DACW 33-85-D-0010

D.O. # 2

GEOTECHNICAL ENGINEERS INC.

FINAL REPORT

QUALITY ASSURANCE
OLD QUINCY RESERVOIR DAM
BRAINTREE, MASSACHUSETTS

New England Division
Corps of Engineers

November 7, 1985

Prepared for

New England Division, Corps of Engineers
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by

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Project 85736

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Stephen L. Whiteside
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1. INTRODUCTION

1.1 Purpose

This report summarizes the quality assurance services provided by Geotechnical Engineers Inc. (GEI) for the borings and pressure tests performed at the Old Quincy Reservoir Dam, Braintree, Massachusetts. The borings were performed by the Mobile District, Corps of Engineers (MD-CE) for the New England Division, Corps of Engineers (NED-CE).

1.2 Scope

The scope of work performed for this study was as follows:

a. Make a site visit to Old Quincy Reservoir Dam to observe site conditions.

b. Survey locations and elevations of proposed borings.

c. Observe drilling, sampling, and pressure testing. Conduct weekly safety meetings.

d. Provide a security guard for the drill rig during nonworking hours, including weekends.

e. Provide an engineering report containing the scope of the investigation, boring logs, pressure test results, quality assurance of the drilling and surveying, summary of daily activities, safety reports, chain of custody, and survey drawings.

1.3 Authorization

The authority for this work is set forth under Public Law-98-360, Energy and Water Development Appropriations Act dated July 16, 1984.

1.4 Available Data

The following plans entitled "Water Resources Development Project, Town Brook Local Protection" were provided by the NED-CE:

Plate 1 - General Plan

Plate 7 - Old Quincy Reservoir
General Plan - Dam and Dike (including NED-CE boring locations)

Plate 9 - Old Quincy Reservoir
Spillway - Civil
Plans, Profiles, and Sections

1.5 Personnel

The following personnel at GEI were involved with the project site visit, field observation of borings and pressure tests, and preparation of the report for this project:

Principal-in-Charge	Ronald C. Hirschfeld, P.E.
Project Manager	Stephen L. Whiteside, P.E.
Geotechnical Engineers	Michael A. McCaffrey
	Charles R. Conlon
	Paul A. Deterling

Boston Survey Consultants of Boston, Massachusetts provided us with locations and ground surface elevations for the borings.

2. SITE AND PROJECT DESCRIPTION

Old Quincy Reservoir Dam is located on the Town Brook in Braintree, Massachusetts (see Fig. 1). A plan and cross section of the dam are shown in Figs. 2 and 3. The dam is an earthfill embankment with a concrete core wall, a granite-block-lined spillway, and a low-level outlet. The embankment is about 500 ft long and has a maximum height of about 35 ft. The dam crest elevation is about 85.5 ft National Geodetic Vertical Datum (NGVD), and the crest width ranges from about 20 to 40 ft.

The field investigation was performed for the NED-CE evaluation of the Old Quincy Reservoir Dam. The investigation consisted of 17 borings and auger probes drilled by the MD-CE at the locations shown in Fig. 2. The borings are summarized in Table 1. Borings FD85-1 through FD85-6 were performed in the embankments upstream and downstream of the core wall. Standard Penetration Tests (SPT) on split-spoon samples were performed in these borings.

The concrete core wall was cored in borings FD85-7F, FD85-8, and FD85-9. Water pressure tests were performed in the core wall in each boring.

Eight auger probes, FD85-7A through FD85-7E and FD85-7G through FD85-7I were performed to investigate the location of the core wall in the vicinity of FD85-5 and FD85-6 (Fig. 2).

Boring logs are presented in Appendix A. Water pressure test data are presented in Appendix B.

3. QUALITY ASSURANCE

3.1 General

All borings were drilled with a Failing 314 truck-mounted rig supplied by the MD-CE. The NED-CE planned the layout of the borings. Boston Survey Consultants of Boston, MA determined the locations and elevations of borings FD85-1 through FD85-6, FD85-7A, FD85-8, and FD85-9. The locations and elevations of borings FD85-7B through FD85-7I were determined by GEI by measuring from surveyed borings FD85-5, FD85-6, and FD85-7A.

3.2 Drilling Equipment and Procedures

3.2.1 Standard Penetration Test Borings

Standard Penetration Tests (SPT) on split-spoon samples were performed in borings FD85-1 through FD85-6. The following equipment and procedures were used to perform the work:

a. Equipment

(1) Sampler: SPTs and soil samples were obtained with a 1-3/8-in.-inside-diameter (ID), 2-ft-long split spoon.

(2) Drive Hammer: A 140-lb safety drive hammer was used to advance the split-spoon sampler.

(3) Core Barrel: A 10-ft-long core barrel was used to core rock boulders.

(4) Casing, Rods, and Drill Bits: Four-inch flush joint casing was used. NW rods were used for drilling and AW rods for advancing the split-spoon sampler. A 3-in. fishtail and 3-in. roller bit were used to advance the boreholes through soil. A 3-7/8-in.-outside-diameter (OD) diamond rock-coring bit was used with the core barrel.

(5) Drilling Mud: Revert™ was used to prevent uncased sections of boreholes from collapsing and to flush the cuttings to the surface.

b. Procedures

Standard Penetration Tests and split-spoon samples were obtained at about 2.5-ft intervals in the soil. The sampler was driven 18 in. with a 140-lb hammer falling 30 in. Where refusal was encountered, the boring was advanced by coring or with a roller bit. Refusal indicates less than 6 in. of penetration of the split-spoon sampler after at least 100 blows with a 140-lb hammer falling 30 in. The boring was advanced between sampling intervals with the fishtail or roller bit. Four-inch flush joint casing was used to advance the upper portion of the borings (generally less than 20 ft). Below this depth the borings were drilled uncased using Revert™ drilling mud to prevent the borehole from collapsing.

Soil samples were classified in the field and sealed in plastic jars with appropriate labeling. Sample descriptions were checked in the GEI laboratory.

3.2.2 Concrete Core/Pressure Test Borings

The concrete core wall of the dam was cored, and water pressure tests performed in the core wall in borings FD85-7F, FD85-8, and FD85-9. The following equipment and procedures were used to perform the work:

a. Equipment

(1) Core Barrel: Five- and 10-ft-long core barrels were used to core the concrete core wall.

(2) Bits: A 3-7/8-in.-OD diamond rock coring bit was used with the core barrel. A 5-in.-OD solid-stem auger was used to penetrate the overburden soil.

(3) Casing and Rods: Five-in.-diameter flush joint casing was used to the top of the core wall. NW rods were used for core drilling.

(4) Pressure Test Equipment: Two inflatable rubber packers, 3.2 ft long with a 3-1/2-in. OD, separated by a 5-ft-long, 1-in.-OD perforated steel pipe. The riser

pipes were NW rods. A standard water flowmeter with one division equal to 0.1 gallon was used. Two water pressure gauges were used, one with one division equal to 2 psi and range from 0 to 60 psi and one with one division equal to 5 psi and range from 0 to 100 psi. Water was pumped with the drill rig pump. A 20-ft section of 3-in.-OD rubber hose was used to connect the meter and gauge to the universal swivel at the top of the drill rods.

(5) Drilling Fluid: The drilling fluid used was water.

b. Procedures

The borings were advanced to the top of the core wall using the 5-in.-OD auger. The concrete crete core wall was continuously cored with either the 5- or 10-ft-long core barrel. The core diameter was 2-3/4 in. The penetration per run was limited to 5 ft. Coring was continued below the bottom of the concrete core wall into either bedrock or glacial till. All cores recovered were classified in the field and placed in core boxes with appropriate labeling.

Water pressure tests were performed in the boreholes at 5-ft intervals in the concrete core wall. In each test section a holding test was performed to determine the rate of water pressure loss, and a flow test was performed to determine the rate of flow.

The water pressure gauge was located on the ground surface. Gauge readings of about 5 psi were used at the start of the holding test and during the flow test. The actual pressure at the test location equals the gauge reading plus the hydrostatic head from the ground surface to the test depth. A minor loss of pressure at the test location may be attributable to head loss due to water conduit friction between the pressure gauge and the test location. The water flow path extends from the gauge through a 20-ft-long, approximately 2-1/2-in.-ID rubber hose attached to the drill rods at a height which varied between about 8 and 13 ft above the ground surface through the drill rods to the test location. The inside diameter of the drill rods was about 1-1/8 in.

3.2.3 Auger Probes

Auger probes were performed to locate the concrete core wall in borings FD85-7A through FD85-7E and FD85-7G through FD85-7I. Auger refusal at about 3 ft indicated the presence of the concrete core wall. The following equipment and procedures were used to perform the work:

a. Equipment

(1) Drill Bit: A 5-in.-OD solid-stem auger was used to penetrate the soil.

b. Procedure

The probes were advanced without sampling using the 5-in.-OD auger to depths of 3 to 10.5 ft. Casing and drilling fluid were not used.

3.3 Records

The GEI field geotechnical engineer kept records of field activities and procedures.

Appendix A contains logs for each boring and data sheets for each Standard Penetration Test performed in the SPT borings.

Appendix B contains the data sheets for the water pressure tests in the core wall.

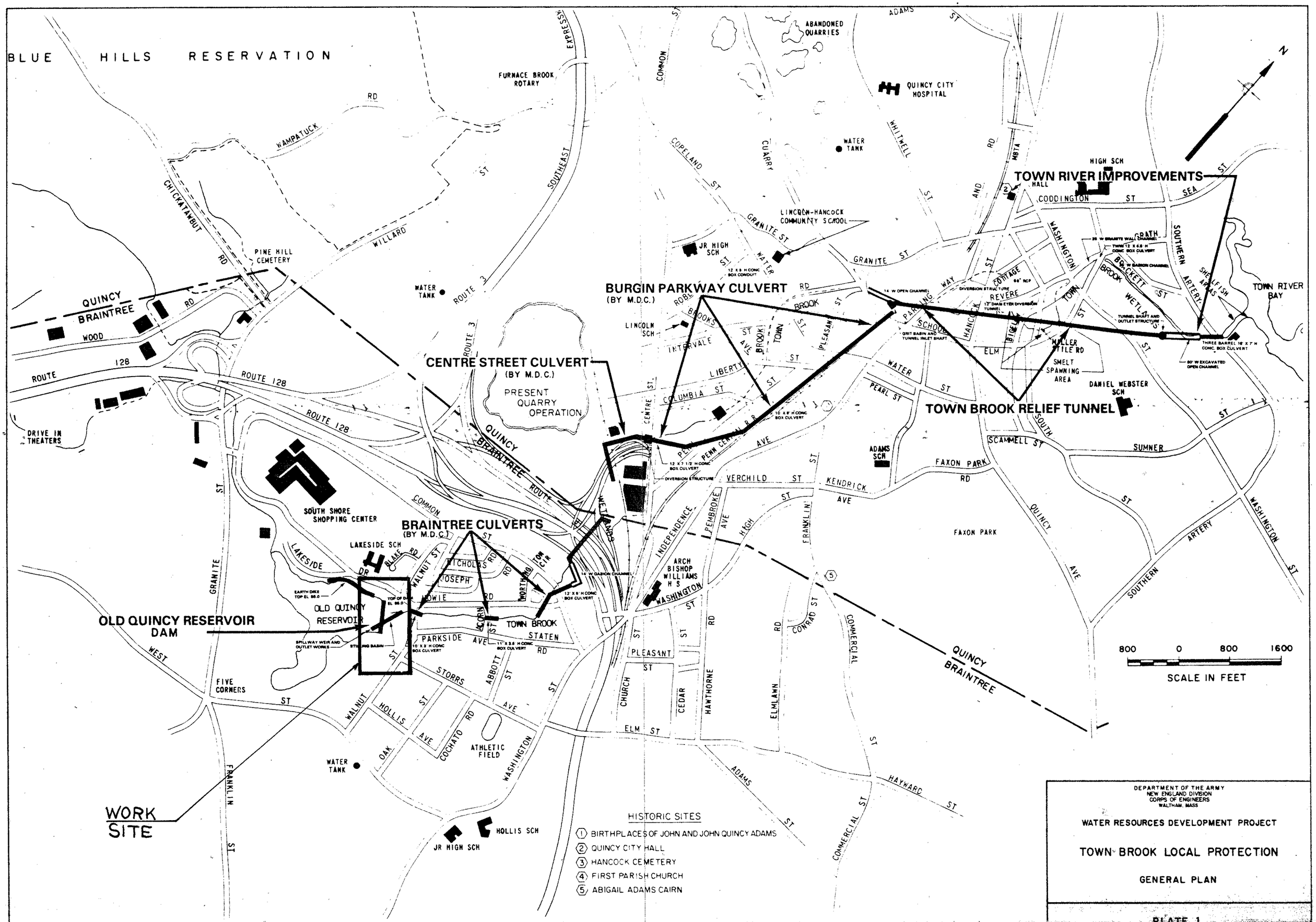
3.4 Quality Control

Our report has been subjected to our internal review and coordination procedures to evaluate the completeness of the submission, check for conflicts, errors and omissions, and evaluate the overall professional and technical accuracy of the submission.

TABLE 1 - SUMMARY OF BORINGS
Quality Assurance
Old Quincy Reservoir Dam
Braintree, Massachusetts

Boring Number	Station	Offset (ft)(1)	Ground Surface Elevation (NGVD) ft(2)	Depth of Boring (ft)	Pressure Tests Performed
FD85-1	2+50	7DS	85.8	32.5	No
FD85-2	2+50	7US	85.4	32.5	No
FD85-3	4+25	8DS	85.1	56.3	No
FD85-4	4+26	8US	84.7	57.5	No
FD85-5	5+10	10DS	85.8	57.5	No
FD85-6	5+10	10US	84.7	64.5	No
FD85-7A	5+10	0	85.1	10.5	No
FD85-7B	5+10	2.5US	85.0	7.0	No
FD85-7C	5+10	5US	84.9	7.0	No
FD85-7D	5+10	7.5US	84.8	10.5	No
FD85-7E	5+07	0	85.1	3.0	No
FD85-7F	5+03.5	0	85.1	48.9	Yes
FD85-7G	5+10	7.5DS	85.6	10.5	No
FD85-7H	5+10	5DS	85.4	9.5	No
FD85-7I	5+10	2.5DS	85.2	10.5	No
FD85-8	4+25	0	84.5	62.2	Yes
FD85-9	2+50	0	85.2	33.3	Yes

NOTES: (1) US = Upstream of the dam crest centerline
DS = Downstream of the dam crest centerline
(2) NGVD = National Geodetic Vertical Datum



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORPS OF ENGINEERS
WALTHAM, MASS

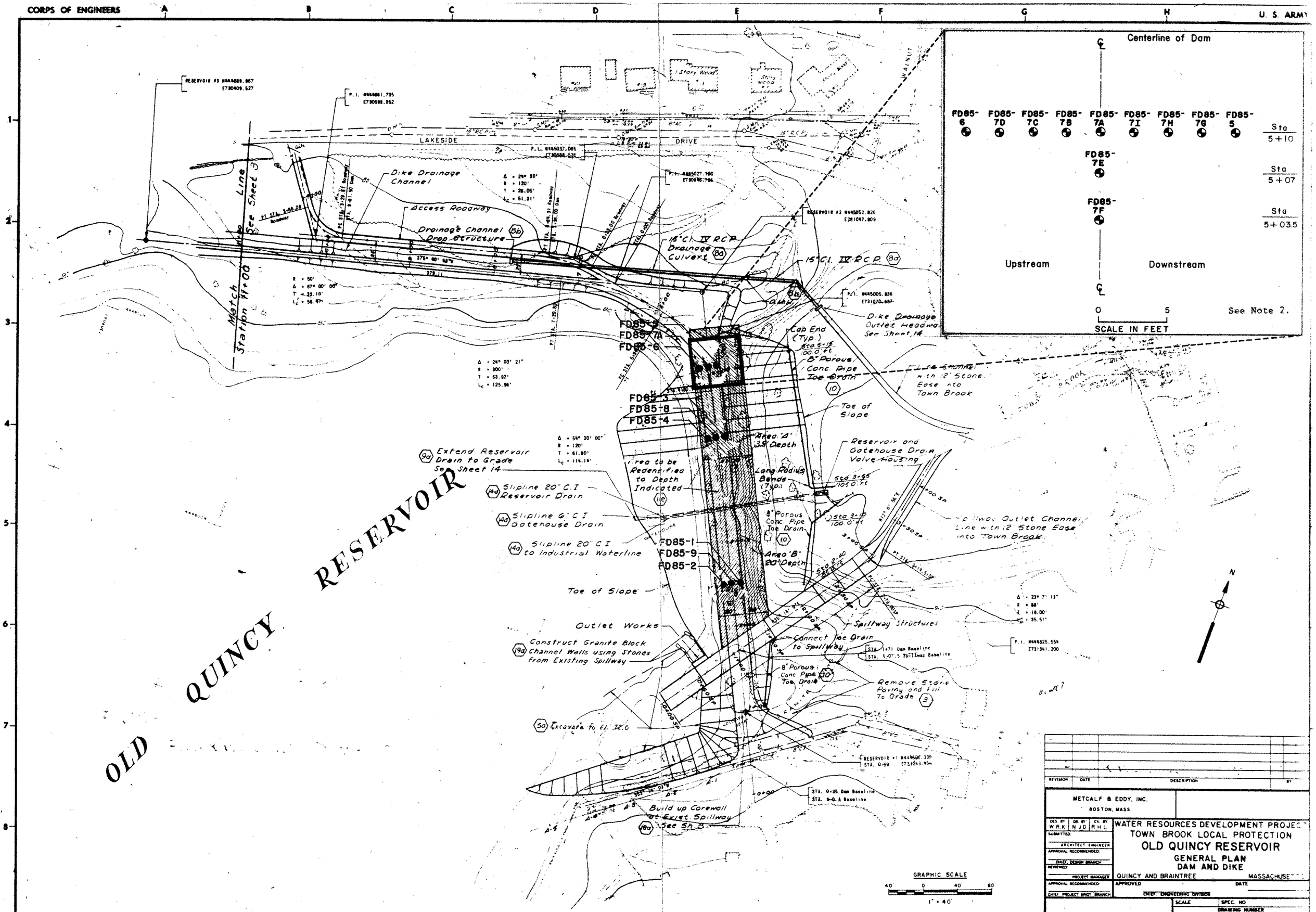
WATER RESOURCES DEVELOPMENT PROJECT

TOWN BROOK LOCAL PROTECTION

GENERAL PLAN

PLATE 1

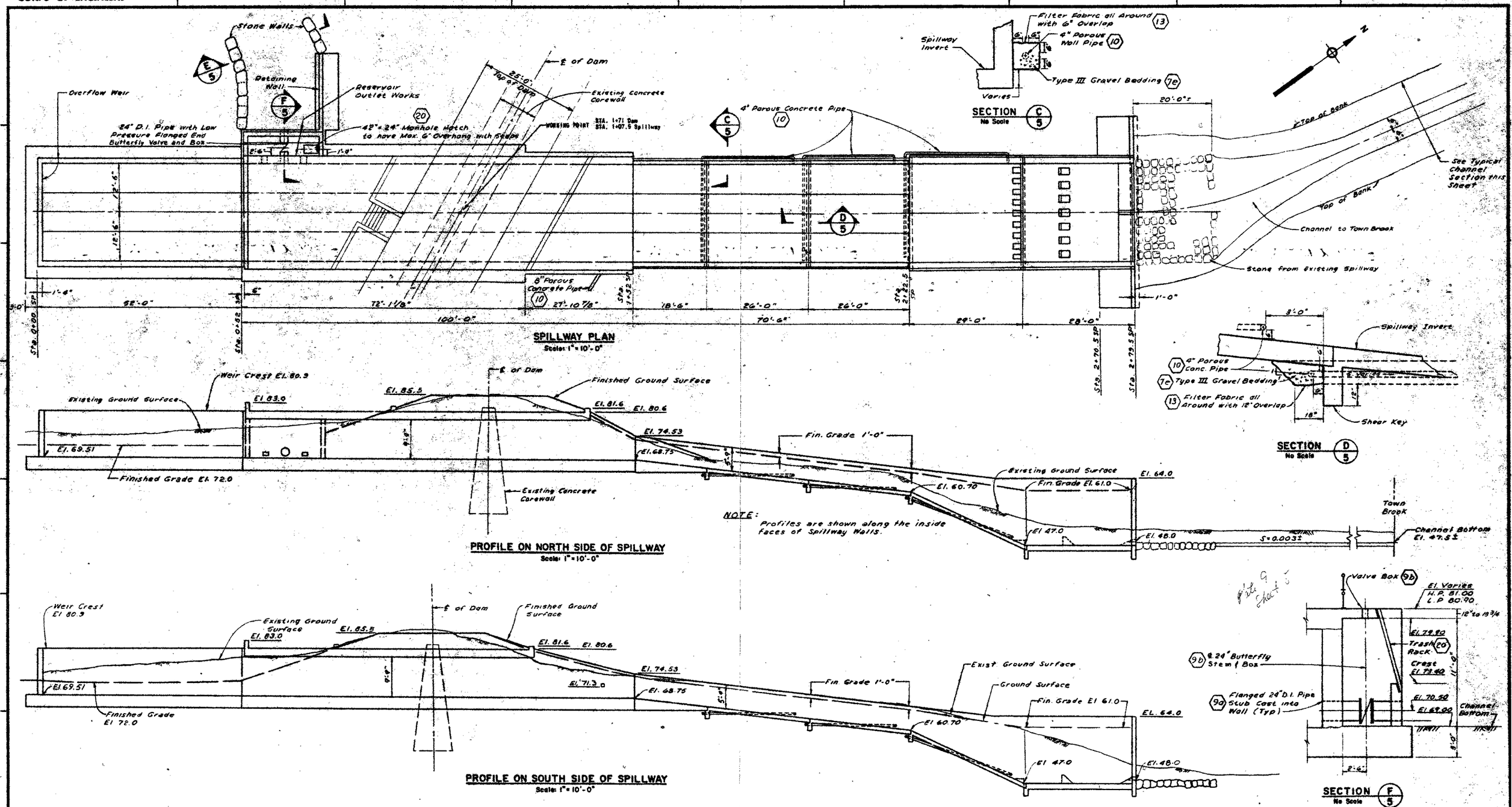
U.S. Corps of Engineers Waltham, Massachusetts	Quality Assurance Old Quincy Reservoir Dam Braintree, Massachusetts	SITE LOCATION PLAN
GEOTECHNICAL ENGINEERS INC. WINCHESTER • MASSACHUSETTS	Project 85736	Oct. 8, 1985 Fig. 1



NOTES: (1) See Table 1 for summary of borings.
(2) FD85-1 through FD85-6 are SPT borings; FD85-7F, FD85-8, and FD85-9 are concrete core/pressure test borings; FD85-7A through FD85-7E and FD85-7G through FD85-7I are auger probes.

U.S. Corps of Engineers Waltham, Massachusetts	Quality Assurance Old Quincy Reservoir Dam Braintree, Massachusetts	PLAN OF DAM AND BORING LOCATIONS
GEOTECHNICAL ENGINEERS INC. WINCHESTER • MASSACHUSETTS	Project 85736	Oct. 8, 1985 Fig. 2

CORPS OF ENGINEERS — U. S. ARMY



REVISION	DATE	DESCRIPTION	BY

METCALF & EDDY, INC.
BOSTON, MASS.

DES. BY W.R.K. | DR. BY E.S.D. | CK. BY R.H.L.

WATER RESOURCES DEVELOPMENT PROJECT
TOWN BROOK LOCAL PROTECTION
OLD QUINCY RESERVOIR
SPILLWAY - CIVIL
PLANS, PROFILES AND SECTIONS
QUINCY AND BRAINTREE MASSACHUSETTS

SCALE | SPEC. NO. | DRAWING NUMBER

PLATE 9 SHEET 5

U.S. Corps of Engineers Waltham, Massachusetts	Quality Assurance Old Quincy Reservoir Dam Braintree, Massachusetts	SPILLWAY PLANS AND SECTIONS
GEOTECHNICAL ENGINEERS INC. WINCHESTER • MASSACHUSETTS	Project 85736	Oct. 8, 1985 Fig. 3

APPENDIX A

BORING LOGS AND STANDARD PENETRATION TEST DATA SHEETS

Hole No. FD85-1

DRILLING LOG	DIVISION NEW ENGLAND	INSTALLATION -	SHEET 1 OF 2 SHEETS

1. PROJECT: OLD QUINCY RESERVOIR DAM
2. LOCATION (Coordinates or Station): STA 2+50 7 FT DOWNSTREAM ℄
3. DRILLING AGENCY: CE MOBILE, AL DISTRICT
4. HOLE NO. (As shown on drawing title and file number): FD85-1
5. NAME OF DRILLER: CARL MOON
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN:
8. DEPTH DRILLED INTO ROCK: 0
9. TOTAL DEPTH OF HOLE: 32.5 FT
10. SIZE AND TYPE OF BIT: 4 IN. FISHTAIL
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): NGVD
12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING 314
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 14; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES:
15. ELEVATION GROUND WATER: NOT MEASURED
16. DATE HOLE: STARTED 8-14-85; COMPLETED 8-15-85
17. ELEVATION TOP OF HOLE: 85.8 FT
18. TOTAL CORE RECOVERY FOR BORING: %
19. SIGNATURE OF INSPECTOR: Charles R. Conlon

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	1, 2		BR., LOOSE, SILTY F-C SAND. ~20-30% SLIGHTLY PLASTIC FINES. ROOTS. (SM)	22	J-1	DRIVE 1 3 4 6
						ADVANCED BOREHOLE USING REVERT W/O CASING
	3, 4		LT. BR., MED DENSE, GRAVELLY F-C SAND. ~10% SL-NON PLASTIC FINES. (SW-SM)	56	J-2	0.1' SLOUGH DRIVE 2 9 12 13
	5, 6, 7		SAME AS ABOVE.	11	J-3	0.2' SLOUGH DRIVE 3 8 8 5
	8, 9		LT. BR., MED DENSE, GRAVELLY F-C SAND. ~5% SL-NON PLASTIC FINES. (SW)	44	J-4	0.2' SLOUGH DRIVE 4 7 7 9
	10, 11, 12		BR., MED DENSE, GRAVELLY F-C SAND. ~10-15% SL-NON PLASTIC FINES. (SW-SM)	28	J-5	DRIVE 5 4 4 5
	13, 14		BR., MED DENSE F-C SANDY GRAVEL. ~5-10% SL-NON PLASTIC FINES. (GW-GM)	11	J-6	0.1' SLOUGH DRIVE 6 11 11 10
	15, 16, 17		LT. BR., MED DENSE, GRAVELLY F-C SAND. ~5% SL-NON PLASTIC FINES. (SW)	33	J-7	0.2' SLOUGH DRIVE 7 8 10 8
	18, 19		SAME AS ABOVE	11	J-8	0.2' SLOUGH DRIVE 8 10 12 14
						0.2' SLOUGH

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PROJECT: OLD QUINCY RES. DAM HOLE NO. FD85-1

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 85.8 | Hole No. FD85-1

PROJECT OLD QUINCY RESERVOIR DAM | INSTALLATION – | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	21		RUSTY BR., MED DENSE, F-M SAND. SOME GRAVEL. ~5-10% SL PLASTIC FINES. (SP-SM)	17	J-9	0.2' SLOUGH DRIVE 9 6 8 8 DROPPED CASING TO 9.0'
	22					THICKENED DRILLING MUD 2 ATTEMPTS TO CLEAN HOLE 0.4' SLOUGH
	23		NO RECOVERY	0	J-10	DRIVE 10 9 9 4 POUNDED CASING TO 19.0'
	24					
	25					0.25' SLOUGH
	26		LT. BR., LOOSE, SILTY, GRAVELLY F-C SAND, ~20% SL. PLASTIC FINES. GRAVEL IS BROKEN SLATE. (SM) WEATHERED ROCK?	28	J-11	DRIVE 11 6 5 3
	27					
	28		NO RECOVERY	0	J-12	0.15' SLOUGH DRIVE 12 1 9 13
	29					LOSING DRILLING MUD -THICKENED MUD CLEAN HOLE 2 TIMES
	30		TAN - GRAY, DENSE SANDY SILTY GRAVEL. ~20-30% MED PLASTIC FINES. GRAVEL IS BROKEN SLATE. (GM) WEATHERED ROCK?	44	J-13	DRIVE 13 8 4 92/0.4'
	31					
	32		WASH	100	J-14	0.2' SLOUGH 68/0.2' REFUSAL RODS BOUNCING
	33					B.O.B. 32.5'

STANDARD PENETRATION TEST

Project OLD QUINCY RES DAM

Page 1 of 7

Hole No. FD85-1

Date 8-14-85

DRIVE 1

Depth of Test 0 to 1.5'

Blow	Gage Reading	Penetration per Blow
1	0.23	0.23
2	0.33	0.10
3	0.42	0.09
4	0.57	0.15
5	0.66	0.09
6	0.78	0.12
7	0.92	0.14
8	1.05	0.13
9	1.15	0.10
10	1.25	0.10
11	1.35	0.10
12	1.45	0.10
13	1.55	0.10
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0		
	1	
	1	
0.5'	1	3
	1	
	1	
	1	
1.0'	1	4
	1	
	1	
	1	
	1	
1.5'	2	6

Remarks

DRIVE 2

Depth of Test 2.4' to 3.9'

Blow	Gage Reading	Penetration per Blow
1	0.10	0.10
2	0.15	0.05
3	0.20	0.05
4	0.25	0.05
5	0.30	0.05
6	0.35	0.05
7	0.40	0.05
8	0.45	0.05
9	0.50	0.05
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	1	
	2	
	2	
	2	
0.5'	2	9
	2	
	3	
	2	
	2	
1.0'	3	12
	2	
	4	
	3	
	2	
1.5'	2	13

Remarks 0.1' SLOUGH

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES DAM Page 2 of 7

Hole No. FD85-1 Date 8-14-85

DRIVE 3

Depth of Test 4.8' to 6.3'

Blow	Gage Reading	Penetration per Blow
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15	0.90	
16	1.05	0.15
17	1.15	0.10
18	1.25	0.10
19	1.35	0.10
20	1.45	0.10
21	1.55	0.10

	Blows per 0.1 ft.		
0	1		
	2		
	1		
	2		
0.5'	2	8	
	2		
	2		
	1		
	2		
1.0'	1	8	
	1		
	1		
	1		
	1		
1.5'	1	5	

Remarks SLOUGH = 0.2'

DRIVE 4

Depth of Test 7.3' to 8.8'

Blow	Gage Reading	Penetration per Blow
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.		
0	1		
	1		
	2		
	2		
0.5'	1	7	7
	1		
	1		
	2		
	1		
1.0'	2	7	7
	1		
	2		
	2		
	2		
1.5'	2	9	9

Remarks SLOUGH = 0.2'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES DAM Page 3 of 7

Hole No. FD85-1 Date 8-14-85

DRIVE 5

Depth of Test 10.0' to 11.5'

Blow	Gage Reading	Penetration per Blow
1	0.10	0.10
2	0.20	0.10
3	0.30	0.10
4	0.45	0.15
5	0.60	0.15
6	0.70	0.10
7	0.85	0.15
8	0.95	0.10
9	1.10	0.15
10	1.30	0.20
11	1.40	0.10
12	1.45	0.05
13	1.50	0.05
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	1	
	1	
	1	
0.5'	1	4
	1	
	1	
	1	
1.0'	1	4
	1	
	1	
	1	
1.5'	2	5

Remarks SLOUGH = 0

DRIVE 6

Depth of Test 12.4' to 13.9'

Blow	Gage Reading	Penetration per Blow
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	2	
	2	
	3	
	2	
0.5'	2	11
	2	
	3	
	2	
	2	
1.0'	2	11
	2	
	2	
	2	
	2	
1.5'	2	10

Remarks SLOUGH = 0.1'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 4 of 7

Hole No. FD85-1 Date 8-14/15-85

DRIVE 7

Depth of Test 14.8' to 16.3'

Blow	Gage Reading	Penetration per Blow
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	1	
	1	
	2	
	2	
0.5'	2	8
	2	
	2	
	2	
	2	
1.0'	2	10
	1	
	2	
	2	
	1	
1.5'	2	8

Remarks SLOUGH = 0.2'

DRIVE 8

Depth of Test 17.3' to 18.8'

Blow	Gage Reading	Penetration per Blow
1	0.05	0.05
2	0.12	0.07
3	0.20	0.08
4	0.24	0.04
5	0.27	0.03
6	0.30	0.03
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	1	
	2	
	3	
	2	
0.5'	2	10
	2	
	2	
	3	
	3	
1.0'	2	12
	2	
	2	
	3	
	4	
1.5'	3	14

Remarks SLOUGH = 0.2'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 5 of 7

Hole No. FD85-1 Date 8-15-85

DRIVE 9
Depth of Test 19.8' to 21.3'

Blow	Gage Reading	Penetration per Blow
1	0.07	0.07
2	0.12	0.05
3	0.24	0.12
4	0.30	0.08
5	0.38	0.08
6	0.50	0.12
7	0.60	0.10
8	0.67	0.07
9	0.72	0.05
10	0.80	0.08
11	0.85	0.05
12	0.89	0.04
13	0.94	0.05
14	0.99	0.05
15	1.06	0.07
16	1.12	0.06
17	1.18	0.06
18	1.25	0.07
19	1.31	0.06
20	1.37	0.06
21	1.43	0.06
22	1.50	0.07

	Blows per 0.1 ft.	
0	1	
	1	
	2	
	1	
0.5'	1	6
	1	
	1	
	2	
	2	
1.0'	2	8
	1	
	2	
	1	
	2	
1.5'	2	8

Remarks SLOUGH = 0.2'

DRIVE 10
Depth of Test 22.1' to 23.7'

Blow	Gage Reading	Penetration per Blow
1	0.06	0.06
2	0.14	0.08
3	0.20	0.06
4	0.25	0.05
5	0.29	0.04
6	0.33	0.04
7	0.37	0.04
8	0.42	0.05
9	0.47	0.05
10	0.52	0.05
11	0.57	0.05
12	0.62	0.05
13	0.66	0.04
14	0.70	0.04
15	0.75	0.05
16	0.83	0.08
17	0.90	0.07
18	0.99	0.09
19	1.10	0.11
20	1.20	0.10
21	1.45	0.25
22	1.65	0.20

	Blows per 0.1 ft.	
0	1	
	2	
	2	
	2	
0.5'	2	9
	2	
	3	
	1	
	2	
1.0'	1	9
	1	
	1	
1.5'	1	4

Remarks SLOUGH = 0.4' ATTEMPTED TO CLEAN BOREHOLE TWO TIMES

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 6 of 7

Hole No. FD85-1 Date 8-15-85

• DRIVE 11

Depth of Test 24.8' to 26.3'

Blow	Gage Reading	Penetration per Blow
1	0.07	0.07
2	0.15	0.08
3	0.21	0.06
4	0.29	0.08
5	0.36	0.07
6	0.47	0.11
7	0.59	0.12
8	0.70	0.11
9	0.80	0.10
10	0.91	0.11
11	1.00	0.09
12	1.12	0.12
13	1.25	0.13
14	1.45	0.20
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	1	
	1	
	2	
	1	
0.5'	1	6
	1	
	1	
	1	
	1	
1.0'	1	5
	1	
	1	
1.5'	1	3

Remarks: SLOUGH = 0.25'
WASHED BOREHOLE FOR 20 MIN.

DRIVE 12

Depth of Test 27.3' to 28.8'

Blow	Gage Reading	Penetration per Blow
1	0.70	0.70
2	0.80	0.10
3	0.82	0.02
4	0.85	0.03
5	0.87	0.02
6	0.90	0.03
7	0.92	0.02
8	0.95	0.03
9	0.97	0.02
10	1.01	0.04
11	1.05	0.04
12	1.09	0.04
13	1.11	0.02
14	1.15	0.04
15	1.17	0.02
16	1.20	0.03
17	1.24	0.04
18	1.30	0.06
19	1.32	0.02
20	1.36	0.04
	1.40	0.04
	1.45	0.05
	1.50	0.05

	Blows per 0.1 ft.	
0		
0.5'		1
	1	
	1	
	4	
1.0'	4	9
	2	
	4	
	2	
	3	
1.5'	2	13

Remarks: SLOUGH = 0.15'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 7 of 7

Hole No. FD85-1 Date 8-15-85

DRIVE 13

Depth of Test 30.0' to 31.5'

Blow	Gage Reading	Penetration per Blow
1	0.08	
2	0.12	
3	0.17	
4	0.21	
5	0.25	
6	0.31	
7	0.37	
8	0.44	
9	0.54	
10	0.67	
11	0.86	
12	1.03	
13	1.09	
14	1.12	
15	1.14	
16	1.15	
17	1.17	
18		
19		
20		

	Blows per 0.1 ft.	
0	1	
	2	
	2	
	2	
0.5'	1	8
	1	
	1	
	1	
1.0'	1	4
	1	
	4	
	27	
	60	92
1.5'		

Remarks SLOUGH = 0

DRIVE 14

Depth of Test 32.3' to 32.5'

Blow	Gage Reading	Penetration per Blow
1	0.05	0.05
2	0.09	0.04
3	0.10	0.01
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	3	
	65	68
0.5'		
1.0'		
1.5'		

Remarks SLOUGH = 0.2'

MRO Form 1713, 1 Dec 78 (Temp)

DRILLING LOG	DIVISION NEW ENGLAND	INSTALLATION —	SHEET 1 OF 2 SHEETS

1. PROJECT OLD QUINCY RESERVOIR DAM	10. SIZE AND TYPE OF BIT 4 in. FISHTAIL
2. LOCATION (Coordinates or Station) STA 2+50 7 FT UPSTREAM ℄	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD
3. DRILLING AGENCY CE MOBILE, AL DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 314
4. HOLE NO. (As shown on drawing title and file number) FD85-2	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 14; UNDISTURBED 0
5. NAME OF DRILLER CARL MOON	14. TOTAL NUMBER CORE BOXES —
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER NOT MEASURED
	16. DATE HOLE: STARTED 8-15-85; COMPLETED 8-16-85
	17. ELEVATION TOP OF HOLE 85.4 FT
7. THICKNESS OF OVERBURDEN —	18. TOTAL CORE RECOVERY FOR BORING — %
8. DEPTH DRILLED INTO ROCK 0	19. SIGNATURE OF INSPECTOR Charles E. Conlon
9. TOTAL DEPTH OF HOLE 37.5 FT	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			BR., MED DENSE, GRAVELLY SILTY F-C SAND. ~15% SL PLASTIC FINES. ROOTS. (SM)	44	J-1	DRIVE 1 5 5 10
	2					
			LT. BR., MED DENSE, GRAVELLY F-C SAND. ~5% SL.-NON PLASTIC FINES. (SW)	55	J-2	(0.1' SLOUGH) DRIVE 2 7 13 12
	4					
			SAME AS ABOVE. (SW)	22	J-3	(0.2' SLOUGH) DRIVE 3 7 9 9; 1¼" GRAVEL FALL IN BLOCKING SS CATCHER
	6					
	8		SAME AS ABOVE. (SW)	28	J-4	(0.2' SLOUGH) DRIVE 4 6 7 6; 1¼" GRAVEL PUSHED SS CATCHER UP; POUNDED CASING TO 9.0'
	10		SAME AS ABOVE. (SW)	50	J-5	0.3' SLOUGH; DRIVE 5 11 11 11
	12		NO SAMPLE			COULD NOT OBTAIN SAMPLE — COARSE GRAVEL GETTING CAUGHT BETWEEN CASING AND DRILL RODS - LIFTING AND DROPPING CASING POUNDED CASING TO 14' CHANGED TO 4 in. ROLLER BIT.
	14					
			GRAY, MED DENSE, SANDY SILTY GRAVEL. ~10% SL. PLASTIC FINES. (GW-GM)	TOP 4" 39	J-6.1	DRIVE 6 8 8 5
	16		LT. BR., MED DENSE, GRAVELLY F-C SAND. ~5% SL-NON PLASTIC FINES. (SW)	BOT 3"	J-6.2	
	18		NO RECOVERY.	0	J-7	(0.1' SLOUGH) DRIVE 7 2 2 2
						CHANGED BACK TO 4 in. FISHTAIL

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT OLD QUINCY RES. DAM | HOLE NO. FD85-2

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE 85.4 **Hole No.** FD85-2

PROJECT OLD QUINCY RESERVOIR DAM | INSTALLATION – | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			NO RECOVERY.	0	J-8	0.3' SLOUGH DRIVE 8 1 1 1
	22					
			FALL IN. SIMILAR TO SAMPLE J-6.1	7 FAIL 6	J-9	0.2' SLOUGH DRIVE 9 2 3 3
	24					
			NO RECOVERY.	0	J-10	0.1' SLOUGH DRIVE 10 5 3 4
	26					
	28		GRAY, DENSE, SANDY SILTY GRAVEL. ~10% MED PLASTIC FINES. GRAVEL IS BROKEN SLATE. (GW-GM) WEATHERED ROCK?	50	J-11	DRIVE 11 15 26 21
	30		SAME AS ABOVE.	89	J-12.1 J-12.2	0.2' SLOUGH DRIVE 12 5 38 39
	32					CHANGED TO 4 IN. ROLLER BIT
	34					20/0" REFUSAL RODS BOUNCING B.O.B. 32.5'

STANDARD PENETRATION TEST

Project OLD QUINCY RES DAM Page 1 of 7

Hole No. FD85-2 Date 8-15-85

DRIVE 1
Depth of Test 0 to 1.5

Blow	Gage Reading	Penetration per Blow
1	0.10	0.10
2	0.20	0.10
3	0.28	0.08
4	0.38	0.10
5	0.49	0.11
6	0.56	0.07
7	0.69	0.13
8	0.81	0.12
9	0.92	0.11
10	1.00	0.08
11	1.10	0.10
12	1.15	0.05
13	1.20	0.05
14	1.25	0.05
15	1.30	0.05
16	1.34	0.04
17	1.38	0.04
18	1.41	0.03
19	1.47	0.06
20	1.50	0.03

	Blows per 0.1 ft.
0	
	1
	1
	1
	1
0.5'	1 5
	1
	1
	1
	1
1.0'	1 5
	2
	2
	2
	2
1.5'	2 10

Remarks SLOUGH = 0

DRIVE 2
Depth of Test 2.4' to 3.9'

Blow	Gage Reading	Penetration per Blow
1	0.17	0.17
2	0.20	0.03
3	0.29	0.09
4	0.33	0.04
5	0.39	0.06
6	0.45	0.06
7	0.49	0.04
8	0.54	0.05
9	0.58	0.04
10	0.62	0.04
11	0.67	0.05
12	0.71	0.04
13	0.76	0.05
14	0.80	0.04
15	0.83	0.03
16	0.87	0.04
17	0.90	0.03
18	0.93	0.03
19	0.97	0.04
20	1.00	0.03

	Blows per 0.1 ft.
0	
	2
	1
	2
0.5'	2 7
	2
	2
	3
	3
1.0'	3 13
	2
	3
	3
	2
1.5'	2 12

Remarks SLOUGH = 0.1'

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STANDARD PENETRATION TEST

Project OLD QUINCY RES DAM Page 2 of 7

Hole No. FD85-2 Date 8-15-85

DRIVE 3
Depth of Test 4.8' to 6.3'

Blow	Gage Reading	Penetration per Blow
1	0.10	0.10
2	0.20	0.10
3	0.25	0.05
4	0.32	0.07
5	0.37	0.05
6	0.42	0.05
7	0.48	0.06
8	0.54	0.06
9	0.59	0.05
10	0.65	0.06
11	0.70	0.05
12	0.76	0.06
13	0.81	0.05
14	0.86	0.05
15	0.91	0.05
16	0.97	0.06
17	1.01	0.04
18	1.08	0.07
19	1.13	0.05
20	1.19	0.06
21	1.23	0.04
22	1.30	0.07
23	1.35	0.05
24	1.42	0.07
25	1.50	0.08

	Blows per 0.1 ft.	
0	1	
	1	
	1	
	2	
0.5'	2	7
	2	
	2	
	1	
	2	
1.0'	2	9
	2	
	2	
	2	
	1	
1.5'	2	9

Remarks SLOUGH = 0.2'

DRIVE 4
Depth of Test 7.3' to 8.8

Blow	Gage Reading	Penetration per Blow
1	0.10	0.10
2	0.18	0.08
3	0.25	0.07
4	0.31	0.06
5	0.40	0.09
6	0.47	0.07
7	0.54	0.07
8	0.60	0.06
9	0.66	0.06
10	0.76	0.10
11	0.83	0.07
12	0.92	0.09
13	1.00	0.08
14	1.10	0.10
15	1.18	0.08
16	1.27	0.09
17	1.35	0.08
18	1.42	0.07
19	1.50	0.08
20		

	Blows per 0.1 ft.	
0	1	
	1	
	1	
	2	
0.5'	1	6
	2	
	1	
	1	
	1	
1.0'	2	7
	1	
	1	
	1	
	1	
1.5'	2	6

Remarks SLOUGH = 0.2'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES DAM Page 3 of 7

Hole No. FD85-2 Date 8-16-85

DRIVE 5
Depth of Test 9.8' to 11.3'

Blow	Gage Reading	Penetration per Blow
1	0.05	0.05
2	0.10	0.05
3	0.14	0.04
4	0.19	0.05
5	0.22	0.03
6	0.26	0.04
7	0.30	0.04
8	0.33	0.03
9	0.38	0.05
10	0.42	0.04
11	0.47	0.05
12	0.51	0.04
13	0.56	0.05
14	0.60	0.04
15	0.68	0.08
16	0.71	0.03
17	0.75	0.04
18	0.80	0.05
19	0.85	0.05
20	0.89	0.04
21	0.94	0.05
22	0.99	0.05

	Blows per 0.1 ft.	
0	2	
	2	
	3	
	2	
0.5'	2	11
	3	
	1	
	3	
	2	
1.0'	2	11
	2	
	2	
	2	
	3	
1.5'	2	11

Remarks SLOUGH = 0.3'

DRIVE 6
Depth of Test 15.0' to 16.5'

Blow	Gage Reading	Penetration per Blow
1	0.05	0.05
2	0.11	0.06
3	0.16	0.05
4	0.25	0.09
5	0.30	0.05
6	0.36	0.06
7	0.42	0.06
8	0.50	0.08
9	0.57	0.07
10	0.62	0.05
11	0.68	0.06
12	0.73	0.05
13	0.76	0.06
14	0.80	0.04
15	0.86	0.06
16	0.97	0.11
17	1.04	0.07
18	1.14	0.10
19	1.25	0.11
20	1.39	0.14
	1.50	0.11

	Blows per 0.1 ft.	
0	1	
	2	
	2	
	1	
0.5'	2	8
	1	
	2	
	3	
	1	
1.0'	1	8
	1	
	1	
	1	
	1	
1.5'	1	5

Remarks SLOUGH = 0 USED ROLLERBIT

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES DAM

Page 4 of 7

Hole No. FD85-2

Date 8-16-85

DRIVE 7

Depth of Test 17.4' to 19.0'

Blow	Gage Reading	Penetration per Blow
1	0.11	0.11
2	0.30	0.19
3	0.61	0.31
4	0.81	0.20
5	1.09	0.28
6	1.60	0.51
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.
0	1
	1
0.5'	2
	1
	1
1.0'	2
	1
1.5'	1 2

Remarks SLOUGH = 0.1'

DRIVE 8

Depth of Test 19.7' to 21.3'

Blow	Gage Reading	Penetration per Blow
1	0.31	0.31
2	1.25	0.94
3	1.65	0.40
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.
0	
	1
0.5'	
1.0'	
	1
1.5'	1

Remarks SLOUGH = 0.3'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES DAM Page 5 of 7

Hole No. FD85-2 Date 8-16-85

DRIVE 9

Depth of Test 22.3' to 23.9'

Blow	Gage Reading	Penetration per Blow
	0.10	0.10/WOH
1	0.30	0.02
2	0.42	0.12
3	0.55	0.13
4	0.71	0.16
5	0.90	0.19
6	1.05	0.15
7	1.38	0.33
8	1.60	0.22
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.
0	—
	1
0.5'	1 2
	1
	1
	1
1.0'	3
	1
	1
1.5'	1 3

Remarks

SLOUGH = 0.2'

WOH = WEIGHT OF HAMMER

DRIVE 10

Depth of Test 25.1' to 26.6'

Blow	Gage Reading	Penetration per Blow
1	0.14	0.14
2	0.21	0.07
3	0.30	0.09
4	0.37	0.07
5	0.48	0.11
6	0.59	0.11
7	0.68	0.09
8	0.80	0.12
9	1.08	0.28
10	1.28	0.20
11	1.40	0.12
12	1.53	0.13
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.
0	
	1
	2
	1
0.5'	1 5
	1
	1
	1
1.0'	3
	1
	1
	1
1.5'	1 4

Remarks

SLOUGH = 0.1'

CLEANED BOREHOLE 2 TIMES

OVERWASHED 0.2'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES DAM

Page 6 of 7

Hole No. FD85-2

Date 8-16-85

DRIVE 11

Depth of Test 27.5' to 29.0'

Blow	Gage Reading	Penetration per Blow
1	0.08	0.08
2	0.12	0.04
3	0.17	0.05
4	0.20	0.03
5	0.23	0.03
6	0.27	0.04
7	0.30	0.03
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	1	
	3	
	3	
	3	
0.5'	5	15
	5	
	5	
	5	
	5	
1.0'	6	26
	5	
	4	
	4	
	4	
1.5'	4	21

Remarks

SLOUGH = 0

CLEANED HOLE 2 TIMES

TWO CATCHERS IN SPLITSPOON

BECAUSE NO RECOVERY IN LAST 4 DRIVES

DRIVE 12

Depth of Test 29.8' to 31.3'

Blow	Gage Reading	Penetration per Blow
1	0.30	0.30
2	0.40	0.10
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0		
	1	
	1	
0.5'	3	5
	3	
	9	
	10	
	9	
1.0'	7	38
	7	
	7	
	7	
	9	
1.5'	9	39

Remarks

SLOUGH = 0.2'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES DAM Page 7 of 7

Hole No. FD85-2 Date 8-16-85

DRIVE 13
Depth of Test 32.5' to 32.5'

Blow	Gage Reading	Penetration per Blow
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20	0	0

	Blows per 0.1 ft.
0	
0.5'	
1.0'	
1.5'	

Remarks
SLOUGH = 0
20 BL / 0' PENETRATION
RODS BOUNCING

Depth of Test _____ to _____

Blow	Gage Reading	Penetration per Blow
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.
0	
0.5'	
1.0'	
1.5'	

Remarks

MRO Form 1713, 1 Dec 78 (Temp)

Hole No. FD85-3

DRILLING LOG	DIVISION NEW ENGLAND	INSTALLATION —	SHEET 1 OF 3 SHEETS

1. PROJECT: OLD QUINCY RESERVOIR DAM
2. LOCATION (Coordinates or Station): STA 4+25 8 FT DOWNSTREAM ℄
3. DRILLING AGENCY: CE MOBILE, AL DISTRICT
4. HOLE NO. (As shown on drawing title and file number): FD 85-3
5. NAME OF DRILLER: CARL MOON
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: —
8. DEPTH DRILLED INTO ROCK: 0
9. TOTAL DEPTH OF HOLE: 56.3 FT
10. SIZE AND TYPE OF BIT: 4" FISHTAIL
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): NGVD
12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING 314
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 23; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER: NOT MEASURED
16. DATE HOLE: STARTED 8-28-85; COMPLETED 8-29-85
17. ELEVATION TOP OF HOLE: 85.1 FT
18. TOTAL CORE RECOVERY FOR BORING: — %
19. SIGNATURE OF INSPECTOR: Charles R. Conlon

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		TOP 6"	DK. BR., MED DENSE, SILTY F-C SAND. ~20-30% SLIGHTLY PLASTIC FINES. ROOTS. (SM)	67	J-1.1	DRIVE 1 5 9 12
		BOT 6"	LT. BR., MED DENSE, F-C SAND. ~10% GRAVEL. ~10% SLIGHTLY TO NON PLASTIC FINES. (SW-SM)		J-1.2	
	2		LT. BR., MED DENSE, F-C SAND. ~25% GRAVEL ~5-10% SLIGHTLY TO NON PLASTIC FINES. (SW-SM)	61	J-2	0.1' SLOUGH DRIVE 2 10 15 18
	4		SAME AS ABOVE. (SW-SM)	50	J-3	0.1' SLOUGH DRIVE 3 13 17 20 TWO - 1" PIECES OF GRAVEL IN TOP OF SAMPLE
	6		LT. BR., MED DENSE, GRAVELLY, F-C SAND. ~5-10% SLIGHTLY TO NONPLASTIC FINES. (SW-SM)	50	J-4	0.1' SLOUGH DRIVE 4 10 12 14
	8		SAME AS ABOVE. (SW-SM)	17	J-5	0.1' SLOUGH DRIVE 5 11 13 13 1½" GRAVEL STUCK IN BOT OF SS SHOE
	10					VERY GRAVELLY @ 12 FT ADVANCING BOREHOLE
	12		SAME AS ABOVE. (SW-SM)	50	J-6	0.1' SLOUGH DRIVE 6 14 14 13
	14		SAME AS ABOVE. (SW-SM)	33	J-7	DRIVE 7 9 8 9
	16		RUSTY BR., MED DENSE, GRAVELLY, F-C SAND. ~10-15% SLIGHTLY TO NONPLASTIC FINES. (SW-SM)	44	J-8	0.1' SLOUGH DRIVE 8 8 10 12
	18					

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: OLD QUINCY RES. DAM | HOLE NO. FD85-3

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE 85.1 **Hole No.** FD85-3

PROJECT OLD QUINCY RESERVOIR DAM INSTALLATION SHEET 2 OF 3 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			RUSTY BR. TO GRAY, DENSE, GRAVELLY, F-C SAND. ~10-15% SLIGHTLY PLASTIC FINES. TILL-LIKE. (SW-SM)	67	J-9	Co.1' SLOUGH DRIVE 9 18 32 25
	22					
		TOP 7"	BR. MED DENSE, GRAVELLY F-C SAND. ~5-10% SLIGHTLY PLASTIC FINES. (SW-SM)	56	J-10.1	Co.1' SLOUGH DRIVE 10 7 9 16
		BOT 3"	RUSTY BR., MED DENSE, GRAVELLY F-C SAND. ~5% SLIGHTLY TO NON PLASTIC FINES. (SW)		J-10.2	
	24					
			BR., MED DENSE, GRAVELLY F-C SAND. ~5-10% SLIGHTLY TO NONPLASTIC FINES. (SW-SM)	50	J-11	Co.2' SLOUGH DRIVE 11 17 16 13
	26					
	28		NO RECOVERY.	0	J-12	Co.1' SLOUGH DRIVE 12 4 7 7
	30		BR., MED DENSE, GRAVELLY F-C SAND. ~10-15% SLIGHTLY TO NONPLASTIC FINES. GRAVEL SIZES ARE TAN COLORED BROKEN ROCK. (SW-SM)	33	J-13	Co.2' SLOUGH DRIVE 13 7 8 13
	32					
			NO RECOVERY.	FALL IN 6	J-14	Co.1' SLOUGH DRIVE 14 9 11 14
	34					THICKENED DRILLING MUD.
			NO RECOVERY.	FALL IN 11	J-15	Co.1' SLOUGH DRIVE 15 5 4 4
	36					
	38		NO RECOVERY.	0	J-16	Co.2' SLOUGH DRIVE 16 5 2 2
	40		NO RECOVERY.	0	J-17	Co.2' SLOUGH DRIVE 17 7 8 11
	42					
			NO RECOVERY.	0	J-18	Co.2' SLOUGH DRIVE 18 11 13 13

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 85.1 | **Hole No.** FDBS-3

PROJECT OLD QUINCY RESERVOIR DAM | INSTALLATION | SHEET 3 OF 3 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
						CHANGED TO 4" ROLLERBIT AND THICKENED DRILLING MUD
			NO RECOVERY.	0	J-19	C0.2' SLOUGH DRIVE 19 9 12 13
	46					CHANGED BACK TO 4" FISHTAIL.
	48		OLIVE, MED DENSE, SILTY FINE SAND. ~40-50% SLIGHTLY PLASTIC FINES. (SM-ML)	67	J-20	C0.1' SLOUGH DRIVE 20 12 10 13
	50		OLIVE, DENSE, SILTY FINE SAND. ~40-50% SLIGHTLY PLASTIC FINES. (SM-ML)	72	J-21.1 J-21.2	C0.2' SLOUGH DRIVE 21 21 23 1" PIECE OF GRAVEL IN TOP OF SAMPLE 24
	52					LOOSING DRILLING MUD.
			NO RECOVERY.	0	J-22	C0.2' SLOUGH DRIVE 22 24 31 PROBABLY PUSHING A COBBLE. 29
	54					LOOSING DRILLING MUD.
	56		OLIVE, DENSE, SILTY FINE SAND. ~40-50% SLIGHTLY PLASTIC FINES. (SM-ML) BROKEN FRIABLE GRANITE BOT 0.2' OF SAMPLE	81	J-23.1 J-23.2	C0.2' SLOUGH DRIVE 23 20 25 60/0.3' REFUSAL
	58					CHANGED TO 4" ROLLERBIT – ROUGH PENETRATION FROM 56.2' TO 56.3' NO PENETRATION AT 56.3'. B.O.B. 56.3 FT

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 1 of 12

Hole No. FD85-3 Date 8-28-85

DRIVE 1

Depth of Test 0 to 1.5

Blow	Gage Reading	Penetration per Blow
1	0.09	0.09
2	0.19	0.10
3	0.29	0.10
4	0.38	0.09
5	0.46	0.08
6	0.55	0.09
7	0.61	0.06
8	0.66	0.05
9	0.71	0.05
10	0.77	0.06
11	0.84	0.07
12	0.89	0.05
13	0.94	0.05
14	0.99	0.05
15	1.03	0.04
16	1.08	0.05
17	1.14	0.06
18	1.18	0.04
19	1.21	0.03
20	1.25	0.04
21	1.30	0.05
22	1.33	0.03

1.37 - 0.04
1.42 - 0.05
1.45 - 0.03
1.49 - 0.04

	Blows per 0.1 ft.	
0	1	
	1	
	1	
	1	
0.5'	1	5
	1	
	2	
	2	
	2	
1.0'	2	9
	2	
	2	
	3	
	2	
1.5'	3	12

Remarks

DRIVE 2

Depth of Test 2.5' to 4.0

Blow	Gage Reading	Penetration per Blow
1	0.05	0.05
2	0.10	0.05
3	0.15	0.05
4	0.20	0.05
5	0.24	0.04
6	0.29	0.05
7	0.34	0.05
8	0.38	0.04
9	0.43	0.05
10	0.48	0.05
11	0.52	0.04
12	0.56	0.04
13	0.60	0.04
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	2	
	2	
	2	
	2	
0.5'	2	10
	3	
	3	
	3	
	3	
1.0'	3	15
	3	
	4	
	3	
	4	
1.5'	4	18

Remarks SLOUGH = 0.1'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 2 of 12

Hole No. FD85-3 Date 8-28-85

DRIVE 3
Depth of Test 5.0' to 6.5'

Blow	Gage Reading	Penetration per Blow
1	0.05	0.05
2	0.09	0.04
3	0.14	0.05
4	0.17	0.03
5	0.20	0.03
6	0.24	0.04
7	0.28	0.04
8	0.30	0.02
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	2	
	3	
	3	
	3	
0.5'	2	13
	3	
	3	
	4	
	3	
1.0'	4	17
	3	
	4	
	4	
	5	
1.5'	4	20

Remarks SLOUGH = 0.1'

DRIVE 4
Depth of Test 7.4' to 8.9'

Blow	Gage Reading	Penetration per Blow
1	0.08	0.08
2	0.13	0.05
3	0.17	0.04
4	0.23	0.06
5	0.27	0.04
6	0.32	0.05
7	0.36	0.04
8	0.40	0.04
9	0.46	0.06
10	0.50	0.04
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	1	
	2	
	2	
	3	
0.5'	2	10
	3	
	2	
	2	
	3	
1.0'	2	12
	2	
	3	
	3	
	3	
1.5'	3	14

Remarks SLOUGH = 0.1'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 3 of 12

Hole No. FD85-3 Date 8-28-85

DRIVE 5

Depth of Test 10.0' to 11.5'

Blow	Gage Reading	Penetration per Blow
1	0.08	0.08
2	0.13	0.05
3	0.18	0.05
4	0.23	0.05
5	0.27	0.04
6	0.30	0.03
7	0.34	0.04
8	0.38	0.04
9	0.43	0.05
10	0.47	0.04
11	0.50	0.03
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	1	
	2	
	3	
	2	
0.5'	3	11
	3	
	3	
	2	
	3	
1.0'	2	13
	3	
	2	
	3	
	2	
1.5'	3	13

Remarks: SLOUGH = 0.1'; 1½' GRAVEL STUCK IN BOTTOM OF SPLIT SPOON SHOE

DRIVE 6

Depth of Test 12.4' to 13.9'

Blow	Gage Reading	Penetration per Blow
1	0.08	0.08
2	0.15	0.07
3	0.20	0.05
4	0.23	0.03
5	0.26	0.03
6	0.30	0.04
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	1	
	2	
	3	
	3	
0.5'	5	14
	3	
	3	
	3	
	2	
1.0'	3	14
	2	
	3	
	3	
	2	
1.5'	3	13

Remarks: SLOUGH = 0.1'

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STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM

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Hole No. FD85-3

Date 8-28-85

DRIVE 7

Depth of Test 15.2' to 16.7'

Blow	Gage Reading	Penetration per Blow
1	0.05	0.05
2	0.10	0.05
3	0.15	0.05
4	0.21	0.06
5	0.26	0.05
6	0.32	0.06
7	0.38	0.06
8	0.44	0.06
9	0.50	0.06
10	0.56	0.06
11	0.61	0.05
12	0.66	0.05
13	0.72	0.06
14	0.77	0.05
15	0.83	0.06
16	0.89	0.06
17	0.96	0.07
18	1.02	0.06
19	1.09	0.07
20	1.14	0.05
21	1.21	0.07
22	1.28	0.07

1.34 - 0.06
1.39 - 0.05
1.44 - 0.05
1.49 - 0.05

	Blows per 0.1 ft.	
0	2	
	1	
	2	
	2	
0.5'	2	9
	1	
	2	
	2	
	2	
1.0'	1	8
	2	
	1	
	2	
	2	
1.5'	2	9

Remarks SLOUGH = 0

DRIVE 8

Depth of Test 17.4' to 18.9'

Blow	Gage Reading	Penetration per Blow
1	0.05	0.05
2	0.10	0.05
3	0.15	0.05
4	0.20	0.05
5	0.26	0.06
6	0.34	0.08
7	0.40	0.06
8	0.46	0.06
9	0.51	0.05
10	0.58	0.07
11	0.63	0.05
12	0.68	0.05
13	0.73	0.05
14	0.78	0.05
15	0.83	0.05
16	0.87	0.04
17	0.93	0.06
18	0.97	0.04
19	1.01	0.04
20	1.06	0.05
21	1.11	0.05
22	1.16	0.05

	Blows per 0.1 ft.	
0	2	
	2	
	1	
	2	
0.5'	1	8
	2	
	2	
	2	
	2	
1.0'	2	10
	2	
	2	
	3	
	2	
1.5'	3	12

Remarks SLOUGH = 0.1'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 5 of 12

Hole No. FD85-3 Date 8-28-85

DRIVE 9

Depth of Test 20.0' to 21.5'

Blow	Gage Reading	Penetration per Blow
1	0.10	0.10
2	0.14	0.04
3	0.18	0.04
4	0.20	0.02
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	1	
	3	
	4	
	5	
0.5'	5	18
	6	
	7	
	6	
	7	
1.0'	6	32
	6	
	6	
	5	
	4	
1.5'	4	25

Remarks SLOUGH = 0.1'

DRIVE 10

Depth of Test 22.4' to 23.9'

Blow	Gage Reading	Penetration per Blow
1	0.07	0.07
2	0.14	0.07
3	0.20	0.06
4	0.26	0.06
5	0.35	0.09
6	0.43	0.08
7	0.51	0.08
8	0.59	0.08
9	0.65	0.06
10	0.71	0.06
11	0.76	0.05
12	0.81	0.05
13	0.85	0.04
14	0.90	0.05
15	0.94	0.04
16	0.98	0.04
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	1	
	2	
	1	
	1	
0.5'	2	7
	1	
	1	
	2	
	3	
1.0'	2	9
	3	
	4	
	4	
	2	
1.5'	3	16

Remarks SLOUGH = 0.1'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM

Page 6 of 12

Hole No. FD85-3

Date 8-28-85

DRIVE 11

Depth of Test 24.8' to 26.3'

Blow	Gage Reading	Penetration per Blow
1	0.05	0.05
2	0.10	0.05
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	2	
	4	
	4	
	4	
0.5'	3	17
	4	
	3	
	3	
	3	
1.0'	3	16
	3	
	3	
	2	
	2	
1.5'	3	13

Remarks SLOUGH = 0.2'

DRIVE 12

Depth of Test 27.5' to 29.0'

Blow	Gage Reading	Penetration per Blow
1	0.20	0.20
2	0.30	0.10
3	0.40	0.10
4	0.50	0.10
5	0.57	0.07
6	0.65	0.08
7	0.72	0.07
8	0.78	0.06
9	0.85	0.07
10	0.90	0.05
11	1.00	0.10
12	1.06	0.06
13	1.13	0.07
14	1.20	0.07
15	1.27	0.07
16	1.34	0.07
17	1.40	0.06
18	1.48	0.08
19		
20		

	Blows per 0.1 ft.	
0		
	1	
	1	
	1	
0.5'	1	4
	1	
	1	
	2	
	2	
1.0'	1	7
	1	
	2	
	1	
	2	
1.5'	1	7

Remarks SLOUGH = 0.1'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM

Page 7 of 12

Hole No. FD85-3

Date 8-28-85

DRIVE 13

Depth of Test 29.8' to 31.3'

Blow	Gage Reading	Penetration per Blow
1	0.14	0.14
2	0.22	0.08
3	0.29	0.07
4	0.34	0.05
5	0.39	0.05
6	0.44	0.05
7	0.49	0.05
8	0.55	0.06
9	0.61	0.05
10	0.67	0.06
11	0.74	0.07
12	0.80	0.06
13	0.86	0.06
14	0.92	0.06
15	0.98	0.06
16	1.02	0.04
17	1.08	0.06
18	1.12	0.04
19	1.19	0.07
20		

	Blows per 0.1 ft.	
0		
	1	
	2	
	2	
0.5'	2	7
	1	
	2	
	2	
	1	
1.0'	2	8
	2	
	2	
	3	
	3	
1.5'	3	13

Remarks SLOUGH = 0.2'

DRIVE 14

Depth of Test 32.4' to 33.9'

Blow	Gage Reading	Penetration per Blow
1	0.12	0.12
2	0.18	0.06
3	0.22	0.04
4	0.26	0.04
5	0.30	0.04
6	0.34	0.04
7	0.39	0.05
8	0.44	0.05
9	0.50	0.06
10	0.55	0.05
11	0.60	0.05
12	0.65	0.05
13	0.70	0.05
14	0.74	0.04
15	0.79	0.05
16	0.82	0.03
17	0.85	0.03
18	0.90	0.05
19	0.95	0.05
20	1.00	0.05
	1.05	0.05
	1.09	0.04

1.13 - 0.03
1.16 - 0.03
1.20 - 0.04

	Blows per 0.1 ft.	
0		
	2	
	3	
	2	
0.5'	2	9
	2	
	2	
	2	
	3	
1.0'	2	11
	2	
	3	
	3	
	3	
1.5'	3	14

Remarks SLOUGH = 0.1'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM

Page 8 of 12

Hole No. FD85-3

Date 8-28-85

DRIVE 15

Depth of Test 35.0' to 36.5'

Blow	Gage Reading	Penetration per Blow
1	0.11	0.11
2	0.20	0.09
3	0.28	0.08
4	0.34	0.06
5	0.44	0.10
6	0.55	0.11
7	0.68	0.13
8	0.80	0.12
9	0.95	0.15
10	1.09	0.14
11	1.22	0.13
12	1.35	0.13
13	1.47	0.12
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.
0	
	2
	1
	1
0.5'	1 5
	1
	1
	1
1.0'	1 4
	1
	1
	1
1.5'	1 4

Remarks SLOUGH = 0.1'

DRIVE 16

Depth of Test 37.3' to 39.1'

Blow	Gage Reading	Penetration per Blow
1	0.10	0.10
2	0.20	0.10
3	0.30	0.10
4	0.38	0.08
5	0.47	0.09
6	0.66	0.19
7	0.94	0.28
8	1.35	0.41
9	1.80	0.45
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.
0	1
	1
	1
	1
0.5'	1 5
	1
1.0'	1 2
	1
1.5'	2

Remarks SLOUGH = 0.2'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 9 of 12

Hole No. FD85-3 Date 8-28-85

DRIVE 17
Depth of Test 39.8' to 41.3'

Blow	Gage Reading	Penetration per Blow
1	0.16	0.16
2	0.21	0.05
3	0.25	0.04
4	0.29	0.04
5	0.34	0.05
6	0.41	0.07
7	0.50	0.09
8	0.56	0.06
9	0.62	0.06
10	0.69	0.07
11	0.76	0.07
12	0.83	0.07
13	0.89	0.06
14	0.96	0.07
15	1.00	0.04
16	1.07	0.07
17	1.12	0.05
18	1.17	0.05
19	1.22	0.05
20	1.26	0.04
21	1.30	0.04

	Blows per 0.1 ft.	
0		
	1	
	3	
	1	
0.5'	2	7
	1	
	2	
	1	
	2	
1.0'	2	8
	1	
	2	
	3	
	2	
1.5'	3	11

Remarks SLOUGH = 0.2'

DRIVE 18
Depth of Test 42.4' to 43.9'

Blow	Gage Reading	Penetration per Blow
1	0.10	0.10
2	0.17	0.07
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0		
	1	
	1	
	3	
	3	
0.5'	3	11
	3	
	3	
	2	
	3	
1.0'	2	13
	3	
	2	
	3	
	2	
1.5'	3	13

Remarks SLOUGH = 0.2'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 10 of 12

Hole No. FD85-3 Date 8-28-85

DRIVE 19
Depth of Test 44.9' to 46.4'

Blow	Gage Reading	Penetration per Blow
1	0.16	0.16
2	0.22	0.06
3	0.26	0.04
4	0.30	0.04
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0		
	1	
	3	
	3	
0.5'	2	9
	3	
	2	
	2	
	2	
1.0'	3	12
	3	
	2	
	3	
	2	
1.5'	3	13

Remarks SLOUGH = 0.2'

DRIVE 20
Depth of Test 47.6' to 49.1'

Blow	Gage Reading	Penetration per Blow
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1' ft.	
0	3	
	3	
	2	
	2	
0.5'	2	12
	2	
	2	
	2	
	2	
1.0'	2	10
	2	
	3	
	3	
	2	
1.5'	3	13

Remarks SLOUGH = 0.1'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 11 of 12

Hole No. FD85-3 Date 8-29-85

DRIVE 21
Depth of Test 49.9' to 51.4'

Blow	Gage Reading	Penetration per Blow
1	0.06	0.06
2	0.08	0.02
3	0.10	0.02
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	3	
	5	
	4	
	5	
0.5'	4	21
	5	
	4	
	4	
	5	
1.0'	5	23
	4	
	5	
	5	
	5	
1.5'	5	24

Remarks SLOUGH = 0.2'

DRIVE 22
Depth of Test 52.4' to 53.9'

Blow	Gage Reading	Penetration per Blow
1	0.04	0.04
2	0.07	0.03
3	0.09	0.02
4	0.12	0.03
5	0.14	0.02
6	0.16	0.02
7	0.18	0.02
8	0.20	0.02
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	3	
	5	
	5	
	5	
0.5'	6	24
	7	
	7	
	6	
	5	
1.0'	6	31
	5	
	5	
	5	
	6	
1.5'	8	29

Remarks SLOUGH = 0.2'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 12 of 12

Hole No. FD85-3 Date 8-29-85

DRIVE 23

Depth of Test 55.0' to 56.3'

Blow	Gage Reading	Penetration per Blow
1	0.07	0.07
2	0.10	0.03
3	0.13	0.03
4	0.16	0.03
5	0.18	0.02
6	0.20	0.02
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	2	
	4	
	4	
	5	
0.5'	5	20
	5	
	6	
	5	
	5	
1.0'	4	25
	5	
	10	
	45	60
1.5'		

Remarks SLOUGH = 0.2'

Depth of Test _____ to _____

Blow	Gage Reading	Penetration per Blow
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.
0	
0.5'	
1.0'	
1.5'	

Remarks

MRO Form 1713, 1 Dec 78 (Temp)

Hole No. FD85-4

DRILLING LOG	DIVISION NEW ENGLAND	INSTALLATION —	SHEET 1 OF 3 SHEETS

1. PROJECT OLD QUINCY RESERVIOR DAM	10. SIZE AND TYPE OF BIT 4 IN. FISHTAIL
2. LOCATION (Coordinates or Station) STA 4+26 8 FT UPSTREAM ℄	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD
3. DRILLING AGENCY CE MOBILE, AL DISTRICT	12. MANUFACTURER'S DESIGNATION OF DRILL FAILING 314
4. HOLE NO. (As shown on drawing title and file number) FD85-4	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 28; UNDISTURBED 0
5. NAME OF DRILLER CARL MOON	14. TOTAL NUMBER CORE BOXES —
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER NOT MEASURED
	16. DATE HOLE: STARTED 8-19-85; COMPLETED 8-20-85
	17. ELEVATION TOP OF HOLE 84.7 FT
7. THICKNESS OF OVERBURDEN	18. TOTAL CORE RECOVERY FOR BORING — %
8. DEPTH DRILLED INTO ROCK 0	19. SIGNATURE OF INSPECTOR Charles R. Conlon
9. TOTAL DEPTH OF HOLE 57.5 FT	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			BR., MED DENSE, SILTY F-C SAND. ~20% SL. PLASTIC FINES. (SM)	44	J-1	DRIVE 1 4 4 7
	2					
			LT. BR., MED DENSE, GRAVELLY F-C SAND. ~5% SL-NON PLASTIC FINES. (SW)	50	J-2	DRIVE 2 9 16 18
	4					
			SAME AS ABOVE. (SW)	39	J-3	0.1' SLOUGH DRIVE 3 10 10 15
	6					
	8		LT. BR., MED DENSE, SANDY GRAVEL. (GW)	11	J-4	DRIVE 4 9 12 10 1¼" GRAVEL STUCK IN SS SHOE.
	10		LT. BR., MED DENSE, GRAVELLY F-C SAND, ~5-10% SL-NON PLASTIC FINES. (SW-SM)	44	J-5	0.1' SLOUGH DRIVE 5 8 6 7
						POUNDED CASING TO 9.0'
	12		SAME AS ABOVE.	TOP 6" 50	J-6.1	0.1' SLOUGH DRIVE 6 10 8 7
	14		GRAY, MED DENSE, SANDY GRAVEL. ~15% MED PLASTIC FINES. GRAVEL IS BROKEN SLATE. (GM)	BOT 3"	J-6.2	
	16		NO RECOVERY	0	J-7	0.1' SLOUGH DRIVE 7 8 6 9
	18		GRAY, MED DENSE, SANDY GRAVEL. ~15% MED PLASTIC FINES. GRAVEL IS BROKEN SLATE. (GM)-J-8.1 3" FROM BOT. 1" THICK. LT. BR. GRAVELLY F-C SAND. (SW) (J-8.2)	56	J-8.1 J-8.2 J-8.1	0.1' SLOUGH DRIVE 8 4 10 9

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT OLD QUINCY RES. DAM HOLE NO. FD85-4

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 84.7 | **Hole No.** FD85-4

PROJECT: OLD QUINCY RESERVOIR DAM | INSTALLATION: | SHEET 2 OF 3 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
				6 WASH	J-9	(SLOUGH = 0.1' DRIVE 9 2 3 3 ROD DROP RIGHT BEFORE 20.0' PRIOR TO SAMPLING
						THICKENED DRILLING MUD CLEANED HOLE 2 TIMES
	22					SLOUGH 0.3'
			NO RECOVERY.	0	J-10	DRIVE 10 6 6 14 ROD DROP RIGHT BEFORE 22.5' PRIOR TO SAMPLING
	24					POUNDED CASING TO 24.0'
			BR., MED DENSE, SANDY GRAVEL. ~10-15% SL-NON PLASTIC FINES. (GW-GM)	11	J-11	(0.2' SLOUGH DRIVE 11 7 5 5 1¼" GRAVEL STUCK IN SS SHOE
	26					CLEANED HOLE 2 TIMES
						0.3' SLOUGH
			NO RECOVERY.	0	J-12	DRIVE 12 18 12 10
	28					POUNDED CASING TO 26.0'
	30		GRAYISH BR., MED DENSE, GRAVELLY F-C SAND. ~5-10% SL. PLASTIC FINES. (SW-SM)	44	J-13	DRIVE 13 13 12 14
	32					
			SAME AS ABOVE. (SW-SM)	44	J-14	DRIVE 14 9 11 9
	34					
						0.3' SLOUGH
			NO RECOVERY.	0	J-15	DRIVE 15 10 14 11
	36					
						0.3' SLOUGH
			NO RECOVERY.	0	J-16	DRIVE 16 5 4 4
	38					
	40		NO RECOVERY	0	J-17	(0.1' SLOUGH DRIVE 17 12 14 13
	42					
			OLIVE, MED DENSE, SILTY FINE SAND. ~15% SL. PLASTIC FINES. (SM)	50	J-18	(0.1' SLOUGH DRIVE 18 8 9 10

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 84.7 | Hole No. FD85-4

PROJECT: OLD QUINCY RESERVOIR DAM | INSTALLATION: | SHEET 3 OF 3 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	46		OLIVE, MED DENSE, SILTY FINE SAND. ~40-50% SL. PLASTIC FINES. (SM-ML)	44	J-19	0.2' SLOUGH DRIVE 19 5 5 6
	48		OLIVE, MED DENSE, SILTY FINE SAND. ~40-50% SL. PLASTIC FINES. (SM-ML)	78	J-20.1 J-20.2	0.3' SLOUGH DRIVE 20 8 10 10
	50		OLIVE, MED DENSE, SILTY FINE SAND. ~40-50% SL. PLASTIC FINES. (SM-ML)	78	J-21.1 J-21.2	DRIVE 21 12 13 13
	52		SAME AS ABOVE. WITH CHIPS OF GRANITE IN BOT 3 IN.	100	J-22.1 J-22.2	0.1' SLOUGH DRIVE 22 11 63
	54		ROCK. BOULDERY TILL?			4 IN ROLLERBIT SLOW PENETRATION BEDROCK OR BOULDER. RIG BOUNCING UP AND DOWN AT TIMES INDICATING COBBLES AND COARSE GRAVEL.
	56					
	58					B.O.B. 57.5'

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 1 of 11

Hole No. FD85-4 Date 8-19-85

DRIVE 1

Depth of Test 0 to 1.5'

Blow	Gage Reading	Penetration per Blow
1	0.12	0.12
2	0.26	0.14
3	0.40	0.14
4	0.50	0.10
5	0.60	0.10
6	0.71	0.11
7	0.82	0.11
8	0.92	0.10
9	1.02	0.10
10	1.11	0.09
11	1.20	0.09
12	1.27	0.07
13	1.34	0.07
14	1.42	0.08
15	1.49	0.07
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0		
	1	
	1	
	1	
0.5'	1	4
	1	
	1	
	1	
1.0'	1	4
	1	
	2	
	1	
	1	
1.5'	2	7

Remarks

DRIVE 2

Depth of Test 2.6' to 4.1'

Blow	Gage Reading	Penetration per Blow
1	0.10	0.10
2	0.18	0.08
3	0.23	0.05
4	0.29	0.06
5	0.33	0.04
6	0.38	0.05
7	0.42	0.04
8	0.46	0.04
9	0.48	0.02
10	0.51	0.03
11	0.55	0.04
12	0.58	0.03
13	0.62	0.04
14	0.66	0.04
15	0.70	0.04
16	0.73	0.03
17	0.75	0.02
18	0.78	0.03
19	0.80	0.02
20		

	Blows per 0.1 ft.	
0		
	1	
	1	
	2	
	2	
0.5'	3	9
	3	
	3	
	4	
	3	
1.0'	3	16
	3	
	4	
	3	
	4	
1.5'	4	18

Remarks SLOUGH = 0

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM

Page 2 of 11

Hole No. FD85-4

Date 8-19-85

DRIVE 3

Depth of Test 4.9' to 6.4'

Blow	Gage Reading	Penetration per Blow
1	0.11	0.11
2	0.20	0.09
3	0.24	0.04
4	0.28	0.04
5	0.32	0.04
6	0.36	0.04
7	0.40	0.04
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0		
	2	
	2	
	3	
0.5'	3	10
	2	
	2	
	2	
	2	
1.0'	2	10
	3	
	3	
	3	
	3	
1.5'	3	15

Remarks SLOUGH = 0.1' CLEANED BOREHOLE TWO TIMES

DRIVE 4

Depth of Test 7.5' to 9.0'

Blow	Gage Reading	Penetration per Blow
1	0.08	0.08
2	0.13	0.05
3	0.20	0.07
4	0.24	0.04
5	0.30	0.06
6	0.35	0.05
7	0.40	0.05
8	0.44	0.04
9	0.49	0.05
10	0.54	0.05
11	0.59	0.05
12	0.63	0.04
13	0.68	0.05
14	0.72	0.04
15	0.78	0.06
16	0.80	0.02
17	0.83	0.03
18	0.87	0.04
19	0.91	0.04
20	0.95	0.04
21	1.00	0.05

	Blows per 0.1 ft.	
0	1	
	2	
	2	
	2	
0.5'	2	9
	2	
	2	
	3	
	2	
1.0'	3	12
	2	
	2	
	2	
	2	
1.5'	2	10

Remarks SLOUGH = 0

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 3 of 11

Hole No. FD85-4 Date 8-19-85

DRIVE 5

Depth of Test 9.9' to 11.4'

Blow	Gage Reading	Penetration per Blow
1	0.09	0.09
2	0.14	0.05
3	0.21	0.07
4	0.28	0.07
5	0.32	0.04
6	0.38	0.06
7	0.43	0.05
8	0.50	0.07
9	0.56	0.06
10	0.63	0.07
11	0.70	0.07
12	0.80	0.10
13	0.87	0.07
14	0.95	0.08
15	1.04	0.09
16	1.12	0.08
17	1.19	0.07
18	1.28	0.09
19	1.36	0.08
20	1.43	0.07
21	1.50	0.07

	Blows per 0.1 ft.	
0	1	
	1	
	2	
	2	
0.5'	2	8
	1	
	2	
	1	
	1	
1.0'	1	6
	1	
	2	
	1	
	1	
1.5'	2	7

Remarks SLOUGH = 0.1'

DRIVE 6

Depth of Test 12.5' to 14.0'

Blow	Gage Reading	Penetration per Blow
1	0.07	0.07
2	0.11	0.04
3	0.16	0.05
4	0.20	0.04
5	0.25	0.05
6	0.30	0.05
7	0.34	0.04
8	0.39	0.05
9	0.42	0.03
10	0.46	0.04
11	0.51	0.05
12	0.56	0.05
13	0.61	0.05
14	0.66	0.05
15	0.72	0.04
16	0.78	0.06
17	0.85	0.07
18	0.93	0.08
19	1.01	0.08
20	1.11	0.10
	1.21	0.10
	1.28	0.07
	1.33	0.05

1.40 — 0.07
1.50 — 0.10

	Blows per 0.1 ft.	
0	1	
	3	
	2	
	2	
0.5'	2	10
	2	
	2	
	2	
	1	
1.0'	1	8
	1	
	1	
	2	
	2	
1.5'	1	7

Remarks SLOUGH = 0.1' OVERDRILLED = 0.1' TO 12.6'

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STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 4 of 11

Hole No. FD85-4 Date 8-19-85

DRIVE 7

Depth of Test 14.9' to 16.4'

Blow	Gage Reading	Penetration per Blow
1	0.06	0.06
2	0.11	0.05
3	0.16	0.05
4	0.21	0.05
5	0.27	0.06
6	0.32	0.05
7	0.40	0.08
8	0.48	0.08
9	0.55	0.07
10	0.62	0.07
11	0.70	0.08
12	0.78	0.08
13	0.88	0.10
14	1.00	0.12
15	1.08	0.08
16	1.14	0.06
17	1.20	0.06
18	1.25	0.05
19	1.30	0.05
20	1.35	0.05
21	1.40	0.05
22	1.45	0.05
23	1.50	0.05

	Blows per 0.1 ft.	
0	1	
	2	
	2	
	2	
0.5'	1	8
	1	
	2	
	1	
	1	
1.0'	1	6
	1	
	2	
	2	
	2	
1.5'	2	9

Remarks SLOUGH = 0.1'

DRIVE 8

Depth of Test 17.4' to 18.9'

Blow	Gage Reading	Penetration per Blow
1	0.11	0.11
2	0.24	0.13
3	0.37	0.13
4	0.50	0.13
5	0.60	0.10
6	0.67	0.07
7	0.71	0.04
8	0.75	0.04
9	0.79	0.04
10	0.82	0.03
11	0.87	0.05
12	0.90	0.03
13	0.94	0.04
14	0.99	0.05
15	1.07	0.08
16	1.10	0.03
17	1.12	0.02
18	1.15	0.03
19	1.20	0.05
20	1.25	0.05
21	1.33	0.08
22	1.42	0.09
23	1.50	0.08

	Blows per 0.1 ft.	
0		
	1	
	1	
	1	
0.5'	1	4
	1	
	1	
	3	
	3	
1.0'	2	10
	2	
	3	
	1	
	1	
1.5'	2	9

Remarks SLOUGH = 0.1'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 5 of 11

Hole No. FD85-4 Date 8-19-85

DRIVE 9

Depth of Test 20.1' to 21.6'

Blow	Gage Reading	Penetration per Blow
1	0.20	0.20
2	0.52	0.32
3	0.66	0.14
4	0.80	0.14
5	1.04	0.24
6	1.20	0.16
7	1.36	0.16
8	1.55	0.19
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.
0	
	1
0.5'	1 2
	1
	1
1.0'	1 3
	1
	1
1.5'	1 3

Remarks SLOUGH = 0.1' OVERDRILLED 0.2' TO 20.2'

DRIVE 10

Depth of Test 22.2' to 23.7'

Blow	Gage Reading	Penetration per Blow
1	0.10	0.10
2	0.16	0.06
3	0.24	0.08
4	0.33	0.09
5	0.40	0.07
6	0.51	0.11
7	0.69	0.18
8	0.84	0.15
9	0.90	0.06
10	0.94	0.04
11	0.98	0.04
12	1.00	0.02
13	1.04	0.04
14	1.07	0.03
15	1.10	0.03
16	1.14	0.04
17	1.17	0.03
18	1.20	0.03
19	1.25	0.05
20	1.27	0.02
21	1.30	0.03

	Blows per 0.1 ft.
0	1
	1
	1
	2
0.5'	1 6
	1
	2
1.0'	3 6
	3
	3
	3
	3
1.5'	2 14

Remarks SLOUGH = 0.3'

CLEANED HOLE TWO TIMES

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM

Page 6 of 11

Hole No. FD85-4

Date 8-19-85

DRIVE 11

Depth of Test 24.8' to 26.3'

Blow	Gage Reading	Penetration per Blow
1	0.06	0.06
2	0.11	0.05
3	0.16	0.05
4	0.21	0.05
5	0.28	0.07
6	0.37	0.09
7	0.46	0.09
8	0.55	0.09
9	0.64	0.09
10	0.74	0.10
11	0.87	0.07
12	1.00	0.13
13	1.11	0.11
14	1.20	0.09
15	1.29	0.09
16	1.38	0.09
17	1.47	0.09
18		
19		
20		

	Blows per 0.1 ft.	
0	1	
	2	
	2	
	1	
0.5'	1	7
	1	
	1	
	1	
	1	
1.0'	1	5
	2	
	1	
	1	
1.5'	1	5

Remarks SLOUGH = 0.2'

DRIVE 12

Depth of Test 27.2' to 28.7'

Blow	Gage Reading	Penetration per Blow
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	4	
	4	
	4	
	3	
0.5'	3	18
	3	
	3	
	2	
	2	
1.0'	2	12
	2	
	2	
	2	
	2	
1.5'	2	10

Remarks SLOUGH = 0.3'

CLEANED BOREHOLE TWO TIMES

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 7 of 11

Hole No. FD85-4 Date 8-19-85

Depth of Test 30.2' to 31.7'

Blow	Gage Reading	Penetration per Blow
1	0.03	
2	0.07	
3	0.10	
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	3	
	3	
	3	
	2	
0.5'	2	13
	2	
	2	
	3	
	3	
1.0'	2	12
	3	
	3	
	3	
	3	
1.5'	2	14

Remarks SLOUGH = 0 OVERDRILLED 0.2' TO 30.2'

DRIVE 14

Depth of Test 32.5' to 34.0'

Blow	Gage Reading	Penetration per Blow
1	0.05	0.05
2	0.10	0.05
3	0.15	0.05
4	0.22	0.07
5	0.30	0.08
6	0.34	0.04
7	0.40	0.06
8	0.44	0.04
9	0.48	0.04
10	0.52	0.04
11	0.57	0.05
12	0.60	0.03
13	0.64	0.04
14	0.68	0.04
15	0.72	0.04
16	0.77	0.05
17	0.81	0.04
18	0.86	0.05
19	0.92	0.06
20	0.97	0.05
21	1.02	0.05
22	1.09	0.07
23	1.15	0.06

	Blows per 0.1 ft.	
0	2	
	1	
	2	
	2	
0.5'	2	9
	3	
	2	
	2	
	2	
1.0'	2	11
	2	
	1	
	2	
	2	
1.5'	2	9

1.21 - 0.06
1.28 - 0.07
1.34 - 0.06
1.39 - 0.05
1.44 - 0.05
1.49 - 0.05

Remarks SLOUGH = 0

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 8 of 11

Hole No. FD85-4 Date 8-19/20-85

DRIVE 15

Depth of Test 34.7' to 36.2'

Blow	Gage Reading	Penetration per Blow
1	0.06	0.06
2	0.12	0.06
3	0.17	0.05
4	0.22	0.05
5	0.27	0.05
6	0.31	0.04
7	0.36	0.05
8	0.41	0.05
9	0.46	0.05
10	0.50	0.04
11	0.54	0.04
12	0.57	0.03
13	0.59	0.02
14	0.63	0.04
15	0.66	0.03
16	0.68	0.02
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	1	
	2	
	2	
	2	
0.5'	3	10
	3	
	3	
	3	
	3	
1.0'	2	14
	2	
	3	
	2	
	2	
1.5'	2	11

Remarks SLOUGH = 0.3'

DRIVE 16

Depth of Test 37.2' to 38.7'

Blow	Gage Reading	Penetration per Blow
1	0.05	0.05
2	0.12	0.07
3	0.19	0.07
4	0.29	0.10
5	0.41	0.12
6	0.53	0.12
7	0.68	0.15
8	0.80	0.12
9	0.93	0.13
10	1.11	0.18
11	1.23	0.12
12	1.35	0.12
13	1.46	0.11
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	1	
	2	
	1	
0.5'	1	5
	1	
	1	
	1	
1.0'	1	4
	1	
	1	
	1	
1.5'	1	4

Remarks SLOUGH = 0.3'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM

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Hole No. FD85-4

Date 8-20-85

DRIVE 17

Depth of Test 39.9' to 41.4'

Blow	Gage Reading	Penetration per Blow
1	0.02	0.02
2	0.06	0.04
3	0.10	0.04
4	0.15	0.05
5	0.19	0.04
6	0.24	0.05
7	0.28	0.04
8	0.32	0.04
9	0.36	0.04
10	0.40	0.04
11	0.44	0.04
12	0.49	0.05
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	3	
	2	
	2	
	3	
0.5'	2	12
	3	
	3	
	3	
	3	
1.0'	2	14
	3	
	2	
	3	
	2	
1.5'	3	13

Remarks SLOUGH = 0.1'

DRIVE 18

Depth of Test 42.4' to 43.9'

Blow	Gage Reading	Penetration per Blow
1	0.08	0.08
2	0.15	0.07
3	0.22	0.07
4	0.29	0.07
5	0.33	0.04
6	0.40	0.07
7	0.44	0.04
8	0.50	0.06
9	0.55	0.05
10	0.61	0.06
11	0.66	0.05
12	0.72	0.06
13	0.78	0.06
14	0.83	0.05
15	0.88	0.05
16	0.94	0.06
17	1.00	0.06
18	1.04	0.04
19	1.09	0.05
20	1.16	0.07
21	1.20	0.04
22	1.24	0.04

1.30 - 0.06
1.36 - 0.06
1.40 - 0.04
1.46 - 0.06
1.52 - 0.06

	Blows per 0.1 ft.	
0	1	
	1	
	2	
	2	
0.5'	2	8
	1	
	2	
	2	
	2	
1.0'	2	9
	2	
	2	
	2	
	2	
1.5'	2	10

Remarks SLOUGH = 0.1'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM

Page 10 of 11

Hole No. FD85-4

Date 8-20-85

DRIVE 19

Depth of Test 44.8' to 46.3'

Blow	Gage Reading	Penetration per Blow
1	0.15	0.15
2	0.22	0.07
3	0.31	0.09
4	0.39	0.08
5	0.47	0.08
6	0.55	0.08
7	0.63	0.08
8	0.73	0.10
9	0.84	0.11
10	0.95	0.11
11	1.06	0.11
12	1.17	0.11
13	1.26	0.09
14	1.33	0.07
15	1.40	0.07
16	1.50	0.10
17		
18		
19		
20		

	Blows per 0.1 ft.	
0		
	1	
	1	
	2	
0.5'	1	5
	1	
	1	
	1	
	1	
1.0'	1	5
	1	
	1	
	1	
	2	
1.5'	1	6

Remarks SLOUGH = 0.2'

DRIVE 20

Depth of Test 47.2' to 48.7'

Blow	Gage Reading	Penetration per Blow
1	0.10	0.10
2	0.19	0.09
3	0.25	0.06
4	0.31	0.06
5	0.36	0.05
6	0.41	0.05
7	0.45	0.04
8	0.50	0.05
9	0.55	0.05
10	0.60	0.05
11	0.65	0.05
12	0.70	0.05
13	0.75	0.05
14	0.80	0.05
15	0.85	0.05
16	0.90	0.05
17	0.95	0.05
18	1.00	0.05
19	1.05	0.05
20	1.10	0.05
21	1.15	0.05
22	1.20	0.05

	Blows per 0.1 ft.	
0	1	
	1	
	1	
	2	
0.5'	3	8
	2	
	2	
	2	
	2	
1.0'	2	10
	2	
	2	
	2	
	2	
1.5'	2	10

Remarks SLOUGH = 0.3'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 11 of 11

Hole No. FD85-4 Date 8-20-85

DRIVE 21
Depth of Test 50.0' to 51.5'

Blow	Gage Reading	Penetration per Blow
1	0.08	0.08
2	0.12	0.04
3	0.16	0.04
4	0.20	0.04
5	0.24	0.04
6	0.29	0.05
7	0.33	0.04
8	0.36	0.03
9	0.40	0.04
10	0.43	0.03
11	0.47	0.04
12	0.50	0.03
13	0.54	0.04
14	0.58	0.04
15	0.62	0.04
16	0.65	0.03
17	0.70	0.05
18	0.74	0.04
19	0.77	0.03
20	0.80	0.03

	Blows per 0.1 ft.	
0	1	
	3	
	2	
	3	
0.5'	3	12
	2	
	3	
	3	
	2	
1.0'	3	13
	2	
	3	
	2	
	3	
1.5'	3	13

Remarks SLOUGH = 0

DRIVE 22
Depth of Test 52.4' to 53.4'

Blow	Gage Reading	Penetration per Blow
1	0.04	0.04
2	0.10	0.06
3	0.15	0.05
4	0.20	0.05
5	0.25	0.05
6	0.29	0.04
7	0.34	0.05
8	0.37	0.03
9	0.41	0.04
10	0.45	0.04
11	0.49	0.04
12	0.53	0.04
13	0.56	0.03
14	0.60	0.04
15	0.64	0.04
16	0.67	0.03
17	0.70	0.03
18		
19		
20		

	Blows per 0.1 ft.	
0	2	
	2	
	2	
	2	
0.5'	3	11
	3	
	3	
	3	
	4	
1.0'	50	63
	REFUSAL	
1.5'		

Remarks SLOUGH = 0.1'

MRO Form 1713, 1 Dec 78 (Temp)

Hole No. FD85-5

DRILLING LOG	DIVISION NEW ENGLAND	INSTALLATION —	SHEET 1 OF 3 SHEETS

1. PROJECT: OLD QUINCY RESERVOIR DAM
2. LOCATION (Coordinates or Station): STA 5+10 10 FT DOWNSTREAM ℄
3. DRILLING AGENCY: CE MOBILE, AL DISTRICT
4. HOLE NO. (As shown on drawing title and file number): FD 85-5
5. NAME OF DRILLER: CARL MOON
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: –
8. DEPTH DRILLED INTO ROCK: 0
9. TOTAL DEPTH OF HOLE: 57.5 FT
10. SIZE AND TYPE OF BIT: 4" FISHTAIL
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): NGVD
12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING 314
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 21; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER: NOT MEASURED
16. DATE HOLE: STARTED 8-26-85; COMPLETED 8-28-85
17. ELEVATION TOP OF HOLE: 85.8 FT
18. TOTAL CORE RECOVERY FOR BORING: — %
19. SIGNATURE OF INSPECTOR: Charles R. Conlon

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			DK. BR., LOOSE, SILTY F-C SAND. ~20-30% SLIGHTLY PLASTIC FINES. (SM)	39	J-1	DRIVE 1 3 3 5
	2					
			LT. BR., MED DENSE, GRAVELLY F-C SAND. ~10% SLIGHTLY TO NON PLASTIC FINES. (SW-SM)	56	J-2	0.1' SLOUGH DRIVE 2 12 15 11
	4					
			SAME AS ABOVE.	50	J-3	0.1' SLOUGH DRIVE 3 11 14 15
	6					
	8		LT. BR, MED DENSE, GRAVELLY F-C SAND. ~5-10% SLIGHTLY TO NONPLASTIC FINES. (SW-SM)	50	J-4	0.1' SLOUGH DRIVE 4 7 9 10
	10		LT. BR., LOOSE, GRAVELLY F-C SAND. ~5-10% SLIGHTLY TO NONPLASTIC FINES. (SW-SM)	29	J-5	0.1' SLOUGH DRIVE 5 4 3 4 OVERDRIVE SS 3" TO RECOVERY SAMPLE
	12		LT. BR., MED DENSE, GRAVELLY F-C SAND. ~5-10% SLIGHTLY TO NON PLASTIC FINES. (SW-SM)	33	J-6	0.1' SLOUGH DRIVE 6 2 4 6
	14		SAME AS ABOVE.	44	J-7	0.1' SLOUGH DRIVE 7 5 6 6
	16		NO RECOVERY.	0	J-8	0.3' SLOUGH DRIVE 8 4 8 11 INCREASED LENGTH OF WASHING TIME
	18					

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: OLD QUINCY RES. DAM | HOLE NO. FD85-5

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 85.8 | **Hole No.** FD85-5

PROJECT: OLD QUINCY RESERVOIR DAM | INSTALLATION: | SHEET 2 OF 3 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			RUSTY BR., DENSE, GRAVELLY F-C SAND. ~10-15% SLIGHTLY TO NONPLASTIC FINES. (SW-SM)	39	J-9	0.1' SLOUGH DRIVE 9 22 20 19
	22					
			RUSTY BR., MED DENSE, GRAVELLY F-C SAND. ~10-15% SLIGHTLY TO NON PLASTIC FINES. (SW-SM)	50	J-10	0.1' SLOUGH DRIVE 10 11 11 12
	24					
			LT. BR., DENSE, GRAVELLY F-C SAND. ~5-10% SLIGHTLY TO NONPLASTIC FINES. (SW-SM)	67	J-11	0.1' SLOUGH DRIVE 11 13 18 20
	26					
			LT. BR., MED DENSE, F-C SANDY GRAVEL. ~10-15% SLIGHTLY TO NONPLASTIC FINES. (GW-GM)	33	J-12	0.2' SLOUGH DRIVE 12 10 7 8
	28					
	30		LT. BR., MED DENSE, GRAVELLY F-C SAND. ~5-10% SLIGHTLY TO NON PLASTIC FINES. (SW-SM)	44	J-13	0.3' SLOUGH DRIVE 13 10 8 8
	32					
			NO RECOVERY.	0	J-14	0.1' SLOUGH DRIVE 14 5 5 5
	34					
	36		GRAVEL.	11	J-15	0.1' SLOUGH DRIVE 15 5 16 15 2" GRAVEL STUCK IN BOTTOM OF SS SHOE
	38		OLIVE, MED DENSE SILTY FINE SAND. ~40-50% SLIGHTLY PLASTIC FINES. RUST STAINING TOP 3". (SM-ML)	72	J-16	0.2' SLOUGH DRIVE 16 12 15 14
	40		OLIVE, MED DENSE, SILTY FINE SAND. ~40-50% SLIGHTLY PLASTIC FINES. (SM-ML)	78	J-17.1 / J-17.2	0.1' SLOUGH DRIVE 17 10 12 12
	42		SAME AS ABOVE.	78	J-18.1 / J-18.2	DRIVE 18 9 10 11

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 85.8 | Hole No. FD85-5

PROJECT: OLD QUINCY RESERVOIR DAM | INSTALLATION: | SHEET 3 OF 3 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	46		OLIVE, MED DENSE, SILTY FINE SAND. ~40-50% SLIGHTLY PLASTIC FINES. (SM-ML)	83	J-19.1 J-19.2	DRIVE 19 8 12 11
	48		SAME AS ABOVE.	94	J-20.1 J-20.2	DRIVE 20 6 6 6
	50		TOP 8": SAME AS ABOVE. BOT 9": TAN, DENSE, SILTY FINE SAND. ~40-50% SLIGHTLY PLASTIC FINES. (SM-ML). COARSE SAND SIZE PIECES OF BROKEN ROCK 4"-6" FROM BOTTOM OF SAMPLE.	94	J-21.1 J-21.2	DRIVE 21 8 14 52
						CHANGED TO 4" ROLLERBIT
	52		ROCK. COBBLES AND TILL? BOULDERS.			UNABLE TO OBTAIN SPLIT SPOON SAMPLE. 1 HOUR 15 MIN. TO ADVANCE 5.5' WITH 400 PSI DOWN PRESSURE ON ROLLERBIT. RIG BOUNCING UP AND DOWN INDICATED COBBLES OR COARSE GRAVEL. VERY SLOW ADVANCE OF ROLLERBIT INDICATES DIRECTLY ON TOP OF BOULDER.
	54					
	56					
	58					B.O.B 57.5 FT

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 1 of 11

Hole No. FD85-5 Date 8-26-85

DRIVE 1

Depth of Test 0' to 1.5'

Blow	Gage Reading	Penetration per Blow
1	0.19	0.19
2	0.32	0.13
3	0.46	0.14
4	0.60	0.14
5	0.73	0.13
6	0.89	0.16
7	1.05	0.16
8	1.21	0.16
9	1.34	0.13
10	1.41	0.07
11	1.48	0.07
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0		
	1	
	1	
0.5'	1	3
	1	
	1	
	1	
1.0'		3
	1	
	1	
	1	
1.5'	2	5

Remarks SLOUGH = 0

DRIVE 2

Depth of Test 2.5' to 4.0'

Blow	Gage Reading	Penetration per Blow
1	0.09	0.09
2	0.13	0.04
3	0.18	0.05
4	0.22	0.04
5	0.26	0.04
6	0.29	0.03
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	1	
	2	
	3	
	3	
0.5'	3	12
	3	
	3	
	4	
	3	
1.0'	2	15
	2	
	2	
	2	
	2	
1.5'	3	11

Remarks SLOUGH = 0.1'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM

Page 2 of 11

Hole No. FD85-5

Date 8-26/27-85

DRIVE 3

Depth of Test 5.0' to 6.5'

Blow	Gage Reading	Penetration per Blow
1	0.04	0.04
2	0.09	0.05
3	0.13	0.04
4	0.16	0.03
5	0.22	0.06
6	0.27	0.05
7	0.30	0.03
8	0.34	0.04
9	0.39	0.05
10	0.44	0.05
11	0.48	0.04
12	0.51	0.03
13	0.55	0.04
14	0.58	0.03
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	2	
	2	
	3	
	2	
0.5'	2	11
	3	
	3	
	2	
	3	
1.0'	3	14
	3	
	3	
	3	
	3	
1.5'	3	15

Remarks SLOUGH = 0.1'

DRIVE 4

Depth of Test 7.4' to 8.9'

Blow	Gage Reading	Penetration per Blow
1	0.08	0.08
2	0.16	0.08
3	0.23	0.07
4	0.30	0.07
5	0.35	0.05
6	0.41	0.06
7	0.47	0.06
8	0.54	0.07
9	0.59	0.05
10	0.63	0.04
11	0.69	0.06
12	0.74	0.05
13	0.79	0.05
14	0.85	0.06
15	0.91	0.06
16	0.99	0.08
17	1.05	0.06
18	1.09	0.04
19	1.15	0.06
20	1.19	0.04
	1.24	0.05
	1.30	0.06
	1.36	0.06

	Blows per 0.1 ft.	
0	1	
	1	
	2	
	1	
0.5'	2	7
	2	
	2	
	2	
	1	
1.0'	2	9
	2	
	2	
	2	
	1	
1.5'	3	10

1.41 - 0.05
1.46 - 0.05
1.52 - 0.06

Remarks SLOUGH = 0.1'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 3 of 11

Hole No. FD85-5 Date 8-27-85

DRIVE 5
Depth of Test 10.0' to 11.5'

Blow	Gage Reading	Penetration per Blow
1	0.11	0.11
2	0.20	0.09
3	0.32	0.12
4	0.43	0.11
5	0.57	0.14
6	0.75	0.18
7	0.93	0.18
8	1.09	0.16
9	1.20	0.11
10	1.34	0.14
11	1.47	0.13
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.
0	
	2
	1
0.5'	1 4
	1
	1
1.0'	1 3
	1
	1
	1
1.5'	1 4

Remarks SLOUGH = 0.1'

DRIVE 6
Depth of Test 12.5' to 14.0'

Blow	Gage Reading	Penetration per Blow
1	0.20	0.20
2	0.41	0.21
3	0.59	0.18
4	0.72	0.13
5	0.81	0.09
6	0.91	0.10
7	1.02	0.11
8	1.11	0.09
9	1.21	0.10
10	1.29	0.08
11	1.39	0.10
12	1.48	0.09
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.
0	
	1
0.5'	1 2
	1
	1
	1
1.0'	1 4
	1
	1
	2
	1
1.5'	1 6

Remarks SLOUGH = 0.1'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM

Page 4 of 11

Hole No. FD85-5

Date 8-27-85

DRIVE 7

Depth of Test 15.0' to 16.5'

Blow	Gage Reading	Penetration per Blow
1	0.08	0.08
2	0.18	0.10
3	0.28	0.10
4	0.38	0.10
5	0.48	0.10
6	0.58	0.10
7	0.67	0.09
8	0.75	0.08
9	0.83	0.08
10	0.92	0.09
11	0.99	0.07
12	1.06	0.07
13	1.14	0.08
14	1.22	0.08
15	1.28	0.06
16	1.36	0.08
17	1.46	0.10
18		
19		
20		

	Blows per 0.1 ft.
0	
	1
	1
	1
	1
0.5'	1 5
	1
	1
	1
	1
1.0'	2 6
	1
	1
	2
	1
1.5'	1 6

Remarks SLOUGH = 0.1'

DRIVE 8

Depth of Test 17.2' to 18.7'

Blow	Gage Reading	Penetration per Blow
1	0.14	0.14
2	0.26	0.12
3	0.39	0.13
4	0.48	0.09
5	0.57	0.09
6	0.66	0.09
7	0.72	0.06
8	0.78	0.06
9	0.86	0.08
10	0.90	0.04
11	0.94	0.04
12	1.00	0.06
13	1.04	0.04
14	1.08	0.04
15	1.13	0.05
16	1.17	0.04
17	1.22	0.05
18	1.28	0.06
19	1.33	0.05
20	1.39	0.05
	1.43	0.04
	1.47	0.05
	1.52	0.05

	Blows per 0.1 ft.
0	
	1
	1
	1
0.5'	1 4
	1
	1
	2
	2
1.0'	2 8
	2
	2
	2
	2
1.5'	3 11

Remarks SLOUGH = 0.3'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM

Page 5 of 11

Hole No. FD85-5

Date 8-27-85

DRIVE 9

Depth of Test 20.0' to 21.5'

Blow	Gage Reading	Penetration per Blow
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	4	
	4	
	5	
	5	
0.5'	4	22
	5	
	5	
	4	
	3	
1.0'	3	20
	4	
	4	
	3	
	4	
1.5'	4	19

Remarks SLOUGH = 0.1'

DRIVE 10

Depth of Test 22.5' to 24.0'

Blow	Gage Reading	Penetration per Blow
1	0.04	0.04
2	0.07	0.03
3	0.10	0.03
4	0.14	0.04
5	0.19	0.05
6	0.23	0.04
7	0.27	0.04
8	0.31	0.04
9	0.36	0.05
10	0.40	0.04
11	0.46	0.06
12	0.51	0.05
13	0.57	0.06
14	0.61	0.04
15	0.66	0.05
16	0.73	0.07
17	0.77	0.04
18	0.82	0.05
19	0.87	0.05
20	0.92	0.05
21	0.96	0.04
22	1.00	0.04

	Blows per 0.1 ft.	
0	3	
	2	
	2	
	3	
0.5'	1	11
	2	
	2	
	2	
	2	
1.0'	3	11
	2	
	2	
	3	
	2	
1.5'	3	12

Remarks SLOUGH = 0.1'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 6 of 11

Hole No. FD85-5 Date 8-27-85

DRIVE 11
Depth of Test 25.0' to 26.5'

Blow	Gage Reading	Penetration per Blow
1	0.06	0.06
2	0.10	0.04
3	0.14	0.04
4	0.19	0.05
5	0.22	0.03
6	0.26	0.04
7	0.29	0.03
8	0.33	0.04
9	0.36	0.03
10	0.40	0.04
11	0.43	0.03
12	0.46	0.03
13	0.49	0.03
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	2	
	2	
	3	
	3	
0.5'	3	13
	4	
	3	
	4	
	3	
1.0'	4	18
	4	
	4	
	4	
	4	
1.5'	4	20

Remarks SLOUGH = 0.1'

DRIVE 12
Depth of Test 27.3' to 28.8'

Blow	Gage Reading	Penetration per Blow
1	0.05	0.05
2	0.10	0.05
3	0.13	0.03
4	0.17	0.04
5	0.20	0.03
6	0.25	0.05
7	0.30	0.05
8	0.38	0.08
9	0.44	0.06
10	0.50	0.06
11	0.55	0.05
12	0.63	0.08
13	0.70	0.07
14	0.75	0.05
15	0.83	0.08
16	0.91	0.08
17	0.98	0.07
18	1.06	0.08
19	1.15	0.09
20	1.30	0.05
21	1.26	0.06
22	1.33	0.07

1.39 - 0.06
1.45 - 0.06
1.52 - 0.07

	Blows per 0.1 ft.	
0	2	
	3	
	2	
	1	
0.5'	2	10
	1	
	2	
	1	
	1	
1.0'	2	7
	1	
	2	
	1	
	2	
1.5'	2	8

Remarks SLOUGH = 0.2'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 7 of 11

Hole No. FD85-5 Date 8-27-85

DRIVE 13
Depth of Test 29.8' to 31.3'

Blow	Gage Reading	Penetration per Blow	
1	0.08	0.08	
2	0.14	0.06	
3	0.19	0.05	
4	0.22	0.03	
5	0.25	0.03	
6	0.30	0.05	
7	0.34	0.04	
8	0.38	0.04	
9	0.43	0.05	
10	0.48	0.05	
11	0.53	0.05	
12	0.57	0.04	
13	0.61	0.04	
14	0.67	0.06	
15	0.73	0.06	
16	0.78	0.05	
17	0.86	0.08	
18	0.93	0.07	
19	1.01	0.08	1.29 - 0.09
20	1.06	0.05	1.38 - 0.09
	1.11	0.05	1.47 - 0.09
	1.20	0.09	1.55 - 0.08

	Blows per 0.1 ft.	
0	1	
	2	
	3	
	2	
0.5'	2	10
	2	
	2	
	2	
	1	
1.0'	1	8
	2	
	2	
	1	
	1	
1.5'	2	8

Remarks SLOUGH = 0.3'

DRIVE 14
Depth of Test 32.5' to 34.0'

Blow	Gage Reading	Penetration per Blow
1	0.08	0.08
2	0.16	0.08
3	0.25	0.09
4	0.35	0.10
5	0.42	0.07
6	0.53	0.09
7	0.63	0.10
8	0.74	0.09
9	0.86	0.12
10	0.96	0.10
11	1.07	0.11
12	1.16	0.09
13	1.26	0.10
14	1.39	0.13
15	1.55	0.06
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	1	
	1	
	1	
	1	
0.5'	1	5
	1	
	1	
	1	
	1	
1.0'	1	5
	1	
	1	
	1	
	1	
1.5'	1	5

Remarks SLOUGH = 0.1'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM

Page 8 of 11

Hole No. FD85-5

Date 8-27-85

DRIVE 15

Depth of Test 34.9' to 36.4'

Blow	Gage Reading	Penetration per Blow
1	0.11	0.11
2	0.21	0.10
3	0.33	0.12
4	0.42	0.09
5	0.48	0.06
6	0.52	0.04
7	0.56	0.04
8	0.60	0.04
9	0.64	0.04
10	0.67	0.03
11	0.71	0.04
12	0.73	0.02
13	0.77	0.04
14	0.80	0.03
15	0.83	0.03
16	0.86	0.03
17	0.89	0.03
18	0.92	0.03
19	0.94	0.02
20	0.97	0.03
21	1.00	0.03

	Blows per 0.1 ft.	
0		
	1	
	1	
	1	
0.5'	2	5
	3	
	2	
	4	
	3	
1.0'	4	16
	3	
	3	
	3	
	3	
1.5'	3	15

Remarks SLOUGH = 0.1'
7" GRAVEL STUCK IN BOTTOM OF SS SHOE

DRIVE 16

Depth of Test 37.3' to 38.8'

Blow	Gage Reading	Penetration per Blow
1	0.11	0.11
2	0.16	0.05
3	0.20	0.04
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0		
	3	
	3	
	3	
0.5'	3	12
	3	
	3	
	3	
	3	
1.0'	3	15
	3	
	3	
	3	
	2	
1.5'	3	14

Remarks SLOUGH = 0.2'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM

Page 9 of 11

Hole No. FD85-5

Date 8-27-85

DRIVE 17
Depth of Test 40.0' to 41.5'

Blow	Gage Reading	Penetration per Blow
1	0.07	0.07
2	0.12	0.05
3	0.17	0.05
4	0.22	0.05
5	0.26	0.04
6	0.31	0.05
7	0.36	0.05
8	0.40	0.04
9	0.45	0.05
10	0.49	0.04
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	1	
	2	
	2	
	3	
0.5'	2	10
	2	
	2	
	2	
	3	
1.0'	3	12
	3	
	2	
	2	
	3	
1.5'	2	12

Remarks SLOUGH = 0.1'

DRIVE 18
Depth of Test 42.5' to 44.0'

Blow	Gage Reading	Penetration per Blow
1	0.08	0.08
2	0.14	0.06
3	0.19	0.05
4	0.24	0.05
5	0.30	0.06
6	0.35	0.05
7	0.40	0.05
8	0.45	0.05
9	0.50	0.05
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	1	
	2	
	2	
	2	
0.5'	2	9
	2	
	2	
	2	
	2	
1.0'	2	10
	3	
	2	
	2	
	2	
1.5'	2	11

Remarks SLOUGH = 0

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 10 of 11

Hole No. FD85-5 Date 8-27-85

DRIVE 19

Depth of Test 45.0' to 46.5'

Blow	Gage Reading	Penetration per Blow
1	0.11	0.11
2	0.17	0.06
3	0.22	0.05
4	0.28	0.06
5	0.33	0.05
6	0.38	0.05
7	0.44	0.06
8	0.48	0.04
9	0.53	0.05
10	0.58	0.05
11	0.63	0.05
12	0.67	0.04
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0		
	2	
	2	
	2	
0.5'	2	8
	2	
	2	
	3	
	2	
1.0'	3	12
	2	
	3	
	2	
	2	
1.5'	2	11

Remarks SLOUGH = 0

DRIVE 20

Depth of Test 47.5' to 49.0'

Blow	Gage Reading	Penetration per Blow
1	0.09	0.09
2	0.18	0.09
3	0.24	0.06
4	0.32	0.08
5	0.40	0.08
6	0.47	0.07
7	0.56	0.09
8	0.62	0.06
9	0.70	0.08
10	0.78	0.08
11	0.86	0.08
12	0.95	0.09
13	1.04	0.09
14	1.12	0.08
15	1.21	0.09
16	1.30	0.09
17	1.40	0.10
18	1.50	0.10
19		
20		

	Blows per 0.1 ft.	
0		
	1	
	1	
	1	
	2	
0.5'	1	6
	1	
	2	
	1	
	1	
1.0'	1	6
	1	
	1	
	2	
	1	
1.5'	1	6

Remarks SLOUGH = 0

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 11 of 11

Hole No. FD85-5 Date 8-27-85

DRIVE 21
Depth of Test 50.0' to 51.5'

Blow	Gage Reading	Penetration per Blow
1	0.09	
2	0.15	
3	0.21	
4	0.29	
5	0.35	
6	0.40	
7	0.45	
8	0.50	
9	0.55	
10	0.59	
11	0.63	
12	0.67	
13	0.72	
14	0.76	
15	0.80	
16		
17		
18		
19		
20		

	Blows per 0.5 ft.	
0	1	
	1	
	2	
	2	
0.5'	2	8
	2	
	2	
	3	
	3	
1.0'	4	14
	20	
	16	
	8	
	5	
1.5'	3	52

Remarks SLOUGH = 0

Depth of Test _____ to _____

Blow	Gage Reading	Penetration per Blow
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.5 ft.
0	
0.5'	
1.0'	
1.5'	

Remarks

MRO Form 1713, 1 Dec 78 (Temp)

Hole No. FD85-6

DRILLING LOG	DIVISION NEW ENGLAND	INSTALLATION —	SHEET 1 OF 3 SHEETS

1. PROJECT: OLD QUINCY RESERVOIR DAM
2. LOCATION (Coordinates or Station): STA 5+10 10 FT. UPSTREAM ℄
3. DRILLING AGENCY: CE MOBILE, AL DISTRICT
4. HOLE NO. (As shown on drawing title and file number): FD85-6
5. NAME OF DRILLER: CARL MOON
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: —
8. DEPTH DRILLED INTO ROCK: 1.3 FT
9. TOTAL DEPTH OF HOLE: 64.5 FT
10. SIZE AND TYPE OF BIT: 4" FISHTAIL
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): NGVD
12. MANUFACTURER'S DESIGNATION OF DRILL: FAILING 314
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 22; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER: NOT MEASURED
16. DATE HOLE: STARTED 8-21-85; COMPLETED 8-23-85
17. ELEVATION TOP OF HOLE: 84.7
18. TOTAL CORE RECOVERY FOR BORING: — %
19. SIGNATURE OF INSPECTOR: Charles R. Conlon

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
		TOP 5"	DK. BR., MED DENSE, GRAVELLY SILTY F-C SAND. ~20-30% SL PLASTIC FINES. (SM)	56	J-1.1	DRIVE 1 6 7 11
		BOT 5"	LT. BR., MED DENSE, GRAVELLY F-C SAND. ~5% SL. PLASTIC FINES. (SW)		J-1.2	
	2					
			LT. BR., MED DENSE, GRAVELLY F-C SAND. ~5-10% SL.-NON PLASTIC FINES. (SW-SM)	50	J-2	(0.1' SLOUGH DRIVE 2 9 14 15
	4					
			LT. BR., MED DENSE, GRAVELLY F-C SAND. ~5% SL.-NON PLASTIC FINES. (SW)	22	J-3	(0.2' SLOUGH DRIVE 3 5 10 11 1¼" GRAVEL STUCK IN SS SHOE
	6					
	8		NO RECOVERY.	6 FALL IN	J-4	DRIVE 4 6 7 6
	10		NO RECOVERY.	6 FALL IN	J-5	(0.1' SLOUGH DRIVE 5 1 1 2
						HOLE NOTICED IN BOTTOM OF FISHTAIL - CHANGED BITS POUNDED CASING TO 9.0' CLEANED HOLE 2 TIMES.
	12		NO RECOVERY.	0	J-6	DRIVE 6 4 2 1 USED SS W/CHECK VALVE
	14					
			NO RECOVERY.	0	J-7	(0.2' SLOUGH DRIVE 7 6 7 8 USED SS W/CHECK VALVE
	16					
			NO RECOVERY.	0	J-8	(0.2' SLOUGH DRIVE 8 6 7 8 RETURNED TO PREVIOUS SPLIT SPOON
	18					POUNDED CASING TO 19.0' FISHTAIL NOT PENETRATING AT 18.5' - CHANGED TO 4" ROLLERBIT

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: OLD QUINCY RES. DAM | HOLE NO. FD85-6

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 24.7 | **Hole No.** FD85-6

PROJECT: OLD QUINCY RESERVOIR DAM | INSTALLATION: — | SHEET 2 OF 3 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	21		TAN, LOOSE, SILTY F-C SAND. SOME GRAVEL ~20-30% SL. PLASTIC FINES. GRAVEL AND CO. SAND ARE SLATE FRAGMENTS. (SM)	3	J-9	DRIVE 9 5 3 3
	22					CHANGED BACK TO 4" FISHTAIL
	23		FALL IN IS SIMILAR TO ABOVE - SLATE FRAGMENTS.	3 FALL IN	J-10	DRIVE 10 0.2' SLOUGH 0 3 4
	24					
		TOP 5"	DK. BROWN, MED DENSE, GRAVELLY SILTY F-C SAND. ~20-30% SL. PLASTIC FINES. TILL LIKE. (SM)	56	J-11.1	DRIVE 11 6 9
	26	BOT 5"	BR., MED DENSE, F-C SAND ~10-15% SL-NON PLASTIC FINES. (SW-SM)		J-11.2	9
	28		BR., MED DENSE, GRAVELLY F-C SAND. ~10% SL.-NONPLASTIC FINES. (SW-SM)	44	J-12	DRIVE 12 8 9 13
	30		NO RECOVERY.	0	J-13	0.1' SLOUGH DRIVE 13 5 3 OVERDROVE SS 2" TO TRY TO RECOVER SAMPLE 3
	32					
		TOP 7"	LT. BR-GRAY, MED DENSE, GRAVELLY F-C SAND ~10-15% SL. PLASTIC FINES. (SW-SM)	78	J-14.1	0.1' SLOUGH DRIVE 14 11 11
		BOT 7"	GRAY-OLIVE, MED DENSE F-M SAND. ~10-15% SL. PLASTIC FINES. (SP-SM)		J-14.2	14
	34		OLIVE-BR., MED DENSE, GRAVELLY FINE SAND. ~15-20% SL. PLASTIC FINES. RUST STAINING BOT 7". (SM)	78	J-15.1	0.1' SLOUGH DRIVE 15 11 13
	36				J-15.2	14
	38		OLIVE, MED DENSE, SILTY FINE SAND. ~30-40% SL PLASTIC FINES. OCC'L RUST STAINING. (SM)	78	J-16.1	DRIVE 16 11 16
					J-16.2	18
	40		TAN-OLIVE, MED DENSE, SILTY FINE SAND ~30-40% SL. PLASTIC FINES. (SM)	89	J-17.1	DRIVE 17 11 13
					J-17.2	13
	42		SAME AS ABOVE.	83	J-18.1	0.1' SLOUGH 9 12
					J-18.2	13

ENG FORM 1836-A JUN 67 (ER 1110-1-1801) GPO 1980 OF-628-603 | PROJECT: OLD QUINCY RES. DAM | HOLE NO. FD85-6

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE 84.7 **Hole No.** FD85-6

PROJECT OLD QUINCY RESERVOIR DAM INSTALLATION — SHEET 3 OF 3 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	46		SAME AS ABOVE.	89	J-19.1 J-19.2	0.1' SLOUGH DRIVE 19 9 12 13
	48		SAME AS ABOVE WITH COARSE SAND TO FINE GRAVEL SIZE CHIPS OF GRANITE 7" FROM TOP OF RECOVERY.	72	J-20.1 J-20.2	0.1 SLOUGH DRIVE 20 10 41 18
			BOULDERS AND COBBLES.			CHANGED TO 4" ROLLERBIT
	50		GRANITE. PINK AND GRAY. UNWEATHERED TO SLIGHTLY WEATHERED. 4 PIECES.	75	RUN 1.1 RUN 1.2 RUN 1.3	RUN 1 3 7/8" CORE BARREL 2 3/4" CORE
	52		BOULDERS: 50.0'-51.0' 52.0'-52.6' 53.0'-53.5' 55.0'-56.0'			NOTE RUN 1.1 & 1.2 ARE IN SPLIT SPOON JARS. RUN 1.3 IS IN A PLASTIC BAG.
	54		FALL IN. M-C SANDY GRAVEL. GRANITE.	100	J-21	0.3' SLOUGH DRIVE 21 100/0.3' REFUSAL
	56					
	58		FALL IN. GRAVEL. SOME M-C SAND.	60	J-22	0.5' SLOUGH 22 DRIVE 22 68/0.3' REFUSAL
	60					ADVANCED WITH ROLLER BIT CONSISTENT RESISTANCE TO PENETRATION. NO SPLIT SPOON SAMPLES ATTEMPTED.
	62					
	64					B.O.B. 64.5'
	66					

ENG FORM 1836-A JUN 67 (ER 1110-1-1801) GPO 1980 OF-628-603

PROJECT OLD QUINCY RES. DAM HOLE NO. FD85-6

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 1 of 10

Hole No. FD85-6 Date 8-21-85

DRIVE 1

Depth of Test 0 to 1.5'

Blow	Gage Reading	Penetration per Blow
1	0.10	0.10
2	0.16	0.06
3	0.20	0.04
4	0.24	0.04
5	0.28	0.04
6	0.48	0.20
7	0.54	0.06
8	0.62	0.08
9	0.68	0.06
10	0.74	0.06
11	0.80	0.06
12	0.86	0.06
13	0.95	0.09
14	1.02	0.07
15	1.09	0.07
16	1.14	0.05
17	1.19	0.05
18	1.24	0.05
19	1.29	0.05
20	1.34	0.05
21	1.40	0.06
22	1.44	0.04
23	1.48	0.04
24	1.52	0.04

	Blows per 0.1 ft.	
0	1	
	2	
	2	
0.5'	1	6
	1	
	2	
	2	
	1	
1.0'	1	7
	2	
	2	
	2	
	2	
1.5'	3	11

Remarks

DRIVE 2

Depth of Test 2.4' to 3.9'

Blow	Gage Reading	Penetration per Blow
1	0.10	0.10
2	0.16	0.16
3	0.20	0.04
4	0.26	0.06
5	0.32	0.06
6	0.36	0.04
7	0.41	0.05
8	0.46	0.05
9	0.50	0.04
10	0.55	0.05
11	0.57	0.02
12	0.60	0.03
13	0.65	0.05
14	0.69	0.04
15	0.73	0.04
16	0.77	0.04
17	0.80	0.03
18	0.83	0.03
19	0.87	0.04
20	0.90	0.03

	Blows per 0.1 ft.	
0	1	
	2	
	1	
	2	
0.5'	3	9
	3	
	2	
	3	
	3	
1.0'	3	14
	3	
	3	
	3	
	3	
1.5'	3	15

Remarks SLOUGH = 0.1'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 2 of 10

Hole No. FD85-6 Date 8-21-85

DRIVE 3

Depth of Test 4.8' to 6.3'

Blow	Gage Reading	Penetration per Blow
1	0.12	0.12
2	0.23	0.11
3	0.38	0.15
4	0.44	0.06
5	0.50	0.06
6	0.55	0.05
7	0.60	0.05
8	0.65	0.05
9	0.70	0.05
10	0.74	0.04
11	0.79	0.05
12	0.85	0.06
13	0.89	0.04
14	0.95	0.06
15	1.00	0.05
16	1.05	0.05
17	1.09	0.04
18	1.13	0.04
19	1.18	0.05
20	1.22	0.04
	1.27	0.05
	1.31	0.04

	Blows per 0.1 ft.	
0		
	1	
	1	
	1	
0.5'	2	5
	2	
	2	
	2	
	2	
1.0'	2	10
	2	
	2	
	2	
	3	
1.5'	2	11

1.35 - 0.04
1.40 - 0.05
1.44 - 0.04
1.49 - 0.05

Remarks SLOUGH = 0.2'

DRIVE 4

Depth of Test 7.5' to 9.0'

Blow	Gage Reading	Penetration per Blow
1	0.08	0.08
2	0.15	0.07
3	0.21	0.06
4	0.27	0.06
5	0.36	0.09
6	0.45	0.09
7	0.54	0.09
8	0.62	0.08
9	0.71	0.09
10	0.80	0.09
11	0.88	0.08
12	0.95	0.07
13	1.01	0.06
14	1.09	0.08
15	1.15	0.06
16	1.24	0.09
17	1.32	0.08
18	1.42	0.10
19	1.55	0.13
20		

	Blows per 0.1 ft.	
0		
	1	
	1	
	2	
	1	
0.5'	1	6
	1	
	1	
	2	
	1	
1.0'	2	7
	1	
	1	
	1	
	1	
1.5'	2	6

Remarks SLOUGH = 0

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 3 of 10

Hole No. FD85-6 Date 8-21-85

DRIVE 5

Depth of Test 10.0' to 11.5'

Blow	Gage Reading	Penetration per Blow
1	0.17	0.17
2	0.75	0.58
3	1.29	0.54
4	1.65	0.36
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.
0	
0.5'	1
1.0'	1
1.5'	2

Remarks SLOUGH = 0.1'

DRIVE 6

Depth of Test 12.6' to 14.0'

Blow	Gage Reading	Penetration per Blow
1	0.08	0.08
2	0.18	0.10
3	0.32	0.14
4	0.47	0.15
5	0.60	0.13
6	0.82	0.22
7	1.40	0.58
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.
0	1
	1
	1
0.5'	1 4
	1
	1
1.0'	2
	1
1.5'	1

Remarks SLOUGH = 0

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 4 of 10

Hole No. FD85-6 Date 9-21-85

DRIVE 7

Depth of Test 14.8' to 16.3'

Blow	Gage Reading	Penetration per Blow
1	0.18	0.18
2	0.24	0.06
3	0.30	0.06
4	0.35	0.05
5	0.40	0.05
6	0.48	0.08
7	0.55	0.07
8	0.63	0.08
9	0.70	0.07
10	0.78	0.08
11	0.84	0.06
12	0.90	0.06
13	0.96	0.06
14	1.03	0.07
15	1.10	0.07
16	1.15	0.05
17	1.23	0.08
18	1.30	0.07
19	1.38	0.08
20	1.44	0.06
21	1.50	0.06

	Blows per 0.1 ft.	
0		
	1	
	2	
	2	
0.5'	1	6
	1	
	2	
	1	
	2	
1.0'	1	7
	2	
	1	
	2	
	1	
1.5'	2	8

Remarks SLOUGH = 0.2'

DRIVE 8

Depth of Test 17.4' to 18.9'

Blow	Gage Reading	Penetration per Blow
1	0.13	0.13
2	0.20	0.07
3	0.25	0.05
4	0.31	0.06
5	0.40	0.09
6	0.47	0.07
7	0.55	0.08
8	0.63	0.08
9	0.71	0.08
10	0.79	0.08
11	0.86	0.07
12	0.95	0.09
13	1.03	0.08
14	1.10	0.07
15	1.16	0.06
16	1.21	0.05
17	1.29	0.08
18	1.34	0.05
19	1.39	0.05
20	1.44	0.05
21	1.49	0.05

	Blows per 0.1 ft.	
0		
	2	
	1	
	2	
0.5'	1	6
	1	
	1	
	2	
	1	
1.0'	2	7
	1	
	1	
	2	
	2	
1.5'	2	8

Remarks SLOUGH = 0.2'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 5 of 10

Hole No. FD85-6 Date 8-21-85

DRIVE 9

Depth of Test 20.1' to 20.7'

Blow	Gage Reading	Penetration per Blow
1	0.13	0.13
2	0.20	0.07
3	0.27	0.07
4	0.33	0.06
5	0.46	0.13
6	0.63	0.17
7	0.76	0.13
8	0.91	0.15
9	1.09	0.18
10	1.35	0.26
11	1.60	0.25
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.
0	
	2
	1
	1
0.5'	1 5
	1
	1
1.0'	1 3
	1
	1
1.5'	1 3

Remarks SLOUGH = 0

DRIVE 10

Depth of Test 22.6' to 24.1'

Blow	Gage Reading	Penetration per Blow
1	0.60	0.60
2	0.75	0.15
3	1.01	0.26
4	1.15	0.14
5	1.30	0.15
6	1.43	0.13
7	1.50	0.07
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.
0	
0.5'	0
	1
	1
1.0'	1 3
	1
	1
1.5'	2 4

Remarks SLOUGH = 0

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 6 of 10

Hole No. FD85-6 Date 8-21-85

DRIVE 11
Depth of Test 25.0' to 26.5'

Blow	Gage Reading	Penetration per Blow
1	0.08	0.08
2	0.16	0.08
3	0.22	0.06
4	0.30	0.08
5	0.40	0.10
6	0.50	0.10
7	0.56	0.06
8	0.61	0.05
9	0.66	0.05
10	0.70	0.04
11	0.76	0.06
12	0.82	0.06
13	0.87	0.05
14	0.93	0.06
15	0.99	0.06
16	1.05	0.06
17	1.09	0.04
18	1.14	0.05
19	1.20	0.06
20	1.26	0.06
21	1.32	0.06
22	1.36	0.04
23	1.44	0.08
24	1.50	0.06

	Blows per 0.1 ft.	
0	1	
	1	
	2	
	1	
0.5'	1	6
	1	
	3	
	1	
	2	
1.0'	2	9
	2	
	2	
	1	
	2	
1.5'	2	9

Remarks SLOUGH = 0

DRIVE 12
Depth of Test 27.5' to 29.0'

Blow	Gage Reading	Penetration per Blow
1	0.04	0.04
2	0.08	0.04
3	0.15	0.07
4	0.20	0.05
5	0.29	0.09
6	0.34	0.05
7	0.41	0.07
8	0.50	0.09
9	0.57	0.07
10	0.63	0.06
11	0.70	0.07
12	0.75	0.05
13	0.80	0.05
14	0.85	0.05
15	0.90	0.05
16	0.96	0.06
17	1.00	0.04
18	1.05	0.05
19	1.09	0.04
20		

	Blows per 0.1 ft.	
0	2	
	2	
	1	
	1	
0.5'	2	8
	1	
	2	
	2	
	2	
1.0'	2	9
	2	
	3	
	3	
	2	
1.5'	3	13

Remarks SLOUGH = 0

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 7 of 10

Hole No. FD85-6 Date 8-21-85

DRIVE 13

Depth of Test 30.0' to 31.5'

Blow	Gage Reading	Penetration per Blow
1	0.09	0.09
2	0.16	0.07
3	0.27	0.11
4	0.36	0.09
5	0.47	0.11
6	0.59	0.12
7	0.74	0.15
8	0.92	0.18
9	1.29	0.37
10	1.43	0.14
11	1.50	0.07
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	1	
	1	
	1	
	1	
0.5'	1	5
	1	
	1	
1.0'	1	3
	1	
1.5'	2	3

Remarks SLOUGH = 0.1'

DRIVE 14

Depth of Test 32.5' to 34.0'

Blow	Gage Reading	Penetration per Blow
1	0.04	0.04
2	0.08	0.04
3	0.13	0.05
4	0.17	0.04
5	0.23	0.06
6	0.27	0.04
7	0.31	0.04
8	0.36	0.05
9	0.40	0.04
10	0.45	0.05
11	0.50	0.05
12	0.54	0.04
13	0.58	0.04
14	0.63	0.05
15	0.67	0.04
16	0.72	0.05
17	0.75	0.03
18	0.80	0.05
19		
20		

	Blows per 0.1 ft.	
0	2	
	2	
	2	
	3	
0.5'	2	11
	2	
	2	
	3	
	2	
1.0'	2	11
	3	
	3	
	2	
	3	
1.5'	3	14

Remarks SLOUGH = 0.1'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 8 of 10

Hole No. FD85-6 Date 8-21-85

DRIVE 15
Depth of Test 34.9' to 36.4'

Blow	Gage Reading	Penetration per Blow
1	0.08	0.08
2	0.12	0.04
3	0.16	0.04
4	0.20	0.04
5	0.24	0.04
6	0.28	0.04
7	0.30	0.02
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	1	
	3	
	3	
	2	
0.5'	2	11
	3	
	2	
	3	
	2	
1.0'	3	13
	2	
	3	
	3	
	3	
1.5'	3	14

Remarks SLOUGH = 0.1'

DRIVE 16
Depth of Test 37.5' to 39.0'

Blow	Gage Reading	Penetration per Blow
1	0.05	0.05
2	0.10	0.05
3	0.15	0.05
4	0.20	0.05
5	0.25	0.05
6	0.28	0.03
7	0.32	0.04
8	0.35	0.03
9	0.39	0.04
10	0.44	0.05
11	0.48	0.04
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	2	
	2	
	2	
	3	
0.5'	2	11
	3	
	3	
	4	
	3	
1.0'	3	16
	3	
	4	
	4	
	3	
1.5'	4	18

Remarks SLOUGH = 0

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 9 of 10

Hole No. FD85-6 Date 8-21-85

DRIVE 17
Depth of Test 40.0' to 41.5'

Blow	Gage Reading	Penetration per Blow
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	2	
	2	
	2	
	2	
0.5'	3	11
	2	
	2	
	3	
	3	
1.0'	3	13
	3	
	2	
	3	
	3	
1.5'	2	13

Remarks SLOUGH = 0

DRIVE 18
Depth of Test 42.4' to 43.9'

Blow	Gage Reading	Penetration per Blow
1	0.11	0.11
2	0.19	0.08
3	0.24	0.05
4	0.30	0.06
5	0.35	0.05
6	0.40	0.05
7	0.48	0.08
8	0.53	0.05
9	0.58	0.05
10	0.62	0.04
11	0.67	0.05
12	0.72	0.05
13	0.76	0.04
14	0.82	0.06
15	0.87	0.05
16	0.92	0.05
17	0.97	0.05
18	1.01	[illegible]
19	1.06	0.05
20	1.10	[illegible]
[illegible]	1.16	[illegible]
[illegible]	1.20	[illegible]
	1.25	0.05

	Blows per 0.1 ft.	
0		
	2	
	2	
	2	
0.5'	1	7
	2	
	2	
	2	
	2	
1.0'	3	11
	2	
	2	
	2	
	2	
1.5'	2	10

1.30 – 0.05
1.35 – 0.05
1.40 – 0.05
1.45 – 0.05
1.50 – 0.05

Remarks SLOUGH = 0.1'

MRO Form 1713, 1 Dec 78 (Temp)

STANDARD PENETRATION TEST

Project OLD QUINCY RES. DAM Page 10 of 10

Hole No. FD85-6 Date 8-21-85

DRIVE 19
Depth of Test 45.0' to 46.5'

Blow	Gage Reading	Penetration per Blow
1	0.08	0.08
2	0.14	0.06
3	0.19	0.05
4	0.25	0.06
5	0.30	0.05
6	0.36	0.06
7	0.39	0.03
8	0.44	0.05
9	0.48	0.04
10	0.53	0.05
11	0.56	0.03
12	0.60	0.04
13	0.65	0.05
14	0.69	0.04
15	0.73	0.04
16	0.77	0.04
17	0.81	0.04
18	0.84	0.03
19	0.90	0.06
20	0.94	0.04
	0.97	0.03

	Blows per 0.1 ft.	
0	1	
	2	
	2	
	2	
0.5'	2	9
	3	
	2	
	2	
	3	
1.0'	2	12
	3	
	2	
	2	
	3	
1.5'	3	13

Remarks SLOUGH = 0.1'

DRIVE 20
Depth of Test 47.4' to 48.9'

Blow	Gage Reading	Penetration per Blow
1	0.06	0.06
2	0.11	0.05
3	0.17	0.08
4	0.22	0.05
5	0.27	0.05
6	0.32	0.05
7	0.37	0.05
8	0.41	0.04
9	0.46	0.05
10	0.50	0.04
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

	Blows per 0.1 ft.	
0	1	
	2	
	2	
	2	
0.5'	3	10
	9	
	15	
	10	
	4	
1.0'	3	41
	3	
	3	
	3	
	4	
1.5'	5	18

Remarks SLOUGH = 0.1'

MRO Form 1713, 1 Dec 78 (Temp)

Hole No. FD85-7F

DRILLING LOG	DIVISION New England	INSTALLATION Pressure Test	SHEET 1 OF 3 SHEETS

1. PROJECT Old Quincy Reservoir Dam	10. SIZE AND TYPE OF BIT 3 7/8
2. LOCATION (Coordinates or Station) Centerline of Dam Sta 5+03.5	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD
3. DRILLING AGENCY CE Mobile AL District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. (As shown on drawing title and file number) FD85-7F	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 0; UNDISTURBED 0
5. NAME OF DRILLER Carl Moon	14. TOTAL NUMBER CORE BOXES 4
6. DIRECTION OF HOLE ☑ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER 77.0 (Depth 8.1 ft)
	16. DATE HOLE: STARTED 9-10-85; COMPLETED 9-11-85
7. THICKNESS OF OVERBURDEN 3.0 ft	17. ELEVATION TOP OF HOLE 85.1
8. DEPTH DRILLED INTO ROCK 44.9 ft	18. TOTAL CORE RECOVERY FOR BORING 92 %
9. TOTAL DEPTH OF HOLE 48.9 ft	19. SIGNATURE OF INSPECTOR Michael A McCaffrey

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	1, 2, 3	Gravelly Sand	Gravelly Sand		3.0	Augered to refusal at 3.0 ft. No samples taken Casing advanced to 3.0 ft. Top of Concrete core wall 3.0 ft
	3	Concrete	Cement relatively sound, aggregate unweathered rounded to subrounded sand to Gravel. Cement 45% Aggregate 55%	Pen 0.7 Rec 0.3 REC 43%	Run 1 3.7	Down Pressure = 300 psi Drilling Time = 20 min
	4		Same as Run 1 Fractures not tight, spaced 0.1 to 0.3 ft, a root is embedded in the cement	Pen 1.0 Rec 1.1 REC 110%	Run 2 4.7	300 psi 40 min
	5, 6, 7, 8, 9		Cement relatively sound, aggregate unweathered rounded to subrounded stones of various lithologies, size sand to gravel 0.2 ft. Fractures are tight spaced 0.5 to 1.6 ft. Cement 45% Aggregate 55%	Pen 5.0 Rec 5.0 REC 100%	Run 3 9.7	200 psi 6 min; 200 psi 6 min; 200 psi 6 min; 200 psi 4 min; 200 psi 5 min
	10, 11, 12, 13, 14		Cement relatively sound, aggregate unweathered rounded to subrounded stones of various lithologies, size sand to cobbles 0.3 ft. Fractures are tight except at 14.3 ft, spaced 0.3 to 1.1 ft. Cement 45% Aggregate 55%	Pen 5.0 Rec 5.0 REC 100%	Run 4 14.7	200 psi 4 min; 200 psi 3 min; 200 psi 4 min; 200 psi 4 min; 200 psi 3 min
	15, 16, 17, 18, 19		Cement relatively sound, aggregate unweathered except at 18.9 ft some weathering of granite cobble. From 14.7 to 18.2 ft aggregate rounded to subrounded stones of various lithologies, size; sand to gravel 0.2 ft, from 18.2 to 18.9 granite boulder. Fractures are generally tight, spaced 0.2 to 1.2 ft. Cement 40% Aggregate 60%	Pen 4.5 Rec 4.1 REC 91%	Run 5 19.2	At 18.9 ft encountered little drilling resistance probable soft seam to 19.2 ft; 200 psi 4 min; 200 psi 4 min; 200 psi 1 min
	20				Run 6	200 psi 5 min

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT Old Quincy Reservoir Dam HOLE NO. FD85-7F

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE 85.1 **Hole No.** FD85-7F

PROJECT Old Quincy Reservoir Dam | INSTALLATION Pressure test | SHEET 2 OF 3 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	21, 22, 23, 24		Cement relatively sound except at 21.7 ft, crumbles with finger pressure, aggregate unweathered except at 23.2 to 23.7 ft some weathering along granite fractures, aggregate sand, granite cobbles and boulders to 0.6 ft. Fractures are tight except at 23.0 and 21.7 ft spaced 0.2 to 0.7 ft. Cement 45% Aggregate 55%	Pen 4.8 Rec 5.0 REC 104%	Run 6 / 24.0	200psi 3 min; 200psi 4 min; 250psi 8 min; 250psi 6 min
	25, 26, 27, 28, 29		Cement relatively sound aggregate unweathered granite gravel to boulders 0.7 ft. Fractures are tight except at 27.8 ft some weathering, black and dark green coating, spaced 0.2 to 0.7 ft. Cement 45% Aggregate 55%	Pen 4.9 Rec 4.9 REC 100%	Run 7 / 28.9	250 psi 5 min; 250psi 4 min; 250psi 15 min; 250psi 5 min; 250psi 8 min
	30, 31, 32, 33, 34	Concrete	Cement relatively sound aggregate unweathered to slightly weathered granite, size: gravel to boulders 1.0 ft. Fractures are tight spaced 0.2 to 1.0 ft. Cement 45% Aggregate 55%	Pen 5.0 Rec 4.6 REC 92%	Run 8 / 33.9	200psi 4 min; 200psi 12 min; 250psi 6 min; 250psi 3 min; 250psi 3 min
	35, 36, 37, 38, 39		Cement relatively sound, aggregate unweathered rounded to subangular stones of various lithologies, size: sand to cobbles 0.3 ft Fractures generally not tight, broken, spaced 0.2 to 0.6 ft. White infilling in voids at 36.0 ft. Cement 25% Aggregate 75%	Pen 5.0 Rec 4.1 REC 82%	Run 9 / 38.9	200psi 5 min; 200psi 5 min; 200psi 5 min; 200psi 5 min; 200psi 5 min
	40, 41, 42, 43, 44		Cement relatively sound, aggregate unweathered rounded to subangular stones of various lithologies, size: sand to gravel 0.2 ft. Fractures generally broken and not tight, spaced 0.1 to 0.6 ft. Cement 25% Aggregate 75%	Pen 5.0 Rec 5.0 REC 100%	Run 10 / 43.9	300psi 3 min; 300psi 4 min; 300psi 3 min; 300psi 4 min; 300psi 5 min

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE 85.1 **Hole No.** FD85-7F

PROJECT Old Quincy Reservoir Dam | INSTALLATION Pressure Test | SHEET 3 OF 3 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	45	Concrete	Cement relatively sound, Aggregate unweathered rounded to subangular stones of various lithologies, size: sand to gravel 0.2 ft. Fractures are tight, spaced 0.2 to 0.6 ft Cement 35% Aggregate 65%	Run 5.0 Rec 2.3 REC 48%	Run 11	320psi 4min
	46					320psi 2 min
	47					320psi 2min
	48	Soil				46.9 ft no resistance to penetration and wash water color change from light grey to dark grey.
	49				48.9	
	50		Bottom of boring at 48.9 ft			Bottom of concrete core wall 46.9 ft
	51					
	52					Pressure Tests in the concrete core wall performed on 9-11-85.
	53					
	54					
	55					

Hole No. FD 85-8

DRILLING LOG	DIVISION New England	INSTALLATION Pressure Test	SHEET 1 OF 3 SHEETS

1. PROJECT Old Quincy Reservoir Dam	10. SIZE AND TYPE OF BIT 3 7/8 in
2. LOCATION (Coordinates or Station) Centerline of Dam Sta 4+25	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD
3. DRILLING AGENCY CE Mobile, AL District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. (As shown on drawing title and file number) FD85-8	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 0; UNDISTURBED 0
5. NAME OF DRILLER Carl Moon	14. TOTAL NUMBER CORE BOXES 5
6. DIRECTION OF HOLE ☑ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER 77.9 (Depth 6.6 ft)
	16. DATE HOLE: STARTED 9-4-85; COMPLETED 9-6-85
7. THICKNESS OF OVERBURDEN 2.2 ft	17. ELEVATION TOP OF HOLE 84.5
8. DEPTH DRILLED INTO ROCK 59.9	18. TOTAL CORE RECOVERY FOR BORING 82 %
9. TOTAL DEPTH OF HOLE 62.2 ft	19. SIGNATURE OF INSPECTOR Michael A McCaffrey

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	1, 2	Gravelly Sand	Gravelly Sand		2.2	Augered through soil overburden to concrete at 2.2 ft. No samples taken. Casing advanced to 2.3 ft.
	3, 4, 5, 6, 7	Concrete	Cement relatively sound, aggregate unweathered of a variety of lithologies, rounded to sub-rounded, size range sand to cobbles 0.3 ft. Fractures are tight, spaced 0.3 to 0.7 ft. Cement 45% Aggregate 55%	Pen 5.0 Rec 4.6 REC 92%	2.3 Run 1 7.3	Down Pressure = 200 psi; Drilling Time = 10 min; 250 psi 9 min; 290 psi 7 min; 290 psi 8 min; 290 psi 10 min
	8, 9, 10, 11, 12		Cement relatively sound, aggregate unweathered except at 8.7 ft composed of various lithologies, rounded to subrounded, size range sand to cobbles 0.3 ft. Fractures are tight except at 11.6 ft, spaced 0.3 to 1.1 ft. Cement 50% Aggregate 50%	Pen 4.7 Rec 5.0 REC 106%	Run 2 12.0	Increased drilling RPM at 8.3 ft; 250 psi 12 min; 275 psi 3 min; 275 psi 4 min; 300 psi 5 min; 300 psi 5 min
	13, 14, 15		Cement relatively sound, aggregate unweathered composed of a various lithologies, rounded to subrounded, size range sand to cobbles 0.3 ft. Fractures are tight except at 15 ft, spaced 0.3 to 0.7 ft. Cement 50% Aggregate 50%	Pen 3.4 Rec 2.9 REC 85%	Run 3 15.4	225 psi 6 min; 450 psi 3 min; 500 psi 3 min; 350 psi 6 min
	16, 17, 18, 19		Cement relatively sound, aggregate unweathered composed of various lithologies, rounded to subrounded, size range sand to cobbles 0.3 ft. Fractures tight except at 17.4 and 18.0 ft, spaced 0.5 to 0.6 ft. Voids about 1/4 in. in cement are common. Cement 45% Aggregate 55%	Pen 3.6 Rec 3.4 REC 94%	Run 4 19.0	Top and bottom of Run 4 has loose aggregate, cement probably washed away. Core barrel jambed at 19.0 ft; 250 psi 8 min; 250 psi 10 min; 250 psi 9 min; 250 psi 13 min
	20				Run 5	275 psi 12 min

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT Old Quincy Reservoir Dam | HOLE NO. FD85-8

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE 84.5 **Hole No.** FD 85-8

PROJECT Old Quincy Reservoir Dam | INSTALLATION Pressure Test | SHEET 2 OF 3 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	21, 22, 23, 24		Cement relatively sound, aggregate unweathered granite cobbles and boulders except slight weathering and staining along cobble and boulder edges, 0.3 to 1.2 ft. Fractures are tight, spaced 0.1 to 1.2 ft. Cement 30% Aggregate 70%	Pen 5.0 Rec 5.0 REC 100%	Run 5 24.0	Fractures common at cobble or boulder-cement contact. 275psi 6min; 300psi 10min; 300psi 7min; 300psi 8 min
	25, 26		Cement relatively sound, aggregate unweathered granite cobbles and boulders 0.3 to 1.1 ft. Fractures are tight except at 25.5 ft, spaced 0.1 to 1.1 ft. Cement 15% Aggregate 85%	Pen 2.0 Rec 2.0 REC 100%	Run 6 26.0	300psi 18 min; 300psi 15min
	27, 28, 29		Cement relatively sound, aggregate unweathered granite cobbles to 0.4 ft. Fractures from 26.0 to 27.5 are tight, from 27.5 to 29.3 core is highly fractured, mostly not tight spaced 0.05 to 0.7 ft. Cement 40% Aggregate 60%	Pen 3.3 Rec 3.0 REC 91%	Run 7 29.3	250psi 8 min; 250psi 7min; 250psi 7 min; 250psi 4min
	30, 31, 32, 33, 34	Concrete	Cement relatively sound, aggregate unweathered granite cobbles to 0.8 ft. Fractures are tight, spaced 0.1 to 0.8 ft. Voids with white infilling, volume about ½ in³, at 29.9 and 33.4 ft. Cement 25% Aggregate 75%	Pen 5.0 Rec 4.6 REC 92%	Run 8 34.3	250psi 7 min; 250psi 8 min; 250psi 11 min; 250psi 9min; 250psi 10min
	35, 36, 37, 38, 39		Cement relatively sound, aggregate unweathered of various lithologies, 34.3 to 37.3 ft granite cobbles 37.3 to 39.2 sand to gravel, stones rounded to subrounded. Fractures are generally tight, solution cavities and infilling at 35.3 and 36.8 ft, fracture spacing 0.1 to 1.1 ft. Cement 40% Aggregate 60%	Pen 4.9 Rec 5.3 REC 108%	Run 9 39.2	250psi 8 min; 250psi 8min; 250 psi 11 min; 250psi 12 min; 250psi 10 min
	40, 41, 42, 43, 44		Cement relatively sound aggregate unweathered of various lithologies, rounded to subrounded, size, sand to cobbles 0.3 ft. Fractures tight except at 41.4 and 42.8, spaced 0.2 to 0.7 ft. Cement 35% Aggregate 65%	Pen 5.0 Rec 4.4 REC 88%	Run 10 to 44.2	250psi 10 min; 250psi 8min; 250psi 10 min; 250psi 9min; 250psi 6min

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 84.5 | **Hole No.** FD 85-8

PROJECT: Old Quincy Reservoir Dam | INSTALLATION: Pressure Test | SHEET 3 OF 3 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
	45	Concrete	Cement relatively sound, aggregate unweathered of various lithologies, rounded to subrounded, size, sand to cobble to 0.3 ft. Fractures are generally broken and not tight spaced 0.2 to 0.8 ft. Cement 40% Aggregate 60%	Pen 4.2 Rec 3.5 REC 88%	44.2 Run 11		300psi 4 min
	46						300psi 4 min
	47						250psi 10 min
	48				48.2		300psi 4 min
	49	Concrete with cobbles and boulders	Cement relatively sound, aggregate unweathered rounded to subrounded of various lithologies, size, sand to cobble to 0.25 ft, Fractures are tight except at 48.5 ft, fracture is broken. Top 2.3 ft of recovery is concrete Cement 40% Aggregate 60% Granite cobbles in bottom 0.9 ft of recovery with clay coating on edges of cobbles, size 0.25 to 0.30 ft				275psi 4 min
	50			Pen 9.0 Rec 3.1 REC 34%	Run 12	Wash water color change at 50.3 ft from light grey to brown at 51.2 from brown to dark grey at 53.5 from dark grey to light grey Bottom of Concrete core wall at 50.2 ft	275psi 5 min
	51						275psi 1 min
	52						250psi 2 min
	53						250psi 2 min
	54						300psi 10 min
	55						300psi 2 min
	56						300psi 3 min
	57				57.2		300psi 20 min
	58	Soil	Granite cobbles and boulders 0.2 to 1.2 ft	Pen 5.0 Rec 2.5 REC 50%	Run 13	Boulders encountered at 56.2 to 58.3 ft. Brown Wash water at 59 ft, rapid advance of drilling	300psi 10 min
	59						300psi 4 min
	60						290psi 3 min
	61						290psi 4 min
	62				62.2		250psi 6 min
	63		Bottom of Boring at 62.2 ft			Pressure Tests in the concrete core wall performed on 9-6-85 and 9-9-85	

Hole No. FD85-9

DRILLING LOG	DIVISION New England	INSTALLATION Pressure Test	SHEET 1 OF 2 SHEETS

1. PROJECT Old Quincy Reservoir Dam	10. SIZE AND TYPE OF BIT 3 7/8 in
2. LOCATION (Coordinates or Station) Centerline of Dam Sta 2+50	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD
3. DRILLING AGENCY CE Mobile, AL District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. (As shown on drawing title and file number) FD85-9	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 0; UNDISTURBED 0
5. NAME OF DRILLER Carl Moon	14. TOTAL NUMBER CORE BOXES 3
6. DIRECTION OF HOLE ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER 69.1 (Depth 16.1 ft)
	16. DATE HOLE: STARTED 8-29-85; COMPLETED 9-3-85
7. THICKNESS OF OVERBURDEN 3.2 Ft	17. ELEVATION TOP OF HOLE 85.2
8. DEPTH DRILLED INTO ROCK 30.1 Ft	18. TOTAL CORE RECOVERY FOR BORING 96 %
9. TOTAL DEPTH OF HOLE 33.3 Ft	19. SIGNATURE OF INSPECTOR Michael A McCaffrey

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	1, 2, 3	Gravelly Sand	Gravelly Sand		None 3.2	Augered from ground surface to top of concrete at 3.2 ft. No Samples taken. Casing advanced to 3.3 ft Top of concrete Core wall
	4, 5, 6, 7, 8	Concrete	Cement relatively sound, aggregate unweathered rounded to subrounded stones of various lithology size range sand to cobbles 0.3 ft. Fractures are spaced 0.1 to 0.8 ft are tight except at 7.2 and 7.8 ft. Cement 60% Aggregate 40%	Pen 5.0 Rec 5.0 REC 100%	3.3 Run 1 8.3	Down Pressure = 190 psi, Drilling Time = 11 min Wash water changes color frequently from brown to grey 3.3 to 7.0 ft. 190 psi 15 min 190 psi 15 min 250 psi 8 min 250 psi 8 min
	9, 10	Concrete	Cement relatively sound, aggregate unweathered granite cobbles to 1.0 ft Fractures are tight except in lower 0.5 ft section. Cement 35% Aggregate 65%	Pen 1.7 Rec 1.7 REC 100%	Run 2 10.0	Lost water circulation at 10.0 ft 250 psi 8 min 250 psi 5 min
	11, 12, 13, 14		Cement relatively sound, aggregate unweathered granite cobbles to boulders, Two boulders 1.3 and 1.6 ft diameter spaced by 0.2 ft cement. Granite is intact and slightly weathered along boulder edges. Fractures are tight, spaced 0.2 to 1.6 ft Cement 20% Aggregate 80%	Pen 4.6 Rec 4.5 REC 98%	Run 3 14.6	200 psi 8 min 200 psi 8 min 200 psi 10 min 200 psi 9 min 200 psi 5 min
	15, 16		Cement relatively sound, aggregate unweathered granite cobbles. One fracture, it is not tight. Cement 50% Aggregate 50%	Pen 0.7 Rec 0.7 REC 100%	Run 4 15.1	175 psi 5 min 175 psi 8 min
	17, 18, 19, 20		Cement relatively sound, aggregate unweathered granite cobbles to 0.6 ft. Fractures are tight, spaced 0.2 to 0.6 ft. Cement 35% Aggregate 65%	Pen 4.9 Rec 4.8 REC 98%	Run 5 20.0	Fractures often found at granite cobble-cement contact 190 psi 10 min 190 psi 11 min 190 psi 10 min 190 psi 9 min

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT Old Quincy Reservoir Dam HOLE NO. FD85-9

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE 85.2 **Hole No.** FD85-9

PROJECT Old Quincy Reservoir Dam INSTALLATION Pressure Test SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	21, 22, 23, 24	Concrete	Cement relatively sound, aggregate unweathered slaby slate cobbles, granite cobbles and boulders 0.3 to 1.6 ft. Fractures are tight, spaced 0.2 to 1.6 ft. Cement 35% Aggregate 65%	Pen 4.5 Rec 4.3 REC 96	20.0 Run 6 24.5	200psi 8min; 200psi 9min; 200psi 11min; 200psi 15min; 200psi 4min
	25, 26, 27, 28, 29	Concrete	Cement relatively sound, aggregate unweathered and slaby slate cobbles granite cobbles 0.2 to 0.4 ft. Fractures are tight, spaced 0.1 to 0.4 ft. Cement 45% Aggregate 55%	Pen 4.7 Rec 5.0 REC 106%	Run 7 29.2	200psi 12min; 200psi 13min; 250psi 8min; 250psi 5min; 250psi 13min. Fractures often at cobble-cement contact. Run 7 - from 24.5 to 29.2 ft
		Bedrock	Cement relatively sound			
	30, 31, 32, 33	Bedrock	Grey slate, relatively unweathered. Joints are closely spaced 0.1 to 0.3 ft, most have iron staining, 2 joint sets observed, near vertical and near horizontal. Many fractures from drilling present. Joints and fractures are not tight.	Pen 4.1 Rec 3.0 REC 73% RQD 0%	29.5 Run 8 33.3	Bottom of concrete core wall at 29.5 ft. Run 8 from 29.2 to 33.3. 250psi 8min; 250psi 11min; 250psi 10min; 250psi 7min
	34, 35, 36, 37, 38, 39, 40					Bottom of boring at 33.3 ft. Pressure Tests in the concrete core wall performed on 9-3-85 and 9-4-85

Hole No. FD 85-7A

DRILLING LOG	DIVISION New England	INSTALLATION —	SHEET 1 OF 1 SHEETS

1. PROJECT: Old Quincy Reservoir Dam
2. LOCATION (Coordinates or Station): Centerline of Dam Sta 5+10
3. DRILLING AGENCY: CE Mobile AL District
4. HOLE NO. (As shown on drawing title and file number): FD85-7A
5. NAME OF DRILLER: Carl Moon
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: —
8. DEPTH DRILLED INTO ROCK: 0
9. TOTAL DEPTH OF HOLE: 10.5
10. SIZE AND TYPE OF BIT: 6 in. solid stem auger
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): NGVD
12. MANUFACTURER'S DESIGNATION OF DRILL: Failing 314
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 0; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER: not measured
16. DATE HOLE: STARTED 9-10-85; COMPLETED 9-10-85
17. ELEVATION TOP OF HOLE: 85.1
18. TOTAL CORE RECOVERY FOR BORING: — %
19. SIGNATURE OF INSPECTOR: Michael A. McCaffrey

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	1, 2, 3, 4, 5, 6, 7, 8, 9, 10				10.5	Augered 10.5 ft through silty gravelly sand, did not encounter refusal in attempt to locate concrete core wall. No samples taken. Soil from 7.5 to 10.5 ft saturated with water.
	11					Bottom of boring at 10.5 ft

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: Old Quincy Reservoir Dam HOLE NO. FD 85-7A

Hole No. FD85-7B

DRILLING LOG	DIVISION New England	INSTALLATION —	SHEET 1 OF 1 SHEETS

1. PROJECT: Old Quincy Reservoir Dam
2. LOCATION (Coordinates or Station): Sta 5+10 2.5ft upstream of Centerline
3. DRILLING AGENCY: CE Mobile, AL District
4. HOLE NO. (As shown on drawing title and file number): FD85-7B
5. NAME OF DRILLER: Carl Moon
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: —
8. DEPTH DRILLED INTO ROCK: 0
9. TOTAL DEPTH OF HOLE: 7.0 FT
10. SIZE AND TYPE OF BIT: 6 in. solid stem auger
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): NGVD
12. MANUFACTURER'S DESIGNATION OF DRILL: Failing 314
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 0; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: —
15. ELEVATION GROUND WATER: not measured
16. DATE HOLE: STARTED 9-10-85; COMPLETED 9-10-85
17. ELEVATION TOP OF HOLE: 85.0
18. TOTAL CORE RECOVERY FOR BORING: — %
19. SIGNATURE OF INSPECTOR: Michael A. McCaffrey

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	1					Augered 7.0 ft through silty gravelly sand, did not encounter refusal in attempt to locate concrete core wall. No samples taken.
	2					
	3					
	4					
	5					
	6					
	7				7.0	
	8					Bottom of boring at 7.0 ft
	9					
	10					

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: Old Quincy Reservoir Dam HOLE NO. FD85-7B

Hole No. FD 85-7C

DRILLING LOG	DIVISION New England	INSTALLATION —	SHEET 1 OF 1 SHEETS

1. PROJECT Old Quincy Reservoir Dam	10. SIZE AND TYPE OF BIT 6 in. Solid Stem auger
2. LOCATION (Coordinates or Station) Sta 5+10, 5 ft upstream of centerline	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD
3. DRILLING AGENCY CE Mobile, AL District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. (As shown on drawing title and file number) FD85-7C	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 0; UNDISTURBED 0
5. NAME OF DRILLER Carl Moon	14. TOTAL NUMBER CORE BOXES —
6. DIRECTION OF HOLE ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER not measured
	16. DATE HOLE: STARTED 9-10-85; COMPLETED 9-10-85
7. THICKNESS OF OVERBURDEN —	17. ELEVATION TOP OF HOLE 84.9
8. DEPTH DRILLED INTO ROCK 0	18. TOTAL CORE RECOVERY FOR BORING — %
9. TOTAL DEPTH OF HOLE 7.0 ft	19. SIGNATURE OF INSPECTOR Michael A. McCaffrey

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	1, 2, 3, 4, 5, 6, 7				7.0	Augered 7.0 ft through silty gravelly sand, did not encounter refusal in attempt to locate concrete core wall. No samples taken.
	8, 9, 10					Bottom of boring at 7.0 ft

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT Old Quincy Reservoir Dam | HOLE NO. FD85-7C

Hole No. FD85-7D

DRILLING LOG	DIVISION New England	INSTALLATION —	SHEET 1 OF 1 SHEETS

1. PROJECT Old Quincy Reservoir Dam	10. SIZE AND TYPE OF BIT 6" Solid stem auger
2. LOCATION (Coordinates or Station) Sta 5+10, 7.5 ft upstream of center line	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD
3. DRILLING AGENCY CE Mobile, AL District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. (As shown on drawing title and file number) FD85-7D	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 0; UNDISTURBED 0
5. NAME OF DRILLER Carl Moon	14. TOTAL NUMBER CORE BOXES —
6. DIRECTION OF HOLE ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	15. ELEVATION GROUND WATER not measured
	16. DATE HOLE: STARTED 9-10-85; COMPLETED 9-10-85
7. THICKNESS OF OVERBURDEN —	17. ELEVATION TOP OF HOLE 84.8
8. DEPTH DRILLED INTO ROCK 0	18. TOTAL CORE RECOVERY FOR BORING — %
9. TOTAL DEPTH OF HOLE 10.5 ft	19. SIGNATURE OF INSPECTOR Michael A. McCaffrey

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	1, 2, 3, 4, 5, 6, 7, 8, 9, 10				10.5	Augered 10.5 ft through silty gravelly sand, did not encounter refusal in attempt to locate concrete core wall. No samples taken. Soil from 7.5 to 10.5 ft saturated with water.
	11, 12					Bottom of boring at 10.5 ft

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT Old Quincy Dam Reservoir | HOLE NO. FD85-7D

Hole No. FD85-7E

DRILLING LOG	DIVISION New England	INSTALLATION —	SHEET 1 OF 1 SHEETS

1. PROJECT Old Quincy Reservoir Dam	10. SIZE AND TYPE OF BIT 6" solid stem auger
2. LOCATION (Coordinates or Station) Sta 5+07 on centerline	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD
3. DRILLING AGENCY CE Mobile, AL District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. (As shown on drawing title and file number) FD85-7E	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 0; UNDISTURBED 0
5. NAME OF DRILLER Carl Moon	14. TOTAL NUMBER CORE BOXES —
	15. ELEVATION GROUND WATER not measured
6. DIRECTION OF HOLE ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.	16. DATE HOLE: STARTED 9-10-85; COMPLETED 9-10-85
	17. ELEVATION TOP OF HOLE 85.1
7. THICKNESS OF OVERBURDEN 3.0 ft	18. TOTAL CORE RECOVERY FOR BORING — %
8. DEPTH DRILLED INTO ROCK 0	19. SIGNATURE OF INSPECTOR Michael A McCaffrey
9. TOTAL DEPTH OF HOLE 3.0 ft	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	1 2 3				3.0	Augered through silty gravelly sand, encountered refusal at 3.0 ft in attempt to locate concrete core wall. No samples taken.
	4 5					Bottom of boring at 3.0 ft, probable top of concrete core wall.

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT Old Quincy Reservoir Dam | HOLE NO. FD85-7E

Hole No. FD85-7G

DRILLING LOG	DIVISION New England	INSTALLATION –	SHEET 1 OF 1 SHEETS

1. PROJECT: Old Quincy Reservoir Dam
2. LOCATION (Coordinates or Station): Sta 3+10, 7.5 ft downstream of centerline
3. DRILLING AGENCY: CE Mobile AL District
4. HOLE NO. (As shown on drawing title and file number): FD85-7G
5. NAME OF DRILLER: James Miller
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED _____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: –
8. DEPTH DRILLED INTO ROCK: 0
9. TOTAL DEPTH OF HOLE: 10.5 ft
10. SIZE AND TYPE OF BIT: 6 in solid stem auger
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): NGVD
12. MANUFACTURER'S DESIGNATION OF DRILL: Failing 314
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 0; UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES: –
15. ELEVATION GROUND WATER: None encountered
16. DATE HOLE: STARTED 9-17-85; COMPLETED 9-17-85
17. ELEVATION TOP OF HOLE: 85.6
18. TOTAL CORE RECOVERY FOR BORING: – %
19. SIGNATURE OF INSPECTOR: Michael A McCaffrey

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	1, 2, 3, 4, 5, 6, 7, 8, 9, 10				10.5	Augered 10.5 ft through silty gravelly sand, did not encounter refusal in attempt to locate concrete core wall. No samples taken. Soil is dry. Groundwater table not encountered.
	11, 12					Bottom of Boring 10.5 ft

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT: Old Quincy Reservoir Dam | HOLE NO. FD85-7G

Hole No. FD 85-7H

DRILLING LOG	DIVISION New England	INSTALLATION —	SHEET 1 OF 1 SHEETS

1. PROJECT Old Quincy Reservoir Dam	10. SIZE AND TYPE OF BIT 6 in solid stem auger
2. LOCATION (Coordinates or Station) Sta 5+10, 5.0 ft downstream of centerline	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD
3. DRILLING AGENCY CE Mobile, AL District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. (As shown on drawing title and file number) FD85-7H	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 0; UNDISTURBED 0
5. NAME OF DRILLER James Miller	14. TOTAL NUMBER CORE BOXES —
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER not encountered
	16. DATE HOLE: STARTED 9-17-85; COMPLETED 9-17-85
	17. ELEVATION TOP OF HOLE 85.4
7. THICKNESS OF OVERBURDEN —	18. TOTAL CORE RECOVERY FOR BORING — %
8. DEPTH DRILLED INTO ROCK 0	19. SIGNATURE OF INSPECTOR Michael A McCaffrey
9. TOTAL DEPTH OF HOLE 9.5 ft	

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	1, 2, 3, 4, 5, 6, 7, 8, 9				9.5	Augered 9.5 ft through silty gravelly sand, did not encounter refusal in attempt to locate concrete core wall. No samples taken. Soil is dry. Groundwater table not encountered.
	10, 11, 12					Bottom of Boring 9.5 ft

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT Old Quincy Reservoir Dam | HOLE NO. FD 85-7H

Hole No. FD85-7I

DRILLING LOG	DIVISION New England	INSTALLATION —	SHEET 1 OF 1 SHEETS

1. PROJECT Old Quincy Reservoir Dam	10. SIZE AND TYPE OF BIT 6 in solid stem auger
2. LOCATION (Coordinates or Station) Sta 5+10, 2.5 ft downstream of centerline	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD
3. DRILLING AGENCY CE Mobile, AL District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. (As shown on drawing title and file number) FD85-7I	13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 0; UNDISTURBED 0
5. NAME OF DRILLER James Miller	14. TOTAL NUMBER CORE BOXES —
6. DIRECTION OF HOLE ☑ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER not measured
	16. DATE HOLE: STARTED 9-17-85; COMPLETED 9-17-85
7. THICKNESS OF OVERBURDEN —	17. ELEVATION TOP OF HOLE 85.2
8. DEPTH DRILLED INTO ROCK 0	18. TOTAL CORE RECOVERY FOR BORING — %
9. TOTAL DEPTH OF HOLE 10.5 ft	19. SIGNATURE OF INSPECTOR Michael A McCaffrey

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	1, 2, 3, 4, 5, 6, 7, 8, 9, 10				10.5	Augered 10.5 ft through sitly gravelly sand, did not encounter refusal in attempt to locate concrete core wall. No samples taken. Encountered moist soil from 8.5 to 10.5 ft.
	11, 12					Bottom of boring 10.5 ft

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

PROJECT Old Quincy Reservoir Dam HOLE NO. FD85-7I

APPENDIX B

WATER PRESSURE TESTING LOGS

WATER PRESSURE TESTING

Boring No. FD85-7F

Depth to bottom of boring 48.9 ft

Test Zone Depths

Top 37.8 ft

Bottom 42.8 ft

Depth to water table from ground surface 8.1 ft

Time Started 12:10

Time Completed 12:27

Packers: Length 38 in.

Single (Double)

(Pneumatic) Mechanical

Water Pipe Length 5 ft

Water Pipe I.D. 1 in.

Gage height above groundwater 8.1 ft

Test No. 1

Page 1 of 1

Project 85736

Inspector M. McGaffey

Driller C Moon

Date 9-11-85

Chkd by

Date

	Water Pressure psi (gage)	Elapsed Time min.	Volume ~~cu ft~~ gal	ΔVolume ~~cu ft~~ gal	Packer Press psi	Remarks (Vibration, leaks, packer breaks, rock quality, pressure variation, etc.)
Holding Test	5.0	0:00	9.21		100	Partial circulation water
				0.00		
	0.0	0:05	9.21		100	loss in borehole
Flow Test	5.8	0:00	6.3		100	
				10.1		
	5.5	1:00	16.4		100	
				9.6		
	5.1	2:00	26.0		100	
				9.5		
	5.1	3:00	35.5		100	
				9.8		
	5.1	4:00	45.3		100	
				9.6		
	5.1	5:00	54.9		100	
				9.8		
	5.1	6:00	64.7		100	
				9.6		
	5.1	7:00	74.3		100	

Gage No. 0-60psi Flowmeter No. 27437535

Ground surface is 5.5 ft above reservoir level at time of pressure testing

WATER PRESSURE TESTING

Boring No. FD 85-7F

Depth to bottom of boring 48.9 ft

Test Zone Depths

Top 32.8 ft

Bottom 37.8 ft

Depth to water table from ground surface 8.1 ft

Time Started 12:34

Time Completed 12:57

Packers: Length 38 in.

Single (Double)

(Pneumatic) Mechanical

Water Pipe Length 5 ft

Water Pipe I.D. 1 in.

Gage height above groundwater 8.1 ft

Test No. 2

Page 1 of 1

Project 85736

Inspector M. McCarthy

Driller C. Moon

Date 9-11-85

Chkd by

Date

	Water Pressure psi (gage)	Elapsed Time min.	Volume ~~cu ft~~ gal	ΔVolume ~~cu ft~~ gal	Packer Press psi	Remarks (Vibration, leaks, packer breaks, rock quality, pressure variation, etc.)
Holding Test	7.5	0:00	0.10		100	Partial circulation water
	7.0	0:30	0.10	0.00	100	loss in borehole
	6.5	1:00	0.10	0.00	100	
	6.5	2:00	0.10	0.00	100	
	6.4	3:00	0.10	0.00	100	
	6.4	4:00	0.10	0.00	100	
	6.3	5:00	0.10	0.00	100	
	6.3	6:00	0.10	0.00	100	
Flow Test	7.0	0:00	3.60		100	
	7.0	1:00	3.60	0.00	100	
	7.0	2:00	3.60	0.00	100	
	7.0	3:00	3.60	0.00	100	
	7.0	4:00	3.60	0.00	100	
	7.0	5:00	3.60	0.00	100	

Gage No. 0-60 psi Flowmeter No. 27437535

WATER PRESSURE TESTING

Boring No. FD 85-7F

Depth to bottom of boring 48.9 ft

Test Zone Depths

Top 27.8 ft

Bottom 32.8 ft

Depth to water table from ground surface 8.1 ft

Time Started 1:05

Time Completed 1:25

Packers: Length 18 in.

Single Double

Pneumatic Mechanical

Water Pipe Length 5 ft

Water Pipe I.D. 1 in.

Gage height above groundwater 8.1 ft

Test No. 3

Page 1 of 1

Project 85936

Inspector M. McGaffey

Driller C. Moon

Date 9-11-85

Chkd by

Date

	Water Pressure psi (gage)	Elapsed Time min.	Volume ~~cu ft~~ gal	ΔVolume ~~cu ft~~ gal	Packer Press psi	Remarks (Vibration, leaks, packer breaks, rock quality, pressure variation, etc.)
Holding Test	6.0	0:00	5.95		100	Partial circulation water loss
	5.8	1:00	5.95	0.00	100	in bore hole
	5.6	2:00	5.95	0.00	100	
	5.3	3:00	5.95	0.00	100	
	5.2	4:00	5.95	0.00	100	
	5.1	5:00	5.95	0.00	100	
Flow Test	6.0	0:00	7.05		100	
	6.0	1:00	7.05	0.00	100	
	6.0	2:00	7.05	0.00	100	
	6.0	3:00	7.05	0.00	100	
	6.0	4:00	7.05	0.00	100	
	6.0	5:00	7.05	0.00	100	

Gage No. 0-60 psi Flowmeter No. 27437535

WATER PRESSURE TESTING

Boring No. FD 85-7F

Depth to bottom of boring 48.9 ft

Test Zone Depths

Top 22.8 ft

Bottom 27.8 ft

Depth to water table from ground surface 8.1 ft

Time Started 1:45

Time Completed 2:05

Packers: Length 38 in.

Single (Double)

(Pneumatic) Mechanical

Water Pipe Length 5 ft

Water Pipe I.D. 1 in.

Gage height above groundwater 8.1 ft

Test No. 4

Page 1 of 1

Project 85736

Inspector M. McGoldrick

Driller C. Moon

Date 9-11-85

Chkd by

Date

	Water Pressure psi (gage)	Elapsed Time min.	Volume ~~cu ft~~ gal	ΔVolume ~~cu ft~~ gal	Packer Press psi	Remarks (Vibration, leaks, packer breaks, rock quality, pressure variation, etc.)
Holding Test	4.9	0:00	8.05		100	Partial circulation water
				0.00		
	4.8	1:00	8.05		100	loss in borehole -
				0.00		
	4.7	2:00	8.05		100	
				0.00		
	4.7	3:00	8.05		100	
				0.00		
	4.7	4:00	8.05		100	
				0.00		
	4.7	5:00	8.05		100	
Flow Test	5.2	0:00	8.05		100	
				0.00		
	5.3	1:00	8.05		100	
				0.00		
	5.5	2:00	8.05		100	
				0.00		
	5.5	3:00	8.05		100	
				0.00		
	5.5	4:00	8.05		100	
				0.00		
	5.5	5:00	8.05		100	

Gage No. 0-60 psi Flowmeter No. 27437535

WATER PRESSURE TESTING

Boring No. FD85-7F

Depth to bottom of boring 48.9 ft

Test Zone Depths

Top 17.8 ft
Bottom 22.8 ft

Depth to water table from ground surface 8.1 ft

Time Started 2:12
Time Completed 2:27

Packers: Length 38 in.

Single Double
Pneumatic Mechanical

Water Pipe Length 5 ft
Water Pipe I.D. 1 in.
Gage height above groundwater 8.1 ft

Test No. 5
Page 1 of 1
Project 85736
Inspector M. McGaffney
Driller C. Moon
Date 9-11-85
Chkd by
Date

	Water Pressure psi (gage)	Elapsed Time min.	Volume ~~cu ft~~ gal	ΔVolume ~~cu ft~~ gal	Packer Press psi	Remarks (Vibration, leaks, packer breaks, rock quality, pressure variation, etc.)
Holding Test	6.0	0:00	2.90		100	Partial circulation water
				0.00		
	0.0	0:05	2.90		100	loss in borehole
Flow Test	6.0	0:00	6.60		100	
				6.30		
	6.1	1:00	12.90		100	
				6.10		
	6.1	2:00	19.00		100	
				6.20		
	6.1	3:00	25.20		100	
				6.10		
	6.2	4:00	31.30		100	
				6.00		
	6.2	5:00	37.30		100	

Gage No. 0-60 psi Flowmeter No. 27437535

WATER PRESSURE TESTING

Boring No. FD 85-7F

Depth to bottom of boring 48.9 ft

Test Zone Depths

Top 12.8 ft

Bottom 17.8 ft

Depth to water table from ground surface 8.1 ft

Time Started 2:32

Time Completed 2:55

Packers: Length 38 in.

Single Double

Pneumatic Mechanical

Water Pipe Length 5 ft

Water Pipe I.D. 1 in.

Gage height above groundwater 8.1 ft

Test No. 6

Page 1 of 1

Project 85736

Inspector M. McCaffrey

Driller C. Moon

Date 9-11-85

Chkd by

Date

	Water Pressure psi (gage)	Elapsed Time min.	Volume ~~cu ft~~ gal	ΔVolume ~~cu ft~~ gal	Packer Press psi	Remarks (Vibration, leaks, packer breaks, rock quality, pressure variation, etc.)
Holding Test	5.5	0:00	5.90		75	Partial circulation water
	5.5	1:00	5.90	0.00	75	loss in borehole
	5.5	2:00	5.90	0.00	75	
	5.5	3:00	5.90	0.00	75	
	5.5	4:00	5.90	0.00	75	
	5.5	5:00	5.90	0.00	75	
Flow Test	6.0	0:00	5.70		75	
	6.0	1:00	5.70	0.00	75	
	7.0	2:00	5.70	0.00	75	
	7.0	3:00	5.70	0.00	75	
	7.0	4:00	5.70	0.00	75	
	7.0	5:00	5.70	0.00	75	

Gage No. 0-60 psi Flowmeter No. 27437535

WATER PRESSURE TESTING

Boring No. FD85-7F

Depth to bottom of boring 48.9 ft

Test Zone Depths

Top 7.8 ft

Bottom 12.8 ft

Depth to water table from ground surface 8.1 ft

Time Started 3:01

Time Completed 3:15

Packers: Length 38 in.

Single (Double)

(Pneumatic) Mechanical

Water Pipe Length 5 ft

Water Pipe I.D. 1 in.

Gage height above groundwater 8.1 ft

Test No. 7

Page 1 of 1

Project 85736

Inspector M. McLaffrey

Driller C. Moon

Date 9-11-85

Chkd by

Date

	Water Pressure psi (gage)	Elapsed Time min.	Volume ~~cu ft~~ gal	ΔVolume ~~cu ft~~ gal	Packer Press psi	Remarks (Vibration, leaks, packer breaks, rock quality, pressure variation, etc.)
Holding Test	6.0	0:00	6.35		75	Partial circulation water
				0.00		
	4.0	1:00	6.35		75	loss in bore hole
				0.00		
	1.0	2:00	6.35		75	
				0.00		
	0.0	3:00	6.35		75	
Flow Test	6.0	0:00	6.48		75	
				0.01		
	6.0	1:00	6.49		75	
				0.02		
	6.0	2:00	6.50		75	
				0.10		
	6.0	3:00	6.60		75	
				0.05		
	6.1	4:00	6.65		75	
				0.07		
	6.1	5:00	6.72		75	
				0.08		
	6.1	6:00	6.80		75	

Gage No. 0-60psi Flowmeter No. 27437535

WATER PRESSURE TESTING

Boring No. FD 85-8

Depth to bottom of boring 62 ft

Test Zone Depths

Top 44.5 ft

Bottom 49.5 ft

Depth to water table from ground surface 6.6 ft

Time Started 12:15

Time Completed 12:30

Packers: Length 38 in.

Single (Double)

(Pneumatic) Mechanical

Water Pipe Length 5 ft

Water Pipe I.D. 1 in.

Gage height above groundwater 6.6 ft

Test No. 1

Page 1 of

Project 85736

Inspector M. McCoffrey

Driller C. Moon

Date 9-6-85

Chkd by

Date

	Water Pressure psi (gage)	Elapsed Time min.	Volume ~~cu ft~~ gal	ΔVolume ~~cu ft~~ gal	Packer Press psi	Remarks (Vibration, leaks, packer breaks, rock quality, pressure variation, etc.)
Holding Test	5	0:00	1.40		100	Partial loss of circulation
				0.00		
	0	0:05	1.40		100	Water in borehole
Flow Test	5.0	0:00	5.00		100	
				4.85		
	5.2	0:30	9.85		100	
				4.05		
	5.5	1:00	13.95		100	
				9.05		
	5.5	2:00	23.00		100	
				8.95		
	5.5	3:00	31.95		100	
				9.00		
	5.1	4:00	40.95		100	
				8.61		
	5.2	5:00	49.56		100	
				8.94		
	5.2	6:00	58.50		100	
				8.75		
	5.2	7:00	67.25		100	
				8.53		
	5.2	8:00	75.78		100	
				8.66		
	5.2	9:00	84.44		100	
				8.69		
	5.2	10:00	93.13		100	

Gage No. 0-60psi Flowmeter No. 27437535

Ground surface is 6.3 ft above reservoir level at time of pressure testing

WATER PRESSURE TESTING

Boring No. FD85-8

Depth to bottom of boring 62.2 ft

Test Zone Depths

Top 39.5 ft

Bottom 44.5 ft

Depth to water table from ground surface 6.6 ft

Time Started 1:33

Time Completed 1:57

Packers: Length 38 in.

Single Double

Pneumatic Mechanical

Water Pipe Length 5 ft

Water Pipe I.D. 1 in.

Gage height above groundwater 6.6 ft

Test No. 2

Page 1 of

Project 85736

Inspector M. McCaffrey

Driller C. Moon

Date 9-6-85

Chkd by

Date

	Water Pressure psi (gage)	Elapsed Time min.	Volume ~~cu ft~~ gal	ΔVolume ~~cu ft~~ gal	Packer Press psi	Remarks (Vibration, leaks, packer breaks, rock quality, pressure variation, etc.)
Holding Test	5.0	0:00	0.49		50	Partial loss of circulation
	4.9	0:30	0.49	0.00	50	water in borehole
	4.8	1:00	0.49	0.00	50	
	4.8	2:00	0.49	0.00	50	
	4.7	3:00	0.49	0.00	50	
	4.6	4:00	0.49	0.00	50	
	4.6	5:00	0.49	0.00	50	
	4.6	6:00	0.49	0.00	50	
	4.6	7:00	0.49	0.00	50	
	4.6	10:00	0.49	0.00	50	
Flow Test	5.5	0:00	0.50		50	
	5.5	1:00	0.51	0.01	50	
	5.5	2:00	0.51	0.00	50	
	5.5	3:00	0.51	0.00	50	
	5.5	4:00	0.51	0.00	50	
	5.5	5:00	0.51	0.00	50	
	5.5	6:00	0.51	0.00	50	

Gage No. 0-60 -SI Flowmeter No. 2743 7535

WATER PRESSURE TESTING

Boring No. FD 85-8

Depth to bottom of boring 62.2 ft

Test Zone Depths

Top 34.5 ft

Bottom 39.5 ft

Depth to water table from ground surface 6.6 ft

Time Started 2:05

Time Completed 2:22

Packers: Length 38 in.

Single / (Double) Pneumatic / Mechanical

Water Pipe Length 5 ft

Water Pipe I.D. 1 in.

Gage height above groundwater 6.6 ft

Test No. 3

Page 1 of 1

Project 85774

Inspector [illegible]

Driller [illegible]

Date 9-6-85

Chkd by

Date

	Water Pressure psi (gage)	Elapsed Time min.	Volume ~~cu ft~~ gal	ΔVolume ~~cu ft~~ gal	Packer Press psi	Remarks (Vibration, leaks, packer breaks, rock quality, pressure variation, etc.)
Holding Test	5.0	0:00	9.88		50	Water circulation to
	5.0	1:00	9.88	0.00	50	surface less than
	5.0	2:00	9.88	0.00	50	volume of flush in
	4.9	3:00	9.88	0.00	50	borehole.
	4.9	4:00	9.88	0.00	50	
	4.9	5:00	9.88	0.00	50	
	4.9	6:00	9.88	0.00	50	
	4.9	7:00	9.88	0.00	50	
Flow Test	5.0	0:00	9.89		50	
	5.2	1:00	9.89	0.00	50	
	5.2	3:00	9.89	0.00	50	
	5.2	5:00	9.89	0.00	50	

Gage No. 0-60 psi Flowmeter No. 2743535

WATER PRESSURE TESTING

Boring No. FD 85-8

Depth to bottom of boring 62.2 ft

Test Zone Depths

Top 29.5 ft

Bottom 34.5 ft

Depth to water table from ground surface 6.6 ft

Time Started 2:28

Time Completed 2:48

Packers: Length 38 in.

Single Double

Pneumatic Mechanical

Water Pipe Length ___ ft

Water Pipe I.D. ___ in.

Gage height above groundwater 6.6 ft

Test No. 4

Page 1 of 1

Project 85736

Inspector [illegible]

Driller C. [illegible]

Date 9-6-85

Chkd by ___

Date ___

	Water Pressure psi (gage)	Elapsed Time min.	Volume ~~cu ft~~ gal	ΔVolume ~~cu ft~~ gal	Packer Press psi	Remarks (Vibration, leaks, packer breaks, rock quality, pressure variation, etc.)
Holding Test	5.0	0:00	7.10		50	Partial loss of circulation
	4.8	0:30	7.10	0.00	50	water in borehole
	4.0	1:00	7.10	0.00	50	
	4.0	2:00	7.10	0.00	50	
	4.0	3:00	7.10	0.00	50	
	4.0	4:00	7.10	0.00	50	
	4.0	5:00	7.10	0.00	50	
Flow Test	5.0	0:00	7.21		50	
	5.0	1:00	7.21	0.00	50	
	5.0	2:00	7.21	0.00	50	
	5.0	5:00	7.21	0.00	50	

Gage No. 0-60 psi Flowmeter No. 27437535

WATER PRESSURE TESTING

Boring No. FD85-8

Depth to bottom of boring 62.2 ft

Test Zone Depths

Top 24.5 ft

Bottom 29.5 ft

Depth to water table from ground surface 6.6 ft

Time Started 7:50

Time Completed 8:10

Packers: Length 38 in.

Single (Double)

(Pneumatic) Mechanical

Water Pipe Length 5 ft

Water Pipe I.D. 1 in.

Gage height above groundwater 6.6 ft

Test No. 5

Page 1 of 1

Project 85736

Inspector M. McGoffin

Driller C. Moon

Date 9-9-85

Chkd by

Date

	Water Pressure psi (gage)	Elapsed Time min.	Volume ~~cu ft~~ gal	ΔVolume ~~cu ft~~ gal	Packer Press psi	Remarks (Vibration, leaks, packer breaks, rock quality, pressure variation, etc.)
Holding Test	5.0	0:00	5.24		50	Partial loss of circulation
	0.0	0:05	5.24	0.00	50	water in borehole
Flow Test	5.5	0:00	5.22		50	
	5.6	1:00	5.22	0.00	50	
	5.6	2:00	5.22	0.00	50	
	5.6	3:00	5.22	0.00	50	
	5.6	4:00	5.23	0.01	50	
	5.6	5:00	5.23	0.00	50	
	5.6	6:00	5.23	0.00	50	

Gage No. 0-60psi Flowmeter No. 27437535

WATER PRESSURE TESTING

Boring No. FD85-8

Depth to bottom of boring 62.2 ft

Test Zone Depths

Top 19.5 ft

Bottom 29.5 ft

Depth to water table from ground surface 6.6 ft

Time Started 8:20

Time Completed 8:37

Packers: Length 38 in.

Single (Double)

(Pneumatic) Mechanical

Water Pipe Length 5 ft

Water Pipe I.D. 1 in.

Gage height above ground-water 6.6 ft

Test No. 6

Page 1 of 1

Project 85736

Inspector M. McCoy

Driller C. Moon

Date 9-9-85

Chkd by

Date

	Water Pressure psi (gage)	Elapsed Time min.	Volume ~~cu ft~~ gal	ΔVolume ~~cu ft~~ gal	Packer Press psi	Remarks (Vibration, leaks, packer breaks, rock quality, pressure variation, etc.)
Holding Test	5.0	0:00	3.33		50	Partial circulation
				0.00		
	0.0	0:05	3.33		50	Water loss in borehole
Flow Test	5.5	0:00	3.35		50	
				0.01		
	5.5	1:00	3.36		50	
				0.00		
	5.5	2:00	3.36		50	
				0.00		
	5.5	3:00	3.36		50	
				0.00		
	5.5	4:00	3.36		50	
				0.00		
	5.5	5:00	3.36		50	
				0.03		
	5.5	7:00	3.39		50	
				0.00		
	5.5	9:00	3.39		50	

Gage No. 0-60psi Flowmeter No. 27437535

WATER PRESSURE TESTING

Boring No. FD 85-8

Depth to bottom of boring 62.2 ft

Test Zone Depths

Top 14.5 ft

Bottom 19.5 ft

Depth to water table from ground surface 6.6 ft

Time Started 8:42

Time Completed 9:05

Packers: Length 38 in.

Single (Double)

(Pneumatic) Mechanical

Water Pipe Length 5 ft

Water Pipe I.D. 1 in.

Gage height above ground-water 6.6 ft

Test No. 7

Page 1 of 1

Project 85736

Inspector M. McCoffrey

Driller C. Moon

Date 9-9-85

Chkd by

Date

	Water Pressure psi (gage)	Elapsed Time min.	Volume ~~cu ft~~ gal	ΔVolume ~~cu ft~~ gal	Packer Press psi	Remarks (Vibration, leaks, packer breaks, rock quality, pressure variation, etc.)
Holding Test	5.8	0:00	9.74		50	Partial loss of circulation
	5.8	0:30	9.74	0.00	50	water in borehole.
	5.8	1:00	9.74	0.00	50	
	5.8	2:00	9.74	0.00	50	
	5.8	3:00	9.74	0.00	50	
	5.8	5:00	9.75	0.00	50	
	5.8	8:00	9.75	0.00	50	
Flow Test	5.7	0:00	9.50		50	
	5.7	1:00	9.50	0.00	50	
	5.7	2:00	9.50	0.00	50	
	5.7	3:00	9.50	0.00	50	
	5.7	5:00	9.50	0.00	50	

Gage No. 0-60psi Flowmeter No. 27437535

WATER PRESSURE TESTING

Boring No. FD 85-8

Depth to bottom of boring 62.2 ft

Test Zone Depths

Top 9.5 ft

Bottom 14.5 ft

Depth to water table from ground surface 6.6 ft

Time Started 9:18

Time Completed 9:55

Packers: Length 38 in.

Single Double

Pneumatic Mechanical

Water Pipe Length 5 ft

Water Pipe I.D. 1 in.

Gage height above groundwater 6.6 ft

Test No. 8

Page 1 of 1

Project 85736

Inspector M. Mafatia

Driller C. Moon

Date 9-9-85

Chkd by

Date

	Water Pressure psi (gage)	Elapsed Time min.	Volume ~~cu ft~~ gal	ΔVolume ~~cu ft~~ gal	Packer Press psi	Remarks (Vibration, leaks, packer breaks, rock quality, pressure variation, etc.)
Holding Test	5.8	0:00	9.32		50	Partial loss of circulation
				0.00		
	5.8	1:00	9.32		50	water in borehole
				0.00		
	5.8	2:00	9.32		50	
				0.00		
	5.7	3:00	9.32		50	
				0.00		
	5.7	4:00	9.32		50	
				0.00		
	5.7	5:00	9.32		50	
				0.00		
	5.7	6:00	9.32		50	
Flow Test	5.5	0:00	9.81		50	
				0.49		
	5.8	1:00	10.30		50	
				0.30		
	5.7	2:00	10.60		50	
				0.70		
	5.7	3:00	11.30		50	
				0.80		
	5.7	4:00	12.10		50	
				0.60		
	5.7	5:00	12.70		50	
				0.70		
	5.7	6:00	13.40		50	
				1.10		
	5.7	7:00	14.50		50	
				1.35		
	5.7	8:00	15.85		50	
				1.05		
	5.6	9:00	16.90		50	

Gage No. 0-60psi Flowmeter No. 274375

WATER PRESSURE TESTING

Boring No. FD85-8

Depth to bottom of boring 62.2 ft.

Test Zone Depths

Top 4.5 ft

Bottom 9.5 ft

Depth to water table from ground surface 6.6 ft

Time Started 10:00

Time Completed 10:27

Packers: Length 3.8 in.

Single Double

~~Pneumatic~~ Mechanical

Water Pipe Length 5 ft

Water Pipe I.D. 1 in.

Gage height above groundwater 6.6 ft

Test No. 9

Page 1 of 1

Project 85736

Inspector M. McCoffin

Driller C. Moon

Date 9-9-85

Chkd by

Date

	Water Pressure psi (gage)	Elapsed Time min.	Volume ~~cu ft~~ gal	ΔVolume ~~cu ft~~ gal	Packer Press psi	Remarks (Vibration, leaks, packer breaks, rock quality, pressure variation, etc.)
Holding Test	5.8	0:00	5.60		50	Partial loss of circulation water
				0.00		
	5.8	1:00	5.60		50	
				0.00		
	5.8	2:00	5.60		50	
				0.00		
	5.8	3:00	5.60		50	
				0.00		
	5.8	4:00	5.60		50	
				0.00		
	5.8	5:00	5.60		50	
				0.00		
	5.8	6:00	5.60		50	
				0.00		
	5.8	7:00	5.60		50	
Flow Test	6.0	0:00	5.51		50	
				0.00		
	6.0	1:00	5.51		50	
				0.00		
	6.0	2:00	5.51		50	
				0.00		
	6.0	3:00	5.51		50	
				0.00		
	6.0	4:00	5.51		50	
				0.00		
	6.0	5:00	5.51		50	

Gage No. 0-60 psi Flowmeter No. 274375

Reservoir water level 6.0 ft below ground surface at boring B-8

WATER PRESSURE TESTING

Boring No. FD 85-9

Depth to bottom of boring 33.3 ft

Test Zone Depths

Top 20.8 ft

Bottom 25.8 ft

Depth to water table from ground surface 16.1 ft

Time Started 2:45

Time Completed 3:20

Packers: Length 38 in.

Single (Double)

(Pneumatic) Mechanical

Water Pipe Length 5 ft

Water Pipe I.D. 1 in.

Gage height above groundwater 16.1 ft

Test No. 1

Page 1 of 1

Project E5736

Inspector M. McCaffrey

Driller C. Moon

Date 9-3-85

Chkd by

Date

	Water Pressure psi (gage)	Elapsed Time min.	Volume ~~cu ft~~ gal	ΔVolume ~~cu ft~~ gal	Packer Press psi	Remarks (Vibration, leaks, packer breaks, rock quality, pressure variation, etc.)
Holding Test	6.0	0:00	4.85		40	With packers deflated water
				0.00		
	5.9	0:30	4.85		40	flow through pipe. circulation
				0.00		
	5.9	1:00	4.85		40	to surface could not be
				0.00		
	5.9	1:30	4.85		40	acheived in 10 min of flow,
				0.00		
	5.9	2:00	4.85		40	about 100 gal pumped
				0.00		
	5.8	3:00	4.85		40	
				0.00		
	5.2	4:00	4.85		40	
				0.00		
	5.0	5:00	4.85		40	
				0.00		
	4.4	6:00	4.85		40	
				0.00		
	4.0	7:00	4.85		40	
				0.00		
	4.0	8:00	4.85		40	
				0.00		
	3.8	9:00	4.85		40	
Flow Test	5	0.0	5.65		40	
				0.00		
	5	1:00	5.65		40	
				0.00		
	5	2:00	5.65		40	
				0.00		
	5	3:00	5.65		40	
				0.00		
	5	5:00	5.65		40	
				0.00		
	5	7:00	5.65		40	
				0.00		
	5	10:00	5.65		40	

Gage No. 0-100psi Flowmeter No. 27437535

Ground surface is 6.5 ft above reservoir level at time of pressure testing

WATER PRESSURE TESTING

Boring No. FD 85-9

Depth to bottom of boring 33.3 ft

Test Zone Depths

Top 15.8 ft

Bottom 20.8 ft

Depth to water table from ground surface 16.1 ft

Time Started 8:40

Time Completed 9:06

Packers: Length 38 in.

Single Double

Pneumatic Mechanical

Water Pipe Length 5 ft

Water Pipe I.D. 1 in.

Gage height above groundwater 16.1 ft Reservoir 6.54

Test No. 2

Page 1 of 1

Project 85736

Inspector M Mc[illegible]

Driller C. Moon

Date 9-4-85

Chkd by

Date

	Water Pressure psi (gage)	Elapsed Time min.	Volume ~~cu ft~~ gal	ΔVolume ~~cu ft~~ gal	Packer Press psi	Remarks (Vibration, leaks, packer breaks, rock quality, pressure variation, etc.)
Holding - Test	5.0	0:00	7.30		50	Packers deflated [illegible]
	4.0	0:30	7.30	0.00	50	[illegible]
	3.8	1:00	7.30	0.00	50	surface could not be achieved
	3.8	2:00	7.30	0.00	50	in 10 min of flow about
	3.8	3:00	7.30	0.00	50	100 gal pumped
	3.8	4:00	7.30	0.00	50	
	3.8	5:00	7.30	0.00	50	
	3.8	7:00	7.40	0.10	50	
	3.8	10:00	7.40	0.00	50	
Flow Test	5.5	0:00	7.60		50	
	5.0	1:00	7.75	0.15	50	
	5.5	2:00	7.76	0.01	50	
	5.0	3:00	7.77	0.01	50	
	5.2	4:00	7.79	0.02	50	
	5.0	5:00	7.79	0.00	50	
	5.0	6:00	7.79	0.00	50	
	5.0	7:00	7.79	0.00	50	
	5.0	8:00	7.79	0.00	50	
	5.0	9:00	7.79	0.00	50	
	5.0	10:00	7.79	0.00	50	

Gage No. 0-60psi Flowmeter No. 27437535

WATER PRESSURE TESTING

Boring No. FD 85-9

Depth to bottom of boring 33.3 ft

Test Zone Depths

Top 10.8 ft

Bottom 5.8 ft

Depth to water table from ground surface 16.1 ft

Time Started 9:12

Time Completed 9:37

Packers: Length 38 in.

Single (Double) Pneumatic Mechanical

Water Pipe Length 5 ft

Water Pipe I.D. 1 in.

Gage height above groundwater 16.1 ft Reservoir 6.5 ft

Test No. 3

Page 1 of 1

Project 85736

Inspector M. McFadden

Driller C. Moon

Date 9-4-85

Chkd by

Date

	Water Pressure psi (gage)	Elapsed Time min.	Volume ~~cu ft~~ gal	ΔVolume ~~cu ft~~ gal	Packer Press psi	Remarks (Vibration, leaks, packer breaks, rock quality, pressure variation, etc.)
Holding Test	5.0	0:00	0.29		50	Packers deflated water flow
	4.2	1:00	0.29	0.00	50	through pipe, circulation to
	3.7	2:00	0.29	0.00	50	surface could not be achieved
	3.5	3:00	0.29	0.00	50	in 5 min of flow, about
	3.2	4:00	0.29	0.00	50	50 gal pumped
	3.0	5:00	0.29	0.00	50	
	2.8	7:00	0.29	0.00		
Flow Test	5.0	0:00	1.31		50	
	5.0	1:00	1.31	0.00	50	
	5.0	2:00	1.39	0.08	50	
	5.0	3:00	1.42	0.03	50	
	5.0	4:00	1.49	0.06	50	
	5.0	5:00	1.50	0.02	50	
	5.0	6:00	1.51	0.01	50	
	5.0	7:00	1.54	0.03	50	
	5.0	8:00	1.56	0.02	50	
	5.0	9:00	1.58	0.02	50	
	5.0	10:00	1.60	0.02	50	

Gage No. 0-60 psi Flowmeter No. 27437535

WATER PRESSURE TESTING

Boring No. FD 85-9

Depth to bottom of boring 33.3 ft

Test Zone Depths

Top 5.4 ft

Bottom 10.4 ft

Depth to water table from ground surface 16.1 ft

Time Started 9:52

Time Completed 10:10

Packers: Length 38 in.

~~Single~~ Double

Pneumatic ~~Mechanical~~

Water Pipe Length 5 ft

Water Pipe I.D. 1 in.

Gage height above groundwater 16.1 ft Reservoir 6.5 ft

Test No. 4

Page 1 of 1

Project [illegible]

Inspector [illegible]

Driller [illegible]

Date 9-4-85

Chkd by

Date

	Water Pressure psi (gage)	Elapsed Time min.	Volume ~~cu ft~~ gal	ΔVolume ~~cu ft~~ gal	Packer Press psi	Remarks (Vibration, leaks, packer breaks, rock quality, pressure variation, etc.)
Holding Test	4.8	0:00	6.41		50	Packers deflated water flow
	4.6	1:00	6.41	0.00	50	through pipe circulation to
	4.5	2:00	6.41	0.00	50	surface could not be achieved
	4.5	3:00	6.41	0.00	50	in 5 min of flow at 5psi
	4.5	4:00	6.41	0.00	50	about 50 gal pumped
	4.5	5:00	6.41	0.00	50	
	4.5	7:00	6.41	0.00	50	
Flow Test	5.0	0:00	6.35		50	
	5.1	1:00	6.35	0.00	50	
	5.1	2:00	6.37	0.02	50	
	5.2	3:00	6.41	0.04	50	
	5.2	4:00	6.44	0.03	50	
	5.3	5:00	6.48	0.04	50	
	5.3	6:00	6.50	0.02	50	
	5.3	7:00	6.51	0.01	50	
	5.4	8:00	6.51	0.00	50	
	5.4	9:00	6.51	0.00	50	
	5.4	10:00	6.51	0.00	50	

Gage No. 0-60 psi Flowmeter No. 27437535

APPENDIX C

DAILY ACTIVITY LOGS

DAILY ACTIVITY LOG

Date	Activity
August 14, 1985	Stephen Whiteside and Charles Conlon (GEI) met Paul L'Heureux (NED-CE) on site at 0730. Located control points for centerline of dam. Drill crew arrived on site at 1100. Set up on boring FD85-1. Drilled and sampled from 0 to 10 ft.
August 15, 1985	Continued boring FD85-1. Drilled and sampled from 10 to 32.5 ft. Left site to buy cement. Grouted borehole. Set up on boring FD85-2. Paul L'Heureux (NED-CE) was on site most of the day to observe the drilling and sampling operations.
August 16, 1985	Began boring FD85-2. Drilled and sampled from 0 to 32.5 ft. Grouted borehole. Set up on boring FD85-4.
August 19, 1985	Began boring FD85-4. Drilled and sampled from 0 to 40 ft.
August 20, 1985	Continued boring FD85-4. Drilled and sampled from 40 to 53.4 ft. Drilled without sampling from 53.4 to 57.5 ft. Grouted borehole. Set up on boring FD85-6. Conducted safety meeting.
August 21, 1985	Drill rig down for 2 hours to remove grout clogged in pump and hoses. Began boring FD85-6. Drilled and sampled from 0 to 40 ft.
August 22, 1985	Continued boring FD85-6. Drilled and sampled from 40 to 49 ft. Drilled without sampling from 49 to 56 ft.
August 23, 1985	Continued boring FD85-6. Drilled without sampling from 56 to 64.5 ft. Terry Wong (NED-CE) was on site in the afternoon to observe the drilling operations. Surveyors were on site for 4 hours in the afternoon to locate boreholes for water pressure testing and determine as-drilled locations of completed boreholes.

August 26, 1985	Rain delayed work for 4 hours. Grouted boring FD85-6. Set up on boring FD85-5. Drilled and sampled from 0 to 20 ft.
August 27, 1985	Continued boring FD85-5. Drilled and sampled from 20 to 52 ft. Conducted safety meeting.
August 28, 1985	Continued boring FD85-5. Drilled without sampling from 52.0 to 57.5 ft. Grouted borehole. Set up on boring FD85-3. Drilled and sampled from 0 to 30 ft.
August 29, 1985	Continued boring FD85-3. Drilled and sampled from 30 to 56.3 ft. Grouted borehole. Set up on boring FD85-9. Michael McCaffrey (GEI) arrived at the site at 1100. Charles Conlon left the site at 1400. Augered without sampling from 0 to 3.2 ft. Casing advanced to 3.3 ft. Cored the concrete core wall from 3.3 to 10.0 ft.
August 30, 1985	Continued boring FD85-9. Cored concrete from 10.0 to 24.5 ft.
September 3, 1985	Continued boring FD85-9. Cored concrete from 24.5 to 29.5 ft and bedrock from 29.5 to 33.3 ft. Set up water pressure testing equipment. Performed water pressure tests from 25.8 to 20.8 ft. Held safety meeting.
September 4, 1985	Performed water pressure tests in boring FD85-9 from 20.8 ft to 5.4 ft. Grouted borehole. Began boring FD85-8. Augered without sampling from 0 to 2.2 ft. Casing advanced to 2.3 ft. Cored the concrete core wall from 2.3 to 12.0 ft.
September 5, 1985	Continued boring FD85-8. Cored the concrete core wall from 12.0 to 39.2 ft.
September 6, 1985	Continued boring FD85-8. Cored the concrete core wall from 39.2 to 50.2 ft and soil with cobbles and boulders from 50.2 to 62.2 ft. Performed water pressure tests from 49.5 to 29.5 ft. John Hart and Terry Wong (NED-CE) visited the site to observe the water pressure testing.
September 9, 1985	Continued boring FD85-8 water pressure tests from 29.5 to 4.5 ft. Grouted borehole. Set up on boring FD85-7A. Held safety meeting.

September 10, 1985 Began boring FD85-7A. Augered 10.5 ft without encountering the concrete core wall. Began boring FD85-7B. Augered 7.0 ft without encountering the concrete core wall. Began boring FD85-7C. Augered 7.0 ft without encountering the concrete core wall. Began boring FD85-7D. Augered 10.5 ft without encountering the concrete core wall. Began boring FD85-7E. Augered 3.0 ft, encountered refusal on the concrete core wall. Began boring FD85-7F. Augered to 3.0 ft, encountered refusal on the concrete core wall. Cored the concrete core wall in boring FD85-7F from 3.0 to 33.9 ft.

September 11, 1985 Continued boring FD85-7F. Cored the concrete core wall from 33.9 to 46.9 ft and soil underlying the core wall from 46.9 to 48.9 ft. Performed water pressure tests from 42.8 to 7.8 ft.

September 17, 1985 Grouted borehole FD85-7F. Began boring FD85-7G. Augered 10.5 ft without encountering the concrete core wall. Began boring FD85-7H. Augered 9.5 ft without encountering the concrete core wall. Began boring FD85-7I. Augered 10.5 ft without encountering the concrete core wall. Demobilized equipment and left the site.

GEOTECHNICAL ENGINEERS INC.

WEEKLY SAFETY MEETING

TO: Safety Office, NED

Date Held: August 20, 1985

FROM: Field Engineer

Time: 1515 Hours

THRU: Project Manager

Weekly safety meeting was held this date for the following personnel:

Contract No. DACW33-85-D-0010

Conducted by: Charles Conlon

Personnel present:
Charles Conlon of GEI
Carl Moon, Israel Allison, and Philip Hemba of COE-Mobile District

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

Accident Prevention Plan
Individual Protective Equipment - Hard hats and gloves
Prevention of Falls - Not applicable (N.A.)
Back Injury, Safe Lifting Techniques - OK
Fire Prevention - Three fire extinguishers
Sanitation, First Aid, Waste Disposal - First aid kit, plastic bag for trash, no toilet
Tripping Hazards - Trash, hose, nails in lumber - Hoses not a hazard
Staging, Ladders, Concrete Forms, Safety Nets - N.A.
Hand Tools, Portable Power Tools, Woodworking Machinery - Good condition
Equipment Inspection and Maintenance (Zero Defects) - Fluid levels checked daily
Hoisting Equipment - Good condition
Ropes, Hooks, Chains, and Slings - Good condition
Electrical Grounding, Temporary Wiring, GFCI - N.A.
Lockouts for Safe Clearance Procedures - Electrical, pressure, moving parts - N.A.
Welding, Cutting - N.A.
Excavations - N.A.
Loose Rock and Steep Slopes - N.A.
Explosives - N.A.
Water Safety - N.A.
Toxic Materials - hazards, MSDS, respiratory, ventilation - N.A.
Other - N.A.

Prepared by: Charles Conlon
GEI Field Engineer

GEOTECHNICAL ENGINEERS INC.

WEEKLY SAFETY MEETING

TO: Safety Office, NED

Date Held: August 20, 1985

FROM: Field Engineer

Time: 1515 Hours

THRU: Project Manager

2. Exposure: Total on-site exposure hours for August 14-August 20, 1985:

Charles Conlon	48 man hours
COE Drilling Personnel	108 man hours
Security Guards	125 man hours

Signature: Stephen L. Whitford
GEI Project Manager

3. Forwarded: NED, Waltham, MA

GEOTECHNICAL ENGINEERS INC.

WEEKLY SAFETY MEETING

TO: Safety Office, NED

Date Held: August 27, 1985

FROM: Field Engineer

Time: 1500 Hours

THRU: Project Manager

Weekly safety meeting was held this date for the following personnel:

Contract No. DACW33-85-D-0010

Conducted by: Charles Conlon

Personnel present:
Charles Conlon of GEI
Carl Moon, Israel Allison, and Philip Hemba of COE-Mobile District

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

Individual Protective Equipment - Hard hats worn and gloves
Prevention of Falls - Not applicable (N.A.)
Back Injury, Safe Lifting Techniques - OK
Fire Prevention - Two fire extinguishers stolen over weekend; one fire extinguisher left in pick up
Sanitation, First Aid, Waste Disposal - First aid kit, no toilet
Tripping Hazards - Trash, hose, nails in lumber - Hoses not a hazard
Staging, Ladders, Concrete Forms, Safety Nets - N.A.
Hand Tools, Portable Power Tools, Woodworking Machinery - Good condition
Equipment Inspection and Maintenance (Zero Defects) - Fluid levels checked daily
Hoisting Equipment - Good condition
Ropes, Hooks, Chains, and Slings - Good condition
Electrical Grounding, Temporary Wiring, GFCI - N.A.
Lockouts for Safe Clearance Procedures - Electrical, pressure, moving parts - N.A.
Welding, Cutting - N.A.
Excavations - N.A.
Loose Rock and Steep Slopes - N.A.
Explosives - N.A.
Water Safety - N.A.
Toxic Materials - hazards, MSDS, respiratory, ventilation - N.A.
Other - N.A.

Prepared by: Charles Conlon
GEI Field Engineer

GEOTECHNICAL ENGINEERS INC.

WEEKLY SAFETY MEETING

TO: Safety Office, NED

Date Held: August 27, 1985

FROM: Field Engineer

Time: 1500 Hours

THRU: Project Manager

2. Exposure: Total on-site exposure hours for August 21-August 27, 1985:

Charles Conlon	48 man hours
COE Drilling Personnel	120 man hours
Security Guards	123 man hours

Signature: Stephen L. Whitcomb
GEI Project Manager

3. Forwarded: NED, Waltham, MA

GEOTECHNICAL ENGINEERS INC.

WEEKLY SAFETY MEETING

TO: Safety Office, NED

Date Held: September 3, 1985

FROM: Field Engineer

Time: 1245 Hours

THRU: Project Manager

Weekly safety meeting was held this date for the following personnel:

Contract No. DACW33-85-D-0010

Conducted by: Michael McCaffrey

Personnel present:
Michael McCaffrey of GEI
Carl Moon, Israel Allison, and Philip Hemba of COE-Mobile District

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

Accident Prevention Plan
Individual Protective Equipment - Hard hats, gloves, steel toe boots, goggles
Prevention of Falls - OK
Back Injury, Safe Lifting Techniques - OK
Fire Prevention - Fire extinguisher
Sanitation, First Aid, Waste Disposal - First aid kit, plastic bag for trash, no toilet
Tripping Hazards - Trash, hose, nails in lumber - None
Staging, Ladders, Concrete Forms, Safety Nets - Not Applicable (N.A.)
Hand Tools, Portable Power Tools, Woodworking Machinery - N.A.
Equipment Inspection and Maintenance (Zero Defects) - OK, greased daily
Hoisting Equipment - OK
Ropes, Hooks, Chains, and Slings - OK
Electrical Grounding, Temporary Wiring, GFCI - N.A.
Lockouts for Safe Clearance Procedures - Electrical, pressure, moving parts - N.A.
Welding, Cutting - N.A.
Excavations - N.A.
Loose Rock and Steep Slopes - N.A.
Explosives - N.A.
Water Safety - N.A.
Toxic Materials - hazards, MSDS, respiratory, ventilation - N.A.
Other - N.A.

Prepared by: Michael McCaffrey
Geotechnical Engineer

GEOTECHNICAL ENGINEERS INC.

WEEKLY SAFETY MEETING

TO: Safety Office, NED

Date Held: September 3, 1985

FROM: Field Engineer

Time: 1245 Hours

THRU: Project Manager

2. Exposure: Total on-site exposure hours for August 28-September 3, 1985:

Charles Conlon/Michael McCaffrey	38 man hours
COE Drilling Personnel	96 man hours
Security Guards	48 man hours

Signature: Stephen L. Whitsad
GEI Project Manager

3. Forwarded: NED, Waltham, MA

GEOTECHNICAL ENGINEERS INC.

WEEKLY SAFETY MEETING

TO: Safety Office, NED

Date Held: September 9, 1985

FROM: Field Engineer

Time: 1230 Hours

THRU: Project Manager

Weekly safety meeting was held this date for the following personnel:

Contract No. DACW33-85-D-0010

Conducted by: Michael McCaffrey

Personnel present:
Michael McCaffrey of GEI
Carl Moon, Israel Allison, and Philip Hemba of COE-Mobile District

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

Accident Prevention Plan
Individual Protective Equipment - Hard hats, steel toe boots, goggles
Prevention of Falls - OK
Back Injury, Safe Lifting Techniques - OK
Fire Prevention - Fire extinguisher
Sanitation, First Aid, Waste Disposal - First aid kit, plastic bag for trash, no toilet
Tripping Hazards - Trash, hose, nails in lumber - None
Staging, Ladders, Concrete Forms, Safety Nets - Not Applicable (N.A.)
Hand Tools, Portable Power Tools, Woodworking Machinery - N.A.
Equipment Inspection and Maintenance (Zero Defects) - Daily
Hoisting Equipment - OK
Ropes, Hooks, Chains, and Slings - OK
Electrical Grounding, Temporary Wiring, GFCI - N.A.
Lockouts for Safe Clearance Procedures - Electrical, pressure, moving parts - N.A.
Welding, Cutting - N.A.
Excavations - N.A.
Loose Rock and Steep Slopes - N.A.
Explosives - N.A.
Water Safety - N.A.
Toxic Materials - hazards, MSDS, respiratory, ventilation - N.A.
Other - N.A.

Prepared by: Michael McCaffrey
Geotechnical Engineer

GEOTECHNICAL ENGINEERS INC.

WEEKLY SAFETY MEETING

TO: Safety Office, NED

Date Held: September 9, 1985

FROM: Field Engineer

Time: 1230 Hours

THRU: Project Manager

2. Exposure: Total on-site exposure hours for September 4-September 6, 1985:

Michael McCaffrey	32 man hours
COE Drilling Personnel	72 man hours
Security Guards	40 man hours
John Hart, NED-COE	2 man hours
Terry Wong, NED-COE	2 man hours

Signature: Stephen L. Whitcomb
GEI Project Manager

3. Forwarded: NED, Waltham, MA

GEOTECHNICAL ENGINEERS INC.

WEEKLY SAFETY REPORT

TO: Safety Office, NED Date: September 20, 1985

FROM: Field Engineer

THRU: Project Manager

Weekly safety report for final segment of Old Quincy Reservoir Dam field work. Safety meeting was not held due to partial work week.

Contract No. DACW33-85-D-0010

1. Exposure: Total on-site exposure hours for September 9-September 17, 1985:

Michael McCaffrey/Paul Deterling	30 man hours
CE Drilling Personnel	31 man hours
Security Guards	62 man hours

Signature: Stephen L. Whitcomb
GEI Project Manager

2. Forwarded: NED, Waltham, MA

APPENDIX E

CHAIN OF CUSTODY RECORD

GEOTECHNICAL ENGINEERS INC.

CHAIN OF CUSTODY RECORD

Project: Old Quincy Reservoir Dam

Contract DACW-33-85-D-0010
Delivery Order No. 2

Items:

Jar Samples	12 Boxes FD85-1 to FD85-6
Bottles	
Core Boxes	12 Boxes FD85-7F, FD85-8, FD85-9
Sampling Logs	
Other	

Relinquished by (signature)	Date/Time	Received by (signature)
1. Frank Nolan	10/10/85 1130	Michael J Carroll
2.		
3.		
4.		
5.		

APPENDIX F

NED-CE SCOPE OF WORK

1. PROJECT IDENTIFICATION.

a. Authority: The authority for this work is set forth under energy Public Law - 98-360, energy and water development dated 16 July 1984.

b. Project Site: Old Quincy Reservoir, Braintree, Massachusetts

2. PROJECT DESCRIPTION.

a. Old Quincy Reservoir Dam consists of a heterogenous mixture of fill materials consisting of sands and gravels, a centrally located stone masonry and concrete core wall, and a partial timber sheet pile cutoff wall beneath the left half of the embankment. The embankment fill consists of a randomly distributed mixture of fill materials ranging from silty fine sands to silty sandy gravels with densities varying from loose to dense.

Foundation overburden materials beneath the embankment vary in depth from 5 feet at the right abutment to 70 feet beneath the left abutment. The overburden consists mainly of glacial outwash deposits of medium dense to dense stratified silty sands and gravels overlying a thin deposit of glacial till on the right abutment and bedrock over the remaining alignment.

3. ITEMS FURNISHED BY THE GOVERNMENT

Attachment No. 1: Sheets of selected drawings of Old Quincy Reservoir Dam.

Attachment No. 2: SPT Drilling Procedures

Government Drill Crew and Equipment

4. A/E SERVICES

a. General. The A/E shall provide quality assurance, survey, security, safety meetings, instructions for the field drill crew and geotechnical report.

b. Surveying. The test boring locations are shown on Attachment No. 1 and shall be located by the A/E using EDM devices. Locations shall be stake and marked clearly. A sketch showing locations (station and offset or coordinates) and elevations of the proposed boring shall be provided to the geotechnical engineer and the Government immediately following the survey.

Control points "Reservoir #1" and spillway crest at the abutments shall be used for horizontal and vertical controls respectively and shall be noted in the survey data.

c. The depth of each hole is shown on Attachment No. 1. Each hole shall be grouted with a bentonite (10%) - cement (90%) mixture.

d. Six (6) test borings shall be advanced and sampled in the embankment and foundation zone according to specification Attachment No.

2. Drilling mud shall be used as the drilling fluid and to maintain an open hole.

e. Three (3) test borings shall be drilled through the existing core wall with NX size core. Pressure testing of the core wall shall be performed every five (5) feet. Pressure for testing shall be hydrostatic (from top of dam to center of packers) plus five (5) pounds per square inch. This pressure shall be maintained for at least five (5) minutes and the rate of water loss shall be recorded.

f. The drive sample borings and drill holes shall be numbered FD85-1 through FD85-9 in order of their completion. The holes shall be drilled in chronological order (B-1 through B-9).

g. During the time of performing the borings and pressure testing, the geotechnical engineer shall provide telephone reports to Mr. T. Wong, Corps of Engineers Headquarters at least every two working days and upon completion of each hole prior to grouting hole.

h. The A/E shall provide security to prevent vandalism of the drill rig and equipment during non-work hours.

i. All samples shall be delivered to the Corps of Engineers Headquarters in Waltham, Massachusetts by the geotechnical engineer. Sample and copies of drilling logs shall be delivered within seven days of completion of field work. Sample delivery shall be coordinated with the Director, NED Materials and Water Quality Laboratory at 617-647-8367/8392.

j. A geotechnical report shall contain the scope of investigation, quality assurance of the drilling and surveying, summary of daily activities, safety reports, chain of custody and survey drawings.

5. COORDINATION. Liaison will be maintained for the duration of the delivery order through telephone conversations with Mr. Terry Wong.

6. COMPLETION SCHEDULE.

Services under this delivery order shall start (on or about 5 August 1985) as directed by Mr. T. Wong through telephone instructions. Duration of field work is estimated to be twenty-five work days. Copies of drilling logs shall be submitted with samples within seven days after completion of field work. Two copies of the geotechnical report shall be submitted in draft format for review by the Government no later than fourteen calendar days after completion of field work. Review will take approximately ten calendar days from receipt of draft report. Three copies of the final geotechnical report shall be submitted no later than seven calendar days after receipt of draft report including the action taken on possible comments.

7. QUALITY CONTROL.

Your attention is invited to the Contract General Provisions, "Responsibility of the Architect-Engineer" and "Design Within Funding Limitations". You will be held responsible for the quality of the maps submitted and for all damages caused the Government as a result of your negligence in the performance of any services furnished under the contract.

Although submissions required by your contract are technically reviewed by the Government, it is emphasized that your work must be prosecuted using proper internal controls and review procedures. The letter of transmittal for each submission which you make shall include a certification that the submission has been subjected to your own review and coordination procedures to insure (a) completeness for each discipline commensurate with the level of effort required for that submission, (b) elimination of conflicts, errors and omissions, and (c) the overall professional and technical accuracy of the submission. Documents which are significantly deficient in any of these areas will be returned to you for correction and/or upgrading prior to our completing our review. Contract submission dates will not be extended if a resubmission of draft material is required for this reason. It is requested that you indicate in writing in your fee proposal letter your cognizance of this requirement and that your firm and your associates, if any, have the professional competency and technical expertise necessary to accomplish this project in a satisfactory manner.

ATTACHMENT NO. 2

LIQUEFACTION ASSESSMENT

CONTINUOUS (2.5 FT. CENTERS) STANDARD PENETRATION TESTS

1. SCOPE. Apparatus and procedures shall be in conformance with ASTM D-1586-67, STANDARD METHOD FOR PENETRATION TEST AND SPLIT-BARREL SAMPLING SOILS, except as modified and/or amplified hereinafter.

2. Use a rope and drum system, with two turns of the rope around the drum, to lift the falling weight. The rope shall be replaced before it becomes worn or polished.

3. SPT hole diameter shall be kept to a diameter of about 4 inches. Where casing is required, it should be four-inch diameter. A centering device (spider) shall be used to center the rods during the standard penetration test in the cased zone.

4. The type of rods used shall be recorded on the boring log and the length of rods shall be recorded for each drive.

5. The hole shall be cleaned out to a depth of one foot below previous drive (sampling every 2.5 ft). The split-spoon shall be driven no more than 18 inches, including slough, if any. The cumulative penetration resistance per blow, measured to the nearest .025 ft shall be measured and recorded with the aid of a graduated measuring rule securely attached to the casing or fixed reference. If the penetration per blow is less than 0.1 ft, the measurement shall be made after every other blow, or less frequently, so long as at least one measurement is recorded for each 0.1 ft of penetration. For each measurement, record the cumulative number of blows and the cumulative penetration. Depth to the beginning and end of drive shall be measured and recorded for each test. The amount of slough shall be recorded on the forms for the Standard Penetration Tests. If the amount of slough exceeds 0.25 feet, the sampler shall be pulled from the hole and the hole cleaned out before proceeding with the test.

6. Refusal is defined as 100 blows within the first 6 inches or 60 blows within the second or third 6 inch increment. The material giving the refusal shall be cored or roller bit drilled or fishtailed.

7. Two disturbed jar samples shall be taken from each split spoon sample.

8. Casing shall be used only within the upper 10 feet of the hole. The casing shall always be at least 1 foot above start of next drive.

9. The drilling mud shall be used to support the hole and prevent heave of the bottom of the hole. The mud column must be above the water table at all times. The weight and viscosity of the drilling fluid shall be controlled so that the cuttings would be effectively removed from the hole. The actual weight and viscosity shall be varied as necessary. Cuttings shall be cleaned from the hole by stopping rotation at the required depth and maintaining circulation until the final cuttings are removed. The hole shall be cleaned out to the bottom of every SPT sample with a fishtail bit fitted with upward deflectors of the circulation ports. To prevent disturbance of the material being tested, slow withdrawal rates of about 0.5 feet per second shall be used near the bottom of the hole when removing tools after cleanout.