

SEABROOK UPDATED FSAR

APPENDIX 21

GEOTECHNICAL REPORT ADDITIONAL PLANT SITE BORINGS

The information contained in this appendix was not revised, but has been extracted from the original FSAR and is provided for historical information.

GEOTECHNICAL REPORT  
ADDITIONAL PLANT-SITE BORINGS  
FOR WATER AND OIL STORAGE TANKS,  
SETTLING BASIN, RETAINING WALL,  
**SEAWALL**, AND RIP-RAP STRUCTURES  
G-SERIES BORINGS

**SEABROOK STATION, NEW HAMPSHIRE**

Submitted to  
YANKEE ATOMIC ELECTRIC COMPANY

GEOTECHNICAL ENGINEERS INC.  
1017 Main Street  
Winchester, Massachusetts 01890

Project 7286  
October 21, 1974

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## 1.0 INTRODUCTION

### 1.1 Purpose

The purpose of the geotechnical investigation was to provide soil and bedrock descriptions pertinent to the design and construction of several proposed structures which will be located at the plant site, including water and oil storage tanks, settling basin, retaining wall, **seawall**, and rip-rap structures.

### 1.2 Scope

A subsurface investigation, consisting of a total of 12 borings and 1 test pit was made for the following areas:

- a. Water and Oil Tanks At Fire Pump House - One boring was made at the center of the fuel oil storage tank, using standard split-spoon sampling techniques to refusal for the purpose of investigating deposits that may cause settlement problems. Because no unsuitable deposits were encountered at the site for the proposed oil storage tank and based on the general knowledge of site geology, supplementary borings for the proposed water tanks were not done.
- b. Settling Basin - A series of three borings was made in the area of a proposed settling basin using standard split-spoon sampling techniques to refusal for the purpose of investigating soil conditions at the proposed inlet and outlet structures for the basin, and also to examine the in-situ soil for possible use as construction materials for **the dikes**. In addition, a test pit bag sample was taken near the center of the settling basin, tested for grain size distribution, and examined as a possible dike material.
- c. Retaining Wall - A series of four borings was made for a proposed retaining wall for the purpose of locating and sampling the dense glacial till. These borings were advanced by first "washing" to establish the top of the till layer, then sampling this layer by split-spoon techniques, and finally advancing the **borehole** to refusal using a roller bit. Based on the results of geophysical surveys and **other** borings drilled into bedrock in the vicinity, it is believed that refusal does correspond to the bedrock surface in these holes.



## 2.0 BORING AND TEST PIT DATA

### 2.1 Table and Figures

Table I is a summary of the boring data including boring location, "as-bored" coordinates, ground elevation, depth to glacial till, and depth to top of bedrock.

The locations of the borings and one exploratory test pit are included in Fig. 1. Fig. 2 shows the grain size curve from a sieve analysis which was performed on a sample from the test pit.

### 2.2 Boring and Test Pit Logs

Logs of the borings and one exploratory test pit are included in Appendix I. Driller's boring logs are included in Appendix II.

## TABLES

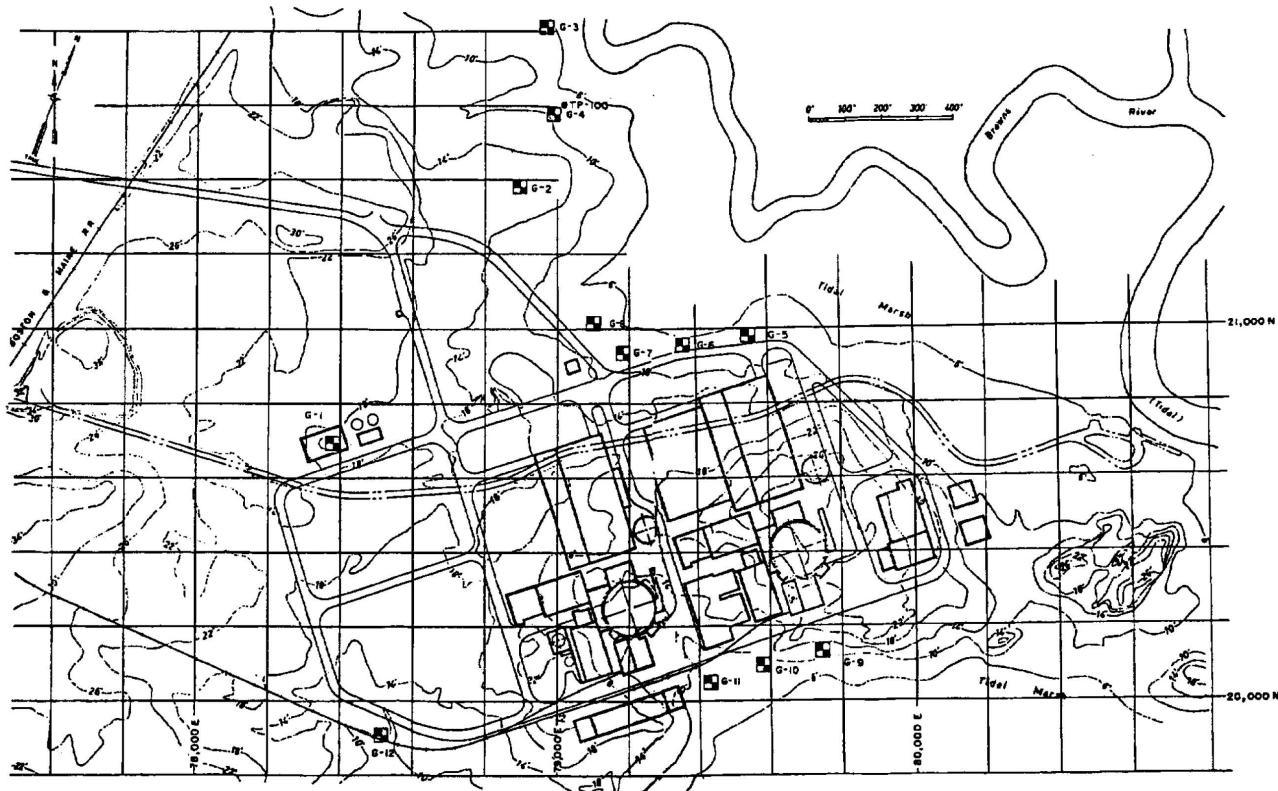
TABLE I  
SURINARY OF BORING DATA

Boring No.	Boring Location	As-bored Coord.	Ground Elev ft	Depth to Top of Till ft	Depth to Top of Bedrock ft
G-1	Oil Storage Tank	29,690N 78,370E	17.3	8.0	--
G-2	Settling Basin (Inlet)	21,380N 78,900E	15.9	5.0	--
G-3	Settling Basin (Outlet)	21,717N 78,949E	9.4	28.0	--
G-4	Settling Basin (additional)	21,571N 78,992E	9.6	19.0	--
G-5	Retaining Wall	20,969N 79,525E	7.8	9.0	9.7"
G-6	Retaining Wall	20,949N 79,349E	8.2	10.8	19.5*
G-7	Retaining Wall	20,932N 79,175E	8.6	11.5	23.2"
G-8	Retaining Wall	21,006N 79,107E	7.3	10.5	19.0"
G-9	Seawall	20,123N 79,720E	9.5	--	10.5
G-10	Seawall	20,083N 78,587E	7.9	--	6.8
G-11	Seawall	20,042N 79,455E	6.8	--	15.9
G-12	Rip-Rap	19,898N 78,500E	7.2	--	11.0*

\*In these holes the boring was made to refusal and no rock was cored. However, based on the results of geophysical surveys and other borings drilled into bedrock in the vicinity, it is believed that refusal does correspond to the bedrock surface.

## FIGURES

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PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE SEABROOK STATION UNITED ENGINEERS & CONSTRUCTORS GEOTECHNICAL ENGINEERS, INC.	SEABROOK STATION SITE TOPOGRAPHY AND PLOT PLAN PLAN OF BORING LOCATIONS OCT. 17, 1974    FIG. 1    G-SERIES BORINGS
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## APPENDIX I

## BORING N O. G-1

pg. 1 of 1

Proj. No. : 7286

Date: Sept. 30, 1974

Ground Elevation +17.3 ft

Depth to Water Level: depth at ground elcv. 0700; 10/1/74

Described by: W. Pitt

Sample no.	Depth ft	Number of Blows per 6"	Description
S-1	0.0-1.0	1-2	Black, soft <u>PEAT</u> and organic <u>SILT</u> ; highly decomposed
S-1A	1.0-2.0	6-14	Gray-brown, gravelly, sandy, slightly organic <u>SILT</u> , contains subangular gravel up to 35 mm in size.
s-2	3.0-5.0	11-16 32-23	Rust brown and brown slightly mottled gravelly, sandy <u>SILT</u> , trace clay. Contains gravel up to 13 mm in size. Moderate reaction to shaking test. Low plasticity.
s-3	5.0-6.5	27-39 57	Similar to S-2. Contains gravel up to 35 mm in size.
s-4	10.0-11.5	100/4"	color change 140# hammer gray, very dense, sandy, gravelly <u>SILT</u> trace clay.
		5/2" 28-22	300# hammer contains broken pieces of gravel up to 35 mm
s - 5	15.0-16.5	5 4 100/4"	140# hammer Similar to S-4
		12/2" 40	300# hammer
			Casing refusal at 16.5 Bottom of Borehole
			End of Exploration



Ground Elevation +15.9 ftDepth to Water Level: -5.1' measured at 0715, 10/2/74Described by: W. Pitt

Sample No.	Depth ft	Number of Blows per 6"	Description
S-1	0. 0-1.0	2-5	Light brown, silty fine <u>SAND</u> . Contains root fibers and decomposed organic matter.
<del>S-1A</del>	1.0 - 2.0	3 - 2	Dark brown/rust brown/gray mottled; fine sandy <u>SILT</u> , trace fine gravel
s-2	3. 0-4.5	17-50/0" 22-42	140# hammer Light brown, gravelly, sandy <u>SILT</u> . 300# hammer Contains gravel from various <u>litho-</u> logies up to 35 mm in size.
s-3	5.0-7.0	15 23 23 33	Light brown silty, gravelly, fine to coarse <u>SAND</u> widely graded, resembles glacial till
s-4	LO. 0-11.5	57-100 33	140# hammer Gray brown /rust brown slightly mottled 300# hammer dense, silty, gravelly <u>SAND</u> (similar to S-3) Contains broken pieces of gravel up to 35 mm in size.  Casing refusal met at 13.8' Roller bit refusal at 14.5'  Bottom of Borehole
			End of Exploration

BORING NO. G-3pg. 1 of 2Proj. No. : 7286Date: Oct. 1, 1974Ground Elevation +9.4 ftDepth to Water Level: -2.1 measured at 0730, 10/2/74Described by: W. Pitt

Sample No.	Depth ft	Number of Blows per 6"	Description
S-1	0.0-2.0	1/1.5' 2/.5'	Brown grading to buff, soft, homogeneous <u>SILT</u> , trace clay. Upper 1-2" contains grass and <b>shallow root zone</b> .
s-2	3.0-5.0	10-20 21-20	Similar to S-1, buff/rust brown mottled, contains black spots - decomposed organic matter? ?; trace roots and mica particles
s-3	6.0-7.0	14-16	Light brown, loose, silty fine <u>SAND</u> , trace clay
S-3A	7.0-8.0	22-32	Rust brown/buff medium dense, mottled <u>SILT</u> , little to trace clay. Low plasticity.
s-4	10.0-12.0	C 2-4 4-5	Gray, medium stiff homogeneous <u>CLAY</u> ; high plasticity
s-5	15.0-17.0	C 2-3 3-4	Similar to S-4
S-6	19.5-20.0	C 32	Gray-brown silty, sandy, <u>GRAVEL</u> ; trace clay. Contains angular pieces of gravel up to 25 mm. <b>Well-graded</b> .
S-6A	20.0-21.5	20-12	Light brown, gravelly, sandy <u>CLAY</u> . Contains gravel pieces up to 25 mm in size
S-7	25-25.5	100/3" 50/2"	140# hammer Similar to S-6, very dense 300# hammer (Resembles glacial till)
			continued)

21.5'



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BORING NO. G-3

(Concluded)

pg. 2 of 2

Proj. No. : 7286

Date: Oct. 1, 1974

Described by: W. Pitt

Ground Elevation +9.4 ft

Depth to Water Level: -2.1 measured at 0730, 10/2/74

Sample NO.	Depth ft	Number of Blows per 6"	Description
S-8	30.0-31.5	25 25 58	Gray, very dense, silty fine <u>SAND</u> , some gravel up to 30 mm in size
s-9	34'10" →	100/0" 20/0"	140# hammer No recovery 300# hammer Casing refusal at 34'10" Bottom of <b>Borehole</b>
			End of Exploration



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BORING NO. G-4

pg. - 1 of 1 -

Proj. No. : 7286Date: Oct. 2, 1974Ground Elevation +9.6 ft  
Depth to Water Level: Not takenDescribed by: W. Pitt

Sample No.	Depth ft	Number of Blows per 6"	Description
S-1	0.0-0.5	1	Dark brown, fibrous <u>PEAT</u> and organic <u>SILT</u>
S-1A	0.5-2.0	1-1-2	Light brown, fine sandy <u>SILT</u> <u>or</u> silty fine <u>SAND</u>
s-2	3.0-5.0	6-10 22-42	Light brown/dark brown/rusty brown slightly mottled, medium dense, silty, gravelly fine <u>SAND</u> . Contains gravel up to 35 mm in size.
s-3	6-7.5	100/5" 3/1" 35-60	140# hammer      Similar to S-2, medium dense to dense 300# hammer
s-4	8.0 10.0-11.5	25-50 57	Large cobble Similar to S-3, coarse to fine <u>SAND</u> Widely graded
s-5	15.0-16.2	100'0" 42 60 75 '3"	140# hammer      Similar to S-4 300# hammer
S-6	20-21	76-76	Gray, very dense, gravelly, silty coarse to fine <u>SAND</u> ; little to trace clay. (Till)
			Roller bit refusal at 22.5 Bottom of Borehole
			End of Exploration

Increase in sand and  
gravel sizes ↓

BORING NO. G-5

pg. - 1 of 1 -

Proj. No. : 7286Date: Oct. 3, 1974Ground Elevation +7.8 ft  
Depth to Water Level: Not takenDescribed by: W. Pitt

Sample No.	Depth ft	Number of Blows per 6"	Description
			Drove casing to 9.0' , where encountered strata change - casing refusal Split-spoon at 9.0 - 9.7
S-1	9.0-9.7	58-100/2" 5/0"	140# hammer gray/brown slightly mottled, very dense silty, gravelly, <u>SAND</u> ; little to 300# hammer to trace clay, (Till)  Roller bit refusal at 9. 7' Bedrock ?  Bottom of Borehole
			End of Exploration

BORING NO. G-Gpg. 1 of 1Proj. No.: 7286Date: Oct. 3, 1974Ground Elevation      +8.2 ft  
Depth to Water Level: Not takenDescribed by: W. Pitt

Sample No.	Depth ft	Number of Blows per 6"	Description
			Drove casing to refusal - 9.0' Roller bitted to 10.8' - strata change Split-spoon attempt at 10. 8'
S-1	10.8-12.3	57 100/4" 8/2" 30	140# hammer gray, very dense, sandy, gravelly <u>SILT</u> , trace to little clay. (Till)  300# hammer  Roller bit refusal at 19.5' <u>Bottom of Borehole</u>
			End of Exploration



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BORING NC). G-7

pg.- 1 of 1 -

Proj. No. : 7286Date: Oct. 3. 1974Described by: W. PittGround Elevation +8.6 ft  
Depth to Water Level: Not taken

Sample No.	Depth ft	Number of Blows per 6"	Description
			Drove casing to 10' Roller bitted to 11.5' - strata change
11.5			
S-1	11.5-13.0	24 92 22	140# hammer gray, very dense gravelly, silty SAND trace to little clay. (Till) 300# hammer Roller bitted to refusal at 23.2 Bottom of Borehole
23.2			
			End of Exploration



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BORING NO. G-8pg. 1 of 1Proj. No. : 7286Date: October 7, 1974Ground Elevation +7.3

Depth to Water Level: Not Taken

Described by: W. Pitt

Sample No.	Depth it	Number of Blows per 6"	Description
	10.1		Cobble. Drove casing to refusal at 10.5. Strata change.
S-1	10.5-12.0	18-16-24	Gray, medium dense clayey silty, <u>SAND</u> , little to trace. Gravel contains <u>subround</u> gravel up to 15 mm in size. Medium plasticity, well graded. Moderate reaction to shaking test.
			Bottom of borehole, roller bit refusal at 19.0'.



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Ground Elevation **+9.5** ft

Depth to Water Level: Not Taken

Run No.	Depth ft.	Recovery and RQD %	Description
			No Samples -- Washed through overburden
			TOP OF ROCK
NX-1'	10.5- 15.5	REC = 100% RQD = 96%	Gray/white mixed fine and medium <b>grained</b> <u>DIORITE</u> . Minor jointing. Fresh and hard throughout. Minor <b>slickensiding</b> on joint surfaces.
NX-2	15.5- 20.5	REC = 100% RQD = 76%	Similar to NX-1; minor to moderately jointed. Joints rusty; vuggy. Moderate weathering on joint surfaces.
NX-3	20.5- 25.5	REC = 100% RQD = 80%	Similar to NX-2; high angle jointing with calcite infilling.
			Bottom of boring @ El. -35.0 ft

Ground Elevation **+7.9 ft**

Depth to Water Level: Not Taken

Run No	Depth ft.	Recovery and RQD %	Description
			<u>No Samples</u> -- Washed through overburden
			TOP OF ROCK
6.5,			Roller bitted to 7.0 ft
NX-1	7.0- 12.0	REC = 98% RQD = 65%	Gray, mixed fine and medium g-rained <u>DIORITE</u> . Moderately jointed. Generally fresh and hard <b>through-</b> out. Moderately weathered; rusty on joint surfaces.
NX-2	12.0- 17.0	REC = 100% RQD = 62%	Similar to NX-1; intact rock generally fresh and hard. Moderate to severe weathering on joint surfaces.
NX-3	17.0- 22.0	REC = 100% RQD = 75%	Similar to NX-2; generally fresh and hard throughout. Moderate we'athering on joint surfaces.
22.0'			Bottom of boring @ El. -29.9 ft.

Ground Elevation +6.8 ft  
 Depth to Water Level: Not Taken

Described by: W. Pitt

Run No	Depth ft.	Recovery and RQD %	Description
			<u>No Samples</u> -- Washed through overburden
15.9'			TOP OF ROCK
			Roller bitted to 16.0 ft
NX-1	16.0- 21.0	REC = 92% RQD = 55%	Gray, mixed fine and medium <u>grained DIORITE</u> ; semi-schistose in texture. Moderately jointed with several high angle joints. Generally hard and fresh throughout with minor clay infilling on slicked joint surfaces.
NX-2	21.0- 26.0	REC = 100% RQD = 67%	Similar to NX-1, moderately hard; vuggy in places with several weathered, high angle joints.
NX-3	26.0- 31.0	REC = 96% RQD = 68%	Similar to NX-2; moderate to severe weathering on joint surfaces.
31.0'			Bottom of boring @ El. <u>-37.8</u> ft.

BORING NO. G-12pg. 1 of 1Proj. No. : 7286Date: October 10, 1974Ground Elevation. +7.2 ft  
Depth to Water Level: Not Taken.Described by: W. Pitt

Sample No.	Depth ft	Number of Blows per 6"	Description
S-1	0.0-1.0	1-4	Brown-black soft <u>PEAT</u> and organic <u>SILT</u> , highly decomposed, root mass throughout.
S-1A	1.0-2.0	6-6	Gray-dark brown mottled, loose fine to medium <u>SAND</u> , little to trace silt.
			----- COLOR CHANGE -----
s-2	5.0-6.5	-12-21-28	Gray, slightly micaceous, similar to S-1A.
s-3	10.0-10.9	5-100/5" 10/0"	140# hammer. Gray, homogeneous <u>CLAY</u> 300# Hammer. High plasticity
			Bottom of hole -----
			Roller bitted 1" - refusal. Bedrock or large boulder. End of exploration.



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# DESCRIPTION OF EXPLORATORY TEST PITS

Test Pit #100

Ground Elev. : +9.6

Location tp adjacent to DH-G-4

Depth to Water: Not encountered

Coord. 21, 572N - 78,993E

Date October 3, 1974

Project 7286

Depth ft	Soil Description
O-1.0	Black-brown fibrous <u>PEAT</u> and organic <u>SILT</u>
1.0' →	<p>TP Sample - light brown-yellow brown, loose, silty fine <u>SAND</u>, cobbles &gt;3" found. throughout.</p> <p>Test pit was hand dug to a depth of approximately 2 ft</p>

## APPENDIX 2

**EAST PROVIDENCE, R. I.**

SHEET 1 OF 1

DATE \_\_\_\_\_

HOLE NO. G-1

LINE 8 STA.

| OFFSET |

SURF. ELEV. \_\_\_\_\_

TO Yankee Atomic Electric Co. ADDRESS Westboro, Mass.

PROJECT NAME	Location	Water System	ADDRESS	Seabrook, N. H.
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REPORT SENT TO Distribution as per Specification PROJ NO 7236

SAMPLES SENT TO Delivered to Geotech at Site OUR JOB NO. 6035

GROUND WATER OBSERVATIONS		CASING	SAMPLER	CORE BAR.	Date	Time
At <u>2"</u>	after <u>14</u> Hours	Type <u>NW</u>	<u>S/S</u>		<u>9/30/74</u>	
		Size I.D. <u>3"</u>	<u>1-3/8"</u>		<u>"</u>	
At _____	after _____ Hours	Hammer Wt. <u>300#</u>	<u>140#</u>			
		Hammer Fall <u>24"</u>	<u>30"</u>	BIT		
				START		
				COMPLETE		
				TOTAL HRS.		
				BORING FOREMAN	<u>K. Allen</u>	
				INSPECTOR	<u>_____</u>	
				SOILS ENGR.		

LOCATION OF BORING:

[illegible]

GROUND SURFACE TO 16' USED 100' ASING: WHEN sampled to 16.5'

Sompte Type ,

O-Dry C=Cored W-washed

UP: Undisturbed Piston

TP= Test Pit A=Auger V=Vone Test

UT= Undisturbed Thinwall

### Proportions Used

trace 0 to 10%

little	10 to 20%
--------	-----------

some 201035%

and 35 to 50%

140lb Wt. x 30" ln

### Cohesionless Density

0-10      Loose

10-30 Med. Dense  
30-50 Dense

30-50 Dense  
50 + Very Dense

on 2" O.D. Sampler

### Cohesive Consistency

o-4 Soft

4 - 8 M/Stiff  
9-15 C+16

8-15 Stiff  
15-30 V-Stiff

## SUMMARY

Earth Boring 16

Rock Coring \_\_\_\_\_

Samples 5

HOLE NO C-1

**EAST PROVIDENCE, R. I.**

Date \_\_\_\_\_ Time \_\_\_\_\_

REPORT SENT TO \_\_\_\_\_ TRACING NO. \_\_\_\_\_  
SAMPLES SENT TO Delivered to Geotech at Site OUR JOB NO. 4-85

GROUND WATER OBSERVATIONS		CASING	SAMPLER	CORE BAR
1	4' after 1/2 Hours	Type NW	S/S	
		Sue I.D. 3"	1-3 /8"	
		Hammer Wt. 300"	140 <sup>±</sup>	
U	after _____ Hours	Hammer Fall 24"	30"	BIT Roller

START 10/1/74  
COMPLETE "  
TOTAL HRS. \_\_\_\_\_  
BORING FOREMAN K. J. Hen  
INSPECTOR W. Pitt  
SOILS ENGR. \_\_\_\_\_

[illegible]

GROUND SURFACE TO 12' 6" USED NO RASING: THEN Roller hit to 14.5'

UT= Undisturbed Thinwoll

ond **35 to 50%**

50 + Very Dense

8-15. Stiff  
15-30 V-Stiff

HOLE NO C-2



# American Drilling & Boring Co., Inc.

100 WATER STREET

EAST PROVIDENCE, R I

SHEET 1 OF 1

DATE \_\_\_\_\_

HOLE NO. G-3

TO Yankee Atomic Electric Co.

ADDRESS Westboro, Mass.

PROJECT NAME Circulating Water System

LOCATION Seabrook, N.H.

REPORT SENT TO Distribution as per Specification

PROJ NO 7286

LINE & STA. \_\_\_\_\_

SAMPLES SENT TO Delivered to Geotech at Site

OUR JOB NO 4-85

OFFSET \_\_\_\_\_

SURF. ELEV. \_\_\_\_\_

GROUND WATER OBSERVATIONS		CASING SAMPLER		CORE BAR.		Date Time	
At _____	after _____ Hours	Type	NW	S/S	START	10/1/74	8:00
At _____	after _____ Hours	Size 0.	3"	1-3/8"	COMPLETE	10/2/74	8:00
		Hammer Wt	300#	140#	TOTAL HRS.		
		Hammer Fall	24"	30"	BORING FOREMAN	K. Allen	
				BIT	INSPECTOR		
					SOILS ENGR.		

## LOCATION OF BORING

DEPTH	Casing Blows per foot	Sample Depths From- to	Type of Sample	Blows per 6" on Sampler			Moisture Density or Consist.	Strata Change Elev	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hardness, Drilling time, seams and etc	SAMPLE		
				From	To					No	Pen	Re
1		0'-2'	D	P	1	S	wet soft			1	24'	24'
3												
4												
7		3'-5'	D	10	20	21	wet hard			2	24'	18'
14						20	wet					
18		6'-7'	D	14	16		dense	6'				
30		7'-8'	D	22	32		wet hard	7'	Brn. fine s i lty SAND Lens)	3	12'	12'
32								9'	Brown silty CLAY			
24		10'-12'	D	2	4	4	wet stiff			4	24'	24'
28						5						
30												
20												
20							wet medium stiff					
25		15'-17'	D	2	3	3				5	24'	24'
25						4						
25												
45		19.5'-20'	D	32			wet dense	19'				
44		20'-21.5'	D	20	12	17	wet very stiff	20'	Gray GRAVEL (fractures)	6	6"	6"
9								21.5'	Brown sandy CLAY	6a	18'	12'
17												
40									Brown silty sandy GRAVEL			
45		25'-25.5'	D	100	50		wet very dense			7	6"	6"
30				(140)	(300)			28'				
45												
65												
75												
44		30'-31.5'	D	25	25	58	"		Gray silty fine SAND, little fine-medium gravel	8	18'	14'
40												
45												
90												
175		34'10"	D	100/0"	20/0"		"	34'10"				
(10")				(14)	(100)							
									Bottom of Boring = 34'10" Refusal			

GROUND SURFACE TO 34'10"

USED 140lb Wt. x 30" fall ON 2" O.D. SAMPLER

THEN Refusal

Sample Type  
D=Dry C=Cored W=Washed  
UP=Undisturbed Piston  
TP=Test Pit A=Auger V=Vane Test  
UT=Undisturbed Thinwall

Proportions Used  
trace 0 to 10%  
little 10 to 20%  
some 20 to 35%  
and 35 to 50%

140lb Wt. x 30" fall on 2" O.D. Sampler  
Cohesionless Density  
0-10 Loose  
10-30 Med. Dense  
30-50 Dense  
50+ Very Dense

Cohesive Consistency  
0-4 Soft 30+ Hard  
4-8 M/Stiff  
8-15 Stiff  
15-30 V-Stiff

SUMMARY:  
Earth Boring 34'10"  
Rock Coring 8  
Samples  
HOLE NO G-3

# American Drilling & Boring Co., Inc.

100 WATER STREET

EAST PROVIDENCE, R. I.

Yankee Atomic Electric Co.

Westboro, Mass.

TO PROJECT NAME

ADDRESS

Seabrook, N. H.

REPORT SENT TO Distribution as per Spec

LOCATION

PROJ. NO. 7286

SAMPLES SENT TO Delivered to Geotech at Site

OUR JOB NO. 4-85

SHEET 1 OF 1

DATE

HOLE NO. G-4

LINE 8 STA.

OFFSET

SURF. ELEV.

## GROUND WATER OBSERVATIONS

At 1'6" after 23 Hours

after \_\_\_\_\_ Hours

CASING

SAMPLER

CORE BAR

Type

NW

S/S

Size I.D.

3"

1-3/8"

Hommer Wt

300#

140#

BIT

Hommer

24 Fall

30"

Date Time

START 10/2/74

COMPLETE

TOTAL HRS.

BORING FOREMAN K. Allen

INSPECTOR

SOILS ENGR.

## LOCATION OF BORING:

Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler			Moisture Density or Consist.	Grata Change Elev.	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc Rock-color, type, condition, hard- ness, Drilling time, seams and etc	SAMPLE		
			From 0-6	6-12	To 12-18				No.	Pen	Rec
1	0'-2'	D	1	1	1	wet	1'	(ionsoil ) Crown SILT	1	24'	6'
1					2	soft					
17						wet					
10	3'-5'	D	6	10	22	very	4'	Brown fine sandy SILT	2	24'	18'
26					42	dense					
10			6"	6"		"					
7	6'-7.5'	D	100	38	60	"		Brown fine SAND, some coarse sand & fine-coarse gravel trace of silt	3	18'	18'
100			140	(300)		"					
2						"					
40						"					
20	10'-11.5'	D	25	50	57	"			4	18'	18'
90						"					
40						"					
125						"					
125						"					
20	15'-16.2'	D	50	42	60	"			5	15'	15'
21			75	(300)		"					
26						"					
75						"	19'				
16						"					
	20'-21'	D	76	76		"		Gray silty SAND, some fine to coarse gravel	6	12'	12'
						"	22.5'				
						"		Bottom of Boring - 22.5' Refusal - Roller Bit			

GROUND SURFACE TO 20'

USED

CASING:

THEN Roller bit to refusal

Sample Type

D=Dry C=Cored W=Washed

UP= Undisturbed Piston

TP= Test Pit A=Auger V=Vane Test

UT=Undisturbed Thinwall

Proportions Used

tmce 0 to 10%

little 10 to 20%

some 20 to 35%

and 35 to 50%

140lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density

0-10 Loose

10-30 Med. Dense

30-50 Dense

50 + Very Dense

Cohesive Consistency

0-4 Soft

4-8 M/Stiff

8-15 Stiff

15-30 V-Stiff

30 + Hard

SUMMARY:

Earth Boring 22.5'

Rock Coring

Samples 6

HOLE NO.

**100 WATER STREET EAST PROVIDENCE, R. I.**

**100** WATER STREET

EAST PROVIDENCE, R. I.

TO Yankee Atomic Electric Co.

ADDRESS Westboro, Mass.

PROJECT NAME Circulating Water System

LOCATION Seabrook, N.H.

REPORT SENT TO Distribution as per specific request

PROJ. NO. 7286

SAMPLES SENT TO Delivered to Geotech. at Site

OUR JOB NO. 4-75

SHEET 1 OF 1

DATE \_\_\_\_\_

HOLE NO. G-5

LINE &amp; STA. \_\_\_\_\_

OFFSET \_\_\_\_\_

SURF. ELEV. \_\_\_\_\_

GROUND WATER OBSERVATIONS		CASING	SAMPLER	CORE	BAR	Date	Time
At _____	after _____ Hours	Type _____	1 1/2" s/S	_____	START	10/4/74	am
		Size I.D. _____	3" 1-3/8"	_____	COMPLETE	"	pm
		Hammer Wt _____	300# 140#	_____	TOTAL HRS. _____		
At _____	after _____ Hours	Hammer Fall _____	27" 30"	BIT _____	BORING FOREMAN _____	F. J. Tien	
					INSPECTOR _____		
					SOILS ENGR. _____		

## LOCATION OF BORING'

[illegible]

GROUND SURFACE TO 9'

USED 10.0

ASING:

1 THEN Kerusa 1 w/roller bit

**Sample Type**

D - Dry C = Cored W = Washed

UP: Undisturbed Piston

TP= Test Pit A=Auger V=Vane Test

UT-Undisturbed Thinwall

### Proportions Used

trace 0 to 10%

title	10 to 20%
1. <u>Introduction</u>	
2. <u>Background</u>	
3. <u>Methodology</u>	
4. <u>Results</u>	
5. <u>Conclusion</u>	
6. <u>References</u>	
7. <u>Appendix</u>	
8. <u>Summary</u>	
9. <u>Discussion</u>	
10. <u>Future Work</u>	
11. <u>Acknowledgments</u>	
12. <u>References</u>	
13. <u>Appendix</u>	
14. <u>Summary</u>	
15. <u>Discussion</u>	
16. <u>Future Work</u>	
17. <u>Acknowledgments</u>	
18. <u>References</u>	
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139. <u>Appendix</u>	
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141. <u>Discussion</u>	
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143. <u>Acknowledgments</u>	
144. <u>References</u>	
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some 20 to 35%

and 351050%

140lb Wt. x 30" fall on 2" O D. Sampler

### Cohesionless Density

O-10      Loose

10- 30 Med. Dense  
20- 50 Dense

30-50 Dense  
50+ Very Dense

### on 2" O D. Sampler

### Cohesive Consistency

0-4 Soft 3

4-8 M/Stiff  
8-15 8-16

8-15 Stiff  
15-30 V=Stiff

**SUMMARY:**

Earth Boring 9' 8"

### Rock Coring

## Samples

HOLE NO. G-5

SHEET 1 OF 1  
DATE \_\_\_\_\_  
HOLE NO. G-6  
LINE & STA. \_\_\_\_\_  
OFFSET \_\_\_\_\_  
SURF. ELEV. \_\_\_\_\_

GROUND WATER OBSERVATIONS		CASING	SAMPLER	CORE BAR	Date	Time
At _____	after _____ Hours	Type NW	S IS		START 10/4/74	8:00
		3"	1-3/8"		COMPLETE	9:00
		Sue I.D.			TOTAL HRS.	
At _____	after _____ Hours	300'	140'		BORING FOREMAN, K. Allen	
		Hammer Wt. 24"	30"	BIT	INSPECTOR	
		Hammer Fall			SOILS ENGR.	

LOCATION OF BORING:

[illegible]

GROUND SURFACE TO 9'

USED 156

ASING: THEN

Roller bit to refusal (rock?)

**Sample T y p e**

### Proportions Used

140lb Wt. x 30" fall on 2" O.D. Sompler

**SUMMARY:**

D = Dry C = Cored W = Washed

trace 0 to 10%

### Cohesionless Density

Cohesive Consistency

Earth Boring 19 6

UP: Undisturbed Piston

little 10 to 20%

0-10 Loose

0-4 Soft

Rock Coring \_\_\_\_\_

TP=Test Pit A=Auger V=Vone Test

some 20to35%

10-30 Med. Dense  
30-50 Dense

4-8 M/Stiff  
9-15 C+14

Samples 1

UT=Undisturbed Thinwall

and 35 to 50%

50 + Very Dense

8-15 Stiff  
15-30 V-Stiff

HOLE NO. G-6

100 WATER STREET EAST PROVIDENCE, R I

SHEET 1 OF 1  
DATE \_\_\_\_\_  
HOLE NO. G-7  
LINE & STA. \_\_\_\_\_  
OFFSET \_\_\_\_\_  
SURF. ELEV. \_\_\_\_\_

GROUND WATER OBSERVATIONS		CASING	SAMPLER	CORE BAR.	Date	Time
A t - _____	o f t e r ____ Hours	Type _____	5/8	_____	10/4/74	_____
_____	_____	Size I.D. _____	1-3/8"	_____	_____	_____
Al _____	a f t e r - - - Hours	Hammer Wt. _____	140	_____	_____	_____
_____	_____	Hammer Fall _____	30"	BIT _____	_____	_____

START \_\_\_\_\_

COMPLETE \_\_\_\_\_

TOTAL HRS. \_\_\_\_\_

BORING FOREMAN \_\_\_\_\_

INSPECTOR \_\_\_\_\_

SOILS ENGR. \_\_\_\_\_

o.p.m.

p.m.

[illegible]

GROUND SURFACE TO 10' USED 17' ASING: THEN Used Roller Bit to 33'2"

Sample Type	Proportions Used	140lb Wt. x 30" fall on 2" O.D. Sampler	SUMMARY:
D-Dry C=Cored W=Washed	trace 0 to 10%	Cohesionless Density Cohesive Consistency	Earth Boring 2"
UP: Undisturbed Piston	little 10 1020%	0-10 Loose 0-4 Soft 30 + HaRock Coring	
TP= Test Pit A-Auger V=Vane Test	s o m e 20 to 35%	10-30 Med. Dense 4 - a M/Stiff	Samples
		30-50 Dense 8-15 Stiff	





100 WATER STREET EAST PROVIDENCE, R. I.

SHEET 10 F 1  
DATE \_\_\_\_\_  
HOLE NO. C-10  
LINE & STA. \_\_\_\_\_  
OFFSET \_\_\_\_\_  
SURF. ELEV. \_\_\_\_\_

GROUND WATER OBSERVATIONS		CASING	SAMPLER	CORE BAR.	Date	Time
At _____	after _____ Hours	Type NW	_____	NO. 3	10/7/74	a.m.
At _____	of ter _____ Hours	Size I.D. 3"	_____	_____	10/8/74	p.m.
		Hammer Wt. 300#	_____	_____		p.m.
		Hammer Fall 24"	_____	BIT		
			_____	disc		
START					10/7/74	a.m.
COMPLETE					10/8/74	p.m.
TOTAL HRS.						
BORING FOREMAN					K. Allen	
INSPECTOR					G. Lee	
SOILS ENGR.						

[illegible]

USED "CASING: THEN Correct 0 22"

Proportions Used		140lb Wt x 30" fall	on 2" O.D. Sampler	
		Cohesionless Density	Cohesive Consistency	
trace	0 to 10%			
little	10 to 20%	O-10 Loose	0-4 Soft	30 + Hard
s o m e	20 to 35%	10-30 Med. Dense	4-8 M/Stiff	
and	35 to 50%	30-50 Dense	8-15 Stiff	
	50 to 60%	50-60 Very Dense	15-20 Very Stiff	

SUMMARY:	
Earth Boring	7'
Rock Coring	15'
Samples	---

HOLE NO. C-10





# American Drilling & Boring Co., Inc.

100 WATER STREET EAST PROVIDENCE, R I

TO Yankee Atomic Electric ADDRESS Westboro, Mass.  
PROJECT NAME Circulating Water System LOCATION Seabrook, N.H.  
REPORT SENT TO Distribution as per Specification PROJ NO 7285  
SAMPLES SENT TO Delivered to Geotech. at Site OUR JOB NO. 4-25

SHEET 1 OF 1  
DATE 10/10/74  
HOLE NO. G-12  
LINE & STA.         
OFFSET         
SURF. ELEV.       

GROUND WATER OBSERVATIONS		CASING	SAMPLER	CURE BAR	Date	Time
W <u>      </u> after <u>      </u> Hours	Type <u>NW</u>	<u>3"</u>	<u>1-3' 8" 2-15/16"</u>	<u>1"</u>	START <u>10/10/74</u>	<u>8:00</u>
Top of Ground	Size I.D. <u>300#</u>	<u>140"</u>	<u>30"</u>	<u>Roller</u>	COMPLETE <u>"</u>	<u>8:15</u>
W <u>      </u> after <u>      </u> Hours	Hammer Wt <u>24"</u>	<u>30"</u>	<u>Roller</u>		TOTAL HRS. <u>      </u>	
	H o m m e r <u>24"</u>	<u>30"</u>	<u>Roller</u>		BORING FOREMAN <u>K. Allen</u>	
					INSPECTOR <u>      </u>	
					SOILS ENGR. <u>      </u>	

## LOCATION OF BORING:

DEPTH	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler			Moisture Density or Consist.	Strata Change Elev	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc Rock-color, type, condition, hardness, Drilling time, seams and etc	SAMPLE		
				From 0-6	To 6-12	To 12-18				No	Pen	Rec
1	0'-1'	D	1	4			w/m/s	1'	Brown FEAT	1	12'	6'
7	1'-2'	D	6	6			wet			1a	12'	3'
14							mediu					
15							dense		Gray fine silty SAND			
33	5'-6' 5"	D	12	21	28		wet			2	18'	12'
35							dense					
37								9'				
37									Gray CLAY			
	10'-10' 11"	D	5	5 5/8"	100/0		" wet	10' 11"		3	11'	11'
				(140)	(140)		stiff	11'	Roller Bit Refusal @ 11'			
									Bottom of Boring- 11'			
									Refusal			

GROUND SURFACE TO 10' USED        CASING: THEN sample to 11'

### Sample Type

D=Dry C=Cored W=Washed  
UP: Undisturbed Piston  
TP= Test Pit A=Auger V=Vane Test  
UT- Undisturbed Thinwall

### Proportions Used

trace 0 to 10%  
little 10 to 20%  
some 20 to 35%  
and 35 to 50%

### 140 lb Wt. x 30" fall on 2" O.D. Sampler

Cohesionless Density  
0-10 Loose  
10-30 Med. Dense  
30-50 Dense  
50+ Very Dense

### Cohesive Consistency

0 - 4 Soft 30 + Hard  
4 - 8 M / Stiff  
8-15 Stiff  
15-30 v-Stiff

### SUMMARY:

Earth Boring 11'  
Rock Coring ---  
Samples 3

HOLE NO. G-1