ENGINEERING REPORT

for

CONTRACT NUMBER DACW-33-81-D-0005
WORK ORDER NUMBER 0007

SUBSURFACE INVESTIGATION

COASTAL FLOOD STUDY
REVERE, MASSACHUSETTS

AUGUST 24 THROUGH SEPTEMBER 3, 1982

BRIGGS

BRIGGS
164 Washington Street, Norwell, MA 02061 ▶ Telephone (617) 773-2780

September 28, 1982

Mr. Joe B. Fryar
Chief Engineering Division
New England Division
U.S. ARMY CORPS OF ENGINEERS
424 Trapelo Road
Waltham, MA 02254

RE: Contract DACW 33-81-D-0005
Work Order No. 0007

Dear Mr. Fryar:

In accordance with Work Order No. 0007 dated 19 August 1982, we enclose one (1) copy of our Engineering Report for the Subsurface Investigation of the Point of Pines, Revere, Massachusetts. Three (3) additional copies have been delivered under separate cover to your Geotechnical Branch. If you have any questions or comments, please do not hesitate to call.

Very truly yours,

David S. Campbell, P.E.

DSC/mc
Enclosure

RECEIVED
OCT 5 1982
Geotech. Branch

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1.0 GENERAL

1.1 Authorization

The work reported herein was performed under Contract DACW 33-81-D-0005, Work Order Number 0007, dated 19 August 1982. The authority for this project was derived from Public Law 80-858, Section 205, of the 1948 Flood Control Act.

1.2 Project Site

The site is located in Revere, Massachusetts. The project site encompasses approximately 4,500 ft of shore line, between Carey Circle and the General Edwards Bridge, on the Point of Pines (see Figure 1).

1.3 Purpose

The purpose of this work was to determine the subsurface conditions so as to design the foundation for repairing and/or replacing the flood wall at the project site.

1.4 Scope of the Investigation

Inspection and exploration instructions, which were provided by the Army Corps of Engineers, New England Division, are included in Appendix A. The project subsurface investigation employed test borings, radar and resistivity testing techniques.

The boring program consisted of drilling eight test borings at the locations shown on the Boring Location Plan (Figure 1). The borings were located along the shore line between 2.8 and 8.0 ft above mean sea level (M.S.L.). Continuous drive sampling using a solid-barrel sampler was performed at 5-foot intervals to a maximum depth of 30 ft below the existing ground surface. The field exploration logs are included in Appendix B.

2.0 SUBSURFACE CONDITIONS

2.1 Subsurface Materials

The following subsurface materials were encountered when the borings were drilled at the site.

a. Miscellaneous Fill, up to 5 ft in thickness at boring FD 82-2 was encountered at the surface. The Gravelly Sand fill consists of concrete fragments from demolition of a restuarant previously at this location.

b. Tidal Deposits of Gravel and Sand, between 15 and 30 ft of Gravelly Sand, Sand with Gravel Layers and Sand was encountered at the surface or beneath the miscellaneous fill at boring location FD 82-2. The material was generally clean with a small amount of shell fragments and less than 10 percent nonplastic fines.

c. Silty Clay, underlies the noncohesive tidal deposits in all borings except boring FD 82-6, where only Sand was encountered, and extends to the maximum depth explored (30.0 ft).

2.2 Groundwater

Groundwater was encountered between 3.0 and 4.0 ft below the existing ground surface at borings FD 82-2 and FD 82-6, respectively. These values, and values at other boring locations are subject to tidal fluctuations and local anomalous conditions such that groundwater observations taken during the drilling operations were considered inaccurate or as tidal.

3.0 QUALITY CONTROL

3.1 General

All work was conducted in accordance with the procedures outlined in the Inspection and Exploration Instructions. The equipment utilized by Briggs Engineering & Testing Co. to perform the required drilling work is described below. All equipment was in satisfactory working condition at the start of the project work.

a. Core Drill: The core drill used was a modern, hydraulically-driven, rotary-head unit manufactured by Acker Drill Company.

b. Truck Mounted Cathead: A pickup truck using a, power take off, rear mounted cathead with the drilling tripod attached to the truck body.

c. Drive Hammer: The drive hammer used to advance the solid-barrel sampler weighed approximately 300 pounds.

d. Casing and Rods: NW (3-0 in. I.D.) flush joint casing was used to keep the borehole open. AW-size drill rods were used in washing out the borehole and driving the solid-barrel sampler.

e. Samplers: The equipment employed to obtain soil samples was a 2-inch I.D. by 63-inch solid-barrel sampler with a ball check head and spring-type retainer.

3.2 Records

NED Forms 58 and 58A, dated March 1971 and entitled "Field Log of Test Boring" were used to record pertinent drilling and sampling data. The logs include the following:

a. Site location, boring location, and number.

b. Make and model of drilling equipment.

c. Type of drilling and sampling operation by depth.

d. Depths at which soil samples were recovered, including top and bottom depth of each run. Classification or description of the soil samples obtained. Penetration resistance given in blows per 12 in. of penetration for driving the solid-barrel sampler.

e. Length of sample of soil recovered per sampling run.

f. Depth at which groundwater is encountered.

3.3 Procedures

a. Boreholes were advanced by driving a 2-inch I.D. by 63-inch solid-barrel sampler below the bottom of the casing or washed hole into undisturbed soil by the impact of a hammer weighing approximately 300 pounds falling 18 inches. Refusal was defined as 100 blows with no penetration or bouncing refusal.

b. The sample spoon shoes were kept reasonably sharp at all times. Dull, bent, or otherwise damaged samplers were not used. Following sampling, the casing was advanced and cleaned out using appropriately sized roller bits, or chopping bits.

c. Samples were classified in the field immediately following the taking of the sample. Classification was in accordance with ASTM D-2487 and D-2488. Representative samples were take from each soil sampling run and placed in 16 oz. glass jars with hermetically sealed lids. Jars were labeled with sample number, sampling interval, boring number, date, location, and soil description. A chain of custody log was maintained documenting custody of the samples between the field and transportation and delivery to the laboratory at NED.

3.4 Safety

The work was performed without personal injury or accident. The geotechnical inspector conducted weekly safety briefings. The Safety Reports are attached to this report.

3.5 Survey

Boring elevations were determined using a hand level from elevation points as shown on the site plan provided by the Corps of Engineers.

3.6 Reflection Survey

Radar and resistivity techniques were employed by Weston Geophysical to delineate the subsurface conditions within the project site between boring locations. A separate report will be submitted by Weston Geophysical containing their findings.

4.0 QUALITY CONTROL CERTIFICATION

I hereby certify that the above mentioned records, equipment, and procedures were used to perform the subsurface exploration described herein. I also certify that the work was performed in a professional manner and meets the requirements set forth in the work order.

CERTIFIED 14 September 1982

Nicholas A. Lanney

Nicholas A. Lanney, P.E.
Massachusetts No. 30789

BRIGGS ENGINEERING CORPORATION

WEEKLY SAFETY MEETING

TO: Safety Office, NED

FROM: Field Engineer — Date held 8-24-82

THRU: Project Engineer — Time 0700

Weekly safety meeting was held this date for the following personnel:
Contract No. DACW 33-81-D-0005 Personnel present: Richie Jones
Work Order No. 007 Charles Reil
Conducted By: R.F. Bukoski

1. Subjects discussed (Note, delete, or add):

x Individual Protective Equipment -
Prevention of Falls -
x Safe Lifting Techniques -
Emergency Communications -
Fire Prevention -
Sanitation, First Aid -
Tripping Hazards - trash, hose, nails in lumber -
Staging, Ladders, Concrete Forms -
Hand Tools -
Portable Power Tools -
Woodworking Machinery -
Equipment Maintenance (Zero defects) -
x Hoisting Equipment -
X Ropes, Hooks, Chains and Slings -
Electrical Grounding, Temporary Wiring -
Lockouts for safe clearance procedures -
Electrical, pressure, moving parts -
Welding -
Excavations -
Loose Rock and Steep Slopes -
Explosives -
Water Safety -
Other -

Prepared by: Ronald F. Bukoski
Field Engineer

2. Exposure:
No previous exposure, start of new work order.

Signature: Nicholas Lanney
Project Engineer

3. Forwarded: NED, Waltham, MA

BRIGGS ENGINEERING CORPORATION

WEEKLY SAFETY MEETING

TO: Safety Office, NED

FROM: Field Engineer — Date held 8-30-82

THRU: Project Engineer — Time 0700

Weekly safety meeting was held this date for the following personnel:
Contract No. DACW 33-81-D-0005 Personnel present: Jeff Mullen
Work Order No. 007 Keith McAuliffe
Conducted By: R.F. Bukoski

1. Subjects discussed (Note, delete, or add):

x Individual Protective Equipment -
X Prevention of Falls -
x Safe Lifting Techniques -
Emergency Communications -
Fire Prevention -
Sanitation, First Aid -
Tripping Hazards - trash, hose, nails in lumber -
Staging, Ladders, Concrete Forms -
Hand Tools -
Portable Power Tools -
Woodworking Machinery -
Equipment Maintenance (Zero defects) -
Hoisting Equipment -
X Ropes, Hooks, Chains and Slings -
Electrical Grounding, Temporary Wiring -
Lockouts for safe clearance procedures -
Electrical, pressure, moving parts -
Welding -
Excavations -
Loose Rock and Steep Slopes -
Explosives -
Water Safety -
Other -

Prepared by: Ronald F. Bukoski
Field Engineer

2. Exposure:
Exposure for the week of 8-23-82, covering three men for a total of 66 man-hours.

Signature: Nicholas A. Larrey
Project Engineer

3. Forwarded: NED, Waltham, MA

BRIGGS ENGINEERING CORPORATION

WEEKLY SAFETY MEETING

TO: Safety Office, NED

FROM: Field Engineer — Date held 9-7-82

THRU: Project Engineer — Time 0700

Weekly safety meeting was held this date for the following personnel:
Contract No. DACW 33-81-D-0005 Personnel present:
Work Order No. 007
Conducted By: R.F. Bukoski

1. Subjects discussed (Note, delete, or add):

Individual Protective Equipment -
Prevention of Falls -
Safe Lifting Techniques -
Emergency Communications -
Fire Prevention -
Sanitation, First Aid -
Tripping Hazards - trash, hose, nails in lumber -
Staging, Ladders, Concrete Forms -
Hand Tools -
Portable Power Tools -
Woodworking Machinery -
Equipment Maintenance (Zero defects) -
Hoisting Equipment -
Ropes, Hooks, Chains and Slings -
Electrical Grounding, Temporary Wiring -
Lockouts for safe clearance procedures -
X Other - Comments by R. Poisson on 30 August 1982:
1. Fire Extinguisher
2. Nut on Tripod Bolt

Prepared by: Ronald F. Bukoski
Field Engineer

2. Exposure:

Exposure for the week of 8-30-82, covering three men for a total of 68 man-hours. Field work completed on 9-3-82.

Exposure for Weston Geophysical personnel on 8 and 9 September 1982, covering 2 men for a total of 40 man-hours. Field work was completed on 9 September 1982.

Signature: Nicholas A. Lamney
Project Engineer

3. Forwarded: NED, Waltham, MA

BRIGGS ENGINEERING CORPORATION

Chain of Custody Log

Project: Subsurface Investigation: Coastal Flood Study
Revere, Massachusetts

Items:

Tubes	None
Bottles	None
Jar Samples	70
Core Boxes	None
Sampling Logs	Borings FD 82-1, FD 82-2, FD 82-3, FD 82-4, FD 82-5, FD 82-6, FD 82-7, FD 82-8

Date & Time Received	Date & Time Transfered	Comments	Custodian
as sampled	9-8-82 0830		Randy Bakali
9-8-82 0830	9-8-82 1140		Steven McKay
		OK	Chris Turek

APPENDIX A: INSPECTION AND EXPLORATION INSTRUCTIONS

GEB REQUISITION #82-47

INSPECTION AND EXPLORATION INSTRUCTIONS

ATTACHMENT NO.1

PROJECT: Revere Coastal Flood Protection Study, Massachusetts, Pt. of Pines

SITE: Revere, MA - Pt. of Pines - From Carey Circle to General Edwards Bridge

AUTHORITY: Section 205 of 1948 Flood Control Act (PL 80-858)

PURPOSE: The subsurface investigations are for determining the subsurface conditions so as to design the foundation for repairing and/or replacing the flood wall at the project site.

SCOPE OF INVESTIGATION

1. The work to be performed is separated into three sections: seismic survey, drive sample borings, and undisturbed soil sampling. The seismic survey and drive sample borings need not be performed separately.

2. The seismic survey will consist of approximately 4,500 lineal feet of reflection survey along the existing wall as shown on attachment No.2. The main purpose of the survey is to determine the thickness of the organic layer which is expected within the foundation area. The seismic line shall be located using features from the existing flood wall. The plan of the seismic line shall include distant measurements to existing features from noted seismic stations. The seismic profiles shall show the seismic stationing along with the elevation in MSL and the delineation of the various zones and their velocities.

3. Eight drive sample borings using a 300 lb. hammer with an 18-inch drop shall be performed at the location shown on Attachment No. 2. The explorations shall go to a maximum depth of 30 feet. Refusal is not expected to be encountered within this zone, but if a refusal (100 blows with no penetration or bouncing refusal) is encountered, the hole shall be moved laterally five feet and driven again. Only one move per hole will be authorized unless otherwise directed by project engineer. The project engineer shall be contacted at the start of FD-82-6 so that a site visit may be arranged to locate the undisturbed sampling bore holes and depths.

4. The undisturbed boring shall be as located by Corps of Engineers personnel during the before mentioned site visit. The samples shall be 5 inch diameter, 30 inch long. The materials to be sampled will basically be organics.

5. The drive sample and undisturbed explorations shall be inspected full time by a Geotechnical Engineer. The Geotechnical Inspector shall also inspect the seismic work if it is performed simultaneously. Top elevations shall be obtained to within ± 0.5 feet using elevation points as shown on Attachment No. 2.

6. Sample delivery shall be within two working days after completion of the field work. Three copies of the draft report shall be postmarked no later than the seven calendar days after completion of field work.

SITE CONDITIONS

The site is located in Revere, MA between Carey Circle and the General Edwards Bridge. It is approximately parallel to Rice Ave. The expected foundation conditions are a sand overlain by a layer of organics with bedrock over 100 feet deep. The surface is expected to have a low bearing capacity. The area to be investigated is trafficked by beach goers during good weather. Portions of the area are within the tidal range.

RIGHTS OF ENTRY

Rights of entry shall be obtained by Corps of Engineers personnel.

COORDINATION

The Project Engineer shall be Mr. R. Poisson, 617-647-8396. Mr. Poisson shall be contacted at the start of FD-82-6 so that a site visit to locate the undisturbed explorations may be arranged. Sample delivery shall be coordinated with Mr. Michael Carroll at 647-8392.

EXPLORATION NUMBERS

The exploration locations are designated using letters on Attachment No. 2. The holes shall be numbered FD-82-1 through FD-82- consecutively in their order of completion. The undisturbed sampling holes shall be numbered UD-82- . The undisturbed hole numbers shall be the same as its adjacent pilot hole.

APPENDIX B: FIELD LOGS OF TEST BORINGS

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site REVERE, MA — Page 1 of 3 Pages

Boring No. FD 82-1 Desig. F Diam. (Casing) 3-0"

Co-ordinates: N NOT GIVEN E

Elevation Top of Boring 5.5' M.S.L. — Hammer Wt. 300 lbs — Boring Started 8-24-82

Total Overburden Drilled 30.0 Feet — Hammer Drop 18

Elevation Top of Rock NONE ENCOUNTERED M.S.L. — Casing Left NONE — Boring Completed 8-24-82

Total Rock Drilled ⊙ Feet — Subsurface Water Data — Page —

Elevation Bottom of Boring -24.5' M.S.L. — Obs. Well NO — 3.2' TIDAL

Total Depth of Boring 30.0 Feet — Drilled By BRIGGS ENGINEERING & TESTING CO.

Core Recovered N/A % No. Boxes — — Mfg. Des. Drill ACKER

Core Recovered N/A Ft. — Diam. — In. — Inspected By: RONALD F. BUKOSKI

Soil Samples 2-0 In. Diam. 6 No. — Classification By: RONALD F. BUKOSKI

Soil Samples 1-3/8 In. Diam. 1 No. — Classification By:

0900 hrs

DEPTH 1"=1.0'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
1.0	S-1 1 JAR	2-0"	0.0 TO 5.0'	7	DROVE 2-0" I.D. X 5-0' SOLID BARREL SAMPLER FROM GROUND SURFACE TO 5.0' USING 300 lb HAMMER DROPPED 18".	SURFACE: BEACH SAND SAND, FINE MEDIUM TO FINE SAND, < 2% NONPLASTIC FINES < 2% SHELL FRAGMENTS, MOIST, LIGHT GRAYISH BROWN, (SP).
2.0				22	RECOVERED 26-0"	
3.0				36	DROVE 3-0" CASING FROM GROUND SURFACE TO 5.0'	2" SEAM OF GRAVELLY SAND AT APPROXIMATELY 2.0'
4.0				33	WASHED OUT CASING USING ROLLER ROCK BIT.	35-45% MEDIUM TO FINE SUBROUNDED GRAVEL, COARSE TO FINE SAND, MOIST, LIGHT GRAYISH BROWN, (SW).
5.0				18		
6.0	S-2 1 JAR	2-0"	5.0 TO 10.0'	17	DROVE 2-0" I.D. X 5.0' SOLID BARREL SAMPLER FROM 5.0 TO 10.0' USING 300 lb HAMMER DROPPED FROM 18"	SAND, FINE MEDIUM TO FINE SAND, < 5% ORGANIC FINES AND DECAYING WOOD, < 5% SHELL FRAGMENTS, SLIGHT ORGANIC ODOR, SATURATED, DARK GRAY, (SP).
7.0				18	RECOVERED 19-0".	
8.0				21	DROVE 3-0" CASING FROM 5.0' TO 10.0' AND WASHED OUT USING ROLLER ROCK BIT.	
9.0				21		
10.0				25		

GENERAL REMARKS: BORING DEPTHS ARE REFERENCED TO EXISTING GROUND SURFACE ELEVATION.

NED ... 58 (Test)

Boring No. FD 82-1
DESIG. F

Site: REVERE, MA	Boring No. FD 82-1 DESIG. F	Page 2 of 3

DEPTH 1" = 1.0'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATER ALS
11.0, 12.0, 13.0, 14.0, 15.0	S-3 1 JAR	2-0"	10.0 TO 15.0'	9, 11, 19, 24, 27	DROVE 2-0" I.D. x 5' SOLID BARREL SAMPLER FROM 10.0 TO 15.0' USING 300 lb HAMMER. RECOVERED 27-0". DROVE 3-0" CASING FROM 10.0 TO 15.0' AND WASHED OUT USING ROLLER ROCK BIT.	SAND WITH PEAT LAYERS, THIN, DISPERSE LAYERS, LESS THAN 1/8" THICK OF PEAT FINE MEDIUM TO FINE SAND, < 2% NONPLASTIC FINES, < 5% SHELL FRAGMENTS, MODERATE ORGANIC ODOR, DARK GRAY, (SP LAYERS Pt).
16.0, 17.0, 18.0, 19.0, 20.0	S-4 1 JAR	2-0"	15.0 TO 20.0'	9, 11, 16, 20, 22	DROVE 2-0" I.D. x 5' SOLID BARREL SAMPLER FROM 15.0 TO 20.0' USING 300 lb HAMMER DROPPED 18". RECOVERED 31-0." DROVE 3-0" CASING FROM 15.0 TO 20.0' AND WASHED OUT USING ROLLER ROCK BIT.	SAND, WIDELY SPACED PEAT LAYERS, 4" LAYER - MEDIUM GRAVEL SIZE PARTICLES INTERSPERSED IN SAND FINE MEDIUM TO FINE SAND, < 5% SHELL FRAGMENTS, < 5% MEDIUM TO FINE GRAVEL, SLIGHT ORGANIC ODOR, GRAY, (SP WITH Pt).
21.0, 22.0	NO SAMPLE TAKEN		20.0 TO 22.0	7, 13	DROVE 2-0" I.D. x 5' SOLID BARREL SAMPLER FROM 20.0 TO 25.0' USING 300 lb HAMMER DROPPED 18". RECOVERED 36"	NO SAMPLE TAKEN BETWEEN 20.0 AND 22.0'. LITTLE RECOVERY; MOSTLY DISTURBED FROM WASH, SAME SAND AS ABOVE.
23.0, 24.0, 25.0	S-5 2 JARS	2-0"	22.0 TO 25.0'	21, 30, 39	DROVE 3-0" CASING FROM 20.0 TO 25.0' AND WASHED OUT USING USING FISHTAIL BIT. DROVE 2-0" I.D. SOLID SPOON SAMPLER FROM 25.0 TO 30.0' NO RECOVERY. VERY STIFF CLAY TRAP BROKEN-OFF WHILE DRIVING. DROVE 1-3/8" I.D. SPLIT-BARREL SAMPLER FOR RECOVERY.	SILTY CLAY, MODERATE PLASTICITY MOTTLED BROWN AND GRAY ~5% PEAT INTERSPERSED, MODERATE DRY STRENGTH, (CL).
26.0	S-6 1 JAR	1-3/8"	25.0 TO 30.0'	7, 11		SILTY CLAY, SAMPLE S-6 SAME AS SAMPLE S-5.

Site: REVERE, MA	Boring No. FD 82-1 DESIG. F	Page 3 of 3

DEPTH: Blows on Casing	DEPTH: 1" = 1.0'	CORE/SAMPLE: NO.	CORE/SAMPLE: SIZE	CORE/SAMPLE: DEPTH RANGE	BLOWS PER FT. / CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
					17		S-6: SILTY CLAY
	28						
					21		
	29						
					24		
	30						
						BOTTOM OF BORING 30.0'	

Site: REVERE, MA

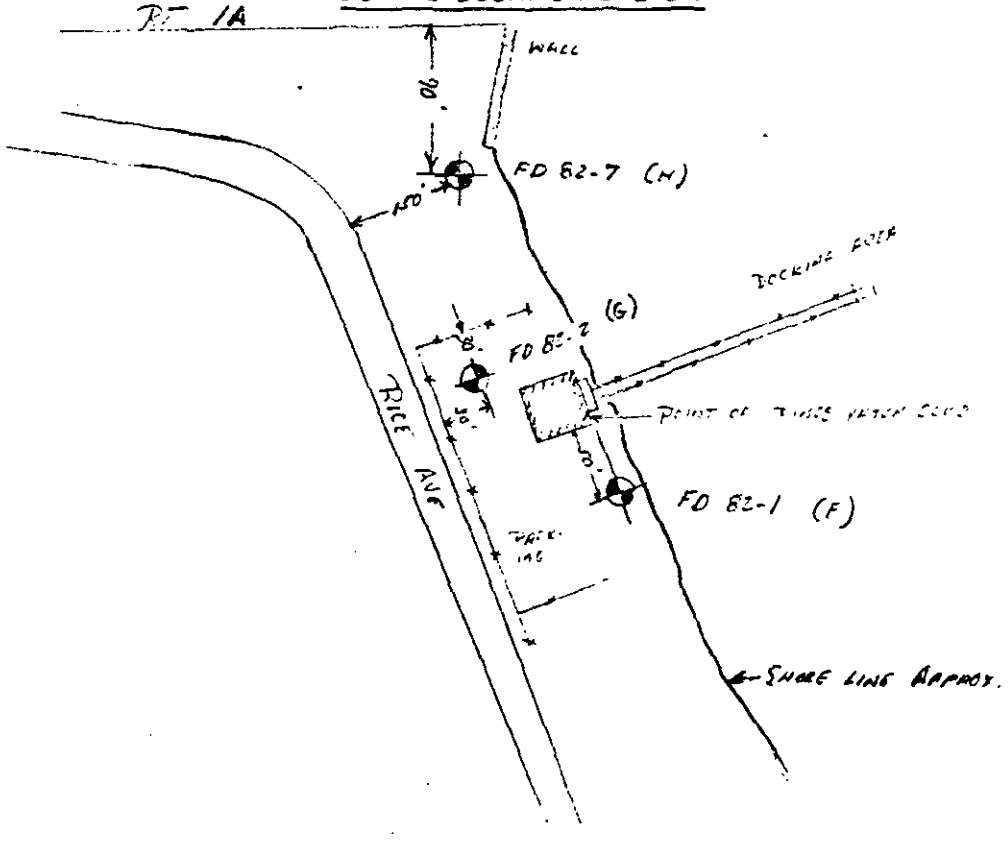
Boring No: FD 82-1

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
8-24	1300	15.0'	30.0'	4.5'	1.0' M.S.L.	TIDAL

Note: Depths are in feet below original ground.

BORING LOCATION SKETCH



FORM 59 (Test)

Boring No FD 82-1

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site REVERE, MA — Page 1 of 3 Pages

Boring No. FD 82-2 Desig. G Diam. (Casing) 3-0"

Co-ordinates: N NOT GIVEN E

Elevation Top of Boring 8.0 M.S.L.
Total Overburden Drilled 30.0 Feet
Elevation Top of Rock NONE ENCOUNTERED M.S.L.
Total Rock Drilled -0- Feet
Elevation Bottom of Boring -22.0' M.S.L.
Total Depth of Boring 30.0' Feet
Core Recovered N/A % No. Boxes —
Core Recovered N/A Ft. — Diam. — In.
Soil Samples 2-0 In. Diam. 10 No.
Soil Samples — In. Diam. — No.

Hammer Wt. 300 lb
Hammer Drop 18"
Casing Left NONE
Subsurface Water Data — Page —
Obs. Well NO 3.0' TIDAL
Drilled By BRIGGS ENGINEERING & TESTING CO.
Mfg. Des. Drill ACKER
Inspected By: RONALD F. BUKOSKI
Classification By: RONALD F. BUKOSKI
Classification By:

Boring Started 8-24-82
Boring Completed 8-25-82

DEPTH 1"=1.0'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
1	S-1 1 JAR	2-0"	0.0 TO 5.0'	7	DROVE 2-0" I.D. x 5' SOLID SPOON SAMPLER FROM 0.0 TO 5.0' USING 300 lb HAMMER DROPPED 18"	SURFACE: YACHT CLUB PARKING AREA - 3/8" CRUSHED STONE
				33	SMALL BOULDER ENCOUNTERED BETWEEN 1 AND 2'.	MISCELLANEOUS FILL: GRAVELLY SAND, 20-30% COARSE TO FINE GRAVEL AND CONCRETE FRAGMENTS, <10% NONPLASTIC FINES, DAMP, GRAYISH, (SW-SM).
2	S-1A 1 JAR			10	RECOVERED 23-0"	S-1A: BOTTOM 4" OF RECOVERED SAMPLE GRAVELLY SAND, 10-20% MEDIUM TO FINE SUBANGULAR GRAVEL, COARSE TO FINE SAND, MOSTLY MEDIUM TO FINE, <10% NONPLASTIC FINES, DAMP, GRAYISH (SP-SM).
3				10	DROVE 3-0" CASING FROM 0.0 TO 5.0' AND WASHED OUT USING ROLLER ROCK BIT.	
4				15		
5				9	DROVE 2-0" I.D. x 5' SOLID SPOON SAMPLER FROM 5.0 TO 10.0' USING 300 lb HAMMER DROPPED 18".	
6			5.0 TO 10.0'	19		
7	S-2 1 JAR	2-0"		24	RECOVERED 23-0".	SAND WITH GRAVEL LAYERS, 3" SEAMS OF MEDIUM TO FINE GRAVEL AT ± 12", FINE MEDIUM TO FINE SAND, <5% NONPLASTIC FINES, MOIST, GRAY, (SP).
8				33	DROVE 3-0" CASING FROM 5.0 TO 10.0' AND WASHED OUT USING ROLLER ROCK BIT.	
9				26		
10						

GENERAL REMARKS: BORING DEPTHS ARE REFERENCED TO EXISTING GROUND SURFACE ELEVATIONS.

Site: REVERE, MA	Boring No. FD 82-2 DESIG. G	Page 2 of 3

DEPTH: Blows on Casing	DEPTH: 1" = 1.0'	CORE/SAMPLE: NO.	CORE/SAMPLE: SIZE	CORE/SAMPLE: DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	11, 12, 13, 14, 15	S-3 1 JAR	2-0"	10.0 TO 15.0'	11, 15, 24, 22, 28	DROVE 2-0" I.D. x 5' SOLID BARREL SAMPLER FROM 10.0 TO 15.0' USING 300 lb HAMMER DROPPED 18". RECOVERED 28-0". DROVE 3-0" CASING FROM 10.0 TO 15.0' AND WASHED OUT USING ROLLER ROCK BIT.	SAND, FINE MEDIUM TO FINE SAND, <10% THIN ORGANIC SEAMS, OR FIBERS, <10% NONPLASTIC FINES, (SP-SM).
	16, 17, 18, 19, 20	S-4 1 JAR	2-0"	15.0 TO 20.0'	5, 3, 9, 12, 17	DROVE 2-0" I.D. x 5.' SOLID BARREL SAMPLER FROM 15.0 TO 20.0' USING 300 lb HAMMER DROPPED 18". RECOVERED 22 1/2" DROVE 3-0" CASING FROM 15.0 TO 20.0' AND WASHED OUT USING A ROLLER ROCK BIT.	SAND, FINE MEDIUM TO FINE SAND, <5% ORGANIC SEAMS, FIBERS OR SHELL FRAGMENTS, <10% NON-PLASTIC FINES, GRAY, (SP-SM).
	21, 22, 23, 24, 25	S-5 1 JAR	2-0"	20.0 TO 23.5'	7, 9, 10, 19	DROVE 2-0" I.D. x 5' SOLID BARREL SAMPLER FROM 20.0 TO 25.0' USING 300 lb HAMMER DROPPED 18". RECOVERED 36" CHANGE IN MATERIAL APPROXIMATELY AT 23.5'	SAND, MEDIUM TO FINE SAND, <5% FINE GRAVEL AND SHELL FRAGMENTS, <10% NON-PLASTIC FINES, GRAY (SP-SM).
	25, 26	S-5A 2 JARS	2-0"	23.5 TO 25.0'	31, 16, 26	DROVE 3-0" CASING FROM 20.0 TO 23.0' AND WASHED OUT USING FISHTAIL BIT. DROVE 2-0" I.D. x 5' SOLID BARREL SAMPLER FROM 25.0 TO 30.0' USING 300 lb HAMMER DROPPED 18"	SILTY CLAY, MODERATELY PLASTIC, <5% PEAT & FIBERS INTERSPERSED, MODERATE DRY STRENGTH, MOTTLED GRAY AND BROWN, (CL).

8-25-82

Site: REVERE, MA	Boring No. FD 82-2 DESIG. G	Page 3 of 3

DEPTH: Blows on Casing	DEPTH: 1" = 1.0'	CORE/SAMPLE: NO.	CORE/SAMPLE: SIZE	CORE/SAMPLE: DEPTH RANGE	BLOWS PER FT. / CORE REC'VT	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
					36	RECOVERED 30.0"	SILTY CLAY, MODERATE PLASTICITY, <5% PEAT & FIBERS INTERSPERSED, MODERATE DRY STRENGTH, MOTTLED BROWNS, (CL)...
	28	S-6 2 JARS	2.0"	25.0 TO 30.0'	44		
	29				55		
	30					BOTTOM OF BORING 30.0'	

Site: REVERE MA

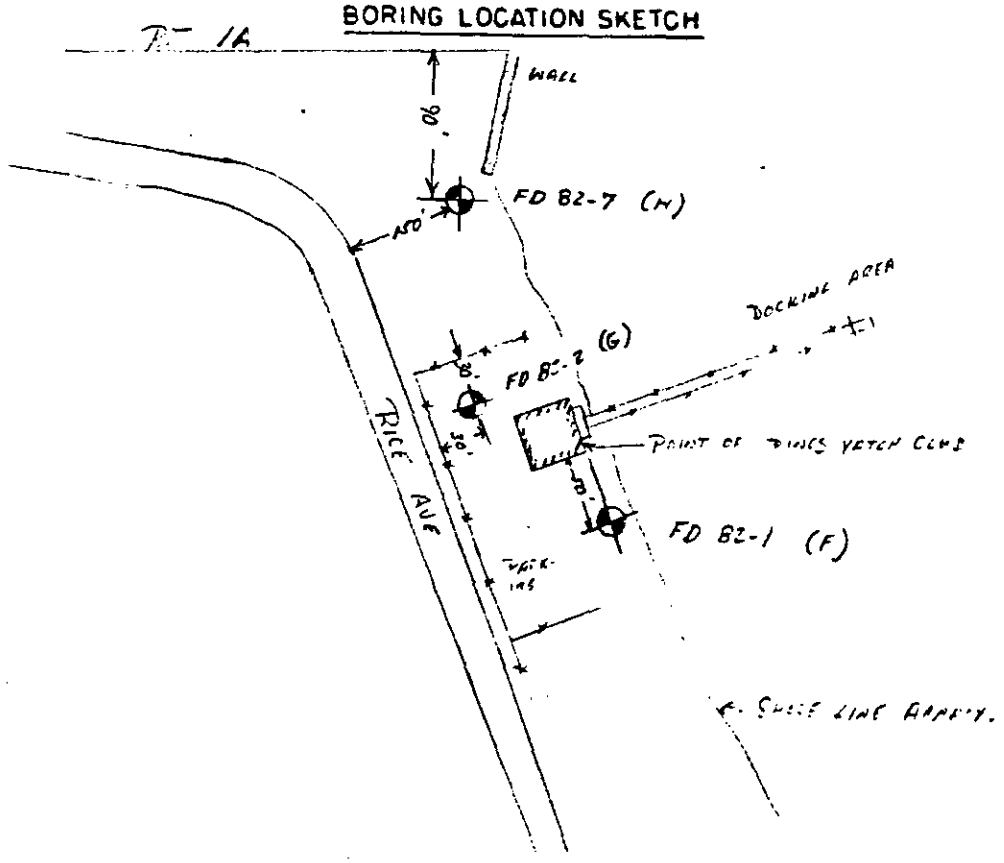
Boring No: FD 82-2

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
8-25	0900	15.0'	30.0'	3.0'	5.0' M.S.L.	TIDAL

Note: Depths are in feet below original ground

BORING LOCATION SKETCH



FORM 50 (Test)

Boring No. FD 82-2

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site REVERE, MA Page 1 of 3 Pages

Boring No. FD 82-3 Desig. E Diam. (Casing) 3-0"

Co-ordinates: N NOT GIVEN E

Elevation Top of Boring 6.2' M.S.L. Hammer Wt. 300 lb Boring Started 8-25-82

Total Overburden Drilled 30.0' Feet Hammer Drop 18" Boring Completed 8-27-82

Elevation Top of Rock NONE ENCOUNTERED M.S.L. Casing Left NONE

Total Rock Drilled -0- Feet Subsurface Water Data TIDAL Page

Elevation Bottom of Boring -23.8' M.S.L. Obs. Well NO

Total Depth of Boring 30.0 Feet Drilled By BRIGGS ENGINEERING & TESTING. CO.

Core Recovered N/A % No. Boxes — Mfg. Des. Drill ACKER

Core Recovered N/A Ft: — Diam. — In. Inspected By: RONALD F. BUKOSKI

Soil Samples 2-0 In. Diam. 10 No. Classification By: RONALD F. BUKOSKI

Soil Samples In. Diam. No. Classification By:

0700
0845 - MOB
0915

DEPTH 1"=1.0'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
1	S-1 1 JAR	2-0"	0.0 TO 2.0'	3 / 11	DROVE 2-0" I.D. x 5' SOLID BARREL SAMPLER FROM 0.0 TO 5.0' USING 300 lb HAMMER DROPPED 18".	SURFACE: BELOW SEA WALL ON SAND BEACH. SAND, FINE MEDIUM TO FINE SAND, <2% NONPLASTIC FINES, DAMP TO SATURATED, LIGHT GRAY, (SP).
2						
3	S-1A 1 JAR	2-0"	2.0 TO 5.0'	26 / 27 / 31	RECOVERED 28-0". DROVE 3-0" CASING FROM 0.0 TO 5.0' AND WASHED OUT USING ROLLER ROCK BIT.	SILTY GRAVEL, COARSE TO FINE GRAVEL, 30-40% COARSE TO FINE SAND, 10-20% NON TO SLIGHTLY PLASTIC FINES, SATURATED, LIGHT GRAYISH BROWN, (GM).
4						
5	S-2 1 of 2	2-0"	5.0 TO 6.0'	18	DROVE 2-0" I.D. x 5' SOLID BARREL SAMPLER FROM 5.0 TO 10.0' USING 300 lb HAMMER DROPPED 18".	LAYERED GRAVEL & SAND GRAVEL, MEDIUM TO FINE SUBROUNDED GRAVEL, 25-35% COARSE TO FINE SAND, <5% NONPLASTIC FINES, GRAYISH BROWN, (GP).
6				19		
7	S-2 2 of 2	2-0"	6.0 TO 10.0'	21	RECOVERED 26-0"	SAND, FINE MEDIUM TO FINE SAND, <2% NON-PLASTIC FINES, GRAYISH BROWN, (SP).
8				24	DROVE 3-0" CASING FROM 5.0 TO 10.0' AND WASHED OUT USING ROLLER ROCK BIT.	
9				26		
10						

8-25-82
RAIN

GENERAL REMARKS: BORING ELEVATIONS ARE REFERENCED TO EXISTING GROUND SURFACE ELEVATIONS.

NED Form 58 (Test)

Boring No. FD 82-3
DESIG. E

Site: REVERE, MA	Boring No. FD 82-3 DESIG. E	Page 2 of 3

8-27-82

DEPTH: Blows on Casing	DEPTH: 1" = ~~2'~~ 1.0'	CORE/SAMPLE: NO.	CORE/SAMPLE: SIZE	CORE/SAMPLE: DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	11	S-3 1 JAR	2.0"	10.0 TO 15.0'	12	DROVE 2-0" I.D. x 5' SOLID BARREL SAMPLER FROM 10.0 TO 15.0' USING 300 lb HAMMER DROPPED 18".	SAND, FINE MEDIUM TO FINE SAND, MOSTLY FINE SAND, < 5% NONPLASTIC FINES, LIGHT GRAYISH BROWN, (SP).
	12				12	RECOVERED 13-0"	
	13				14	DROVE 3-0" CASING FROM 10.0 TO 15.0' AND WASHED OUT USING SIDE DISCHARING CHOPPING BIT.	
	14				15		
	15				25		
	16	S-4 1 JAR	2-0"	15.0 TO 20.0'	6	DROVE 2-0" I.D. x 5' SOLID BARREL SAMPLER FROM 15.0 TO 20.0' USING 300 lb HAMMER DROPPED 18".	SAND WITH THIN LAYERS OF PEAT, SAND, FINE SAND, ±10% NONPLASTIC FINES, GRAY (SP-SM). PEAT, FINE PEAT LAYERS < 1/8" THICK AT 8 TO 10", (Pt).
	17				6		
	18				9	RECOVERED 26-0"	
	19				13	DROVE 3-0" CASING FROM 15.0 TO 20.0' AND WASHED OUT USING SIDE DISCHARING CHOPPING BIT.	
	20				18		
	21	S-5 1 JAR	2-0"	20.0 TO 23.5'	8	DROVE 2-0" I.D. x 5' SOLID BARREL SAMPLER FROM 20.0 TO 25.0' USING 300 lb HAMMER DROPPED 18".	SAND, FINE MEDIUM TO FINE SAND, < 5% NONPLASTIC FINES, GRAY, (SP).
	22				15		
	23				15	RECOVERED 23-0"	
	24	S-5A 1 JAR	2-0"	23.5 TO 25.0	19	DROVE 3-0" CASING FROM 20.0 TO 25.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	SILTY CLAY, MODERATE PLASTICITY, MODERATE DRY STRENGTH, GRAY, (CL).
	25				23		
	26				7	DROVE 2-0" I.D. x 5' SOLID BARREL SAMPLER FROM 25.0 TO 30.0' USING 300 lb HAMMER DROPPED 18-0".	
	27				9		

0845

Site: REVERE, MA	Boring No. FD 82-3 DESIG. E	Page 3 of 3

DEPTH: Blows on Casing	DEPTH: 1"=1.0'	CORE/SAMPLE: NO.	CORE/SAMPLE: SIZE	CORE/SAMPLE: DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
				25.0	10	RECOVERED 60-0".	SILTY CLAY, MODERATE PLASTICITY, GRAY, (CL).
	28	S-6 2 JARS	2-0"	TO			
				30.0'	11		
	29						
					13		
	30						
						BOTTOM OF BORING 30.0'	

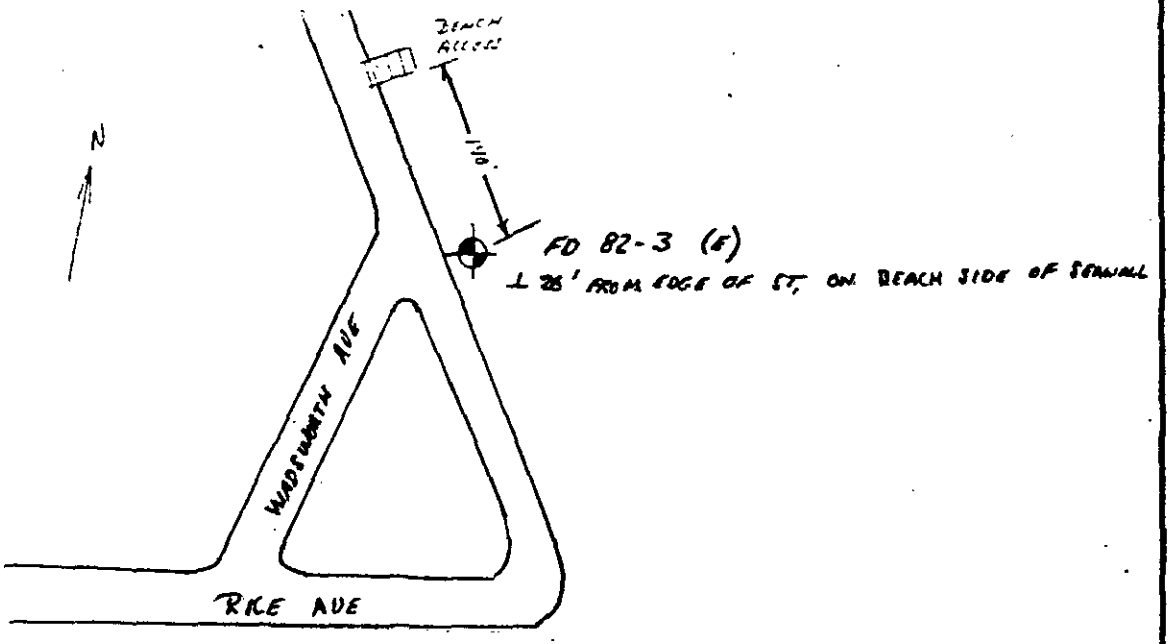
Site: REVERE, MA
Boring No: FD 82-3

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
8-27	1045	15.0'	30.0'	TIDAL/DRILL	WATER NEARLY	TOP OF CASING

Note: Depths are in feet below original ground

BORING LOCATION SKETCH



FORM 59 (Test)

Boring No FD 82-3

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site REVERE, MA — Page 1 of 3 Pages

Boring No. FD82-4 Desig. A Diam. (Casing) 3-0"

Co-ordinates: N NOT GIVEN E

Elevation Top of Boring 3.2' M.S.L.
Total Overburden Drilled 30.0 Feet
Elevation Top of Rock NONE ENCOUNTERED M.S.L.
Total Rock Drilled — 0 — Feet
Elevation Bottom of Boring -26.8' M.S.L.
Total Depth of Boring 30.0' Feet
Core Recovered N/A % No. Boxes —
Core Recovered N/A Ft: — Diam. — In.
Soil Samples 2-0 In. Diam. 12 No.
Soil Samples In. Diam. No.

Hammer Wt. 300 lb Boring Started 8-27-82
Hammer Drop 18"
Boring Completed 9-3-82
Casing Left NONE
Subsurface Water Data — TIDAL Page —
Obs. Well NO
Drilled By BRIGGS ENGINEERING & TESTING CO.
Mfg. Des. Drill PTO CATHEAD - TRUCK MOUNT. TRIPOD.
Inspected By: RONALD F. BUKOSKI
Classification By: RONALD F. BUKOSKI
Classification By:

DEPTH 1"=1.0'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
1, 2, 3, 4, 5	S-1 2 JARS	2-0"	0.0 TO 5.0'	5, 12, 29, 48, 47	DROVE 2-0" I.D. X 5' SOLID BARREL SAMPLER FROM 0.0 TO 5.0' USING 300 lb HAMMER DROPPED 18". RECOVERED 21-0". DROVE 3-0" CASING FROM 0.0 TO 5.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	SURFACE: BASE OF RIPRAP WALL, BORING ON SANDY BEACH. LAYERS OF GRAVELLY SAND AND SAND - MOSTLY GRAVELLY SAND. GRAVELLY SAND, WELL GRADED COARSE TO FINE SAND, 20-30% MEDIUM TO FINE GRAVEL, GRAYISH BROWN, (SW). SAND, MOSTLY FINE SAND, <5% NONPLASTIC FINES, LIGHT GRAYISH BROWN, (SP).
6, 7	S-2 1 JAR	2-0"	5.0 TO 7.5'	23, 13	DROVE 2-0" I.D. X 5' SOLID BARREL SAMPLER FROM 5.0 TO 10.0' USING 300 lb HAMMER DROPPED 18". RECOVERED 21-0".	GRAVELLY SAND, 15-25% MEDIUM TO FINE SUBROUNDED GRAVEL, MOSTLY FINE SAND, <5% NONPLASTIC FINES LIGHT GRAYISH BROWN, (SP).
	APPROXIMATE CHANGE IN MAT.					APPROXIMATE CHANGE IN MAT.
8, 9, 10	S-2A 1 JAR	2-0"	7.5 TO 10.0'	14, 18, 18	DROVE 3-0" CASING FROM 5.0 TO 10.0' AND WASHED OUT USING SIDE DISCHARGING CHOPPING BIT.	SAND, MOSTLY FINE SAND, <5% NONPLASTIC FINES, LIGHT GRAY AND BROWN, (SP).

GENERAL REMARKS: BORING DEPTHS ARE REFERENCED TO EXISTING GROUND SURFACE.

NED FM.56(Test)

Boring No. FD 82-4
DESIG. A

Site: REVERE, MA	Boring No. FD 82-4 DESIG. A	Page 2 of 3

1300

DEPTH (Blows on Casing)	DEPTH (1" = 1.0)	CORE/SAMPLE NO.	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	11	S-3 1 JAR	2-0"	10.0 TO 15.0'	33	DROVE 2-0" I.D. SOLID BARREL SAMPLER FROM 10.0 TO 15.0' USING 300 lb HAMMER DROPPED 18".	SAND, FINE MEDIUM TO FINE SAND, <5% NON-PLASTIC FINES, GRAY, (SP).
	12				20	RECOVERED 24-0".	
	13				12	DROVE 3-0" CASING FROM 10.0 TO 15.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	
	14				19		
	15				25		
	16	S-4 1 JAR	2-0"	15.0 TO 18.5'	11	DROVE 2-0" I.D. x 5' SOLID BARREL SAMPLER FROM 15.0 TO 20.0' USING A 300 lb HAMMER DROPPED 18"	SAND WITH GRAVEL LAYER
	17				8	RECOVERED 27" APPROXIMATELY	SAND, FINE MEDIUM TO FINE SAND, < 5% NONPLASTIC FINES, GRAY, (SP).
	18				13	DROVE 3-0" CASING FROM 20.0 TO 25.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	GRAVELLY SAND LAYER 15-25% MEDIUM TO FINE GRAVEL, MOSTLY FINE SAND, (SP).
	19	S-4A 2 JARS	2-0"	18.5 TO 20.0'	22		SILTY CLAY, MODERATELY PLASTIC, GRAY, (CL).
	20				26		
	21	C-5 2 JARS	2-0"	20.0 TO 25.0'	10	DROVE 2-0" I.D. SOLID BARREL SAMPLER FROM 20.0 TO 25.0' USING 300 lb HAMMER DROPPED 18".	SILTY CLAY, MODERATE PLASTICITY, GRAY, (CL).
	22				10		
	23				14	RECOVERED 29-0" ON SECOND ATTEMPT.	
	24				15	WASHED OUT HOLE USING SIDE DISCHARGE CHOPPING BIT	
	25				18		
	26				6	DROVE 2-0" I.D. x 5' SOLID BARREL SAMPLER FROM 25 TO 30.0'	
	27				6		

8-27-82 ↓

9-3-82

FBA(Test)

Boring No. FD 82-4 DESIG. A

Site: REVERE, MA	Boring No. FD 82-4 DESIG. A	Page 3 of 3

DEPTH: Blows on Casing	DEPTH: Ft. 1.0'	CORE/SAMPLE: NO.	CORE/SAMPLE: SIZE	CORE/SAMPLE: DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
					8		SILTY CLAY, MODERATE PLASTICITY, GRAY, (CL).
	28	S-6 2 JAR	2-0"	25.0 TO 30.0'	9	RECOVERED 37-0"	
	29				11		
	30					BOTTOM OF BORING 30.0'	

Site: REVERE, MA

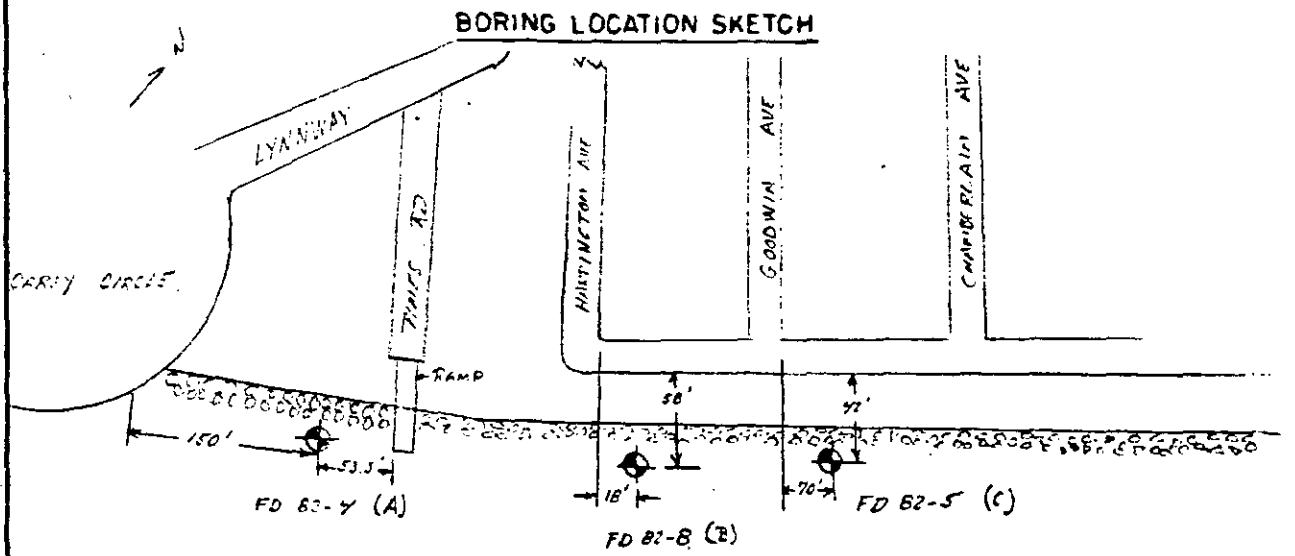
Boring No: FD 82-Y

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
9-3	0815	10.0'	30.0'	TOP OF CASING - BORING BELOW M.H.W.		

Note: Depths are in feet below original ground

BORING LOCATION SKETCH



U.S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site REVERE, MA — Page 1 of 3 Pages

Boring No. FD-82-5 Desig. C Diam. (Casing) 3-0"

Co-ordinates: N NOT GIVEN E

Elevation Top of Boring 3.0' M.S.L.
Total Overburden Drilled 30.0' Feet
Elevation Top of Rock NONE ENCOUNTERED M.S.L.
Total Rock Drilled — 0 — Feet
Elevation Bottom of Boring -27.0' M.S.L.
Total Depth of Boring 30.0' Feet
Core Recovered N/A % No. Boxes —
Core Recovered N/A Ft: — Diam. — In.
Soil Samples 2-0 In. Diam. 9 No.
Soil Samples In. Diam. No.

Hammer Wt. 300 lb Boring Started 8-30-82
Hammer Drop 18" Boring Completed 8-30-82
Casing Left NONE
Subsurface Water Data TIDAL Page —
Obs. Well NO
Drilled By BRIGGS ENGINEERING & TESTING CO.
Mfg. Des. Drill PTO-CATHEAD TRUCK MOUNT, TRIPOD
Inspected By: RONALD F. BUKOSKI
Classification By: RONALD F. BUKOSKI
Classification By:

DEPTH 1"=1.0'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
1	S-1 1 JAR	2-0"	0.0 TO 5.0'	12	DROVE 2-0" I.D. x 5' SOLID SPOON SAMPLER FROM 0.0 TO 5.0' USING 300 lb HAMMER DROPPED 18". RECOVERED 26-0". DROVE 3-0" CASING FROM 0.0 TO 5.0' AND WASHED OUT USING SIDE DISCHARGING CHOPPING BIT. MEDIUM TO FINE GRAVEL IN WASH.	SURFACE; GRAVELLY SAND BEACH. SANDY GRAVEL, MEDIUM TO FINE SUBROUNDED GRAVEL, 30-40% COARSE TO FINE SAND, < 5% NONPLASTIC FINES, LIGHT GRAYISH BROWN, (GP).
2				38		
3				47		
4				57		
5				75		
6	S-2 1 JAR	2-0"	5.0 TO 10.0'	17	DROVE 2-0" I.D x 5.0' SOLID SPOON SAMPLER FROM 5.0 TO 10.0' USING 300 lb HAMMER DROPPED 18". RECOVERED 27-0" DROVE 3-0" CASING FROM 5.0 TO 10.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	SAND, FINE MEDIUM TO FINE SAND, MOSTLY FINE SAND, < 5% NONPLASTIC FINES, LIGHT GRAYISH BROWN, (SP).
7				20		
8				27		
9				24		
10				34		

GENERAL REMARKS: BORING DEPTHS ARE REFERENCED TO EXISTING GROUND SURFACE ELEVATION.

Site: REVERE, MA	Boring No. FD 82-5 DESIG. C	Page 2 of 3

DEPTH: Blows on Casing	DEPTH: 1" = 1.0'	CORE/SAMPLE: NO.	CORE/SAMPLE: SIZE	CORE/SAMPLE: DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	11	S-3 1 JAR	2-0"	10.0 TO 15.0'	9	DROVE 2-0" I.D. x 5' SOLID SPOON SAMPLER FROM 10.0 TO 15.0' USING 300 lb HAMMER DROPPED 18".	SAND WITH THIN LAYERS OF PEAT.
	12				10	RECOVERED 39-0"	SAND, MOSTLY FINE SAND, < 5% NONPLASTIC FINES, GRAY, (SP).
	13				11	DROVE 3-0" CASING FROM 10.0 TO 15.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	PEAT, THIN LAYERS < 1/8" THICK AT ±1" INTERVALS, (pt). SAND AT TIP OF SPOON SLIGHTLY COARSER WITHOUT PEAT.
	14				17		
	15				27		
	16	S-4 1 JAR	2-0"	15.0 TO 18.0'	7	DROVE 2-0" I.D x 5' SOLID SPOON SAMPLER FROM 15.0 TO 20.0' USING 300 lb HAMMER DROPPED 18"	SAND, MEDIUM TO FINE SAND, < 5% NONPLASTIC FINES, LIGHT GRAY, (SP).
	17				16	RECOVERED 29-0"	
1020 Lvs ∇M	18				20	DROVE 3-0" CASING FROM 15.0 TO 20.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	
	19	S-4A 1 JAR	2-0"	18.0 TO 20.0'	27		SILTY CLAY, LOW TO MODERATE PLASTICITY, STIFF, BROWN WITH GRAY STREAKS, (CL)
	20				31		
	21	S-5 2 JARS	2-0"	20.0 TO 25.0'	12	DROVE 2-0" I.D. x 5' SOLID BARREL SAMPLER FROM 20.0 TO 25.0' USING 300 lb HAMMER DROPPED 18".	SILTY CLAY, MODERATE PLASTICITY, STIFFS, GRAY & BROWN STREAKS, (CL).
	22				14	NO RECOVERY 1ST ATTEMPT.	
	23				20	RECOVERED 26-0".	
	24				21	WASHED OUT HOLE FROM 20.0 TO 25.0' USING SIDE DISCHARGE CHOPPING BIT.	
	25				25		
	26				6	DROVE 2-0" I.D. SOLID BARREL SAMPLER FROM 25.0 TO 30.0' USING 300 lb HAMMER DROPPED 18".	
	27				8		

Site: REVERE, MA	Boring No. FD 82-5 DESIG. C	Page 3 of 3

DEPTH: Blows on Casing	DEPTH: Ft. 1.0'	CORE/SAMPLE: NO.	CORE/SAMPLE: SIZE	CORE/SAMPLE: DEPTH RANGE	BLOWS PER FT. / CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	28	S-6 2 JARS	2-0"	25.0 TO 30.0'	8	RECOVERED 34-0"	SILTY CLAY, MODERATE PLASTICITY, STIFF, GRAY (CL). LESS STIFF THAN PREVIOUS SAMPLE.
	29				11		
	30				13		
						BOTTOM OF BORING 30.0'	

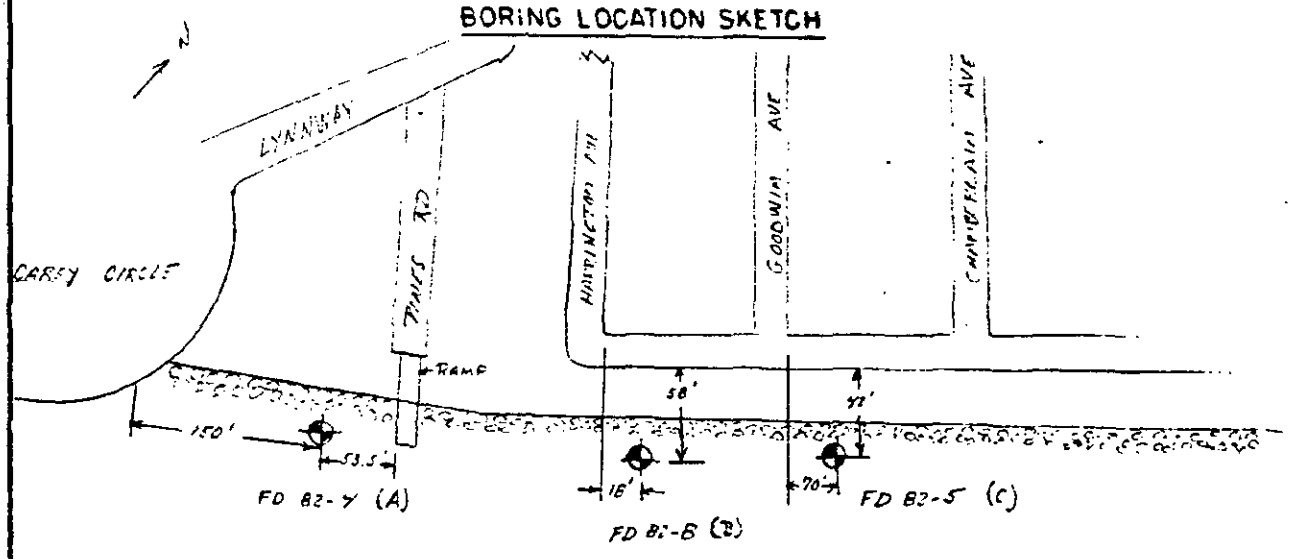
Site: REVERE, MA
Boring No: FD 82-5

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
8-30	—	BORING BELOW M.H.W.				

Note: Depths are in feet below original ground.

BORING LOCATION SKETCH



Boring No FD 82-5

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site REVERE, MA — Page 1 of 3 Pages

Boring No. FD 82-6 Desig. D Diam. (Casing) 3-0"

Co-ordinates: N NOT GIVEN E

Elevation Top of Boring 7.3' M.S.L.
Total Overburden Drilled 30.0 Feet
Elevation Top of Rock NONE ENCOUNTERED M.S.L.
Total Rock Drilled — 0 — Feet
Elevation Bottom of Boring — 22.7' M.S.L.
Total Depth of Boring 30.0' Feet
Core Recovered N/A % No. Boxes —
Core Recovered N/A Ft: — Diam. — In.
Soil Samples 2-0 In. Diam. 6 No.
Soil Samples ____ In. Diam. ____ No.

Hammer Wt. 300 lb Boring Started 8-27-82
Hammer Drop 18" Boring Completed 8-31-82
Casing Left NONE
Subsurface Water Data ____ Page ____
4.0' TIDAL
Obs. Well NO
Drilled By BRIGGS ENGINEERING & TESTING CO.
Mfg. Des. Drill PTO - CATHEAD, TRUCK MOUNT, TRIPOD
Inspected By: RONALD F. BUKOSKI
Classification By: RONALD F. BUKOSKI
Classification By: ____

1410

DEPTH 1"=1.0'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
1	S-1 1 JAR	2-0"	0.0 TO 5.0'	9	DROVE 2-0" I.D. x 5' SOLID SPOON SAMPLER FROM 0.0 TO 5.0' USING 300 lb HAMMER DROPPED 18".	SURFACE: SAND DUNE SAND WITH GRAVELLY SAND LAYERS: SAND, MOSTLY FINE SAND < 10% SHELL FRAGMENTS, < 5% NONPLASTIC FINES, DRY TO MOIST, LIGHT GRAYISH BROWN, (SP). GRAVELLY SAND, MEDIUM TO FINE GRAVEL, MOSTLY FINE SAND, < 5% NONPLASTIC FINES, MOIST, LIGHT GRAYISH BROWN, (SP). SAND, < 5% MEDIUM TO FINE GRAVEL, MOSTLY FINE SAND, 10-20% FINE SHELL FRAGMENTS, LIGHT GRAYISH BROWN, (SP).
2				29		
				28	RECOVERED 16-0"	
3				26	DROVE 3-0" CASING FROM 0.0 TO 5.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	
4				19		
5						
6	S-2 1 JAR	2-0"	5.0 TO 10.0'	11	DROVE 2-0" I.D. x 5' SOLID SPOON SAMPLER FROM 5.0 TO 10.0 USING 300 lb HAMMER DROPPED 18".	
7				16		
8				33	RECOVERED 17-0"	
9				40	DROVE 3-0" CASING FROM 5.0 TO 10.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	
10				39		

GENERAL REMARKS:

NED Form 58 (Test)

Boring No. FD-82-6
DESIG. D

Site: REVERE, MA	Boring No. FD 82-6 DESIG. D	Page 2 of 3

DEPTH: Blows on Casing	DEPTH: 1" = 1.0'	CORE/SAMPLE: NO.	CORE/SAMPLE: SIZE	CORE/SAMPLE: DEPTH RANGE	BLOWS PER FT. / CORE RECV'Y	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	11, 12, 13, 14	S-3 1 JAR	2-0"	10.0 TO 15.0'	14, 23, 34, 43, 44	DROVE 2-0" I.D. x 5' SOLID SPOON SAMPLER FROM 10.0 TO 15.0' USING 300 lb HAMMER DROPPED 18". RECOVERED 16-0". DROVE 3-0" CASING FROM 10.0 TO 15.0' AND WASHED OUT USING CHOPPING BIT.	GRAVELLY SAND, 10-15% COARSE TO FINE SUBROUNDED GRAVEL, MOSTLY FINE SAND, 10-15% SHELL FRAGMENTS, < 5% NONPLASTIC FINES, GRAY, (SP).
8-31-82	15, 16, 17, 18, 19, 20	S-4 1 JAR	2-0"	15.0 TO 20.0'	19, 18, 30, 33, 45	DROVE 2-0" I.D. x 5' SOLID SPOON SAMPLER FROM 15.0 TO 20.0' USING 300 lb HAMMER DROPPED 18". RECOVERED 29-0". DROVE 3-0" CASING FROM 15.0 TO 20.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	SAND, FINE MEDIUM TO FINE SAND, MOSTLY FINE SAND, < 5% SHELL FRAGMENTS, < 5% NON-PLASTIC FINES, < 5% FINE SUBROUNDED GRAVEL, GRAY, (SP).
	21, 22, 23, 24, 25	S-5 1 JAR	2-0"	20.0 TO 25.0'	10, 16, 23, 29, 31	DROVE 2-0" I.D SOLID SPOON SAMPLER FROM 20.0 TO 25.0' USING 300 lb HAMMER DROPPED 18". RECOVERED 26-0". DROVE 3-0" CASING FROM 20.0 TO 25.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	SAND WITH THIN LAYERS OF PEAT. SAND, FINE MEDIUM TO FINE SAND, < 5% NONPLASTIC FINES, GRAY, (SP). PEAT, THIN LAYERS < 1/16" AT RANDOM INTERVALS APPROXIMATELY 2/INCH, MODERATE ORGANIC ODOR, BROWN, (Pt).
	26, 27				12, 14	DROVE 2-0" I.D. x 5' SOLID SPOON SAMPLER FROM 25.0 TO 30.0' USING 300 lb HAMMER DROPPED 18".	

Site: REVERE, MA	Boring No. FD 82-6 DESIG. D	Page 3 of 3

DEPTH: Blows on Casing	DEPTH: 1"=1.0'	CORE/SAMPLE: NO.	CORE/SAMPLE: SIZE	CORE/SAMPLE: DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
					25	RECOVERED 27-0"	SAND WITH THIN PEAT LAYERS
	28	S-6 1 JAR	2-0"	25.0 TO 30.0'	26		SAND, MEDIUM TO FINE SAND, <10 % SHELL FRAGMENTS, <5% NONPLASTIC FINES, GRAY, (SP). PEAT, THIN LAYERS < 1/16" INTERSPERSED, BETWEEN 1/2 TO 1" SAND LAYERS, MODERATE ORGANIC ODOR, BROWN, (Pt).
	29				38		
	30					BOTTOM OF BORING 30.0'	

Site: REVERE, MA

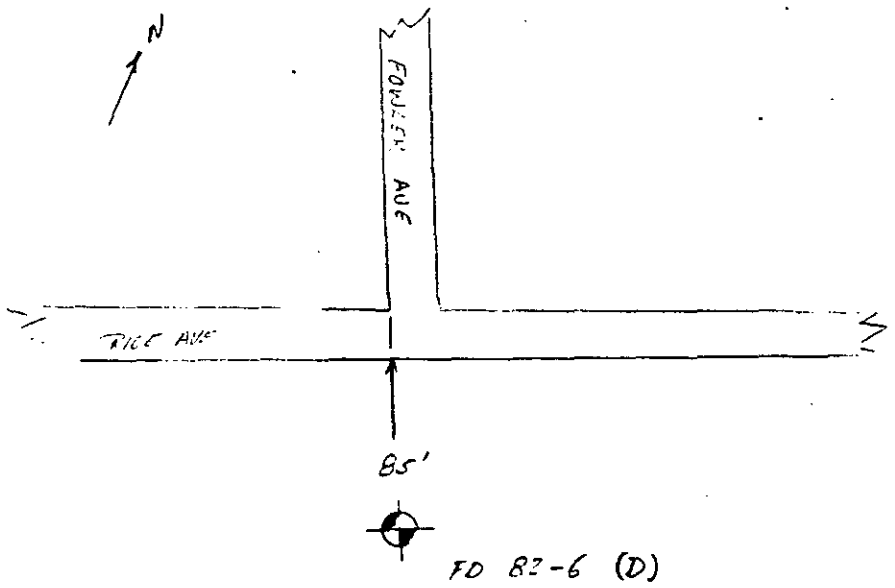
Boring No: FD 82-6

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
8-31	0730	15.0'	15.0'	4.0'	3.3' M.S.L.	TIDAL

Note: Depths are in feet below original ground

BORING LOCATION SKETCH



FORM 59 (Test)

Boring No. FD 82-6

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site REVERE, MA — Page 1 of 3 Pages

Boring No. FD 82-7 Desig. H Diam. (Casing) 3-0"

Co-ordinates: N NOT GIVEN E

Elevation Top of Boring 6.5' M.S.L.
Total Overburden Drilled 30.0' Feet
Elevation Top of Rock NONE ENCOUNTERED M.S.L.
Total Rock Drilled —0— Feet
Elevation Bottom of Boring −23.5' M.S.L.
Total Depth of Boring 30.0 Feet
Core Recovered N/A % No. Boxes —
Core Recovered N/A Ft: — Diam. — In.
Soil Samples 2-0 In. Diam. 7 No.
Soil Samples 1-3/8 In. Diam. 1 No.

Hammer Wt. 300 lb
Hammer Drop 18"
Casing Left NONE
Subsurface Water Data — Page —
TIDAL
Obs. Well NO
Drilled By BRIGGS ENGINEERING & TESTING CO.
Mfg. Des. Drill PTO-CATHEAD, TRUCK MOUNT. TRIPOD
Inspected By: RONALD F. BUKOSKI
Classification By: RONALD F. BUKOSKI
Classification By:

Boring Started 8-31-82
Boring Completed 8-31-82

DEPTH 1"=1.0'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
1	S-1 1 JAR	2-0"	0.0 TO 1.0'	9	DROVE 2-0" I.D. x 5' SOLID SPOON SAMPLER FROM 0.0 TO 5.0' USING 300 lb HAMMER DROPPED 18".	SURFACE: SAND DUNE ABOVE HIGH WATER LINE.
2	S-1A 1 JAR	2-0"	1.0 TO 5.0'	13	RECOVERED 23-0"	SAND, MOSTLY FINE SAND, < 5% NONPLASTIC FINES, DRY TO MOIST, VERY LIGHT GRAYISH BROWN, (SP).
3				25	DROVE 3-0" CASING FROM 0.0 TO 5.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	SANDY GRAVEL, MEDIUM TO FINE SUBROUNDED GRAVEL, 30-40% COARSE TO FINE SAND, < 5% NONPLASTIC FINES, MOIST TO SATURATED AT 4.5', BROWN, (GP).
4				22		
5				23		
6	S-2 1 JAR	2-0"	5.0 TO 10.0'	21	DROVE 2-0" I.D. x 5' SOLID SPOON SAMPLER FROM 5.0 TO 10.0' USING 300 lb HAMMER DROPPED 18"	SANDY GRAVEL, MEDIUM TO FINE SUBROUNDED GRAVEL, 35-45% COARSE TO FINE SAND, < 5% NON-PLASTIC FINES, BROWN, (GP).
7				24		
8				28	RECOVERED 18"	
9				25	DROVE 3-0" CASING FROM 5.0 TO 10.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	
10				19		

GENERAL REMARKS: BORING DEPTHS ARE REFERENCED TO THE EXISTING GROUND SURFACE.

Site: REVERE, MA	Boring No. FD 82-7 DESIG. H	Page 2 of 3

DEPTH: Blows on Casing	DEPTH: 1" = 1.0'	CORE/SAMPLE: NO.	CORE/SAMPLE: SIZE	CORE/SAMPLE: DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	11	S-3 1 JAR	2-0"	10.0 TO 15.0'	9	DROVE 2-0" I.D. x 5' SOLID SPOON SAMPLER FROM 10.0 TO 15.0' USING 300 lb HAMMER DROPPED 18".	SAND WITH THIN LAYERS OF PEAT.
	12				9		SAND, FINE MEDIUM TO FINE SAND, < 5% NONPLASTIC FINES, GRAY, (SP).
	13				10	RECOVERED 27-0"	PEAT, THIN LAYERS < 1/16" THICK, APPROXIMATELY 1/2 TO 1" BETWEEN LAYERS, MODERATE ORGANIC ODOR, BROWN, (Pt).
	14				11	DROVE 3-0" CASING FROM 10.0 TO 15.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT	
	15				12		
	16	S-4 1 JAR	2-0"	15.0 TO 20.0'	3	DROVE 2-0" I.D. x 5' SOLID SPOON SAMPLER FROM 15.0 TO 20.0' USING 300 lb HAMMER DROPPED 18".	SAND WITH THIN LAYERS OF PEAT, SAME AS SAMPLE S-3
	17				4		
	18				7	RECOVERED 30-0".	
	19				12	DROVE 3-0" CASING FROM 15.0 TO 20.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	
	20				17		
	21	S-5 1 JAR	2-0"	20.0 TO 22.75'	4	DROVE 2-0" I.D. x 5' SOLID SPOON SAMPLER FROM 20.0 TO 25.0' USING 300 lb HAMMER DROPPED 18".	SAND, MEDIUM TO FINE SAND, < 5% NONPLASTIC FINES, 5-10% SHELL FRAGMENTS, < 5% INTERSPERSED PEAT, GRAY (SP).
	22				4		
	23				11	RECOVERED 32-0"	
	24	S-5A 1 JAR	2-0"	22.75 TO 25.0'	16	DROVE 3-0" CASING FROM 20.0 TO 25.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	SILTY CLAY, MODERATE PLASTICITY, STIFF, MOTTLED BROWN AND GRAY, (CL).
	25				21		
	26				13	DROVE 2-0" I.D. x 5' SOLID SPOON SAMPLER FROM 25.0 TO 30.0' USING 300 lb HAMMER DROPPED 18".	
	27				24		

1335

Site: REVERE, MA	Boring No. FD 82-7 DESIG. H	Page 3 of 3

DEPTH: Blows on Casing	DEPTH: 1" = 1.0'	CORE/SAMPLE: NO.	CORE/SAMPLE: SIZE	CORE/SAMPLE: DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	28	S-6 1 JAR	1-3/8"	25.0 TO 30.0	37	NO RECOVERY IN TWO ATTEMPTS USING 2-0" I.D. SAMPLER. DROVE 1-3/8" I.D. SPLIT-BARREL SAMPLER FOR RECOVERY. RECOVERED 18".	SILTY CLAY, MODERATE PLASTICITY, STIFF +, MOTTLED GRAY AND BROWN, (CL).
	29				58		
	30				78		
						BOTTOM OF BORING 30.0'	

Site: REVERE MA

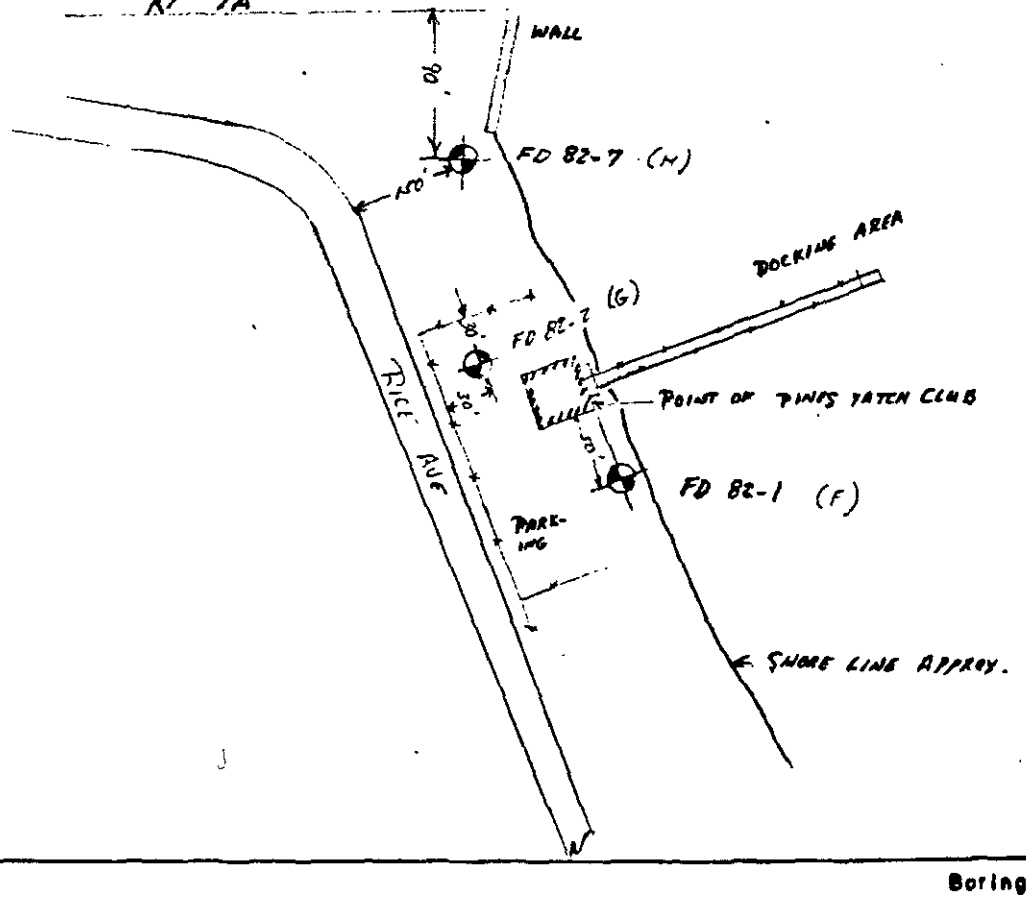
Boring No: FD 82-7

SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
8-31	—	TIDAL 5' DRILL WATER - NEARLY TOP OF CASING - POSSIBLY PUSHED UP FROM SAND FALLING INTO THE BORE HOLE FOLLOWING THE REMOVAL OF CASING.				

Note: Depths are in feet below original ground.

BORING LOCATION SKETCH



FORM 50 (Test)

Boring No. FD 82-7

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site REVERE, MA — Page 1 of 3 Pages

Boring No. FD 82-B Desig. B Diam. (Casing) 3-0"

Co-ordinates. N NOT GIVEN E

Elevation Top of Boring 2.8' M.S.L.
Total Overburden Drilled 30.0 Feet
Elevation Top of Rock NONE ENCOUNTERED M.S.L.
Total Rock Drilled —0— Feet
Elevation Bottom of Boring —27.2 M.S.L.
Total Depth of Boring 30.0 Feet
Core Recovered N/A % No. Boxes —
Core Recovered N/A Ft: — Diam. — In.
Soil Samples 2-0 In. Diam. 8 No.
Soil Samples In. Diam. No.

Hammer Wt. 300 lb Boring Started 9-3-82
Hammer Drop 18"
Boring Completed 9-3-82
Casing Left NONE
Subsurface Water Data TIDAL Page
Obs. Well NO
Drilled By BRIGGS ENGINEERING & TESTING CO.
Mfg. Des. Drill PTO-CATHEAD TRUCK MOUNT TRIPOD
Inspected By: RONALD F. BUKOSKI
Classification By: RONALD F. BUKOSKI
Classification By:

DEPTH 1"=1.0'	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
0530 1	S-1 1 JAR	2-0"	0.0 TO 2.0'	13	DROVE 2-0" I.D. x 5' SOLID SPOON SAMPLER FROM 0.0 TO 5.0' USING 300 lb HAMMER DROPPED 18".	SURFACE: SAND SAND AND SHELL FRAGMENTS COARSE TO FINE SAND, MOSTLY MEDIUM TO FINE, 25-35% SHELL FRAGMENTS, <5% NON-PLASTIC FINES, GRAYISH BROWN, (SP).
2				15	RECOVERED 27-0"	
3	S-1A 1 JAR	2-0"	2.0 TO 5.0'	12	DROVE 3-0" CASING FROM 0.0 TO 5.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	SAND, MOSTLY FINE MEDIUM TO FINE SAND, <5% NON-PLASTIC FINES, THIN SEAM OF FINE GRAVEL, BROWN, (SP)
4				16		
5				18		
6				8	DROVE 2-0" I.D. x 5' SOLID SPOON SAMPLER FROM 5.0 TO 10.0' USING 300 lb HAMMER DROPPED 18".	SAND, <5% FINE GRAVEL, MOSTLY FINE MEDIUM TO FINE SAND, <5% NONPLASTIC FINES, GRAY, (SP).
7	S-2 1 JAR	2-0"	5.0 TO 10.0'	11	RECOVERED 36-1/2"	
8				16	DROVE 3-0" CASING FROM 5.0 TO 10.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	
9				22		
10				33		

GENERAL REMARKS: BORING DEPTHS ARE REF. TO EXISTING GROUND SURFACE ELEVATIONS.

NED [illegible].58(Test)

Boring No. FD 82-B
DESIG. B

Site: REVERE, MA	Boring No. FD 82-8 DESIG. B	Page 2 of 3

DEPTH: Blows on Casing	DEPTH: Ft. 1.0'	CORE/SAMPLE: No.	CORE/SAMPLE: Size	CORE/SAMPLE: Depth Range	Blows per ft. / Core Recvy	Sampling and Coring Operations	Classification of Materials
	11	S-3 1 JAR	2-0"	10.0 TO 15.0'	14	DROVE 2-0" I.D. x 5' SOLID SPOON SAMPLER FROM 10.0 TO 15.0' USING 300 lb HAMMER DROPPED 18"	SAND, MEDIUM TO FINE SAND, < 5% NONPLASTIC FINES, GRAY, (SP). GRADATION SLIGHTLY FINER AT THE TOP OF RECOVERED SAMPLE.
	12				23		
	13				29	RECOVERED 18-0"	
	14				31	DROVE 3-0" CASING FROM 10.0 TO 15.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	
	15				26		
	16	NO RECOVERY			6	DROVE 2-0" I.D. x 5' SOLID SPOON SAMPLER FROM 15.0 TO 20.0' USING 300 lb HAMMER DROPPED 18"	SILTY CLAY IN WASH AT 15.0'
	17				9		
	18				9	NO RECOVERY - CASING DRIVEN BEFORE NO RECOVERY WAS DISCOVERED.	
	19				13	DROVE 3-0" CASING FROM 15.0' TO 20.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	
	20				16		
	21	S-4 2 JARS	2-0"	20.0 TO 25.0'	6	DROVE 2-0" I.D. x 5' SOLID SPOON SAMPLER FROM 20.0 TO 25.0 USING 300 lb HAMMER DROPPED 18".	SILTY CLAY, MODERATE PLASTICITY, GRAY, (CL).
	22				9		
	23				9	RECOVERED 39"	
	24				10	WASHED OUT UNCASED HOLE FROM 20.0 TO 25.0' USING SIDE DISCHARGE CHOPPING BIT.	
	25				14		
	26				5	DROVE 2-0" I.D. x 5' SOLID BARREL SAMPLER FROM 25.0 TO 30.0' USING 300 lb HAMMER DROPPED 18".	
	27				7		

Site: REVERE, MA	Boring No. FD 82-8 DESIG. B	Page 3 of 3

DEPTH: Blows on Casing	DEPTH: 1"	CORE/SAMPLE: NO.	CORE/SAMPLE: SIZE	CORE/SAMPLE: DEPTH RANGE	BLOWS PER FT. / CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	28	S-5 2 JARS	2-0"	25.0 TO 30.0'	7	RECOVERED – (NOT RECORDED IN FIELD) ESTIMATED RECOVERY IN EXCESS OF 36".	SILTY CLAY, MODERATE PLASTICITY, GRAY, (CL).
	29				9		
	30				9		
						BOTTOM OF BORING 30.0'	

Site: REVERE, MA

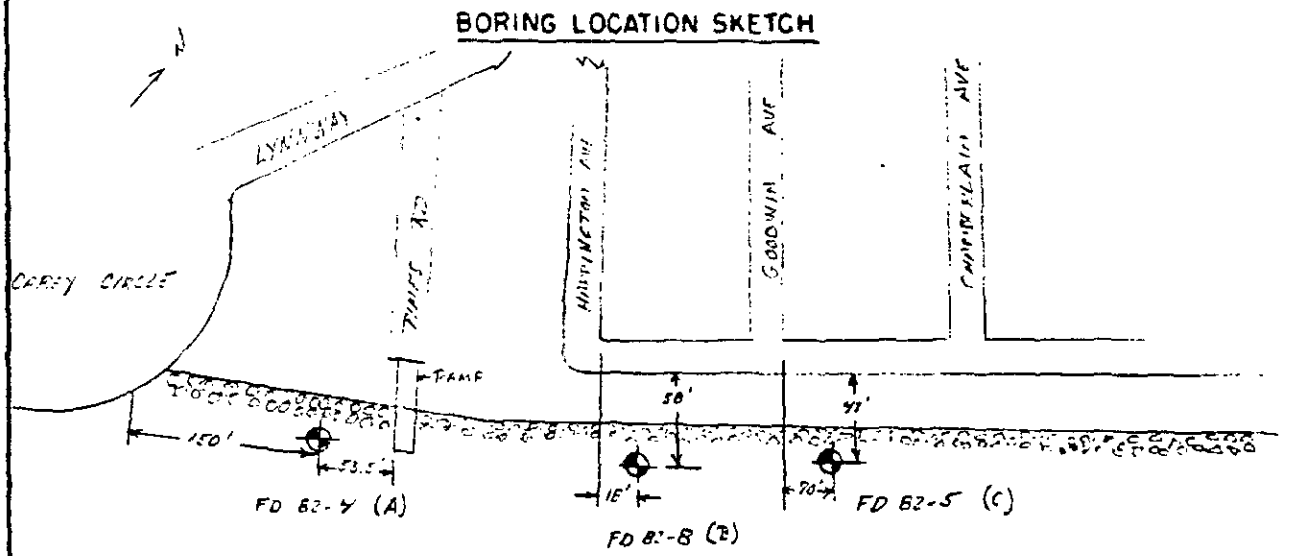
Boring No: FD 82-8

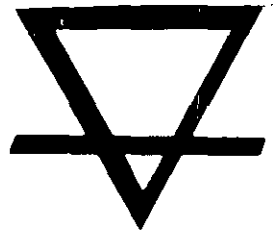
SUBSURFACE WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF BORING	DEPTH TO WATER	ELEVATION WATER	REMARKS
9-3	–	BORING LOCATION BELOW		M.H.W.		

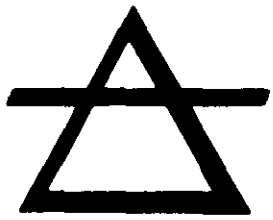
Note: Depths are in feet below original ground.

BORING LOCATION SKETCH

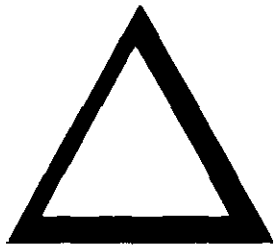




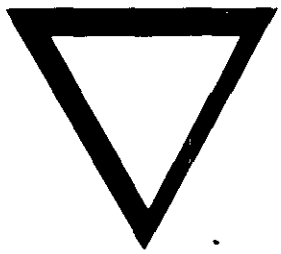
EARTH



AIR



FIRE



WATER

In ancient times
Greek and Hindu philosophers
believed that there were
four elements in the material universe
— EARTH, AIR, FIRE and WATER.
Over the years
man's knowledge has expanded
and the world of materials
is now known to be extremely complex.
The unravelling of these complexities
is the continuing goal of
Briggs Engineering & Testing Company.

BRIGGS

Engineering and Testing

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