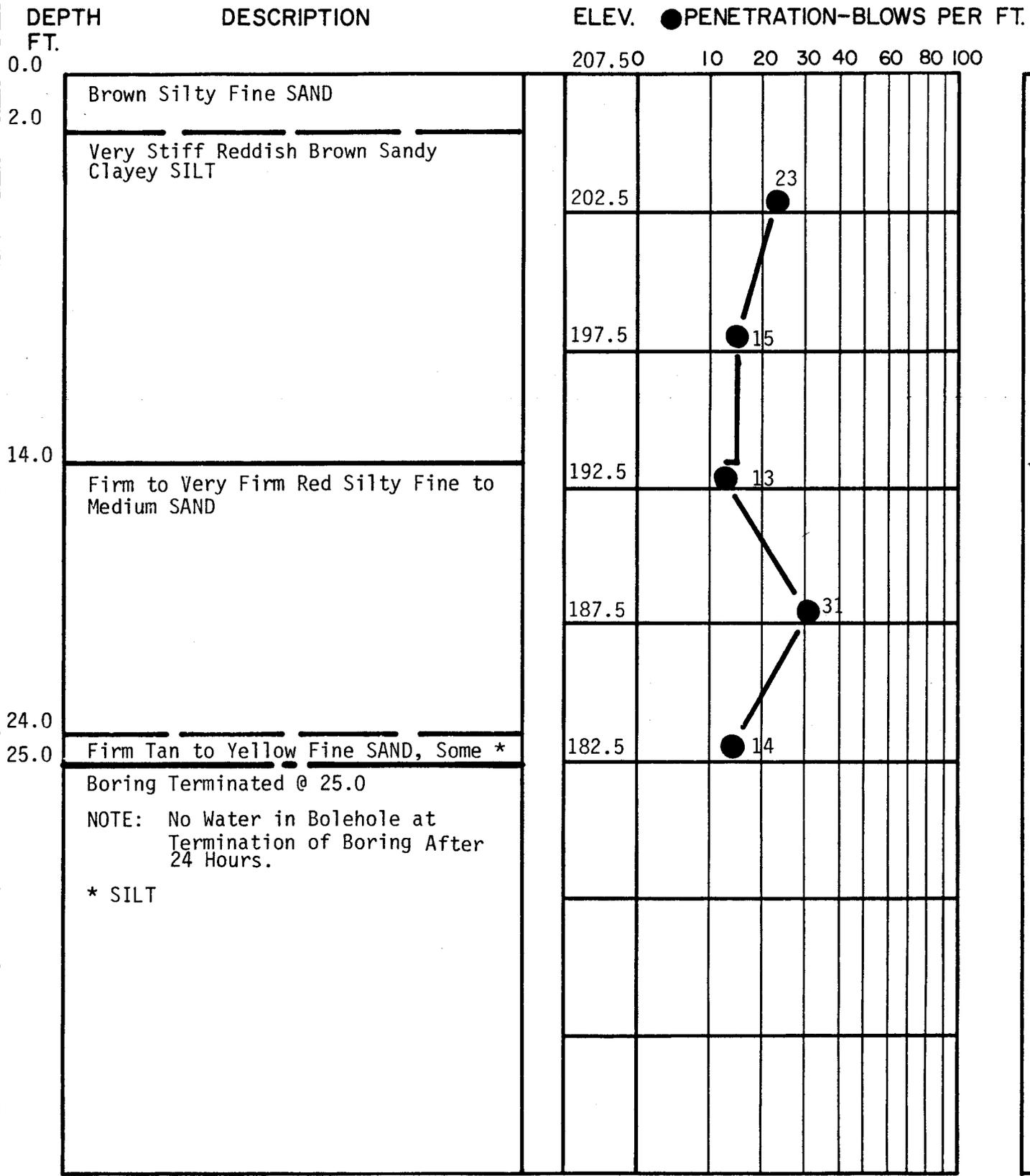
 UNDISTURBED SAMPLE  
 WATER TABLE-24HR.  
 WATER TABLE-1HR.  
 LOSS OF DRILLING WATER

### TEST BORING RECORD

BORING NO. W - 4  
 DATE DRILLED 10-10-81  
 JOB NO. RS-1670

SOIL & MATERIAL ENGINEERS, INC.

SM-14



BORING AND SAMPLING MEETS ASTM D-1586  
 CORE DRILLING MEETS ASTM D-2113

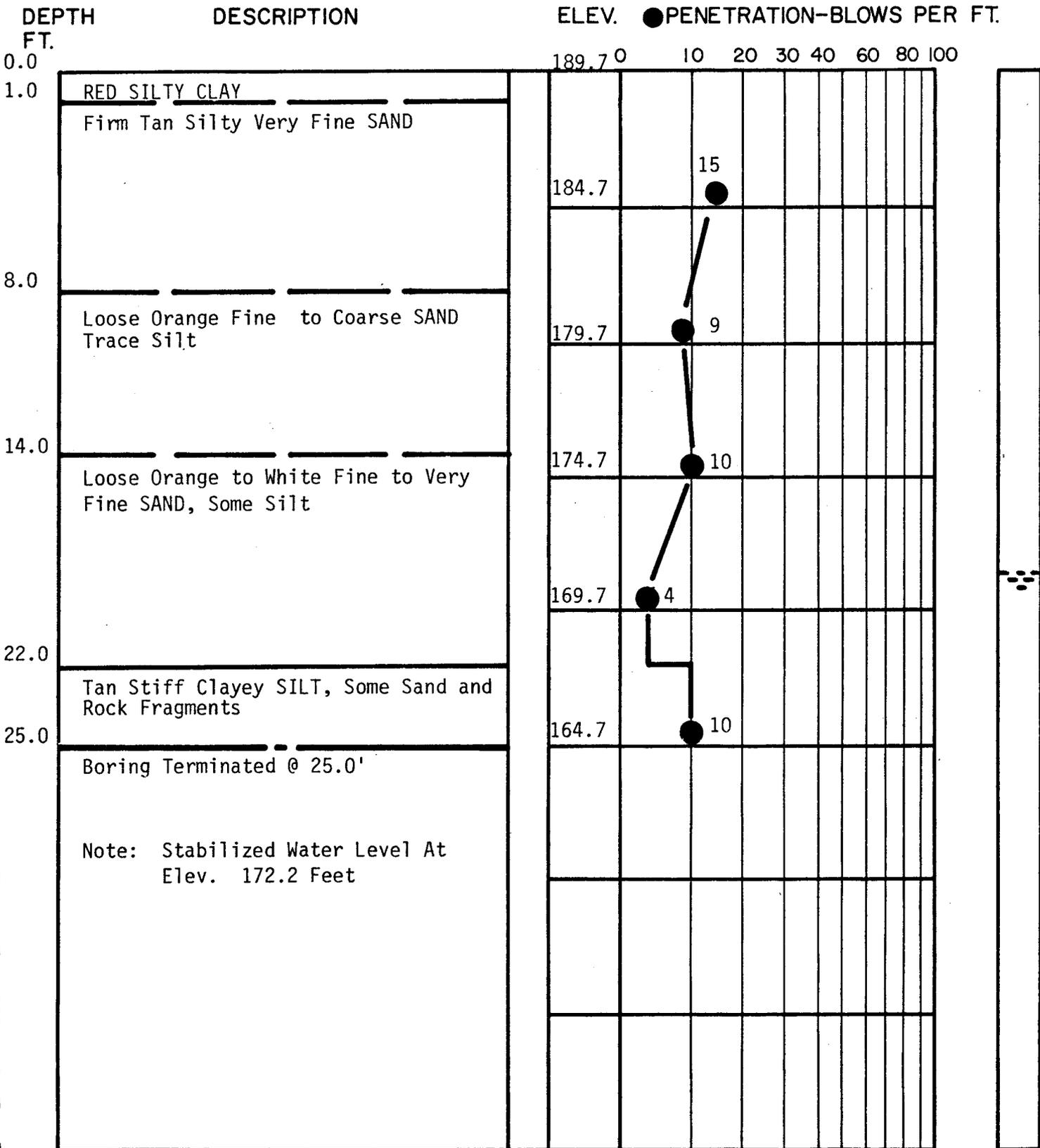
PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

UNDISTURBED SAMPLE     
 WATER TABLE-24HR.  
 50% ROCK CORE RECOVERY     
 WATER TABLE-1HR.  
 LOSS OF DRILLING WATER

**TEST BORING RECORD**

BORING NO. W-5  
 DATE DRILLED 7-10-81  
 JOB NO. RS-1670

**SOIL & MATERIAL ENGINEERS, INC.**



**TEST BORING RECORD**

BORING AND SAMPLING MEETS ASTM D-1586  
 CORE DRILLING MEETS ASTM D-2113  
 PENETRATION IS THE NUMBER OF BLOWS OF 140 LB. HAMMER  
 FALLING 30 IN. REQUIRED TO DRIVE 1.4 IN. I.D. SAMPLER 1 FT.

BORING NO. W-6  
 DATE DRILLED 7-10-81  
 JOB NO. RS-1670

-  UNDISTURBED SAMPLE
-  50% ROCK CORE RECOVERY
-  LOSS OF DRILLING WATER
-  WATER TABLE-24HR.
-  WATER TABLE-1HR.

**SOIL & MATERIAL ENGINEERS, INC.**

