

## OBSERVATION WELL INSTALLATION DETAIL

Client: ARMY CORPS OF ENGINEERS, NED

Aberjona River, Wells G&H

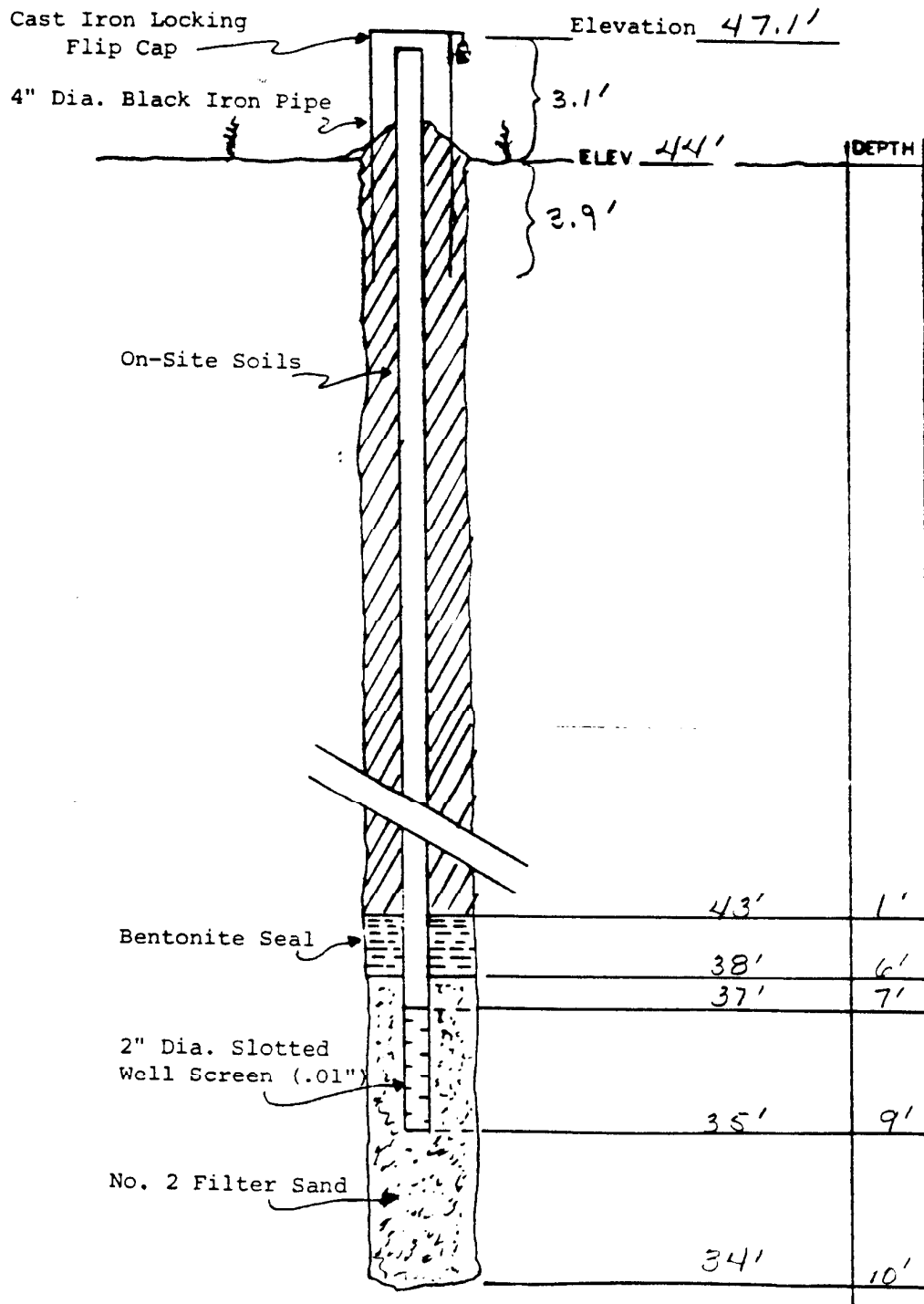
Project: Woburn MA

DACW-33-85-D-001

Project No. D.O.#0003

Well No. FD85- 5

Cluster No. S- 87



5

CLUSTER 3-87 FD-85-5

CORPS OF ENGINEERS, U. S. ARMY  
NEW ENGLAND DIVISION  
FOUNDATION AND MATERIALS BRANCH  
FIELD LOG OF TEST BORING

Site Abetjona River, Woburn PROJECT NO. DACW 23-85-D-0011  
D.O.# 3  
Page 1 of 3 Pages  
Hole No. FD-85-5 Diam. (Casing) 4" Boring Started 10/2/85  
Co-ordinates: N 500000 E — Boring Completed 10/2/85  
Drilled by Davis and Hawkins Report Submitted —

Purpose of Exploration observation wells are required by EPA for  
hydrologic modeling for others

Elevation Top of Hole 44' M.S.L.  
Total Overburden Drilled 10 Feet  
Elevation Top of Rock — M.S.L.  
Elevation Bottom of Hole 34' M.S.L.  
Total Rock Drilled 0 Feet  
Total Depth of Hole 10 Feet  
Core Recovered — %  
Core Recovered — Ft.; — Diam. — In.  
Soil Samples — In. Diam. — No.  
Soil Samples — In. Diam. — No.

Casing Left in Place TOTAL 7.0 Feet  
3.1' stick up

SEE FD-85-4 FOR SOIL LOG

Water Table Depth 1.31

Depth		Method of Drilling and Type of Bit Used	INDEX
From	To		
0.0	10.0	4.5" I 40 (New) SNG. P. 1001	Ground Water <u>—</u> Back of Page <u>1</u>
		HYDRANT WATER USED	Boring Location Sketch <u>—</u> Back of Page <u>1</u>
		DURING ALL DRILLING	Overburden Record <u>—</u> Page <u>2</u>
			Rock Drilling <u>—</u> Page <u>2</u>
			<u>—</u> Page <u>—</u>
			<u>—</u> Page <u>—</u>
			<u>—</u> Page <u>—</u>

Prepared by Field Data Submitted by Lab. Data

PROJECT: <i>Shallow Seismicity Study</i>		DATE: <i>2 Oct 85</i>	
LOCATION (STA): <i>S-10</i>	OFFSET FROM CENTER LINE: <i>—</i>	PIEZ NO.: <i>FD-85-5</i>	
PIEZ TYPE: <i>slotted piezometer</i>	<i>2"x2"</i> DEPTH OF PIEZ: <i>8'</i>	RISER PIPE DIAM: <i>4"</i>	
PIEZ TIP SET IN (SOIL TYPE): <i>clay</i>	SOIL SAMPLE NO.: <i>SS-3</i>		
	BORING DIAM: <i>8"</i>		
METHOD OF INSTALLATION: <i>shallow slotted piezometer</i>			
TYPE OF PROTECTION FOR PIEZ: <i>4" casing 7' total</i>			
GROUND ELEV.: <i>44'</i>	ELEV. TOP OF RISER: <i>47.1'</i>	VENT: <i>lock cap</i>	
		ELEV PIEZ TIP: <i>35'</i>	
FILTER: <i>fine sand</i>	FROM ELEV: <i>39'</i>	TO ELEV: <i>38'</i>	
SEAL: <i>grease</i>	FROM ELEV: <i>38'</i>	TO ELEV: <i>42'</i>	
INSTALLED BY: <i>L. J. ...</i>	CONTRACT <i>LRW 33-85-</i>		
	NO.: <i>0-0011</i>	FOREMAN: <i>Rodriguez</i>	
	D.O. # <i>3</i>		
DATE OF INSTALLATION: <i>2 Oct 85</i>		DATE OF OBSERVATIONS: <i>10/16/85</i>	

DATE OF INSTALLATION: 2 Oct 67

DATE OF OBSERVATIONS: 10/16/75

METHOD OF

TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
		4.41	3	4.41				
1	0	0.18						
	1/2	3.28						
	1	4.11						
	2	4.39						

REMARKS:

FISHER

INSPECTOR

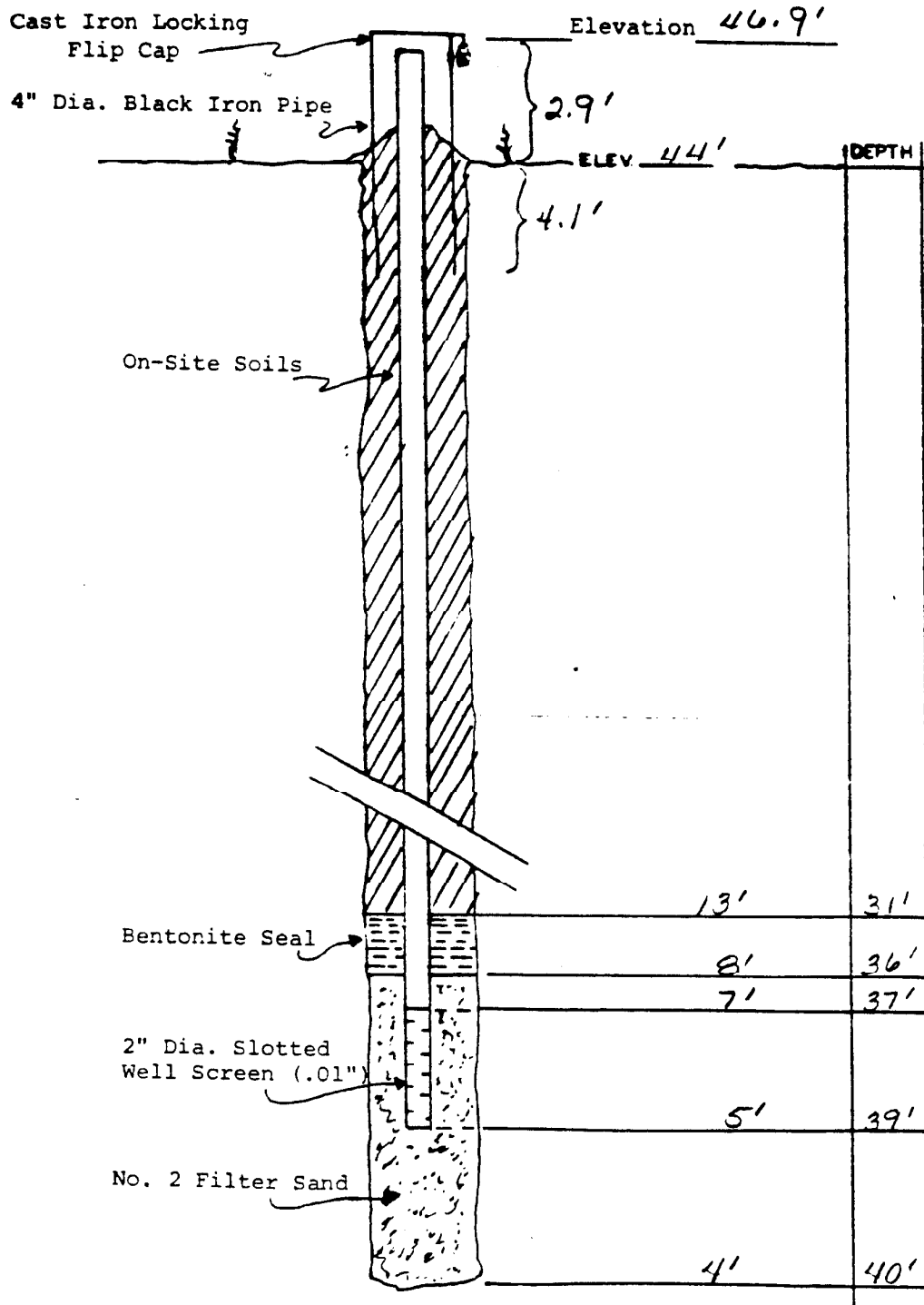
## OBSERVATION WELL INSTALLATION DETAIL

**Client:** ARMY CORPS OF ENGINEERS, NED

**Project No.** DACW-33-85-D-001  
D.O.#0003

**Project:** Aberjona River, Wells G&H  
Woburn MA

**Well No.** FD85-4  
**Cluster No.** S-87



CLUSTER S-87

FD-85-4

CORPS OF ENGINEERS, U. S. ARMY  
NEW ENGLAND DIVISION  
FOUNDATION AND MATERIALS BRANCH  
FIELD LOG OF TEST BORING

PROJECT NO. DACW-55-85-D-0011  
Site ABERTONA River, NORFOLK MASS D.O. #3  
Page 1 of      Pages  
Hole No. FD-85-4 Diam. (Casing) 4 1/4 Boring Started 10/1/85  
Co-ordinates: N 50° 00' E Boring Completed 10/1/85  
Drilled by SAUL DAVIS / ROYAL HARRIS Report Submitted     

Purpose of Exploration SOIL SAMPLING & FLOODING (LUL) INVESTIGATION

Elevation Top of Hole : 44' M.S.L. Casing Left in Place 7.00 TOTAL 2.9' stickup Fe  
Total Overburden Drilled 40 Feet  
Elevation Top of Rock      M.S.L.  
Elevation Bottom of Hole 4' M.S.L.  
Total Rock Drilled 0 Feet  
Total Depth of Hole 40.0 Feet  
Core Recovered      %  
Core Recovered      Ft.;      Diam.      In.  
Soil Samples 138 In. Diam. 8 No.  
Soil Samples      In. Diam.      No. Water Table Depth 1.23'

Depth		Method of Drilling and Type of Bit Used	INDEX	
From	To			
		<u>ANGEL (HORIZONTAL) DRILLING</u>	Ground Water	Back of Page <u>1</u>
		<u>HYDRANT WATER USED DURING</u>	Boring Location Sketch	Back of Page <u>1</u>
		<u>ALL DRILLING</u>	Overburden Record	Page <u>10</u>
			Rock Drilling	Page <u>11</u>
				Page <u>    </u>
				Page <u>    </u>
				Page <u>    </u>

Prepared by GREG J. HETZLER Field Data  
Submitted by      Lab. Data

U. S. ARMY  
CORPS OF ENGINEERS  
NEW ENGLAND DIVISION

Site LIPPERTONA R. JESSUP, MA Page 1 of 2 Page

Boring No. ED-85-4 Desig. 4 Diam. (Casing) 4"

FIELD LOG OF TEST BORING

Co-ordinates: N See Drawing E —

Elevation Top of Boring 44 M.S.L. Hammer Wt. 140<sup>lb</sup> Boring Started 10/1/85  
Total Overburden Drilled 40 Feet Hammer Drop 30"  
Elevation Top of Rock — M.S.L. Casing Left 7' TOTAL 4" casing Boring Completed 10/1/85  
Total Rock Drilled 0 Feet (Subsurface Water Data) — Page —  
Elevation Bottom of Boring 4 M.S.L. Obs. Well 2'  
Total Depth of Boring 40.0 Feet Drilled By PAUL DAVIS / HAWKINS  
Core Recovered — % No. Boxes — Mfg. Des. Drill TRACK MOUNT CME 45  
Core Recovered — Ft. — Diam. — In. Inspected By: PAUL FISHER  
Soil Samples 1 3/8 In. Diam. 8 No. Classification By: PAUL FISHER  
Soil Samples — In. Diam. — No. Classification By: GRV HETELER

DEPTH	CORE/SAMPLE			BLOWS PER FT. CORE RECOVERY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIAL
	NO.	SIZE	PERCENT			
1.0						
1.5	SS 1	1 3/8	35%	1 1/2	8" HOLLOW STEM AUGER	FEAT, BK, Moist. (A) ORGANIC F. SAND, TR. SILT, GR. MARL (C) 5
5.0						POSSIBLE CHANNEL
6.5	SS 2		100%	3 1/4		ORGANIC SILT, BK MARL, BROWN (CL-2) CLAY, TA. SAND, GR. MARL (C) M. SAND, BK (SP)
10.0						
11.5	SS 3		100%	WOR-3 1/2		M. SAND, BK, Moist. (SP) F. SAND, GR, Moist. (SP)
15.0						
16.5	SS 4		75%	2 5/11		SILTY F. SAND, GR, WET (SM)
20						
21.5	SS 5		62	3 2/3	← FLOWING SANDS, ROLLER WASH	SAND; SOME SILT W/FA SP M SAND, GR, WET SP

GENERAL REMARKS:

Piezometer INSTALLED to Elev. 39'

Noted — CONTAMINANTS  
From 15' - 40'

Site <i>Algonquin River, Ontario</i>					Boring No. <i>FD-85-4</i>		Page <i>2</i> of <i>2</i>	
DEPTH		CORE/SAMPLE		BLOWS PER FT CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS		
<i>25</i>	<i>1'</i>	NO.	SIZE				DEPTH RANGE	
<i>25.5</i>		<i>SS-6</i>	<i>1 3/8</i>	<i>53</i>	<i>25.5</i>	<i>cm sand mat, BAN. SW</i>		
<i>30</i>								
<i>31.5</i>		<i>SS-7</i>		<i>68</i>	<i>2.4</i> <i>11</i>	<i>SAME AS SS-5</i>		
<i>35</i>								
<i>36.5</i>		<i>SS-8</i>		<i>65</i>	<i>2.0</i> <i>9.3</i>	<i>CM SAND; wet; TN (SW)</i>		
<i>40.0</i>								
					<i>BOTTOM OF BORING</i>			

# PIEZOMETER INSTALLATION REPORT

PROJECT: ABERJONA RIVER, WOBURN MASS DATE: 10/1/85  
 LOCATION (STA): SEE DRAWING OFFSET FROM CENTER LINE: — PIEZ NO.: 4  
 PIEZ TYPE: CASAGRANDE .0105" 2" X 2' SLOTTED DEPTH OF PIEZ: 39' RISER PIPE DIAM: 2"  
 PIEZ TIP SET IN SOIL (SOIL TYPE): CM SAND, WET, TN, SW SAMPLE NO.: S-B BORING DIAM: 8"  
 METHOD OF INSTALLATION: AUGER 4" ID  
 TYPE OF PROTECTION FOR PIEZ: 4" ID CASING 7' length VENT: LOCK CAP  
 GROUND ELEV.: 44' ELEV. TOP OF RISER: 46.9 ELEV. PIEZ TIP: 5'  
 FILTER: SAND #2 FROM ELEV: 4' TO ELEV: 8'  
 SEAL: BENTONITE Pellets 3/8 FROM ELEV: 8' TO ELEV: 13'  
 INSTALLED BY: PAUL DAVIS / HAWKINS CONTRACT NO.: D.O.#3 FOREMAN: PAT SULLIVAN  
 DATE OF INSTALLATION: 10/1/85 DATE OF OBSERVATIONS: 10/16/85

METHOD OF TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
		4.13	3	4.13	end of test			
4:09	0	0.16						
	1/2	3.21						
	1	3.91						
	2	4.12						

REMARKS:

Gregory J Hetzler  
INSPECTOR



# ATLANTIC TESTING LABORATORIES, LIMITED

aj

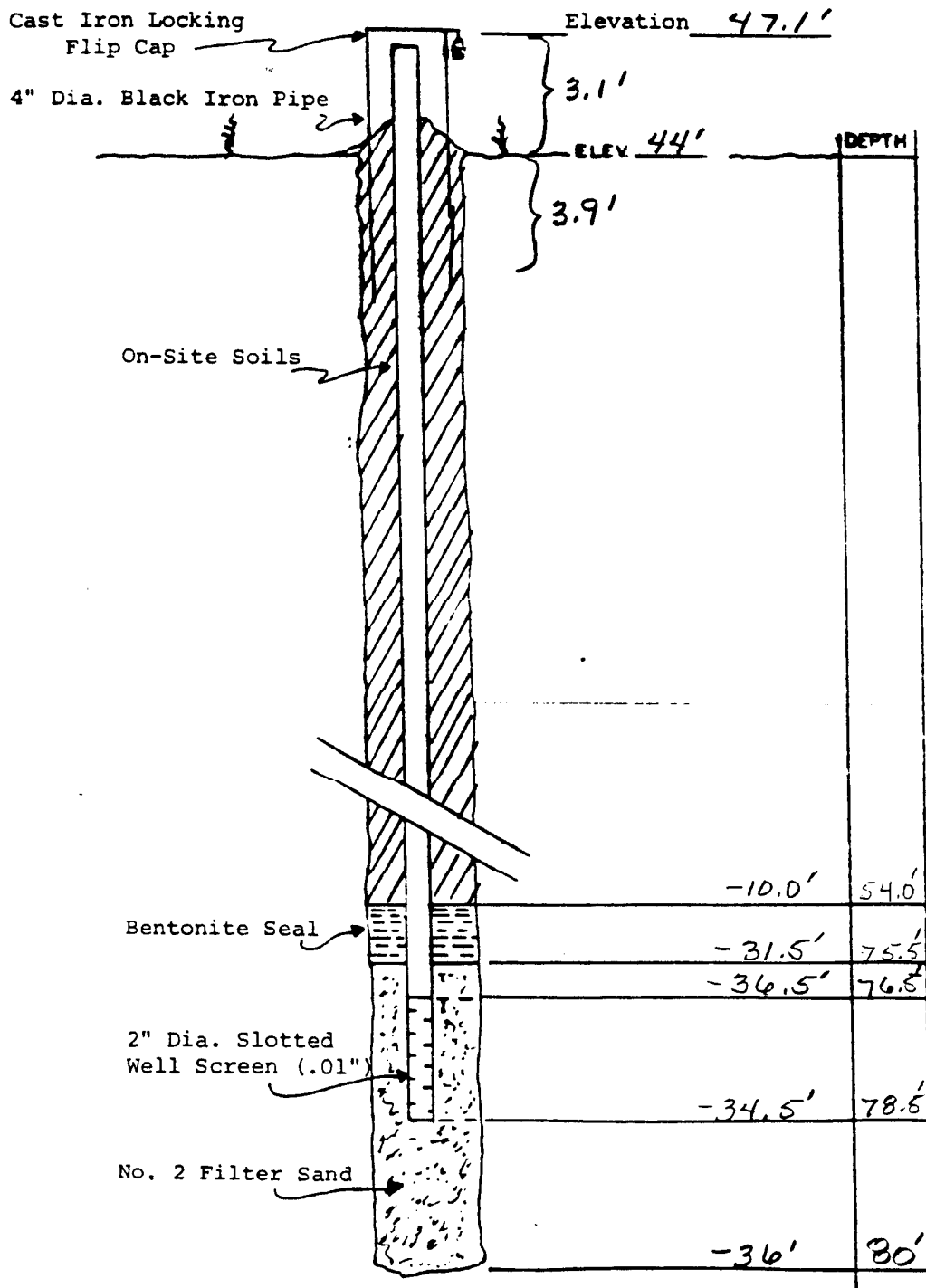
## OBSERVATION WELL INSTALLATION DETAIL

Client: ARMY CORPS OF ENGINEERS, NED

Project No. DACW-33-85-D-001  
D.O.#0003

Project: Aberjona River, Wells G&H  
Woburn MA

Well No. FD85- 14  
Cluster No. S- 87



CLUSTER S-87

FD-85-14

CORPS OF ENGINEERS, U. S. ARMY  
NEW ENGLAND DIVISION  
FOUNDATION AND MATERIALS BRANCH  
FIELD LOG OF TEST BORING

WELLS G+H,  
Site NEERTANA RIVER, WOBURN, MA PROJECT NO. DACN-33-85-D-0011  
D.O. #3  
Page 1 of 1 Pages  
Hole No. FD-85-14 Diam. (Casing) 4' Boring Started 10/11/85  
Co-ordinates: N SEE E DRAWING Boring Completed 10/16/85  
Drilled by CAMBRIDGE S. BAYER Report Submitted \_\_\_\_\_

Purpose of Exploration SOIL SAMPLING + INSTALL PIEZOMETER

Elevation Top of Hole 44' M.S.L.  
Total Overburden Drilled 80.0 Feet  
Elevation Top of Rock — M.S.L.  
Elevation Bottom of Hole -36 M.S.L.  
Total Rock Drilled 0 Feet  
Total Depth of Hole 80.0 Feet  
Core Recovered — %  
Core Recovered — Ft.; — Diam. — In.  
Soil Samples 13/8 In. Diam. 9 No.  
Soil Samples — In. Diam. — No.

Casing Left in Place TOTAL 7.0 Feet  
3.1' stick up

Water Table Depth 1.47'

Depth		Method of Drilling and Type of Bit Used	INDEX
From	To		
0	80	3" ROLLER BIT FOLLOWED BY 4" DRIVEN CASING. HYDRAULIC WATER USED DURING ALL DRILLING	Ground Water _____ Back of Page _____ Boring Location Sketch _____ Back of Page _____ Overburden Record _____ Page _____ Rock Drilling _____ Page _____ _____ Page _____ _____ Page _____ _____ Page _____

Prepared by M. THEN Field Data

Submitted by ATLANTIC TESTING LAB

Lab. Data

U. S. ARMY  
CORPS OF ENGINEERS  
NEW ENGLAND DIVISION

Site ABERJONA R. W. P. D. U. Page 1 of 2 Page

Boring No. FD-B5-14 Desig. 14 Diam. (Casing) 4"

FIELD LOG OF TEST BORING

Co-ordinates: N SEE DRAWING E —

Elevation Top of Boring 44 M.S.L. Hammer Wt. 140# Boring Started 10/11/85  
Total Overburden Drilled 80 Feet Hammer Drop 30"  
Elevation Top of Rock — M.S.L. Casing Left 41 Boring Completed 10/16/85  
Total Rock Drilled 0 Feet  
Elevation Bottom of Boring -36 M.S.L. Obs. Well 2"  
Total Depth of Boring 80 Feet Drilled By CAMBRIDGE + BOYER  
Core Recovered — % No. Boxes — Mfg. Des. Drill TRACK MOUNTED CMR-55  
Core Recovered — Ft. — Diam. — In. Inspected By PAUL FISHER  
Soil Samples 1 3/8 In. Diam. — No. Classification By A. Thew  
Soil Samples — In. Diam. — No. Classification By —

DEPTH 1' 5'	CORE/SAMPLE		BLOWS PER FT. CORE RECOVERED	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIAL
	NO.	SIZE			
			REL	ADVANCE BORING BY 3" ROLLER BIT FOLLOWED BY 4" DRIVEN CASING	SOIL LOGS FOR OTO 40 FT FOUND ON FD-B5-4
40	SS-1	1 3/8	100%		Brown-Black cmf SAND, GRAVE WET (BA-SW)
41.5			100%		
45					
46.5	SS-2	1 3/8	20%		SAME AS SS-11
50					
51.5	SS-3	1 3/8	100%		Brown cmf SAND, and GRAVEL (WET)
53					BOULDER ENCOUNTERED @ 52.0 +
55					
56.5	SS-4	1 3/8	100%		SAME AS SS-3; NGL encountered trace amounts of cordons ments TLE, TETRAHYDROETHYLENE BOULDER ENCOUNTERED @ 56.5 TO 57.5
57.5					
60.0					

GENERAL REMARKS:

Site <u>Alapaha River, Hokee</u>					Boring No. <u>FD-85-14</u>		Page <u>2</u> of <u>2</u>	
DEPTH		CORE/SAMPLE		BLOWS PER FT.	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS		
Feet	NO.	SIZE	PERCENT CORE RECOVERED					
61.5	S-5	1 7/8		52-74 10%		Gray cmf SAND; SOME GRAVEL; trace SILT (wet)		
65.0	S-6	1 7/8				BOULDERS ENCOUNTERED @ 61.0'-65.0' WASH SAMPLE 110.0'-165.0' (43%)		
67.0								
68.5	S-7	1 3/8		93-123 143-150		Brown cmf SAND; and GRAVEL (wet) trace SILT		
70.0						BOULDERS ENCOUNTERED @ 70.0'		
75.0	S-8	1 7/8						
76.5	S-9	1 3/8	10%	19- 100%	Water level 3' 4" (10/16 AM)	Grey cmf SAND; and GRAVEL (wet)		
78.5						BOULDER ENCOUNTERED @ 76.0' to 78.5'		
80.0						BORING TERMINATED @ 80.0'		

# PIEZOMETER INSTALLATION REPORT

PROJECT: Aberjona River, Woburn DATE: 10/15/85  
LOCATION (STA): see Map OFFSET FROM CENTER LINE: — PIEZ NO.: FD-85-14  
PIEZ TYPE: slotted 2" x 2' long DEPTH OF PIEZ: 78.5 RISER PIPE DIAM: 2"  
PIEZ TIP SET IN SOIL (SOIL TYPE): C.M.F. Sand + Gravel SAMPLE NO.: S-9 BORING DIAM: 4"  
METHOD OF INSTALLATION: Hollow Stem Auger Soils  
TYPE OF PROTECTION FOR PIEZ: 4" Casing 7' Total VENT: lock cap  
GROUND ELEV.: 44' ELEV. TOP OF RISER: 47.1' ELEV PIEZ TIP: -34.5'  
FILTER: Silica sand #2 FROM ELEV: -36' TO ELEV: -31.5'  
SEAL: Bentonite Slurry FROM ELEV: -31.5' TO ELEV: -10'  
INSTALLED BY: Cambridge & Boyer CONTRACT NO.: DO-3 FOREMAN: Fisher  
DATE OF INSTALLATION: 10/16/85 DATE OF OBSERVATIONS: 10/16/85

METHOD OF TESTING PIEZ.: Falling Head Test

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
		4.57						
16 23	0	0.10						
	1/2	4.57						

REMARKS:

FISHER

INSPECTOR

# ATLANTIC TESTING LABORATORIES, LIMITED

aj

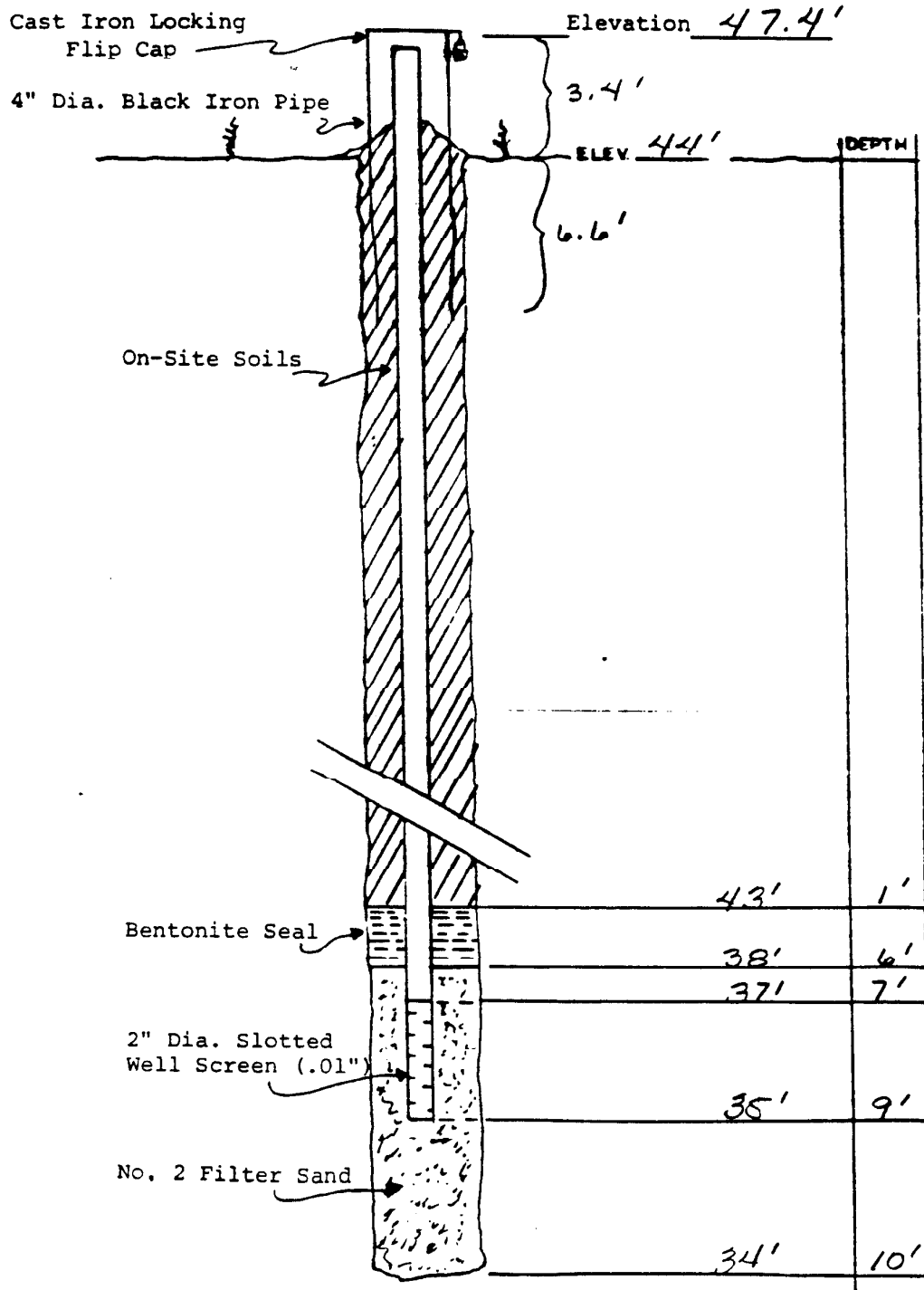
## OBSERVATION WELL INSTALLATION DETAIL

Client: ARMY CORPS OF ENGINEERS, NED

Project No. DACW-33-85-D-0011  
D.O.#0003

Project: Aberjona River, Wells G&H  
Woburn MA

Well No. FD85- 12  
Cluster No. S-88



CLUSTER 5-88

FD-85-12

CORPS OF ENGINEERS, U. S. ARMY

NEW ENGLAND DIVISION

FOUNDATION AND MATERIALS BRANCH

## FIELD LOG OF TEST BORING

Site ABERJONA RIVER  
WENUS G & H, WOBURN, MAPROJECT NO. 00. 3

DACW-33-85-D-0011

Page 1 of 2 Pages

Hole No. FD-85-12 Diam. (Casing) 4"Boring Started 10/11/85Co-ordinates: N SEE E DRAWINGBoring Completed 10/11/85Drilled by DAVIS & HAWKINS

Report Submitted \_\_\_\_\_

Purpose of Exploration FOR INSTALLATION OF PIERSOMETERElevation Top of Hole 44 M.S.L.Casing Left in Place 4" x TOTAL 10 Feet  
3.4 STICKUPTotal Overburden Drilled 10 FeetElevation Top of Rock — M.S.L.

SEE FD-85-9 FOR SOIL LOG

Elevation Bottom of Hole 34 M.S.L.Total Rock Drilled 0 FeetTotal Depth of Hole 10 FeetCore Recovered — %Core Recovered — Ft.; — Diam. — In.Soil Samples — In. Diam. — No.Soil Samples — In. Diam. — No.Water Table Depth 0.53'

Depth		Method of Drilling and Type of Bit Used
From	To	
0	10	3" POWER, FOLLOWED BY 4" DRIVEN CASING. HYDRAULIC WATER USED FOR ALL DRILLING.

## INDEX

Ground Water \_\_\_\_\_ Back of Page \_\_\_\_\_

Boring Location Sketch \_\_\_\_\_ Back of Page 1

Overburden Record \_\_\_\_\_ Page \_\_\_\_\_

Rock Drilling \_\_\_\_\_ Page \_\_\_\_\_

\_\_\_\_\_ Page \_\_\_\_\_

\_\_\_\_\_ Page \_\_\_\_\_

\_\_\_\_\_ Page \_\_\_\_\_

Prepared by FISHER

Field Data

Lab. Data

Submitted by ATLFORM  
DEC 63 121

REPLACES EDITION OF JUN 51 WHICH MAY BE USED UNTIL EXHAUSTED

# PIEZOMETER INSTALLATION REPORT

PROJECT: ADJASONA RIVER, WOBURN, MA DATE: 10/12/85  
 LOCATION (STA): SEE DRAWING OFFSET FROM CENTER LINE: — PIEZ NO.: FD-85-12  
 PIEZ TYPE: 2" SLOTTED .010" x 2' LONG DEPTH OF PIEZ: 9' RISER PIPE DIAM: 2"  
 PIEZ TIP SET IN SOIL FO-85-9  
 (SOIL TYPE): M. G. SAND & GRAVEL SAMPLE NO.: 55-3 BORING DIAM: 4"  
 METHOD OF INSTALLATION: 3" POWER BIT FOLLOWED BY 4" DRIVEN CASING  
 TYPE OF PROTECTION FOR PIEZ: 4" PPE X 10' TIE LENGTH VENT: LOCK CAP  
 GROUND ELEV.: 44 ELEV. TOP OF RISER: 47.4 ELEV PIEZ TIP: 35  
 FILTER: #2 SAND FROM ELEV: 34 TO ELEV: 38  
 SEAL: PELENITE 3/8 FROM ELEV: 38 TO ELEV: 43  
 INSTALLED BY: DAVIS & HAWKINS CONTRACT DACW-33-85-D-0011  
 NO.: D.O. #3 FOREMAN: FISHER  
 DATE OF INSTALLATION: 10/11/85 DATE OF OBSERVATIONS: 10/12/85  
 METHOD OF TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
10:48		3.93						
	0	0.55						
	1/4	3.70						
	1/2	3.90						
	1	3.73						

REMARKS:

FISHER  
INSPECTOR



## OBSERVATION WELL INSTALLATION DETAIL

Client: ARMY CORPS OF ENGINEERS, NED

Aberjona River, Wells G&H

Project: Woburn MA

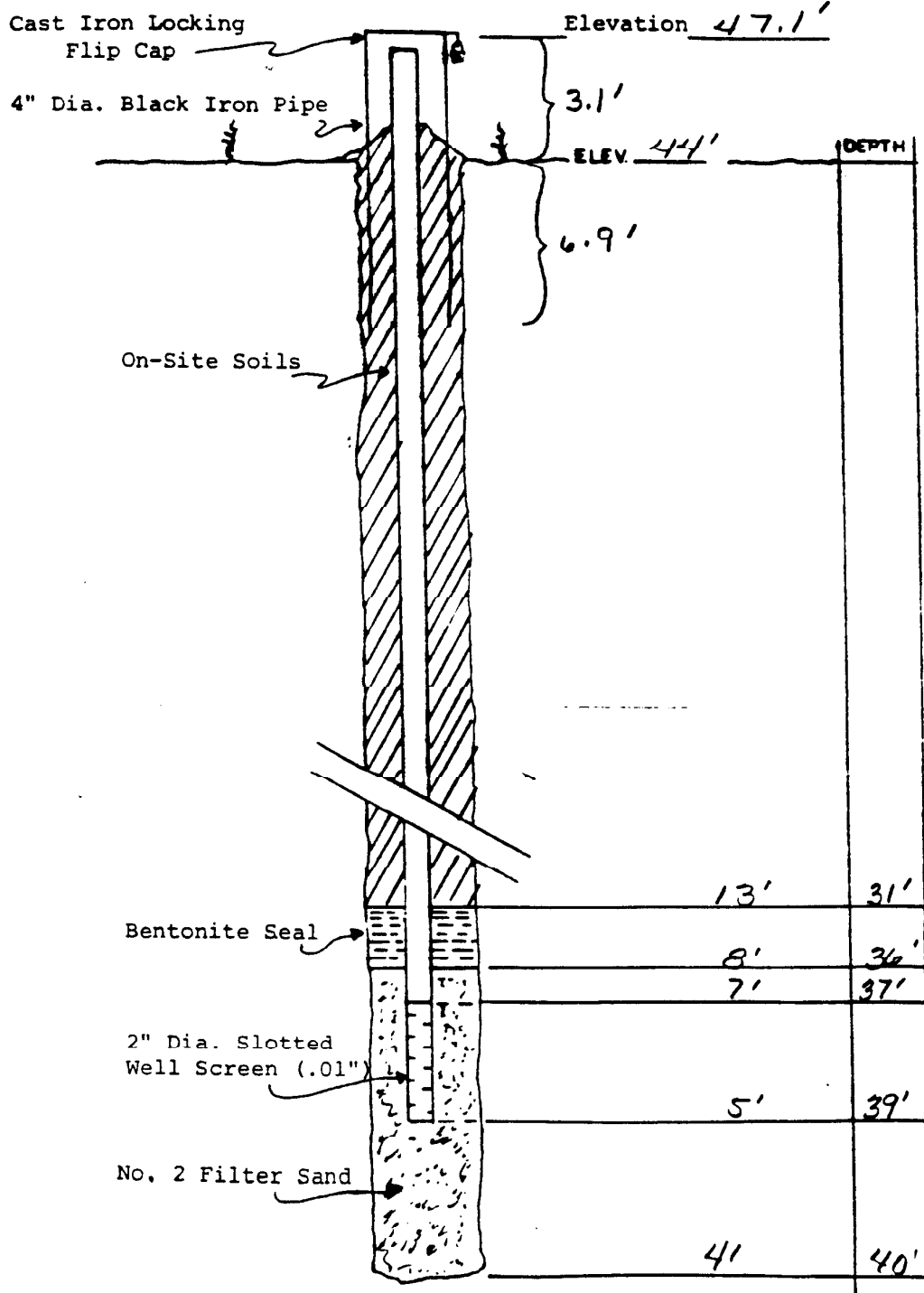
DACW-33-85-D-001

D.O.#0003

Project No.

Well No. FD85- 13

Cluster No. S-88



CLUSTER 5-88

FD-85-13

CORPS OF ENGINEERS, U. S. ARMY  
NEW ENGLAND DIVISION  
FOUNDATION AND MATERIALS BRANCH  
FIELD LOG OF TEST BORING

ABERJONA RIVER  
Site Well G++ Woburn MA PROJECT NO. OACN-33-85-D0011 DP. #3  
Page 1 of      Pages

Hole No. FD-85-13 Diam. (Casing) 4" Boring Started 10/11/85  
Co-ordinates: N SEE E DRAWING Boring Completed 10/11/85  
Drilled by DAVIS & HANKINS Report Submitted                     

Purpose of Exploration SOIL SAMPLING & PRESSOMETER INSTALLATION

Elevation Top of Hole 44 M.S.L.  
Total Overburden Drilled 40 Feet  
Elevation Top of Rock      M.S.L.  
Elevation Bottom of Hole 4 M.S.L.  
Total Rock Drilled 0 Feet  
Total Depth of Hole 40 Feet  
Core Recovered      %  
Core Recovered      Ft.;      Diam.      In.  
Soil Samples      In. Diam.      No.  
Soil Samples      In. Diam.      No.  
Casing Left in Place 4" X TOTAL 10' Feet  
3.1 STICKUP  
SEE FD-85-9 FOR SOIL LOG  
Water Table Depth 0.51'

Depth		Method of Drilling and Type of Bit Used	INDEX	
From	To			
0	40	3" ROLLER BIT FOLLOWED BY 4" DRIVE CASING	Ground Water	Back of Page
		HYDRANT WATER USED DURING ALL DRILLING	Boring Location Sketch	Back of Page <u>1</u>
			Overburden Record	Page
			Rock Drilling	Page
				Page
				Page
				Page

Prepared by FISHER Field Data  
Submitted by ATLANTIC TESTING LAB Lab. Data

# PIEZOMETER INSTALLATION REPORT

PROJECT: ABERJONA RIVER WOODBURN DATE: 10/12/85  
 LOCATION (STA): SEE DRAWING OFFSET FROM CENTER LINE:        PIEZ NO.: FD-85-13  
 PIEZ TYPE: 2"  $\phi$  SLOTTED .010" X 2' OF PIEZ: 39' RISER PIPE DIAM: 2"  
 PIEZ TIP SET IN SOIL FO-85-9  
 (SOIL TYPE): GRAVELLY F SAND (SP) SAMPLE NO.: 53-9 BORING DIAM: 4"  
 METHOD OF INSTALLATION: 4" DRIVEN CASING  
 TYPE OF PROTECTION FOR PIEZ: 4"  $\phi$  PIPE X 10' LENGTH VENT: LOCK CAP  
 GROUND ELEV.: 44 ELEV. TOP OF RISER: 47.1 ELEV. PIEZ TIP: 5  
 FILTER: #2 SAND FROM ELEV: 4 TO ELEV: 8  
 SEAL: PELONITE 3/8"  $\phi$  FROM ELEV: 8 TO ELEV: 13  
 INSTALLED BY: DAVIS & HAWKINS CONTRACT OKN-33-85-D-0011  
 NO.: 00 #3 FOREMAN: FISHER  
 DATE OF INSTALLATION: 10/11/85 DATE OF OBSERVATIONS: 10/12/85  
 METHOD OF TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
<u>10:53</u>		<u>3.61</u>						
	<u>0</u>	<u>0</u>						
	<u>1/4</u>	<u>3.55</u>						
	<u>1/2</u>	<u>3.60</u>						
	<u>1</u>	<u>3.61</u>						

REMARKS:

FISHER  
 INSPECTOR

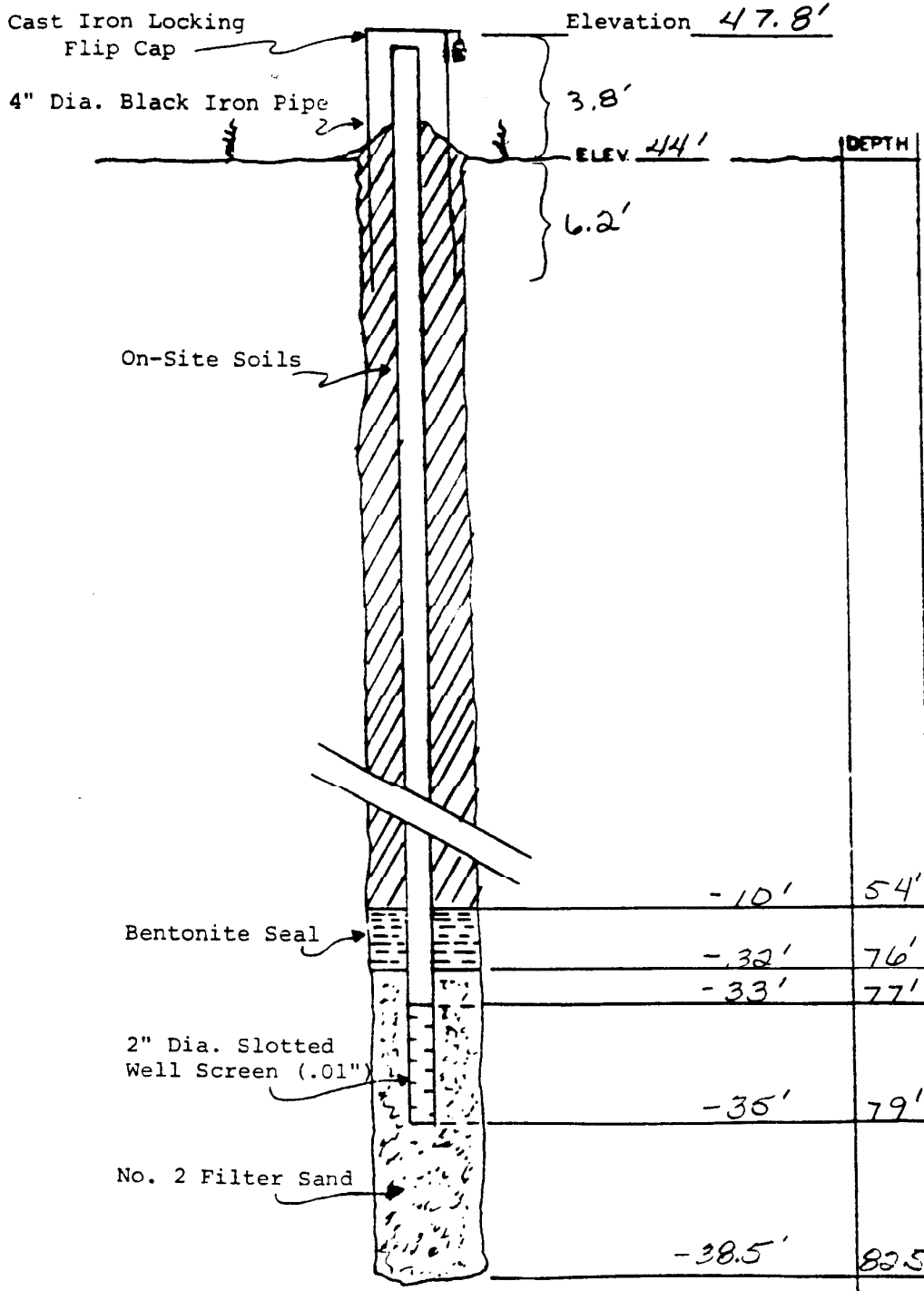
## OBSERVATION WELL INSTALLATION DETAIL

Client: ARMY CORPS OF ENGINEERS, NED

Project No. DACW-33-85-D-001.  
D.O.#0003

Project: Aberjona River, Wells G&H  
Woburn MA

Well No. FD85- 9  
Cluster No. S-88



CLUSTER S-88

FD-85-9

CORPS OF ENGINEERS, U. S. ARMY  
NEW ENGLAND DIVISION  
FOUNDATION AND MATERIALS BRANCH  
FIELD LOG OF TEST BORING

ABERJONA RIVER  
Site WELL G-14, WOBURN, MA PROJECT NO. OACW-33-85-D-0011  
Page 1 of      Pages D.O. # 003  
Hole No. FD-85-9 Diam. (Casing) 4" Boring Started 10/9/85  
Co-ordinates: N SEE R DRAWING Boring Completed 10/10/85  
Drilled by DAVIS + HAWKINS Report Submitted       
Purpose of Exploration OBTAIN SOIL SAMPLES + INSTALL PRESSUREMETER

Elevation Top of Hole 44 M.S.L.  
Total Overburden Drilled 82.5 Feet  
Elevation Top of Rock      M.S.L.  
Elevation Bottom of Hole -38.5 M.S.L.  
Total Rock Drilled 0 Feet  
Total Depth of Hole 82.5 Feet  
Core Recovered      %  
Core Recovered      Ft.:      Diam.      In.  
Soil Samples 178 In. Diam. 13 No.  
Soil Samples      In. Diam.      No.

Casing Left in Place 4" x TOTAL 10' Feet  
3.8' STICKUP

Water Table Depth 0.41'

Depth		Method of Drilling and Type of Bit Used	INDEX
From	To		
0.0	82.5	3" ROLLER BIT FLUSHED WITH HYDRANT WATER, FELLING BY 4" DRIVEN CASING	Ground Water <u>    </u> Back of Page <u>    </u> Boring Location Sketch <u>    </u> Back of Page <u>    </u> Overburden Record <u>    </u> Page <u>    </u> Rock Drilling <u>    </u> Page <u>    </u> <u>    </u> Page <u>    </u> <u>    </u> Page <u>    </u> <u>    </u> Page <u>    </u>

Prepared by PAUL FISHER  
Field Data  
Submitted by ATLANTIC TESTING LAB

Lab. Data

U. S. ARMY  
CORPS OF ENGINEERS  
NEW ENGLAND DIVISION

Site ARRINGTON R. VERMONT MA Page 1 of 3 Page

Boring No. FD-85-9 Desig. P2-9 Diam. (Casing) 4"

Co-ordinates: N SEE DRAWING E

FIELD LOG OF TEST BORING

Elevation Top of Boring 44 M.S.L. Hammer Wt. 140<sup>lb</sup> Boring Started 10/9/85  
Total Overburden Drilled 82.5 Feet Hammer Drop 30"  
Elevation Top of Rock — M.S.L. Casing Left 4" Boring Completed 10/10/85  
Total Rock Drilled 0 Feet (Subsurface Water Data) — Page —  
Elevation Bottom of Boring -38.5 M.S.L. Obs. Well 2"  
Total Depth of Boring 82.5 Feet Drilled By DAVIS & HAWKINS  
Core Recovered — % No. Boxes — Mfg. Des. Drill TRACK MOUNTED CMC 45  
Core Recovered — Ft. — Diam. — In. Inspected By: PAUL FISHER  
Soil Samples 1 3/8 In. Diam. 13 No. Classification By: PAUL FISHER  
Soil Samples — In. Diam. — No. Classification By: —

DEPTH 1" = 5.0'	CORE/SAMPLE		BLOWS PER FT. DEEP		SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIAL
	NO.	SIZE	DEEP RANGE	DEEP RANGE		
1.5	SS-1	1 1/2	REL 52	WT OF ROD	TURNED 3" ROLLER BIT FOLLOWED BY ADRIVEN 4" CASING USING A 300 LB HAMMER	PEAT, ORGANICS, WET, BK (PT)
5.0						
6.5	SS-2		100%	7 10		F.M. SAND, BR, MUIST (SP)
10.0						ASSUMED CHANGE
11.5	SS-3		15	7 6 7	30 BLOW/FT @ 20' ON 4" CASING	M.L. SAND & GRAVEL (SP-GF GREY
15.0						
16.5	SS-4		20	7 24 37		SAME AS SS-3
20.0						
21.5	SS-5		0	21 8 5		NOTED GRAVEL CUTTINGS

GENERAL REMARKS: HYDRANT WATER USED DURING EXPLORATION

Site <u>ASHAUBURN RIVER</u> <u>WELL G+H, WOBURN, MA</u>					Boring No. <u>FD-85-9</u>		Page <u>2</u> of <u>3</u>	
DEPTH		CORE/SAMPLE		BLOWS PER FT	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS		
FT	IN	NO.	SIZE	CORE RECVY				
25.0								
26.5		SS-6	1 1/2	10	37 12 10	SAME AS SS-3		
30.0								
31.5		SS-7		10	16 2 11	SAME AS SS-3		
35.0								
36.5		SS-8		10	14 20 16	SAME AS SS-3		
40.0								
41.5		SS-9		10	17 6 3	GRAVELLY F. SAND, TR SILT BR. WET (SP)		
45.0								
46.5		SS-10		100	4 5 7	F.M. SAND, LITTLE GRAV, GR. M.C. (SP)		
50.0								
51.5				0	15 5 11	NO SAMPLE ASSUME SAME AS SS-10		
55.0				0		END 10/9/85, START 10/10/85		
60.0						SAMPLER ON TOP OF CORE - NO ADVANCEMENT WITH RECORD		
61.5		SS-11		50	23 10 10	GRAVELLY F.M. SAND, TR SILT BR WET (SW-GR)		

Site <u>BERKMAN R</u>					Boring No <u>FD-85-9</u>		Page <u>2</u> of <u>3</u>	
DEPTH		CORE/SAMPLE		BLOWS PER FT	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS		
	NO.	SIZE	DEPTH RANGE	CORE REC'D				
66.5	SS-12	1 1/2	40%	54	DIFFICULTIES WITH ROLLER BIT IN COARSE GRAVEL	SAME AS SS-11 (SW-GP)		
70			0			SAMPLER ON TOP OF COBBLE NO ADVANCEMENT WITH BLOWS		
75			0			SAMPLER ON TOP OF COBBLE NO ADVANCEMENT WITH BLOWS		
80	SS-13	SAMPLE OF CUTTING				SAMPLER ON TOP OF COBBLE - EXTENDED ROLLER BIT TO 82.5, NO CHANGE IN MATERIAL		
82.5					ENDING DRIVEN TO 80'	END OF EXPLORATION		



# PIEZOMETER INSTALLATION REPORT

PROJECT: ABERDEEN RIVER, WABURN MA | DATE: 10/12/85  
 LOCATION (STA): SEE DRAWING OFFSET FROM CENTER LINE: — PIEZ NO.: FD-85-9  
 PIEZ TYPE: 2'x2"  $\phi$  SLOTTED .010" DEPTH OF PIEZ: 79' RISER PIPE DIAM: 2"  
 PIEZ TIP SET IN (SOIL TYPE): SANDY GRAVEL SOIL SAMPLE NO.: SS-13 BORING DIAM: 4"  
 METHOD OF INSTALLATION: 3" ROLLER BIT FOLLOWED BY 4" DRILL CH  
 TYPE OF PROTECTION FOR PIEZ: 4"  $\phi$  PIPE X TOTAL 10' LENGTH INVENT: 20' CAP  
 GROUND ELEV.: 44 ELEV. TOP OF RISER: 47.8 ELEV PIEZ TIP: -35  
 FILTER: #2 SAND FROM ELEV: -36 TO ELEV: -32  
 SEAL: BENTONITE SLURRY FROM ELEV: -32 TO ELEV: -10  
 INSTALLED BY: DAVIS + HAWKINS CONTRACT NO.: DALW-33-85-D-0011 FOREMAN: FISHER  
 DATE OF INSTALLATION: 10/10/85 DATE OF OBSERVATIONS: 10/14/85  
 TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
		4.21						
10:36:30	0	.60						
10:36:45	1/4	4.21						
10:37:00	1/2	4.21						

REMARKS:

FISHER  
INSPECTOR

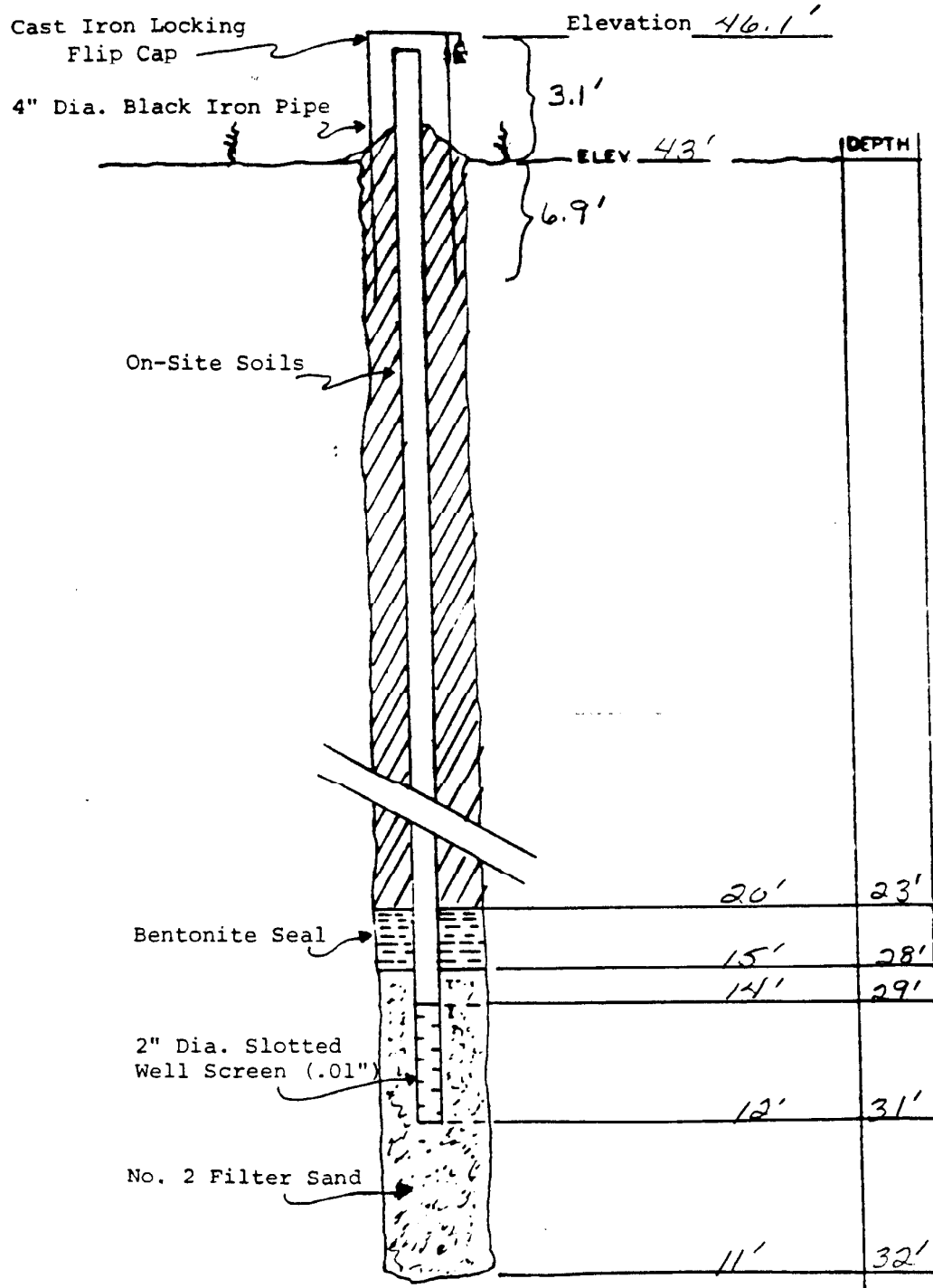
## OBSERVATION WELL INSTALLATION DETAIL

Client: ARMY CORPS OF ENGINEERS, NED

Project No. DACW-33-85-D-00  
D.O.#0003

Project: Aberjona River, Wells G&H  
Woburn MA

Well No. FD85- 10  
Cluster No. S- 89



CLUSTER S-89

FD-85-10

CORPS OF ENGINEERS, U. S. ARMY  
NEW ENGLAND DIVISION  
FOUNDATION AND MATERIALS BRANCH  
FIELD LOG OF TEST BORING

ABERJONA RIVER  
Site Well G+H, Woburn, MA PROJECT NO. DACW-33-85-D-0011, D.O. #003  
Page 1 of 2 Pages  
Hole No. FD-85-10 Diam. (Casing) 4" Boring Started 10/9/85  
Co-ordinates: N SEE & DRAWING Boring Completed 10/9/85  
Drilled by CAMBRIDGE & BOYER Report Submitted \_\_\_\_\_

Purpose of Exploration INSTALLATION OF PIEZOMETER

Elevation Top of Hole 43 ± M.S.L.  
Total Overburden Drilled 32.0 Feet  
Elevation Top of Rock — M.S.L.  
Elevation Bottom of Hole 11 M.S.L.  
Total Rock Drilled 0 Feet  
Total Depth of Hole 32 Feet  
Core Recovered — %  
Core Recovered — Ft.; — Diam. — In.  
Soil Samples NONE In. Diam. — No.  
Soil Samples — In. Diam. — No.

Casing Left in Place 4" φ, TOTAL 10 Feet  
3.1 STICK UP

SEE FD-85-2 FOR SOIL LOG

Water Table Depth AT SURFACE

Depth	Method of Drilling and Type of Bit Used	
	From	To
0	32.0	3" ROLLER AND 4" DRIVEN CASING USING HYDRANT WATER ONLY DURING DRILLING

## INDEX

Ground Water \_\_\_\_\_ Back of Page \_\_\_\_\_  
Boring Location Sketch \_\_\_\_\_ Back of Page \_\_\_\_\_  
Overburden Record \_\_\_\_\_ Page \_\_\_\_\_  
Rock Drilling \_\_\_\_\_ Page \_\_\_\_\_  
\_\_\_\_\_ Page \_\_\_\_\_  
\_\_\_\_\_ Page \_\_\_\_\_  
\_\_\_\_\_ Page \_\_\_\_\_

Prepared by PAUL FISHER  
Field Data

Lab. Data

Submitted by ATLANTIC TESTING LAB

# PIEZOMETER INSTALLATION REPORT

PROJECT: ABERJONA R, WOBURN, MA | DATE: 10/12/85  
 LOCATION (STA): JEE DRAWING OFFSET FROM CENTER LINE: — PIEZ NO.: FD-85-10  
 PIEZ TYPE: 2'x2" SLOTTED .010" DEPTH OF PIEZ: 31 RISER PIPE DIAM: 2"  
 PIEZ TIP SET IN (SOIL TYPE): F.M. SAND SOIL FO-85-2 SAMPLE NO.: 55-7 BORING DIAM: 4"  
 METHOD OF INSTALLATION: 3" ROLLER + 4" DRIVEN CASING  
 TYPE OF PROTECTION FOR PIEZ: 4" PIPE X 10' TOTAL LENGTH VENT: LOCK CAP  
 GROUND ELEV.: 43 ELEV. TOP OF RISER: 46.1 ELEV PIEZ TIP: 12  
 FILTER: #2 SAND FROM ELEV: 11 TO ELEV: 15  
 SEAL: PELONITE 3/8" FROM ELEV: 15 TO ELEV: 20  
 INSTALLED BY: CAMBRIDGE + BOYER CONTRACT DAWN-33-95-D-0011 NO.: D0#3 FOREMAN: FISHER

DATE OF INSTALLATION: 10/9/85 DATE OF OBSERVATIONS: 10/12/85  
 METHOD OF TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
<u>11:51</u>		<u>3.16</u>		<u>4</u>	<u>3.16</u>			
	<u>0</u>	<u>0.10</u>						
	<u>1/2</u>	<u>3.10</u>						
	<u>1</u>	<u>3.11</u>						
	<u>2</u>	<u>3.15</u>						

REMARKS:

FISHER  
INSPECTOR

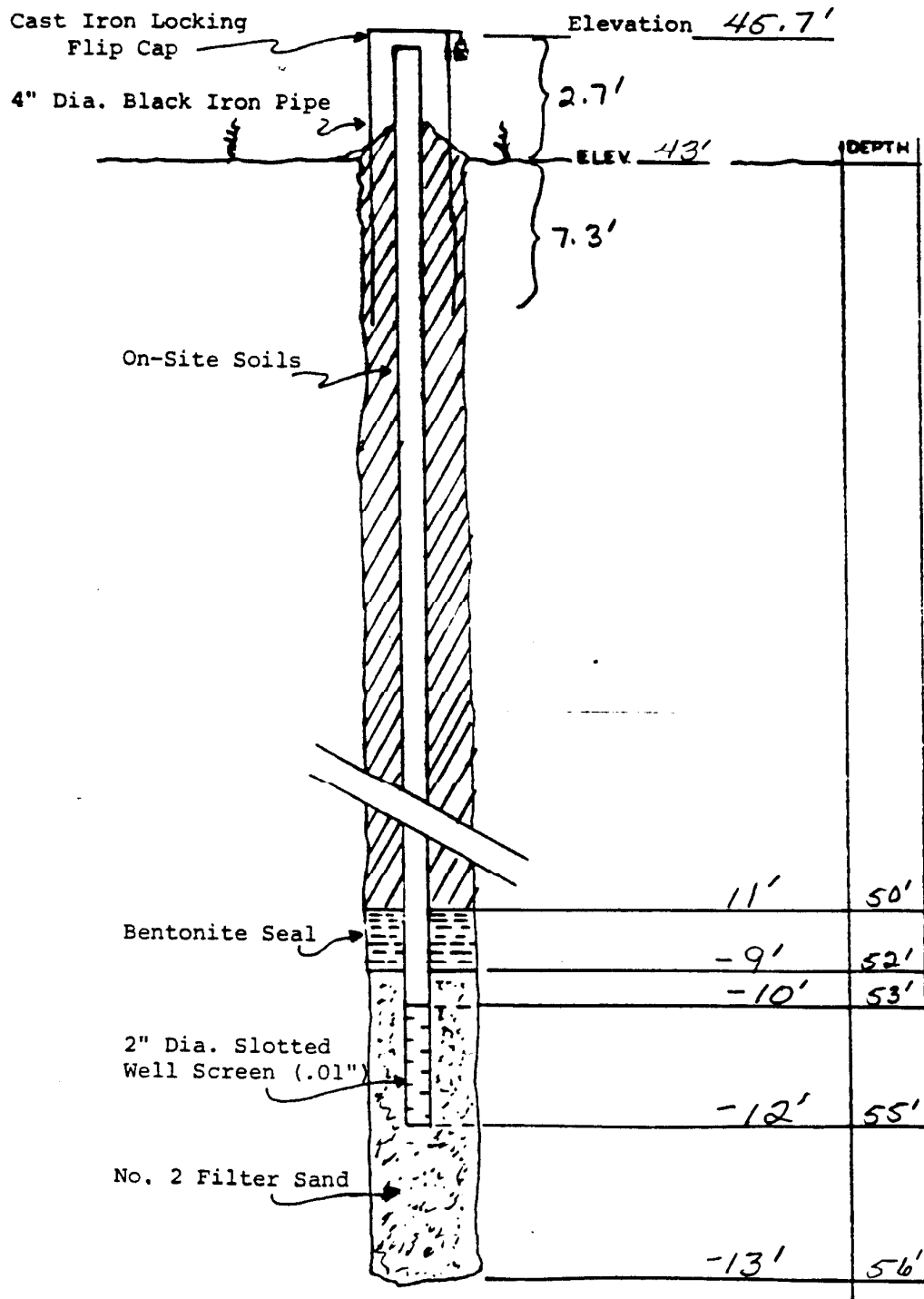
## OBSERVATION WELL INSTALLATION DETAIL

Client: ARMY CORPS OF ENGINEERS, NED

Project No. DACW-33-85-D-0011  
D.O.#0003

Project: Aberjona River, Wells G&H  
Woburn MA

Well No. FD85- 11  
Cluster No. S- 89



CLUSTER S-89

FD-85-11

CORPS OF ENGINEERS, U. S. ARMY  
NEW ENGLAND DIVISION  
FOUNDATION AND MATERIALS BRANCH  
FIELD LOG OF TEST BORING

ACCRIONA RIVER PROJECT NO. DACW-33-85-D-0011  
Site WELLS G+H, WOBURN MA D.O. #3  
Mole No. FD-85-11 Diam. (Casing) 4" Page 1 of 2 Pages  
Co-ordinates: N SEC E DRAWING Boring Started 10/9/85  
Drilled by CAMBRIDGE & BOYER Boring Completed 10/10/85  
Report Submitted

Purpose of Exploration INSTALLATION OF PIEZOMETER

Elevation Top of Hole 43 M.S.L.  
Total Overburden Drilled 56 Feet  
Elevation Top of Rock - M.S.L.  
Elevation Bottom of Hole -13 M.S.L.  
Total Rock Drilled 0 Feet  
Total Depth of Hole 56 Feet  
Core Recovered %  
Core Recovered Ft.: Diam. In.  
Soil Samples In. Diam. No.  
Soil Samples In. Diam. No.

Casing Left in Place 4" X TOTAL 10 Feet  
27' STICKUP

SEE FD-85-2 FOR SOIL LOG

Water Table Depth -0.16'

Depth		Method of Drilling and Type of Bit Used	INDEX	
From	To			
0	56	3" ROVER WASH & 4" DRIVEN CASING. HYDRANT WATER	Ground Water	Back of Page
		USE CORNELL DRILLING	Boring Location Sketch	Back of Page
			Overburden Record	Page
			Rock Drilling	Page
				Page
				Page
				Page

Prepared by FISHER Field Data Lab. Data  
Submitted by ATLANTIC TESTING LAB

# PIEZOMETER INSTALLATION REPORT

PROJECT: ABERSONA R., Woburn, MA DATE: 10/12/85  
 LOCATION (STA): SEE DRAWING OFFSET FROM CENTER LINE: — PIEZ NO.: FD-85-11  
 PIEZ TYPE: 2"  $\phi$  SLOTTED X 2' LONG DEPTH OF PIEZ: 55' RISER PIPE DIAM: 2"  
 PIEZ TIP SET IN (SOIL TYPE): F. SAND TR. M.C. SAND SOIL FD-85-2 SAMPLE NO.: 55-12 BORING DIAM: 4"  
 METHOD OF INSTALLATION: 3" ROLLER + 4" DRIVEN CASING  
 TYPE OF PROTECTION FOR PIEZ: 4"  $\phi$  X 10' TOTAL LENGTH VENT: LOCK CAP  
 GROUND ELEV.: 43 ELEV. TOP OF RISER: 45.7 ELEV. PIEZ TIP: -12  
 FILTER: #2 SAND FROM ELEV: -9 TO ELEV: -13  
 SEAL: BENTONITE SQUARY FROM ELEV: -9 TO ELEV: 11  
 INSTALLED BY: CAMBRIDGE & BOYER CONTRACT DAW-33-85-D-0011  
 NO.: 0,0. #3 FOREMAN: FISHER

DATE OF INSTALLATION: 10/10/85 DATE OF OBSERVATIONS: 10/12/85

METHOD OF TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
11:44		2.54	4	2.54				
	0	.68						
	1/2	2.25						
	1	2.46						
	2	2.50						

REMARKS:

FISHER  
INSPECTOR

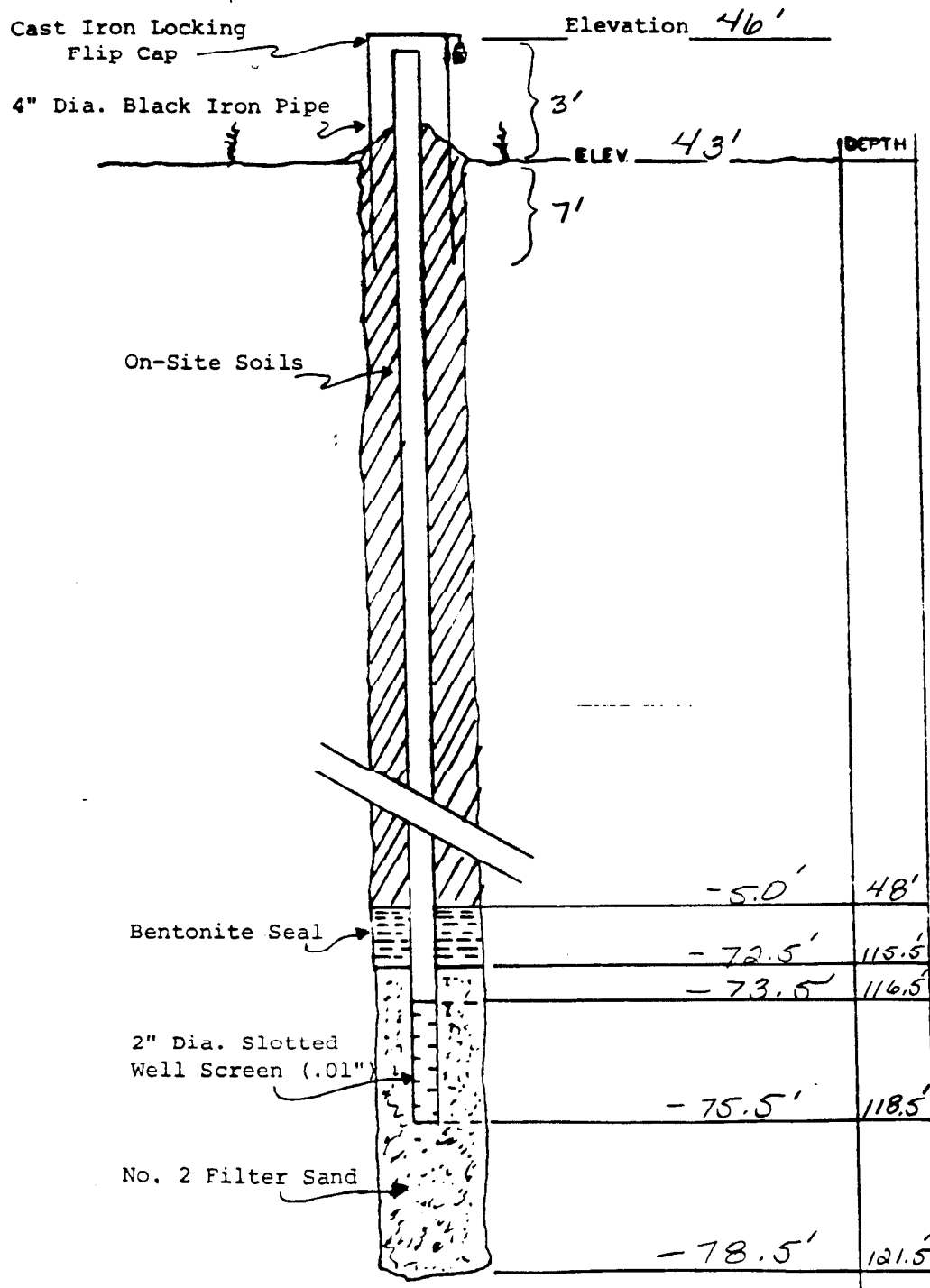
## OBSERVATION WELL INSTALLATION DETAIL

Client: ARMY CORPS OF ENGINEERS, NED

Project No. DACW-33-85-D-00  
D.O.#0003

Project: Aberjona River, Wells G&H  
Woburn MA

Well No. FD85-2  
Cluster No. S-89





CLUSTER S-89

FD-85-2

CORPS OF ENGINEERS, U. S. ARMY  
NEW ENGLAND DIVISION  
FOUNDATION AND MATERIALS BRANCH  
FIELD LOG OF TEST BORING

PROJECT NO. DACW 33-85-D-0011  
E.O. # 3  
Site Aberjona River, Woburn Page 1 of 4 Pages  
Hole No. FD-85-2 Diam. (Casing) 4" Boring Started 9/30/85  
Co-ordinates: N SEE MAP E Boring Completed 10/8/85  
Drilled by Cambridge and Boyer Report Submitted \_\_\_\_\_

Purpose of Exploration observation wells are required by EPA for hydrologic modeling by others

Elevation Top of Hole 43 M.S.L.  
Total Overburden Drilled 121.5 Feet  
Elevation Top of Rock — M.S.L.  
Elevation Bottom of Hole -78.5 M.S.L.  
Total Rock Drilled 0 Feet  
Total Depth of Hole 121.5 Feet  
Core Recovered — %  
Core Recovered — Ft.; — Diam. — In.  
Soil Samples 18 In. Diam. 24 No.  
Soil Samples — In. Diam. — No.

Casing Left in Place 10' TOTAL Feet  
3.0 STICK UP

at surface  
Water Table Depth (0.6' during drilling)

Depth		Method of Drilling and Type of Bit Used	INDEX
From	To		
0	45'	Hollow Stem Auger	Ground Water _____ Back of Page _____
0	126'	4" pipe casing	Boring Location Sketch _____ Back of Page _____
		HYDRANT WATER USED DURING ALL DRILLING	Overburden Record _____ Page _____
			Rock Drilling _____ Page _____
			_____ Page _____
			_____ Page _____
			_____ Page _____

Prepared by PAUL FISHER  
Field Data

Submitted by William T. ...

Lab. Data

U. S. ARMY  
CORPS OF ENGINEERS  
NEW ENGLAND DIVISION

Site ABERJONA RIVER, VERMONT, MA Page 1 of 4 Pages  
(WELLS G+H)  
Boring No. FD-85-2 Desig. 2 Diam. (Casing) 4"

FIELD LOG OF TEST BORING

Co-ordinates: N SEE DRAWING E ---

Elevation Top of Boring 43 M.S.L. Hammer Wt. 140" Boring Started 9/30/85  
Total Overburden Drilled 121.5 Feet Hammer Drop 30"  
Elevation Top of Rock --- M.S.L. Casing Left 10' or 4" Boring Completed 10/9/85  
Total Rock Drilled 0 Feet (Subsurface Water Data) --- Page ---  
Elevation Bottom of Boring -78.5 M.S.L. Obs. Well 2" ID  
Total Depth of Boring 121.5 Feet Drilled By GARY CAMBRIDGE, JIM BEYER  
Core Recovered --- % No. Boxes --- Mfg. Des. Drill TRACK MOUNT CME SS  
Core Recovered --- Ft. --- Diam. --- In. Inspected By: PAUL FISHER  
Soil Samples 1 1/2 In. Diam. 24 No. Classification By: PAUL FISHER  
Soil Samples --- In. Diam. --- No. Classification By: GREG HETZLER

DEPTH	CORE/SAMPLE		BLOWS PER FT.		SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIAL
	NO.	SIZE	PERCENT	REMARKS		
0					4" AUGER	ORGANICS - PEAT, BR, MOIST
1.5	SS-1	1 3/4	5%	WT OF RODS		
5.0						
6.5	SS-2		70%	1-2		PEAT, BR, MOIST (PT) ORGANIC M. SAND, BR, MOIST
12.0						
11.5	SS-3		70%	1-1	100% HAMMER	ORGANIC SILT, BR, WET, TR SAND ROOT HAIR, WOOD (OH)
15.0						
16.5	SS-4		100%	WT OF HAMMER		SAME AS SS-5
20.0						
21.5	SS-5		100%	WT OF HAMMER		SAME AS SS-3
24.5						
GENERAL REMARKS:						

Site ABERJONA RIVER, WOBURN, MA  
WELLS G+H

Boring No.

FD-85-2

Page  
of 4

DEPTH	CORE/SAMPLE		BLOWS PER FT	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIAL
	NO.	SIZE			
1.25 250					
2.5	SS-6	1 3/8	100%	5-6	SAME AS SS-3 M. SAND, GR, WET (SA)
3.0				10/1/85 CONT. 8" HOLLOW STEM AUGER	
3.5	SS-7		100%	17-22	FM. SAND, GR, WET (SP) (SAME AS SS-6)
35.2					
36.5	SS-8		40%	9-12	SAME AS SS-7
40.0					
41.5	SS-9		60%	9-13	F. SAND, TR SILT, TAN, MUST (
45				FLOWING SANDS PULLED ALL AUGERS	
48.5	SS-10		60%	10/2/85 STRIKE DOWN 4" SURFACE CORING	SAME AS SS-9
50.0					
51.5	SS-11		10%	13-15	F. SAND, LIME SILT, BR, WET (S)
55.0					
56.5	SS-12		100%	4-6	F. SAND, TRM-GSAND, TAN, W.
60.0					
61.5	SS-13		40%	10-14	F. SAND, TAN, WET (SP)
65.0					
66.5	SS-14		40%	11-18	SAME AS SS-13

Box 1  
↑  
Box 2  
↓

S110 ABERJONA RIVER  
WELL G+H, WOBURN MA

Boring No.

FD-85-2

Page 3

of 4

DEPTH Ft.	CORE/SAMPLE		BLOWS PER FT.	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	NO.	SIZE			
74.8					
74.5	SS-15		40% 579	10/3/85 CONT. 4" DRIVE CASING @ 70'	F SAND; SILT (SP) WET TAIL.
75.0					
76.5	SS-16		60% 11		F SAND; SILT (SP) 1/8" LAYER OF M SAND.
80				100 BLOW/FT. 4" CASING	
80.5	SS-17		15% 578	2 10/4/85. 1" OF 4" CASING, USE ROLLER BT. TO WASH TO 90'	F SAND; WLF, TAIL (SP)
90	SS-18			2 DRIVE 4" CASING TO 90' (~ 170 BLOW/FT). 10/4 ROLLER WASH TO 100' LOOK FOR GARIBI SPAN.	F SAND; TAIL (SP) (ASSUMED).
97.5	SS-19			BEG. 10/5/85	
100					
101	SS-20A		100% 522	DRIVE 4" CASING TO 100' (~ 350 BLOW/FT).	TAIL (SP) SILT AND SAND SOME GRAVEL; TRACE CL
102	SS-20B		33		
110	SS-21			ENDED 10-5-85 STARTED 10-6-85	
				ENDED 10-6-85 STARTED 10-7-85	
					F SAND; TAIL (SP) Jamp. from 104'-110'

Site ABERJONA RIVER

Boring No.

FD-85-2Page 1of 4Well G+H, Wa

DEPTH		CORE/SAMPLE		BLOWS PER FT	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIAL
	Fe	NO.	SIZE	RECVY		
	115.0					
	116.5	SS 22		WASH	Drive 4" casing to 115'	Tan-Grey F. SANDS.
	117				200 BLOWS/FT.	(ASSUMED)
	118	SS 23		WASHED		M. SAND, TAN, GREY
						ASSUMED
	120					
	121.5	SS 24		30% 75 175	Casing to 120' SET PZ	GRAVELLY L.M.F. SAND TR
					END OF EXPLORATION	TAN-BK

# PIEZOMETER INSTALLATION REPORT

PROJECT: Aboriginal River, Woburn, MA DATE: 10-8-85

LOCATION (STA): SEE DRAWING OFFSET FROM CENTER LINE: 2" x 2' PIEZ NO.: FC85-2

PIEZ TYPE: slotted .010" open grade type DEPTH OF PIEZ: 118.5 RISER PIPE DIAM: 2"

PIEZ TIP SET IN (SOIL TYPE): TAN M. SAND SOIL SAMPLE NO.: SS-23 BORING DIAM: 4"

METHOD OF INSTALLATION: ROLLER BIT + DRIVE CASING

TYPE OF PROTECTION FOR PIEZ: 10' LONG X 4" DIA CASING VENT: LOCK CAP

GROUND ELEV.: 43 ELEV. TOP OF RISER: 46 ELEV. PIEZ TIP: -75.5

FILTER: #2 SAND FROM ELEV: -78.5 TO ELEV: -72.5

SEAL: BENTONITE SLURRY FROM ELEV: -72.5 TO ELEV: -5.0

INSTALLED BY: Boyer and Cambridge CONTRACT LA0033-85-D-001 NO.: D.O.#3 FOREMAN: Fisher

DATE OF INSTALLATION: 10-8-85 DATE OF OBSERVATIONS: 10/12/85

METHOD OF TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
		2.93						
	0	0						
	1/4	2.90						
	1/2	2.93						

REMARKS:

PAUL FISHER  
INSPECTOR

# ATLANTIC TESTING LABORATORIES, LIMITED

al

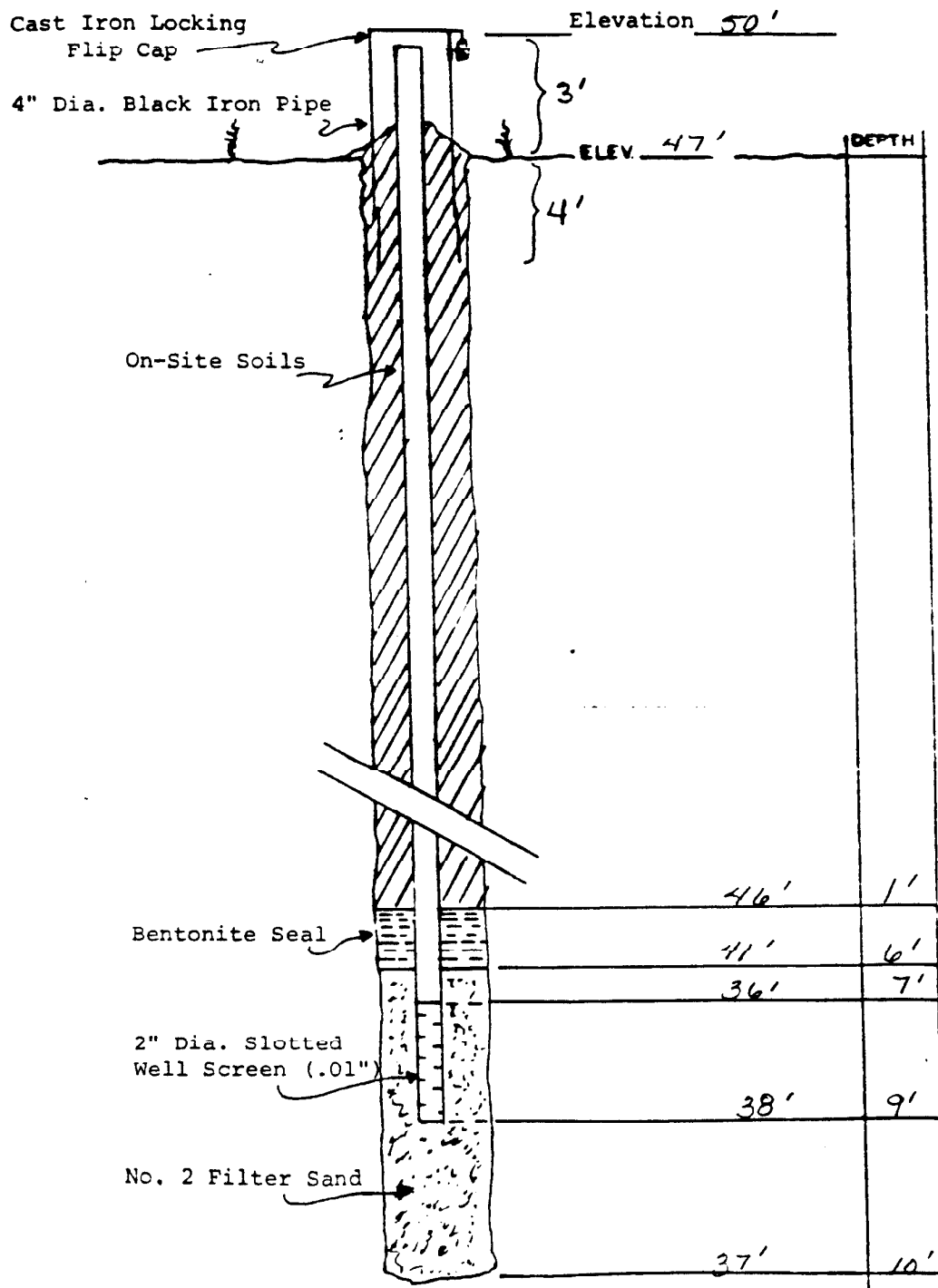
## OBSERVATION WELL INSTALLATION DETAIL

Client: ARMY CORPS OF ENGINEERS, NED

Project: Aberjona River, Wells G&H  
Woburn MA

Project No. DACW-33-85-D-00  
D.O.#0003

Well no. FD85- 3  
Cluster No. S-90



CLUSTER S-90

FD-85-3

CORPS OF ENGINEERS, U. S. ARMY  
NEW ENGLAND DIVISION  
FOUNDATION AND MATERIALS BRANCH  
FIELD LOG OF TEST BORING

Site ABERJONA RIVER, WESTERN MASS PROJECT NO. DACW-33-85-D-0011  
DO. #3  
Page 1 of 2 Pages  
Hole No. FD-85-3 Diam. (Casing) 4" Boring Started 10-1-85  
Co-ordinates: N — E SEE DRAWING Boring Completed 10-1-85  
Drilled by PAUL PAVIS, KEVIN HAWKINS Report Submitted —

Purpose of Exploration INSTALL DIAPHRAGM

Elevation Top of Hole 47 M.S.L.  
Total Overburden Drilled 15 Feet  
Elevation Top of Rock — M.S.L.  
Elevation Bottom of Hole 37 M.S.L.  
Total Rock Drilled 0 Feet  
Total Depth of Hole 10 Feet  
Core Recovered — %  
Core Recovered — Ft.: — Diam. — In.  
Soil Samples — In. Diam. — No.  
Soil Samples — In. Diam. — No.

Casing Left in Place 7' TOTAL Fee  
30' Stickup

See FDSS-1 for drilling log

4.0 on 9/31/85  
Water Table Depth 3.35 on 10/24/85

Depth		Method of Drilling and Type of Bit Used
From	To	
0	15	HYDRANT WATER USED DURING ALL DRILLING

INDEX  
Ground Water — Back of Page 1  
Boring Location Sketch — Back of Page 1  
Overburden Record — Page —  
Rock Drilling — Page —  
— Page —  
— Page —  
— Page —

Prepared by GIG HETZLER Field Data  
Submitted by — Lab. Data



# PIEZOMETER INSTALLATION REPORT

PROJECT: ABERJONA River, WARREN (well 644) DATE: 10/1/85  
LOCATION (STA): SEE DRAWING OFFSET FROM CENTER LINE: — PIEZ NO.: FD-85-3  
PIEZ TYPE: CASAGRANDE 2" x 2' .010" DEPTH OF PIEZ: 9' RISER PIPE DIAM: 2"  
PIEZ TIP SET IN SOIL FO-85-1  
(SOIL TYPE): M SAND SAMPLE NO.: SS-3 BORING DIAM: 8"  
METHOD OF INSTALLATION: AUGER 4" ID  
TYPE OF PROTECTION FOR PIEZ: 4" CASING TOTAL LENGTH VENT: LOCK CAP  
GROUND ELEV.: 47 ELEV. TOP OF RISER: 50.0' ELEV PIEZ TIP: 38'  
FILTER: #2 SAND FROM ELEV: 37 TO ELEV: 41  
SEAL: Polysulfide 4' FROM ELEV: 41 TO ELEV: 46  
INSTALLED BY: Paul Davis / HANKINS CONTRACT NO.: DO-803 FOREMAN: PAT SULLIVAN

DATE OF INSTALLATION: 10/1/85 DATE OF OBSERVATIONS: 10/24/85

METHOD OF TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
8:17		6.35	8:38	4.0	5.71			
8:34	0	.45	8:42	8.0	6.20			
	0.5	2.24	8:49	15.0	6.33			
8:55	1.0	3.38	9:04	30.0	6.35			
8:56	2.0	4.70						

REMARKS:

INSPECTOR

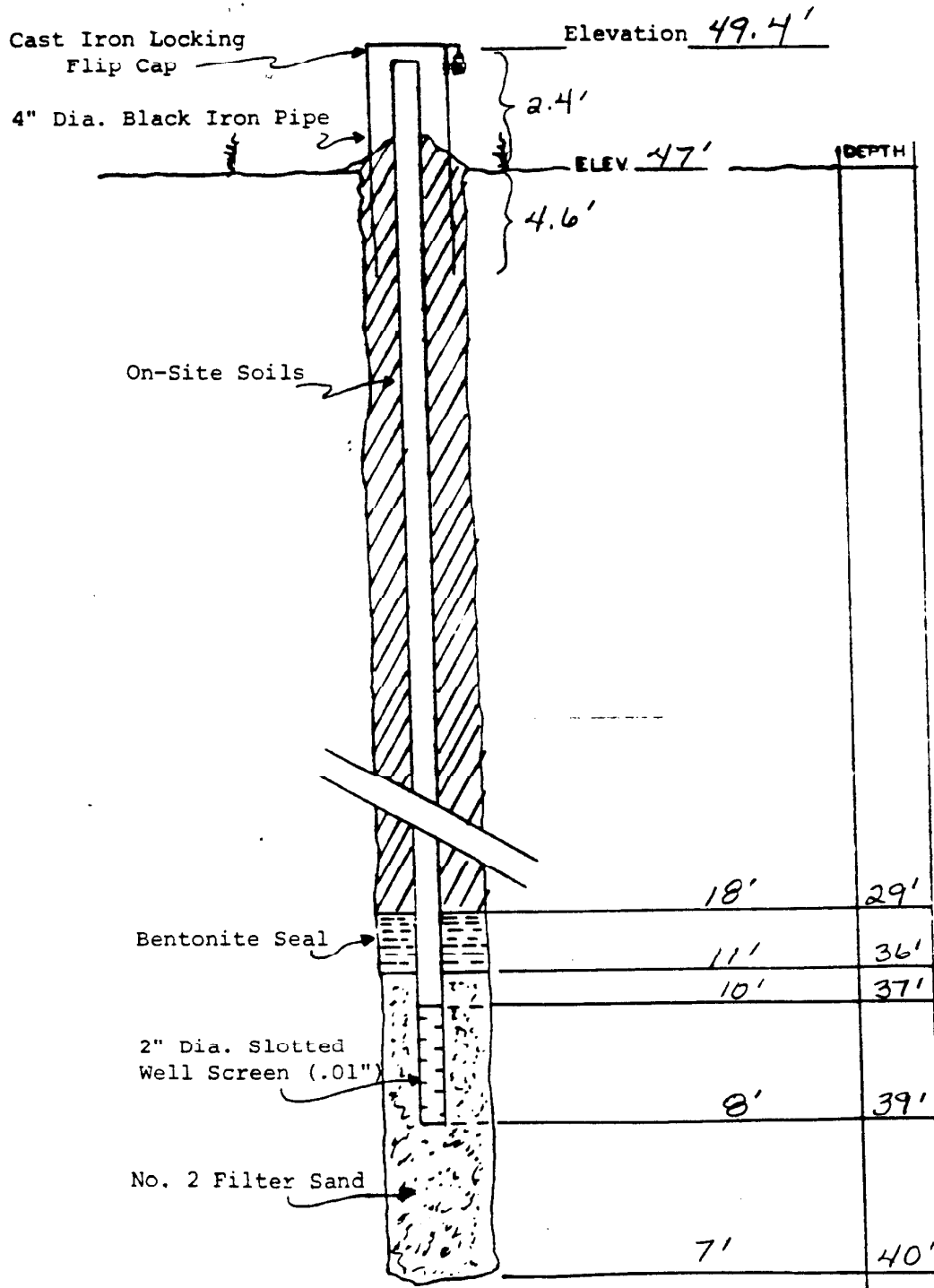
## OBSERVATION WELL INSTALLATION DETAIL

Client: ARMY CORPS OF ENGINEERS, NED

Project: Aberjona River, Wells G&H  
Woburn MA

Project No. DACW-33-85-D-001  
D.O.#0003

Well No. FD85- /  
Cluster No. S-90



①

CLUSTER S-90 FD-85-1

CORPS OF ENGINEERS, U. S. ARMY  
NEW ENGLAND DIVISION  
FOUNDATION AND MATERIALS BRANCH  
FIELD LOG OF TEST BORING

PROJECT NO. DALW-33-85-D-0011  
Site ABERJONA RIVER, WORCESTER MASS O.P. - 3  
Page 1 of 4 Pages  
Hole No. FD-85-1 Diam. (Casing) 4" Boring Started 9/30/85  
Co-ordinates: N — E SEE DRAWING Boring Completed 10-1-85  
Drilled by PAUL DAVIS & HAWKINS Report Submitted —

Purpose of Exploration SOIL SAMPLING / DISCOVERY OF CONTAMINANTS

Elevation Top of Hole : 47 M.S.L. Casing Left in Place 7.00 + 0.00 Feet  
Total Overburden Drilled 40.0 Feet 2.4' - pickup  
Elevation Top of Rock — M.S.L.  
Elevation Bottom of Hole 7.0 M.S.L.  
Total Rock Drilled 0 Feet  
Total Depth of Hole 40.0 Feet  
Core Recovered — %  
Core Recovered — Ft.; — Diam. — In.  
Soil Samples 7 3/8 In. Diam. 8 No.  
Soil Samples — In. Diam. — No.  
Water Table Depth 3.25'  
3.0' DURING DRILLING

Depth		Method of Drilling and Type of Bit Used	INDEX	
From	To			
0	4	4" I.D. Hollow Stem Auger	Ground Water	Back of Page 1
		HYDRANT WATER USE DURING ALL	Boring Location Sketch	Back of Page 1
		DRILLING	Overburden Record	Page 1
			Rock Drilling	Page
				Page
				Page
				Page

Prepared by GEO. NEELER Field Data  
Submitted by — Lab. Data

U. S. ARMY  
CORPS OF ENGINEERS  
NEW ENGLAND DIVISION

Site ABE-100-100, Woburn, MA Page 1 of 2 Pgs  
(Wells 84H)  
Boring No. FD-85 Desig. PZ-11 Diam. (Casing) 4"  
Co-ordinates: N See Drawing E ---

FIELD LOG OF TEST BORING

Elevation Top of Boring 47 M.S.L. Hammer Wt. 140.0 Boring Started 9/30  
Total Overburden Drilled 40 Feet Hammer Drop 30"  
Elevation Top of Rock - M.S.L. Casing Left 7' total 4" casing Boring Completed 9/30/9  
Total Rock Drilled 0 Feet (Subsurface Water Data) --- Page ---  
Elevation Bottom of Boring 7' M.S.L. Obs. Well 2" ID  
Total Depth of Boring 40 Feet Drilled By KEVIN MAJORS / Paul Davis  
Core Recovered --- % No. Bore --- Mfg. Co. Drill TRACK MOUNTED CME 4-  
Core Recovered --- Ft. --- Diam. --- In. Inspected By Glenn Hotaler ATL  
Soil Samples 3 In. Diam. --- No. Classification By Glenn Hotaler ATL  
Soil Samples --- In. Diam. --- No. Classification By ---

DEPTH	CORE/SAMPLE		BLOWS PER FT.		SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIAL
	NO.	SIZE	PER FT.	CORE RECVY		
2.0	SS-1	1 3/8	70	246	4" AUGER	M SAND, DR MOIST (SP)
3.0						
5.0						
7.0	SS-2	1 3/8	60	36		M SAND, TN, MOIST SR
10.0						
12.0	SS-3		50	44		SAME AS SS-2
15.0						
17.0	SS-4		25	23	7/31/85	GRAVELLY SAND, P. MOIST M SAND Some GRAVEL, TAN JET SP/GP
20.0						
21.5	SS-5		100	514		SW/GP M SAND; Little Gravel, Brn (SP) M SAND; Some Gravel Brn

GENERAL REMARKS: SAND WASHED INTO AUGER @ 17.0  
Boring terminated until 40.0

AT 10.0 ft. below ground surface, there was a 10' thick layer of  
fine sand, some gravel, and some silt. The sand was very loose  
and the gravel was small. The silt was very fine and the  
sand was very fine.

Site					Boring No.	Page
ABERTONA RIVER					FD-85-1	2 of 2
DEPTH		CORE/SAMPLE		BLOWS PER FT	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIAL
FEET	INCHES	NO.	SIZE	CORE RECV		
28.5		SS-6	1 1/4	65	Auger 4" Cont.	cmf SAND, little Gravel, Wet (SP)
30.0						
31.5		SS-7		60		cmf SAND; Tr Gravel, Br Wet (SW)
35						
36.5		SS-8		55		cmf SAND; Tr Gravel. Some Gravel, Some Gravel Wet Br, (SW/SP)
40.0						
					* BOTTOM OF HOLE.	

# PIEZOMETER INSTALLATION REPORT

PROJECT: ABERJONA RIVER, WOBURN, MASS. | DATE: OCT 1, 1985  
 LOCATION (STA): See Drawing | OFFSET FROM CENTER LINE: — | PIEZ NO.: FD-85-1  
 PIEZ TYPE: CASA GRANDE | 2" x 2' | DEPTH OF PIEZ: 39' | RISER PIPE DIAM: 2" ID  
 PIEZ TIP SET IN (SOIL TYPE): cm SAND; some Gravel | SOIL SAMPLE NO.: S-8B | BORING DIAM: 8"  
 METHOD OF INSTALLATION: AUGER  
 TYPE OF PROTECTION FOR PIEZ: 4" & CASING 7' length | VENT: LOCK CAP  
 GROUND ELEV.: 47 | ELEV. TOP OF RISER: 49.4' | ELEV PIEZ TIP: 8'  
 FILTER: SAND #2 | FROM ELEV: 7' | TO ELEV: 11'  
 SEAL: PELTONITE, 3/8" | FROM ELEV: 11' | TO ELEV: 16'  
 INSTALLED BY: PAUL DAVIS & HAWKINS | CONTRACT NO.: DO # 3 | FOREMAN: PAT SULLIVAN

DATE OF INSTALLATION: 10-1-85 | DATE OF OBSERVATIONS: 10/24/85

METHOD OF TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
8:14	—	5.95	1040	4.0	5.00			
1045	0	5.22	1050	8.0	5.75			
	6.5	1.49	1057	10.0	5.90			
1043	1.0	2.40	1116	30.0	5.95			
1044	2.0	3.73						

REMARKS: Possible soil compressions determined by falling  
at 5' & 10' - 3' to 10' A water level sand  
filter was placed at 11'

Greg Hargrave  
 INSPECTOR

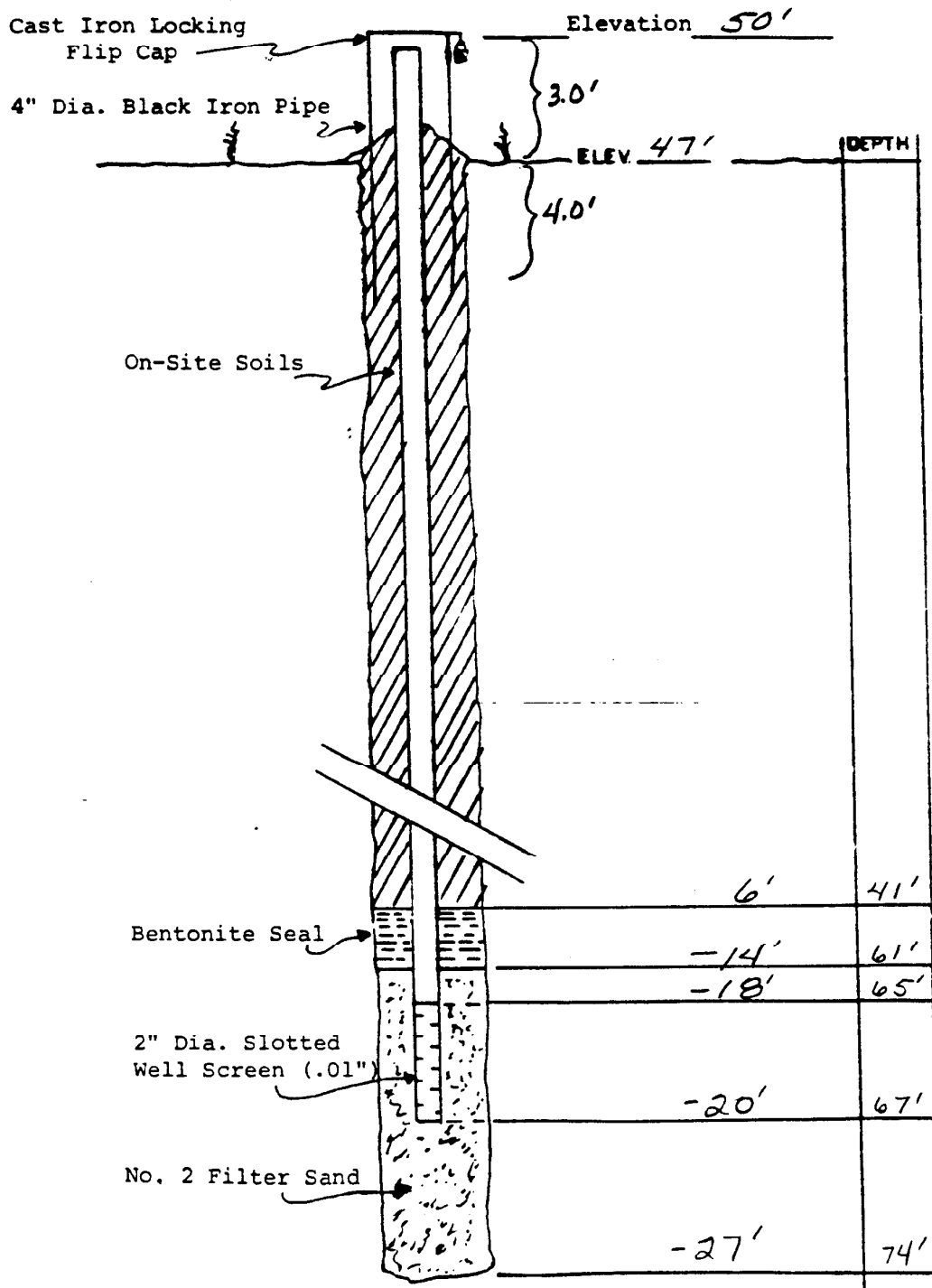
## OBSERVATION WELL INSTALLATION DETAIL

Client: ARMY CORPS OF ENGINEERS, NED

Project: Aberjona River, Wells G&H  
Woburn MA

Project No. DACW-33-85-D-001  
D.O.#0003

Well No. FD85- 15  
Cluster No. S- 90



CLUSTER S-90

FD-85-15

CORPS OF ENGINEERS, U. S. ARMY  
NEW ENGLAND DIVISION  
FOUNDATION AND MATERIALS BRANCH  
FIELD LOG OF TEST BORING

ABERJONA RIVER PROJECT NO. DACH-33-85-D-0011  
Site WELL G+H SITE, WOBURN MA D.O. 003  
Page 1 of      Pages  
Hole No. FD-85-15 Diam. (Casing) 4" Boring Started 10/14/85  
Co-ordinates: N SEE E DRAWING Boring Completed 10/23/85  
Drilled by DAVIS + HANIKER Report Submitted                     

Purpose of Exploration SOIL SAMPLING + SET PIEZOMETER

Elevation Top of Hole 47 M.S.L.  
Total Overburden Drilled 67 Feet  
Elevation Top of Rock -20 M.S.L.  
Elevation Bottom of Hole -27 M.S.L.  
Total Rock Drilled 7 Feet  
Total Depth of Hole 74 Feet  
Core Recovered ROLLER BIT %  
Core Recovered      Ft.;      Diam.      In.  
Soil Samples 138 In. Diam.      No.  
Soil Samples      In. Diam.      No.

Casing Left in Place TOTAL 7.0' Fee  
30 PICKUP

Water Table Depth 3.87'

Depth		Method of Drilling and Type of Bit Used	INDEX	
From	To			
0	61	3" ROLLER BIT FOLLOWED BY 4" DRIVEN CASE TO 14' DEPTH WATER USED DURING ALL DRILLING	Ground Water	Back of Page
			Boring Location Sketch	Back of Page
			Overburden Record	Page
0	61	PULLED 4" CASING & REARRED WITH SPINNING SIDE DUE TO EXISTING BOULDERS OR BEDROCK	Rock Drilling	Page
				Page
				Page
61	70	ADVANCED WITH 3" CASING		Page
70	74	ADVANCED WITH ROLLER BIT		Page

Prepared by PAUL FISHER  
Field Data

Submitted by ATLANTIC TESTING LAB

Lab. Data



U. S. ARMY  
CORPS OF ENGINEERS  
NEW ENGLAND DIVISION

Site Assisena R. WOODMAN Page 1 of 1 Pages

Boring No. ED-85-K Desig. 15 Diam. (Casing) 4"

Co-ordinates: N SEE DRAWING E

FIELD LOG OF TEST BORING

Elevation Top of Boring 47 M.S.L. Hammer Wt. 140 Boring Started 10/14/85  
Total Overburden Drilled 67 Feet Hammer Drop 20  
Elevation Top of Rock -20 M.S.L. Casing Left 4" Boring Completed 10/23/85  
Total Rock Drilled 7 Feet (Subsurface Water Data: \_\_\_\_\_ Page \_\_\_\_\_)  
Elevation Bottom of Boring -27 M.S.L. Obs. Well 2"  
Total Depth of Boring 74 Feet Drilled By DAVIS + HARRIS  
Core Recovered 0 % No. Boxes — Mfg. Des. Drill RAIL MOUNTED CME 45  
Core Recovered — Ft. — Diam. — In. Inspected By: PAUL FISHER  
Soil Samples 13/6 In. Diam. 5 No. Classification By: M. THEN  
Soil Samples — In. Diam. — No. Classification By: P. FISHER

DEPTH	CORE/SAMPLE		BLOWS PER FT.		SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	NO.	SIZE	REMARKS	REMARKS		
40.0				REL		SEE FD-85-1 FOR SOIL LOG FROM 0 TO 40
41.0	S-1	1 3/4	70	100 145 REMARK	ADVANCED BORING BY 3" ROLLER BIT FOLLOWED BY 4" DRIVE CASING	GRAVELLY CME SAND TR SILT, GY (SW)
45.0						
46.5	S-2	"	100	64 63 60		CME SAND + GRAVEL GY/BR (SW/GD)
50.0						
51.5	S-3	"	100	104 80 95		SAME AS S-2
55.0						
54.5				360 400 ft		no recovery due to boulder
60.0						

GENERAL REMARKS: A 4" DRIVE SHOE CASING WAS ADVANCED TO 67' (ROLLER BIT TO 20' IN ROCK) THEN PULLED. A 4" SPIN SHOE CASING WAS THEN ADVANCED TO 61'. A 3" SPIN SHOE WAS TELESCOPED TO 70' IN ROCK FOLLOWED BY A ROLLER BIT TO 74'

Site <u>ABERSONA R.</u> <u>WOBURN, MASS.</u>					Boring No. <u>FD-85-15</u>		Page <u>2</u> of <u>2</u>	
DEPTH	CORE/SAMPLE			BLOWS PER FT. CORE REC'D	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS		
NO.	SIZE	DEPTH PLANE						
60.0								
61.5	S-4	1 1/8	Rec 85	150		Same as S-2		
65.0								
65.5	S-5	1 1/8	90%	110-120	400 Blows/ft	Same as S-2		
67.0					Casing refusal @ 67.0' (4")	Refusal due to boulders or rock BOULDER ON BEDROCK		
70.0					3" SAN CASING STOPPED ADVANCED 2 1/2" ROLLER BIT			
74.0					END OF EXPLORATION			

# PIEZOMETER INSTALLATION REPORT

PROJECT: Aberjona R., Noturn DATE: 10/15/85  
 LOCATION (STA): bee Map OFFSET FROM CENTER LINE: — PIEZ NO.: FD-85-15  
 PIEZ TYPE: Slotted .010" O.D. 2"x2" Type DEPTH OF PIEZ: 67' RISER PIPE DIAM: 2"  
 PIEZ TIP SET IN SOIL SAMPLE NO.: 5-5 BORING DIAM: 4"  
 (SOIL TYPE): CME SAND + GRAVEL  
 METHOD OF INSTALLATION: 4" + 3" SPIN CASING + ROLLER BIT  
 TYPE OF PROTECTION FOR PIEZ: 4" casing 17' Total 3.0 stickup VENT: lock cap  
 GROUND ELEV.: 47 ELEV. TOP OF RISER: 50.0' ELEV. PIEZ TIP: -20'  
 FILTER: 2 SAND + NATURAL GRAVEL FROM ELEV: -27 TO ELEV: -14  
 SEAL: + 3/8 Bentonite Slurry FROM ELEV: -14 TO ELEV: +6  
 INSTALLED BY: HAWKINS & TRAVIS CONTRACT DMW-33-85-D-011  
 NO.: DD #3 FOREMAN: FISHER  
 DATE OF INSTALLATION: 10/23/85 DATE OF OBSERVATIONS: 10/24/85

METHOD OF TESTING PIEZ.: Falling Head Test

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
8:19	—	6.87						
	0	0						

REMARKS: took water faster than we could measure the falling level

FISHER

INSPECTOR

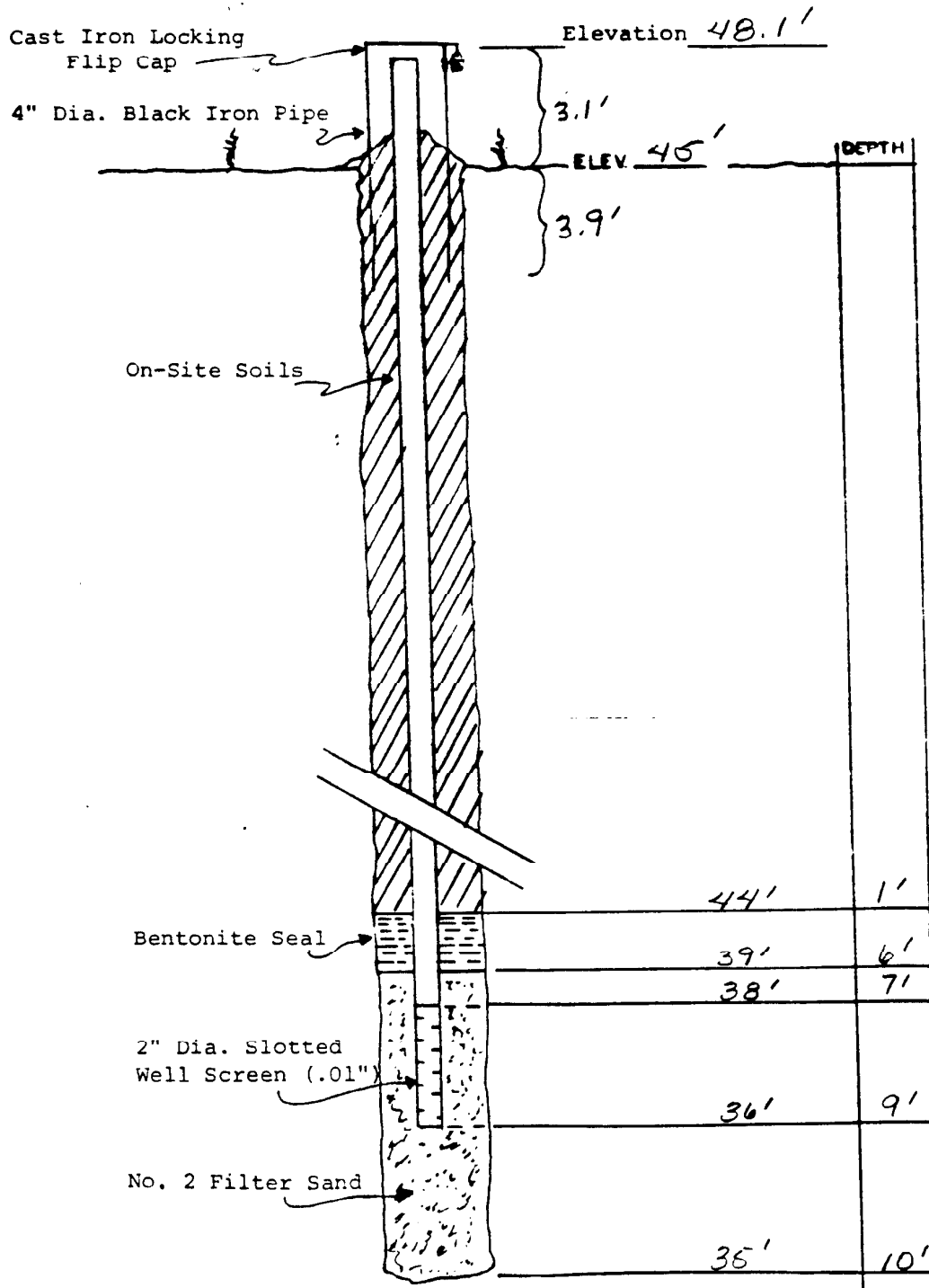
## OBSERVATION WELL INSTALLATION DETAIL

**Client:** ARMY CORPS OF ENGINEERS, NED

**Project:** Aberjona River, Wells G&H  
Woburn MA

**Project No.** DACW-33-85-D-00  
D.O.#0003

**Well No.** FD85- 7  
Cluster No. S-91



FD-85-7

WELLS G+H  
Site Aberjona River, Woburn MA  
Hole No. FD-85-7 Diam. (Casing) 4"  
Co-ordinates: N 58° 45' 15" E  
Drilled by Harris and Rowlands

PROJECT NO. 11-01-85-EE-D-0011  
L.O. # 1  
Page 1 of 3 Pages  
Boring Started 10/2/85  
Boring Completed 10/2/85  
Report Submitted \_\_\_\_\_

Purpose of Exploration observation wells are required to verify FEF for hydrologic modeling for others.

Elevation Top of Hole 45 M.S.L.  
Total Overburden Drilled 0 Feet  
Elevation Top of Rock — M.S.L.  
Elevation Bottom of Hole 15 M.S.L.  
Total Rock Drilled 0 Feet  
Total Depth of Hole 15 Feet  
Core Recovered — %  
Core Recovered — Ft.; — Diam. — In.  
Soil Samples — In. Diam. — No.  
Soil Samples — In. Diam. — No.

Casing Left in Place 7.00 Fee  
3.10' stick up

- SEE FD-85-6 FOR SOIL LOG

Water Table Depth 1.18'

Depth		Method of Drilling and Type of Bit Used	INDEX	
From	To			
0	100	11.85" = 1 1/2" = 1 1/2" = 1 1/2" = 1 1/2"	Ground Water _____	Back of Page _____
		Hydraulic - Water - 1/2" = 1/2" = 1/2" = 1/2" = 1/2"	Boring Location Sketch _____	Back of Page _____
			Overburden Record _____	Page _____
			Rock Drilling _____	Page _____
			_____	Page _____
			_____	Page _____
			_____	Page _____

Prepared by D. J. D. J. Field Data \_\_\_\_\_ Lab. Data \_\_\_\_\_  
Submitted by J. J. J. J.

# PIEZOMETER INSTALLATION REPORT

PROJECT: Alameda Valley Water DATE: 8 Oct 85  
 LOCATION (STA): err map OFFSET FROM CENTER LINE: — PIEZ NO.: FD-85-7  
 PIEZ TYPE: slotted .010" Coro Guard DEPTH: 9' RISER PIPE DIAM: 2"  
 PIEZ TIP SET IN mf sand, some SOIL SSB or  
 (SOIL TYPE): SSM silty, clayey sand SAMPLE NO.: FD85-6 BORING DIAM: 8"  
 METHOD OF INSTALLATION: Hollow Stem Pump Soils  
 TYPE OF PROTECTION  
 FOR PIEZ: 4" Coro. 5' Total 2.10' Slotted VENT: lock cap  
 GROUND ELEV.: 45' ELEV. TOP OF RISER: 48.1' ELEV PIEZ TIP: 36'  
 FILTER: — FROM ELEV: 35' TO ELEV: 39'  
 SEAL: 1/8" Verla. de seals FROM ELEV: 39' TO ELEV: 44'  
 INSTALLED BY: Carle and Blum CONTRACT JACW 33-85-  
 NO.: 48843 FOREMAN: Beddoe

DATE OF INSTALLATION: 9 Oct 85 DATE OF OBSERVATIONS: 10/12/85

METHOD OF TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
		4.23	1638	4	4.06			
16:34	0	0.15	1642	8	4.28			
	1/2	1.45						
	1	2.35						
16:36	2	3.36						

REMARKS:

FISHER  
INSPECTOR

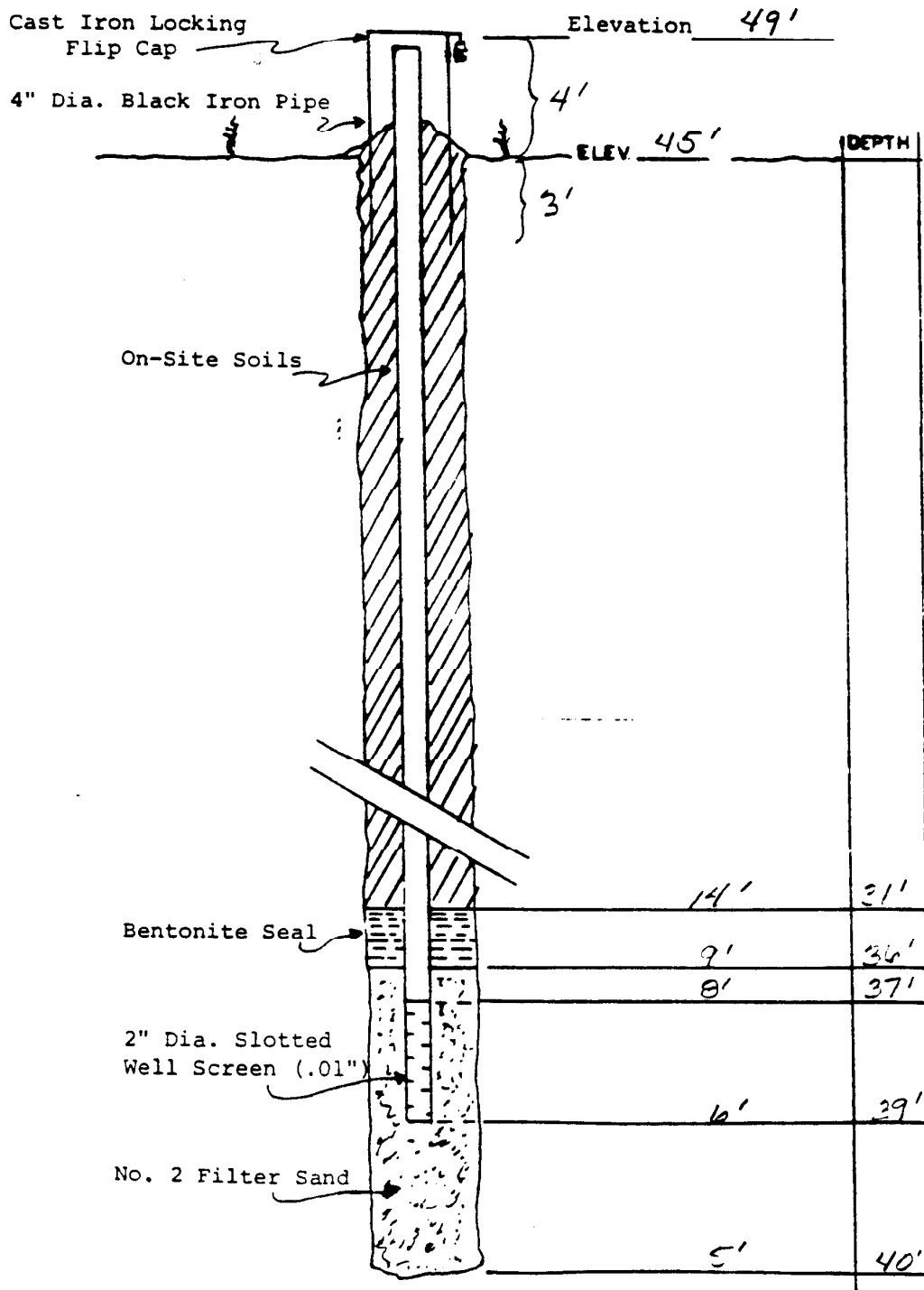
## OBSERVATION WELL INSTALLATION DETAIL

Client: ARMY CORPS OF ENGINEERS, NED

Project No. DACW-33-85-D-00  
D.O.#0003

Project: Aberjona River, Wells G&H  
Woburn MA

Well No. FD85- 6  
Cluster No. S- 9/



CLUSTER S-91

FD-85-6

CORPS OF ENGINEERS, U. S. ARMY  
NEW ENGLAND DIVISION  
FOUNDATION AND MATERIALS BRANCH  
FIELD LOG OF TEST BORING

WELL G+H  
PROJECT NO. 100-1-100  
Site 100-1-100 MA Page 1 of 1 Pages  
Hole No. FD-85-6 Diam. (Casing) 4" Boring Started 10/2/85  
Co-ordinates: N 41° 12' 30" E Boring Completed 10/2/85  
Drilled by Smith and Associates Report Submitted

Purpose of Exploration operation wells are required by EPA for hydrologic modeling purposes

Elevation Top of Hole 45 M.S.L. Casing Left in Place 7.00 Fe  
Total Overburden Drilled 10 Feet 4.0' stickup  
Elevation Top of Rock — M.S.L.  
Elevation Bottom of Hole 5 M.S.L.  
Total Rock Drilled 0 Feet  
Total Depth of Hole 4 Feet  
Core Recovered — %  
Core Recovered — Ft.; — Diam. — In.  
Soil Samples 13/5 In. Diam. 1-5 No.  
Soil Samples — In. Diam. — No. Water Table Depth 1.04'

Depth		Method of Drilling and Type of Bit Used	INDEX
From	To		
0	40.0	4.25" T.D. Hollow Stem Auger	Ground Water <u>—</u> Back of Page <u>—</u>
		Hydraulic Water User Design-A-Celling	Boring Location Sketch <u>—</u> Back of Page <u>—</u>
			Overburden Record <u>—</u> Page <u>—</u>
			Rock Drilling <u>—</u> Page <u>—</u>
			<u>—</u> Page <u>—</u>
			<u>—</u> Page <u>—</u>
			<u>—</u> Page <u>—</u>

Prepared by — Field Data — Lab. Data —  
Submitted by —



U. S. ARMY  
CORPS OF ENGINEERS  
NEW ENGLAND DIVISION

Site FD-85-6 Page 1 of 1 Pages

Boring No. FD-85-6 Desig. PZ6 Diam. (Casing) 4"

Co-ordinates: N 550 1000 E 0

FIELD LOG OF TEST BORING

Elevation Top of Boring 45 M.S.L. Hammer Wt. 100 lb Boring Started 20-45  
Total Overburden Drilled 40 Feet Hammer Drop 50"  
Elevation Top of Rock - M.S.L. Casing Left 20' 7" Boring Completed 20-45  
Total Rock Drilled 0 Feet | Subsurface Water Date        | Page         
Elevation Bottom of Boring 5 M.S.L. | Obs. Well 2"  
Total Depth of Boring 40 Feet Drilled By Davis and Hays (ATI)  
Core Recovered        % No. Boxes        Mfg. Des. Drill CNE 45 Back Mounted  
Core Recovered        Ft |        Diam.        In. Inspected By: Edwards (ATI)  
Soil Samples 13/2 In. Diam. 1-2 No. Classification By: Edwards (ATI)  
Soil Samples        In. Diam.        No. Classification By:       

DEPTH		CORE/SAMPLE		BLOWS PER FT. CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
IN.	NO.	SIZE	DEPTH RANGE			
0					4.25" ID Hollow Stem Drill	
1.5	SS1	1 5/8	REL 100%	2.4		jar 1 of 2: 0.5 ft. of peat, some mf sand, black, mg. Si note change to 0.5-1.0 ft. jar 2 of 2: 50 dark brown mf sand, little organic matter
5.0						
6.5	SS2	1 5/8	100%	2.5		SD - mf sand, trace organic wet, brown changing to grey with depth. trace carbon
10.0						
11.5	SS3	1 5/8	70 90	WOR 2-3		SD-3M mf sand, some silt, trace organics brown, saturated
15.0						
16.5	SS4	1 5/8	100 1%	3.3		SP-SH fine sand, tan with and silt, rust horizons saturated
20.0						
21.5	SS5	1 5/8	50 90	2.2		SP-SH fine sand / tan with and silt, rust horizons saturated, trace carbon
GENERAL REMARKS: Set piez @ 39'						

Site

Boring No.

Page

FD-85-6

of

DEPTH	CORE/SAMPLE			BLOWS PER FT CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIAL
	NO.	SIZE	DEPTH HAND			
25.0						
26.5	SS6	1 5/8	40%	2 1		SM - fine sand and silt tan with rust horizons, we trace contaminants
30.0						
31.5	SS7	1 5/8	65%	3 7 7		SP-SM mp sand, some silt, brown w trace contaminant
35.0						
36.5	SS8	1 5/8	40%	8 10 12		SW-GP mp sand, some gravel, brown, wet
40.0					END OF EXPLORATIONS	

[illegible]

INSPECTOR

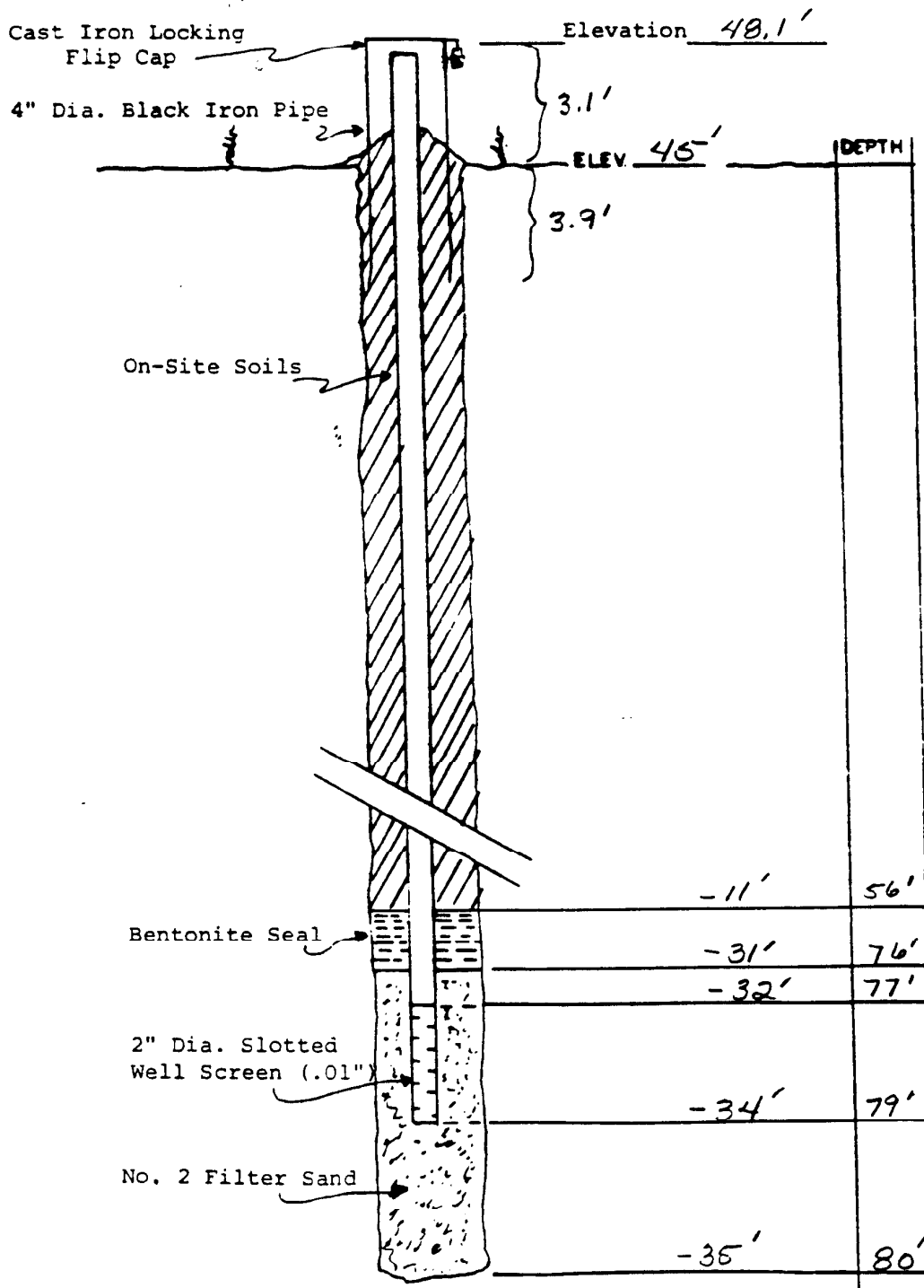
## OBSERVATION WELL INSTALLATION DETAIL

Client: ARMY CORPS OF ENGINEERS, NED

Project: Aberjona River, Wells G&H  
Woburn MA

Project No. DACW-33-85-D-00  
D.O.#0003

Well No. FD85- 8  
Cluster No. S-9/



CLUSTER S-91

FD-85-8

CORPS OF ENGINEERS, U. S. ARMY  
NEW ENGLAND DIVISION  
FOUNDATION AND MATERIALS BRANCH  
FIELD LOG OF TEST BORING

ABERJONA RIVER PROJECT NO. OACW 33-85-D-0011  
Site WELL OYH, WABURN, MA D.O. 2003  
Page 1 of        Pages  
Hole No. FO-85-B Dim. (Casing) 4" Boring Started 10-3-85  
Co-ordinates: N SEE DRAWING Boring Completed 10-8-85  
Drilled by DAVIS + HAWKINS (ATL) Report Submitted       

Purpose of Exploration SOIL SAMPLING + PIEZOMETER INSTALLATION  
FOR EPA CONTAMINATION STUDY

Elevation Top of Hole 45 M.S.L.  
Total Overburden Drilled 80 Feet  
Elevation Top of Rock        M.S.L.  
Elevation Bottom of Hole -35 M.S.L.  
Total Rock Drilled 0 Feet  
Total Depth of Hole 80 Feet  
Core Recovered        %  
Core Recovered        Ft.;        Diam.        In.  
Soil Samples 3/8 In. Diam. 5 No.  
Soil Samples        In. Diam.        No.

Casing Left in Place 4"  $\phi$  TOTAL 7 For  
3.1 STICKUP

SEE FD-85-6 FOR SOIL LOG  
FROM 0 TO 40'

Water Table Depth 1.25'

Depth		Method of Drilling and Type of Bit Used	INDEX
From	To		
0.0	30.0	3" POWER BIT FOLLOWED BY 4" $\phi$ CASING WASH WITH WATER	Ground Water <u>      </u> Back of Page <u>      </u> Boring Location Sketch <u>      </u> Back of Page <u>      </u> Overburden Record <u>      </u> Page <u>      </u> Rock Drilling <u>      </u> Page <u>      </u> <u>      </u> Page <u>      </u> <u>      </u> Page <u>      </u> <u>      </u> Page <u>      </u>
30.0	70.0	3" POWER BIT FOLLOWED BY 4" $\phi$ CASING WASH WITH BENTONITE MIX	
70.0	80.0	FLUSHED OUT BENTONITE AND CONTINUED, AS ABOVE, WITH WATER	

Prepared by PAUL FISHER

Field Data

Lab. Data

Submitted by ATLANTIC TESTING LAB

U. S. ARMY  
CORPS OF ENGINEERS  
NEW ENGLAND DIVISION

Site WELL 104-85 Page 1 of 2 Page

Boring No. FD-85-8 Desig. PZ-8 Diam. (Casing) 4"

FIELD LOG OF TEST BORING

Co-ordinates: N SEE DRAWING E ---

Elevation Top of Boring 45 M.S.L. Hammer Wt. 140 Boring Started 10-3-85  
Total Overburden Drilled 80 Feet Hammer Drop 30"  
Elevation Top of Rock --- M.S.L. Casing Left 7' OF 4" Boring Completed 10-8-85  
Total Rock Drilled --- Feet Subsurface Water Date --- (Page ---)  
Elevation Bottom of Boring -35 M.S.L. Obs. Well 2"  
Total Depth of Boring 80 Feet Drilled By DAVIS, HARRIS  
Core Recovered --- % No. Boxes --- Mfg. Des. Drill TRACK MOUNTED CME 45  
Core Recovered --- Ft. --- Diam. --- In. Inspected By: PAUL FISHER  
Soil Samples 1 3/8 In. Diam. 5 No. Classification By: PAUL FISHER  
Soil Samples --- In. Diam. --- No. Classification By: BEEDS

DEPTH	CORE/SAMPLE		BLOWS PER FT.	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIAL
	NO.	SIZE			
44.2			REC	4" Casing was wash (with water) & turned to 30'. Lost water, mix face drill mud, used dug mud pit. Cont. drilling 4" casing. Started sampling at 40'.	SEE BORING FD-85- FOR SOIL INFORMATION FROM 0.0 TO 40.0 FT
44.5	SS-1		7%	18 15 19	GRAVELLY FINE SAND, TAY. (SP-GF)
45.5					
46.5			NO	33- 21 15	ASSUMED SAND AC SS-1
50.0					
55.0			NO		
60.0	SS-2		WASH SAMPLE		FM C. SAND, AX 400 GRAVELLY SAND AC SS-1
62.0					

GENERAL REMARKS:

HYDRANT WATER USED DURING ALL  
DRILLING

Site <u>251 JUNE RIVER</u> <u>WELL 34 ST WOBURN</u>					Boring No. <u>FD-85-8</u>		Page <u>1</u> of <u>2</u>	
DEPTH		CORE/SAMPLE		BLOWS PER FT	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS		
FE	NO.	SIZE	DEPTH CORE RECVY					
60.0			NO		SPEE - No. 3. Washing 65 to 65 signing of n.			
65.0								
66.5	SS-3	SS	22 1/2 33					20' 10" F. 20' 10" F. 20' 10" F. Wet (SV-32)
70.0					Washed Drill Mud From Hole AND ADVANCED THE REMAINING 10' WITH HYDRANT WATER ONLY	Sand and gravel, little silt, medium (SP-SM)		
71.5	SS-4	SS	75 1/2 48					
75.0								
	SS-5		100 1/2 130 1/2"			GRAVELLY F.M.G. SAND G (SW)		
80.0					END OF EXPLORATION			

# PIEZOMETER INSTALLATION REPORT

PROJECT: ABERJONA RIVER, WELL #14 WYMAN, MA DATE: 10/12/85  
 LOCATION (STA): SEE DRAWING OFFSET FROM CENTER LINE: — PIEZ NO.: FO-85-6  
 PIEZ TYPE: SLOTTED (D10") 2" x 2" DEPTH OF PIEZ: 79' RISER PIPE DIAM: 2"  
 PIEZ TIP SET IN (SOIL TYPE): (SN) SOIL SAMPLE NO.: SS-5 BORING DIAM: 4"  
 METHOD OF INSTALLATION: 4" TURNED CASING  
 TYPE OF PROTECTION FOR PIEZ: 4" CASING, 7' TOTAL, 3.1 STILTRUP VENT: LOCK CAP  
 GROUND ELEV.: 45' ELEV. TOP OF RISER: 48.1 ELEV PIEZ TIP: -34  
 FILTER: #2 SAND FROM ELEV: -35 TO ELEV: -31  
 SEAL: BENTONITE SLURRY FROM ELEV: -31 TO ELEV: -11  
 INSTALLED BY: DAVIS & HAWKINS CONTRACT DAW 33-85-D-0011 NO.: D.O.#3 FOREMAN: FISHER  
 DATE OF INSTALLATION: 10/8/85 DATE OF OBSERVATIONS: 10/12/85

METHOD OF TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
4:27	—	4.35		2	4.35			
	0	.32						
	1/4	2.73						
	1/2	3.70						
	1	4.20						

REMARKS:

FISHER

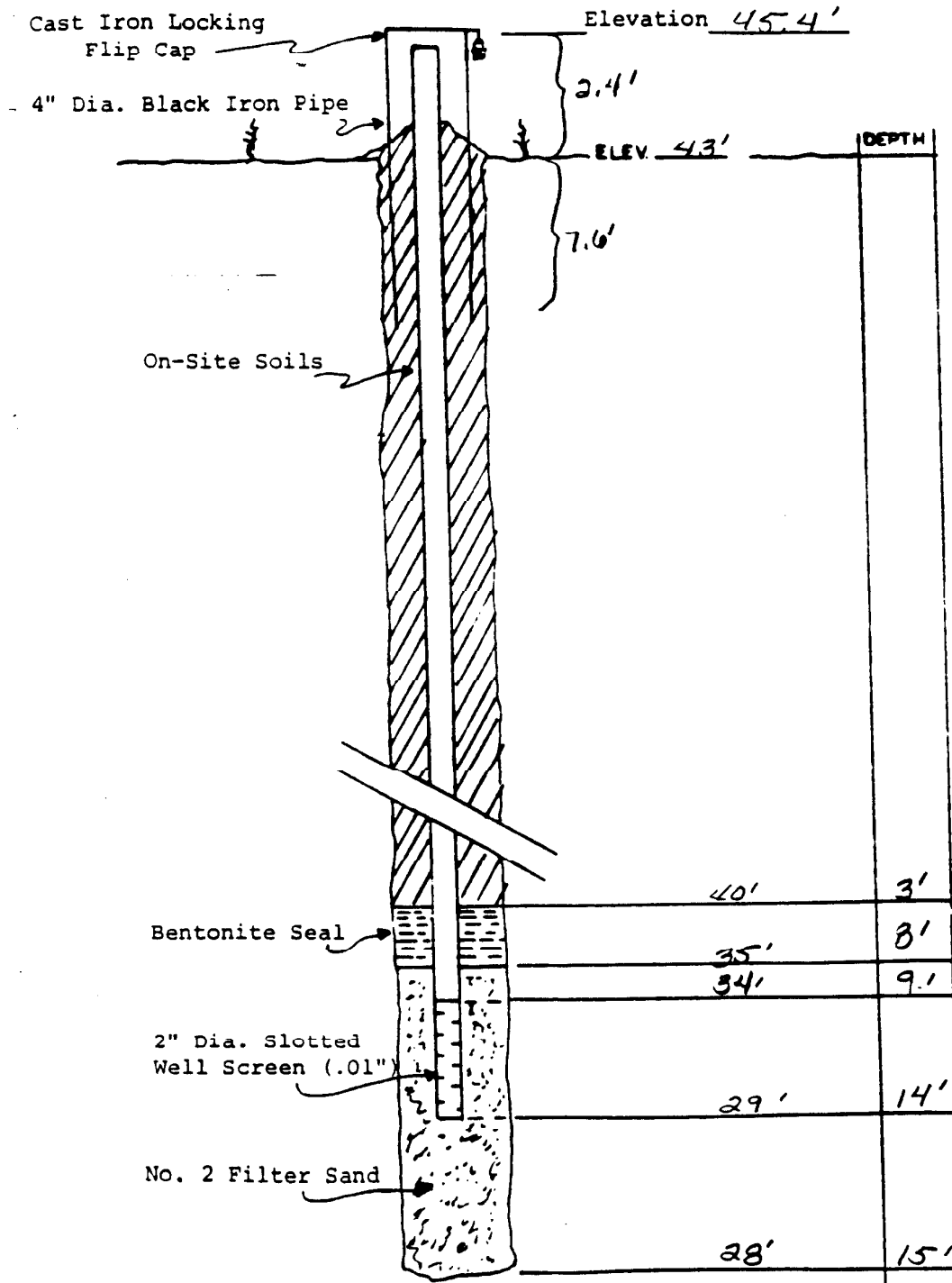
INSPECTOR



## OBSERVATION WELL INSTALLATION DETAIL

**Client:** ARMY CORPS OF ENGINEERS, NED  
**Project:** Aberjona River, Wells G&H  
 Woburn MA

**Project No.** DACW-33-85-D-0011  
 D.O.#0003  
**Well No.** FD85- 27  
 Cluster No. S-92



CLUSTER 5-92

FD-35-27

CORPS OF ENGINEERS, U. S. ARMY  
NEW ENGLAND DIVISION  
FOUNDATION AND MATERIALS BRANCH  
FIELD LOG OF TEST BORING

Site ABERDONA RIVER PROJECT NO. DACW-37-35-D 5011  
WELLS ST. N. WOBURN, MA D.O. 3  
Page 1 of 2 Pages  
Hole No. FD-85-27 Diam. (Casing) 4 Boring Started 11/1/95  
Co-ordinates: N SEE E DRAWING Boring Completed 11/1/95  
Drilled by DAVIS & HAWKINS Report Submitted \_\_\_\_\_  
Purpose of Exploration PIEZOMETER INSTALLATION

Elevation Top of Hole 43' M.S.L.  
Total Overburden Drilled 15 Feet  
Elevation Top of Rock — M.S.L.  
Elevation Bottom of Hole 28 M.S.L.  
Total Rock Drilled 0 Feet  
Total Depth of Hole 15 Feet  
Core Recovered — %  
Core Recovered — Ft.: — Diam. — In.  
Soil Samples — In. Diam. — No.  
Soil Samples — In. Diam. — No.

Casing Left in Place TOTAL 10 Feet

SEE FD-85-25 FOR SOIL LOG

Water Table Depth 0.21'

Depth		Method of Drilling and Type of Bit Used	INDEX
From	To		
0	15	4" ID AUGER	Ground Water _____ Back of Page _____
		HYDRANT WATER USED DURING	Boring Location Sketch _____ Back of Page _____
		ALL DRILLING	Overburden Record _____ Page _____
			Rock Drilling _____ Page _____
			_____ Page _____
			_____ Page _____
			_____ Page _____

Prepared by PAUL FISHER  
Field Data  
Submitted by ATLANTIC TESTING LAB

Lab. Data

# PIEZOMETER INSTALLATION REPORT

PROJECT: ABERDEEN R. WOBURN MA DATE: 11/1/85  
 LOCATION (STA): SEE DRAWING OFFSET FROM CENTER LINE: — PIEZ NO.: FD-85-27  
 PIEZ TYPE: 2"  $\phi$  SLOTTED .010" DEPTH OF PIEZ: 14' RISER PIPE DIAM: 2"  
 PIEZ TIP SET IN (SOIL TYPE): 1 F SAND SOIL FD-85-25 SAMPLE NO.: 55-3 BORING DIAM: 8"  
 METHOD OF INSTALLATION: 4" ID AUGER  
 TYPE OF PROTECTION FOR PIEZ: 4"  $\phi$  X 10' LONG PIPE VENT: LOW CHIN  
 GROUND ELEV.: 43' ELEV. TOP OF RISER: 45.4' ELEV PIEZ TIP: 29'  
 FILTER: #2 SAND FROM ELEV: 28' TO ELEV: 35  
 SEAL: 3/8 PELTONITE FROM ELEV: 35' TO ELEV: 40'  
 INSTALLED BY: DAVIS & HAWKINS CONTRACT NO.: 0.0 #3 FOREMAN: FISHER  
 DATE OF INSTALLATION: 11/1/85 DATE OF OBSERVATIONS: 11/4/85  
 METHOD OF TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
1433		2.61	1447	3	2.61			
1444	0	0						
	1/2	2.46						
1445	1	2.55						
1446	2	2.59						

REMARKS: 2.4 RISER STICKUP  
5' SCREEN

P. FISHER  
 INSPECTOR

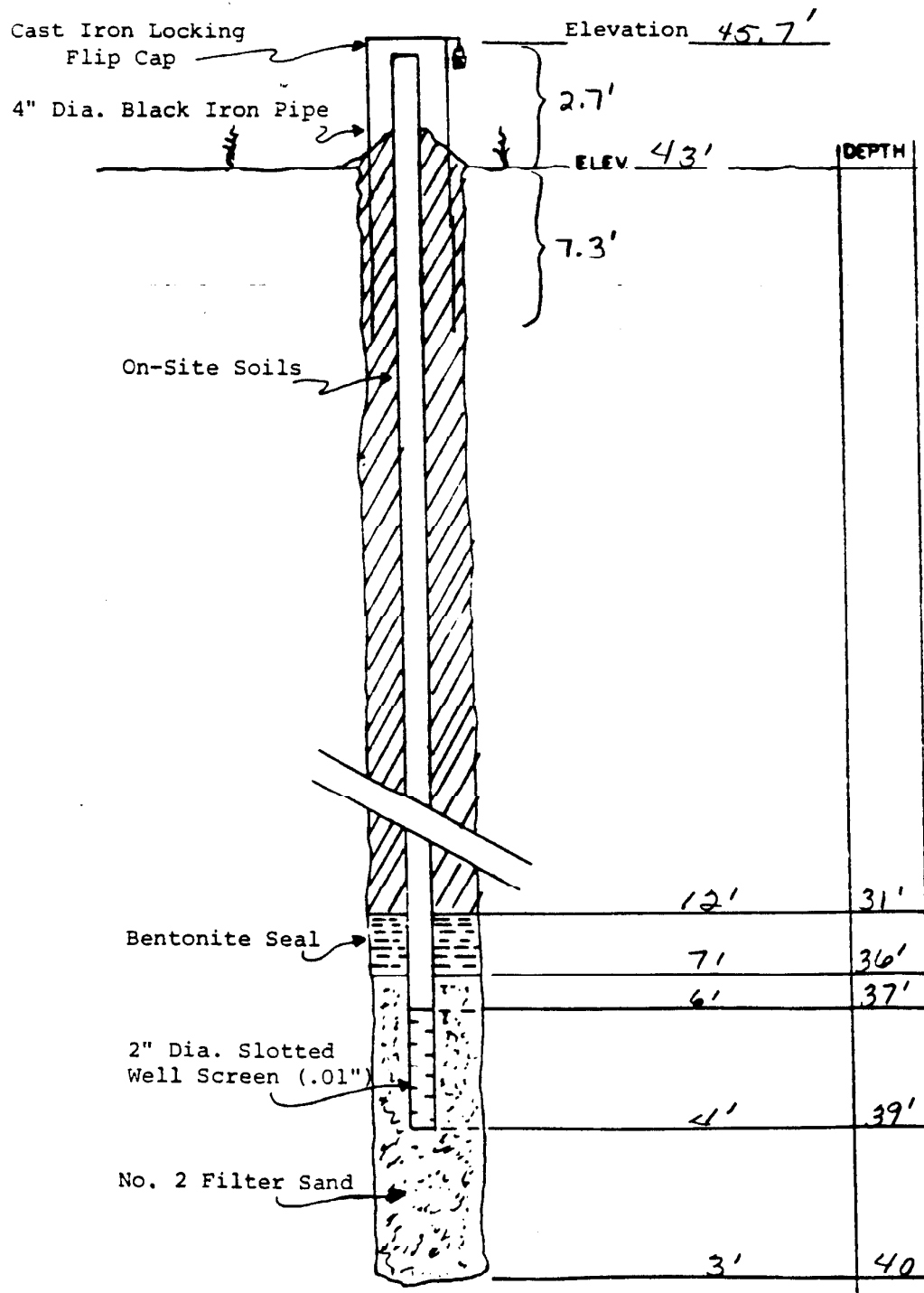
## OBSERVATION WELL INSTALLATION DETAIL

**Client:** ARMY CORPS OF ENGINEERS, NED

**Project No.** DACW-33-85-D-0011  
D.O.#0003

**Project:** Aberjona River, Wells G&H  
Woburn MA

**Well No.** FD85- 28  
Cluster No. S-92



CLUSTER 5-92

FD-85-28

CORPS OF ENGINEERS, U. S. ARMY  
NEW ENGLAND DIVISION  
FOUNDATION AND MATERIALS BRANCH  
FIELD LOG OF TEST BORING

ABERJONA RIVER PROJECT NO. DAEW-33-83-B0011  
D.O. 3  
Site WELLS #14, WOBURN, MA Page 1 of 2 Pages  
Hole No. FD-85-28 Diam. (Casing) 4 Boring Started 11/1/85  
Co-ordinates: N SEE E DRAWING Boring Completed 11/1/85  
Drilled by DAVIS & HAWKINS Report Submitted \_\_\_\_\_  
Purpose of Exploration PIEZOMETER INSTALLATION

Elevation Top of Hole 43 M.S.L.  
Total Overburden Drilled 40 Feet  
Elevation Top of Rock — M.S.L.  
Elevation Bottom of Hole 3 M.S.L.  
Total Rock Drilled 0 Feet  
Total Depth of Hole 40 Feet  
Core Recovered — %  
Core Recovered — Ft. — Diam. — In.  
Soil Samples — In. Diam. — No.  
Soil Samples — In. Diam. — No.

Casing Left in Place TOTAL 10 Feet

SEE FD-85-25 FOR SOIL LOG

Water Table Depth 0.07'

Depth		Method of Drilling and Type of Bit Used	INDEX
From	To		
0	40	4" ID AUGER	Ground Water _____ Back of Page _____
		HYDRANT WATER USE DURING	Boring Location Sketch _____ Back of Page _____
		ALL DRILLING	Overburden Record _____ Page _____
			Rock Drilling _____ Page _____
			_____ Page _____
			_____ Page _____
			_____ Page _____

Prepared by PAUL FISHER

Field Data

Lab. Data

Submitted by ATLANTIC TESTING LAB

# PIEZOMETER INSTALLATION REPORT

PROJECT: ABERJONA R, WOBURN MA | DATE: 11/1/85  
 LOCATION (STA): SEE DRAWING OFFSET FROM CENTER LINE:          PIEZ NO.: FD-85-28  
 PIEZ TYPE: 2"  $\phi$  SLOTTED, .010" DEPTH OF PIEZ: 39' RISER PIPE DIAM: 2"  
 PIEZ TIP SET IN (SOIL TYPE): MF SAND (SP) SOIL FD-85-23 SAMPLE NO.: 55-9 BORING DIAM: 8"  
 METHOD OF INSTALLATION: 4" ID AUGER  
 TYPE OF PROTECTION FOR PIEZ: 4"  $\phi$  X 10' LONG PIPE VENT: LOCK CAP  
 GROUND ELEV.: 43' ELEV. TOP OF RISER: 45.7' ELEV PIEZ TIP: 4'  
 FILTER: #2 SAND FROM ELEV: 3 TO ELEV: 7  
 SEAL: 3/8 PELTONITE FROM ELEV: 7 TO ELEV: 12  
 INSTALLED BY: DAVIS & HAWKINS CONTRACT NO.: 00. 3 FOREMAN: FISHER  
 DATE OF INSTALLATION: 11/1/85 DATE OF OBSERVATIONS: 11/4/85  
 METHOD OF TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
1431	—	2.77						
1449	0	0						
	1/2	2.74						
1450	1	2.76						
1451	2	2.77						

REMARKS: 2.7 RISER STICK UP

P. FISHER  
INSPECTOR

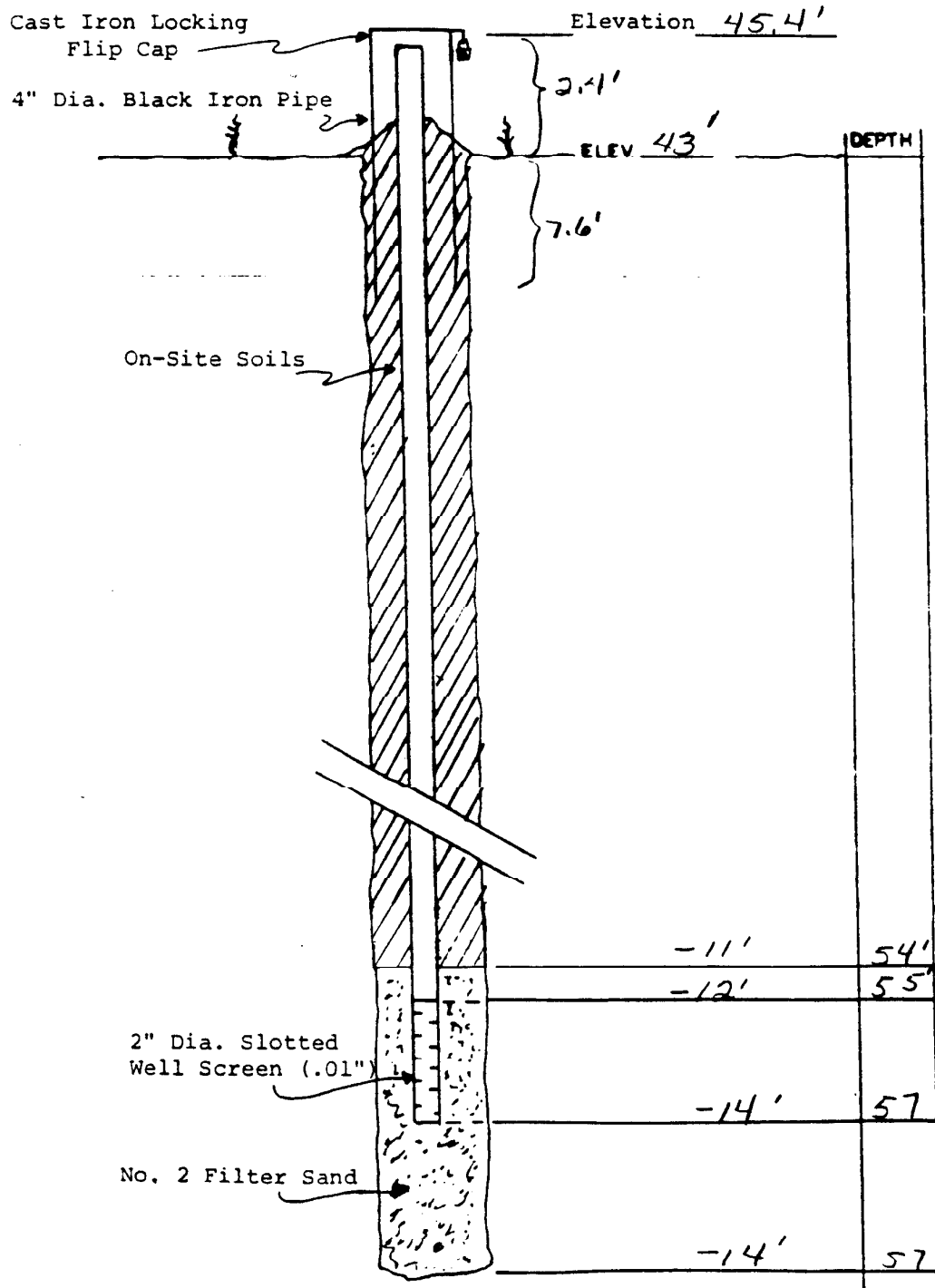
## OBSERVATION WELL INSTALLATION DETAIL

**Client:** ARMY CORPS OF ENGINEERS, NED

**Project No.** DACW-33-85-D-0011  
D.O.#0003

**Project:** Aberjona River, Wells G&H  
Woburn MA

**Well No.** FD85- 29  
Cluster No. S- 92



CLUSTER S-92

FD-85-29

CORPS OF ENGINEERS, U. S. ARMY  
NEW ENGLAND DIVISION  
FOUNDATION AND MATERIALS BRANCH  
FIELD LOG OF TEST BORING

ABERJONA RIVER PROJECT NO. DACW-33-95-D-0011  
Site WELLS G+H, WOBURN, MA 0.0.3  
Page 1 of 2 Pages  
Hole No. FD-8529 Diam. (Casing) 4 Boring Started 11/1/85  
Co-ordinates: N SEC E DRAWING Boring Completed 11/1/95  
Drilled by DAVIS + HAWKINS Report Submitted \_\_\_\_\_

Purpose of Exploration PIEZOMETER INSTALLATION

Elevation Top of Hole 43 M.S.L.  
Total Overburden Drilled 57 Feet  
Elevation Top of Rock \_\_\_\_\_ M.S.L.  
Elevation Bottom of Hole -14 M.S.L.  
Total Rock Drilled 0 Feet  
Total Depth of Hole 57 Feet  
Core Recovered \_\_\_\_\_ %  
Core Recovered \_\_\_\_\_ Ft.; \_\_\_\_\_ Diam. \_\_\_\_\_ In.  
Soil Samples \_\_\_\_\_ In. Diam. \_\_\_\_\_ No.  
Soil Samples \_\_\_\_\_ In. Diam. \_\_\_\_\_ No.

Casing Left in Place TOTAL 10 Feet

SEE FD-85-25 FOR SOIL LOG

Water Table Depth 0.19'

Depth From To	Method of Drilling and Type of Bit Used		INDEX	
0	57	4" ID AUGER	Ground Water	Back of Page
		HYDRANT WATER USED	Boring Location Sketch	Back of Page
		DURING ALL DRILLING	Overburden Record	Page
			Rock Drilling	Page
				Page
				Page
				Page

Prepared by PAUL FISHER

Field Data

Lab. Data

Submitted by ATLANTIC TESTING LAB



# PIEZOMETER INSTALLATION REPORT

PROJECT: ABERJONA R., Woburn, MA | DATE: 11/1/85  
 LOCATION (STA): SEE DRAWING OFFSET FROM CENTER LINE: — | PIEZ NO.: FD-85-29  
 PIEZ TYPE: 2"  $\phi$  SLO-50 .010" DEPTH OF PIEZ: 57' | RISER PIPE DIAM: 2"  
 PIEZ TIP SET IN (SOIL TYPE): MF SAND (SP) SOIL FO-35-25 | SAMPLE NO.: SS-12 BORING DIAM: 8"  
 METHOD OF INSTALLATION: 4" ID AUGER  
 TYPE OF PROTECTION FOR PIEZ: 4"  $\phi$  X 10' LONG PIPE | VENT: LOCK CAP  
 GROUND ELEV.: 43' | ELEV. TOP OF RISER: 45.4' | ELEV PIEZ TIP: -14'  
 FILTER: #2 SAND FROM ELEV: -14 | TO ELEV: -11  
 SEAL: NONE FROM ELEV: — | TO ELEV: —  
 INSTALLED BY: DAVIS & HAWKINS | CONTRACT NO.: D.O. 3 FOREMAN: FISHER  
 DATE OF INSTALLATION: 11/1/85 | DATE OF OBSERVATIONS: 11/4/85  
 METHOD OF TESTING PIEZ.: FALLING HEAD TEST.

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
1435		2.59		3	2.59			
1456	0	0						
	1/2	2.22						
	1	2.50						
	2	2.58						

REMARKS: 2.4 RISER SHUT UP

P. FISHER  
 INSPECTOR

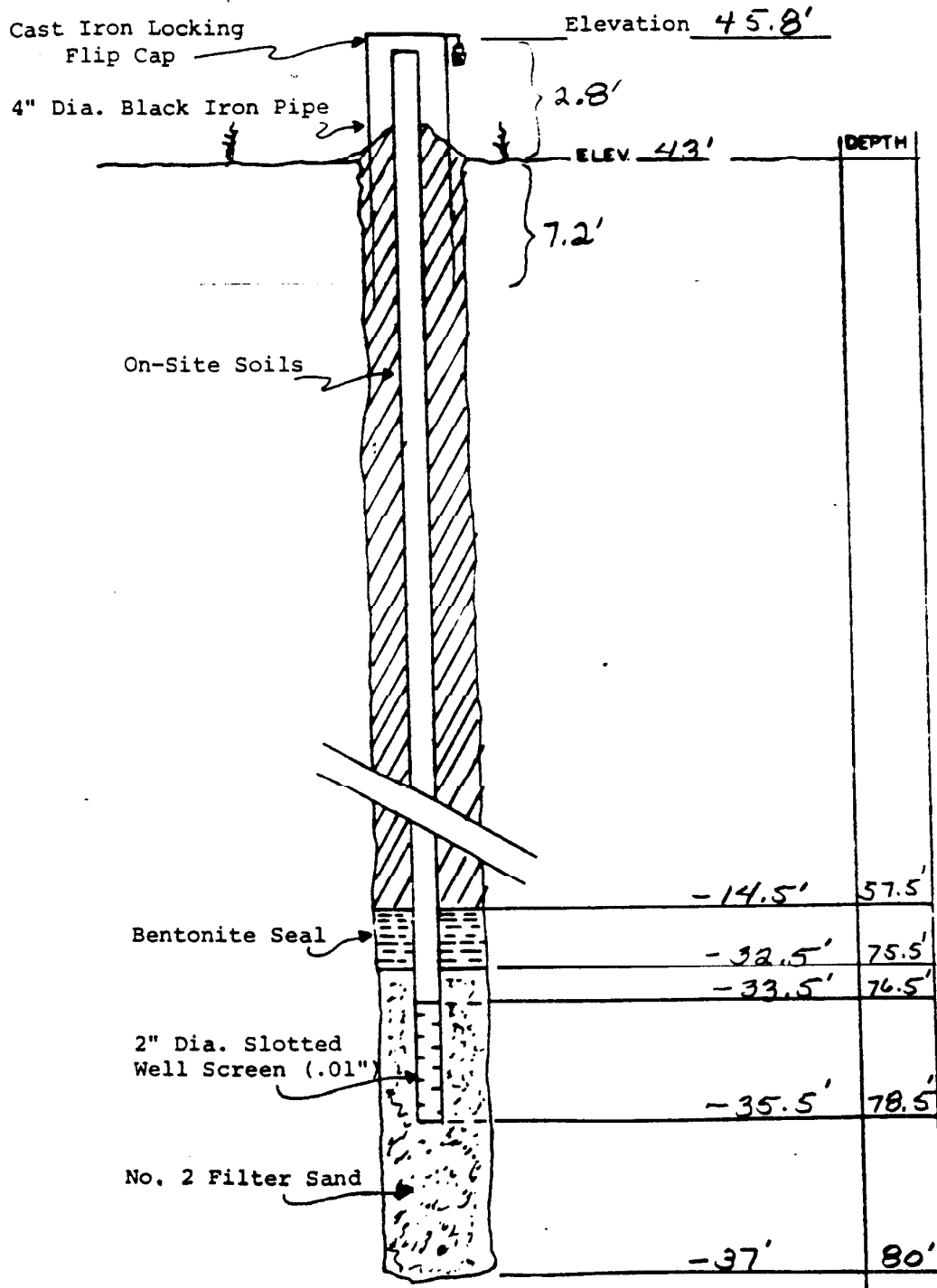
## OBSERVATION WELL INSTALLATION DETAIL

**Client:** ARMY CORPS OF ENGINEERS, NED

**Project No.** DACW-33-85-D-0011  
D.O.#0003

**Project:** Aberjona River, Wells G&H  
Woburn MA

**Well No.** FD85- 25  
Cluster No. S-92



CLUSTER S-92

FD-35-25

CORPS OF ENGINEERS, U. S. ARMY  
NEW ENGLAND DIVISION  
FOUNDATION AND MATERIALS BRANCH  
FIELD LOG OF TEST BORING

ABERJONA RIVER PROJECT NO. DALW-33-85-D-0011  
Site WELLS G+H WOBURN, MA D.O. #3  
Page 1 of 5 Pages  
Hole No. FD-85-25 Diam. (Casing) 4" Boring Started 10/30/85  
Co-ordinates: N SEP E DRAWING Boring Completed 10/31/85  
Drilled by DAVIS + HANKINS Report Submitted \_\_\_\_\_

Purpose of Exploration SOIL SAMPLING AND PIEZOMETER  
INSTALLATION

Elevation Top of Hole 43 M.S.L.  
Total Overburden Drilled 80 Feet  
Elevation Top of Rock — M.S.L.  
Elevation Bottom of Hole -37 M.S.L.  
Total Rock Drilled 0 Feet  
Total Depth of Hole 80 Feet  
Core Recovered — %  
Core Recovered — Ft.: — Diam. — In.  
Soil Samples 1 3/8 In. Diam. 16 No.  
Soil Samples — In. Diam. — No.

Casing Left in Place TOTAL 10 Feet

Water Table Depth -0.04'

Depth		Method of Drilling and Type of Bit Used	INDEX
From	To		
0	80	4" DRIVEN CASING AND 3 3/8 ROLLER BIT	Ground Water _____ Back of Page _____
		HYDRANT WATER USE DURING ALL DRILLING	Boring Location Sketch _____ Back of Page _____
			Overburden Record _____ Page _____
			Rock Drilling _____ Page _____
			_____ Page _____
			_____ Page _____
			_____ Page _____

Prepared by PAUL FISHER  
Field Note

Submitted by ATLANTIC TEST LAB

Lab Note

U. S. ARMY  
CORPS OF ENGINEERS  
NEW ENGLAND DIVISION

Site ABERDEEN R. W. 100' MA Page 1 of 1 Pages

Boring No. FD-85-25 Desig. 25 Diam. (Casing) 4"

Coordinates: N SEC DRAWING E ---

FIELD LOG OF TEST BORING

Elevation Top of Boring 43 M.S.L. Hammer Wt. 140 Boring Started 10/30/05  
Total Overburden Drilled 30 Feet Hammer Drop 30"  
Elevation Top of Rock --- M.S.L. Casing Left 4" Boring Completed 10/31/05  
Total Rock Drilled 0 Feet Subsurface Water Data --- Page ---  
Elevation Bottom of Boring -37 M.S.L. Obs. Well 2"  
Total Depth of Boring 30 Feet Drilled By DAVIS + HAWKINS  
Core Recovered 2% No. Boxes --- Mfg. Des. Drill TACK MOUNTED CME 45  
Core Recovered --- Ft. --- Diam. --- In. Inspected By: PAUL FISHER  
Soil Samples 1 3/8 In. Diam. 16 No. Classification By: PAUL FISHER  
Soil Samples --- In. Diam. --- No. Classification By: MARY Jo AGT

DEPTH	CORE/SAMPLE		BLOWS PER FT.	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	NO.	SIZE			
1.5	SS-1	1 7/8	10	DRIVEN 4" CASING WASHER WITH 3 7/8 ROLLER BIT	PEAT, BLK MOIST, ORGAN GRASS ROOTS
5	SS-2		10		peat, blk moist
10	SS-3		100		gray mf sand
15	SS-4		0		ASSUMED SAME AS SS-3
20	SS-5		100		black silty f sand to clay, moist

GENERAL REMARKS:

Site ABERJONA R.  
- WOBURN, MA

Boring No.

FD-35-25

Page 2  
of 3

DEPTH	CORE/SAMPLE		BLOWS PER FT CORE RECVY	SAMPLING AND CORING OPERATIONS		CLASSIFICATION OF MATERIALS
IN	NO.	SIZE	DEPTH RANGE			
26.5	SS-6		100	3 3/2	Hand rasped (4") Roller wash (3%)	black silt, some p. moist
30						
31.5	SS-7		100	9 6/5		black mf sand
35						
36.5	SS-8		0	5 4/9		change; first two sand in situ Assumed MF SAND, TAN
40						
41.5	SS-9		0	5 4/6	W S A S P L	Tan, mf sand
45						
46.5	SS-10		100	8 5/8		Similar soils As SS-9
50						
51.5	SS-11		100	7 4/7		Similar soils As SS-9
55						
56.5	SS-12		100	13 9/9		Similar soils As SS-9 NO DETECTED CONTAMINANTS
60						
61.5	SS-13		100	11 7/7		Similar soils As SS-9 NO DETECTED CONTAMINANTS
65						
66.5	SS-14		100	7 4/2		similar soils As SS-9

Site ABERJONA R.  
WOBURN, MA

Boring No.

FD-85-25

Page 3

of 3

DEPTH		CORE/SAMPLE		BLOWS PER FT	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	ft.	NO.	SIZE	DEPTH RANGE		
	71.0	SS-15		100	1124	
	71.5					SAME As SS-9
	75.0	SS-16		100	1194	
	75.5					SAME As SS-9
	80.0					
END OF EXPLORATION						

# PIEZOMETER INSTALLATION REPORT

PROJECT: ABERJONA R. WOBURN MA DATE: 10/31/85  
 LOCATION (STA): SEE DRAWING OFFSET FROM CENTER LINE:        PIEZ NO.: FD-85-25  
 PIEZ TYPE: 2"  $\phi$  SLOTTED .010" DEPTH OF PIEZ: 78.5' RISER PIPE DIAM: 2"  
 PIEZ TIP SET IN (SOIL TYPE): MF SAND (SP) SOIL SAMPLE NO.: 55-16 BORING DIAM: 4"  
 METHOD OF INSTALLATION: 4" DRIVEN CASING, 3 $\frac{3}{8}$ " POWER BIT  
 TYPE OF PROTECTION FOR PIEZ: 4"  $\phi$  X 10' LONG PIPE VENT: LOCK CAP  
 GROUND ELEV.: 43' ELEV. TOP OF RISER: 45.8' ELEV. PIEZ TIP: -35.5'  
 FILTER: #2 SAND FROM ELEV: -37' TO ELEV: -32.5'  
 SEAL: BENTONITE SWART FROM ELEV: -32.5' TO ELEV: -14.5'  
 INSTALLED BY: DAVIS & HAWKING CONTRACT NO.: D.O. 3 FOREMAN: FISHER  
 DATE OF INSTALLATION: 10/31/85 DATE OF OBSERVATIONS: 11/4/85  
 METHOD OF TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
1432		2.76	1441	3	2.71			
1438	0	0	1442	4	2.76			
	1/2	2.42						
1439	1	2.56						
1440	2	2.64						

REMARKS: 28 RISER STICK UP

P. FISHER  
INSPECTOR

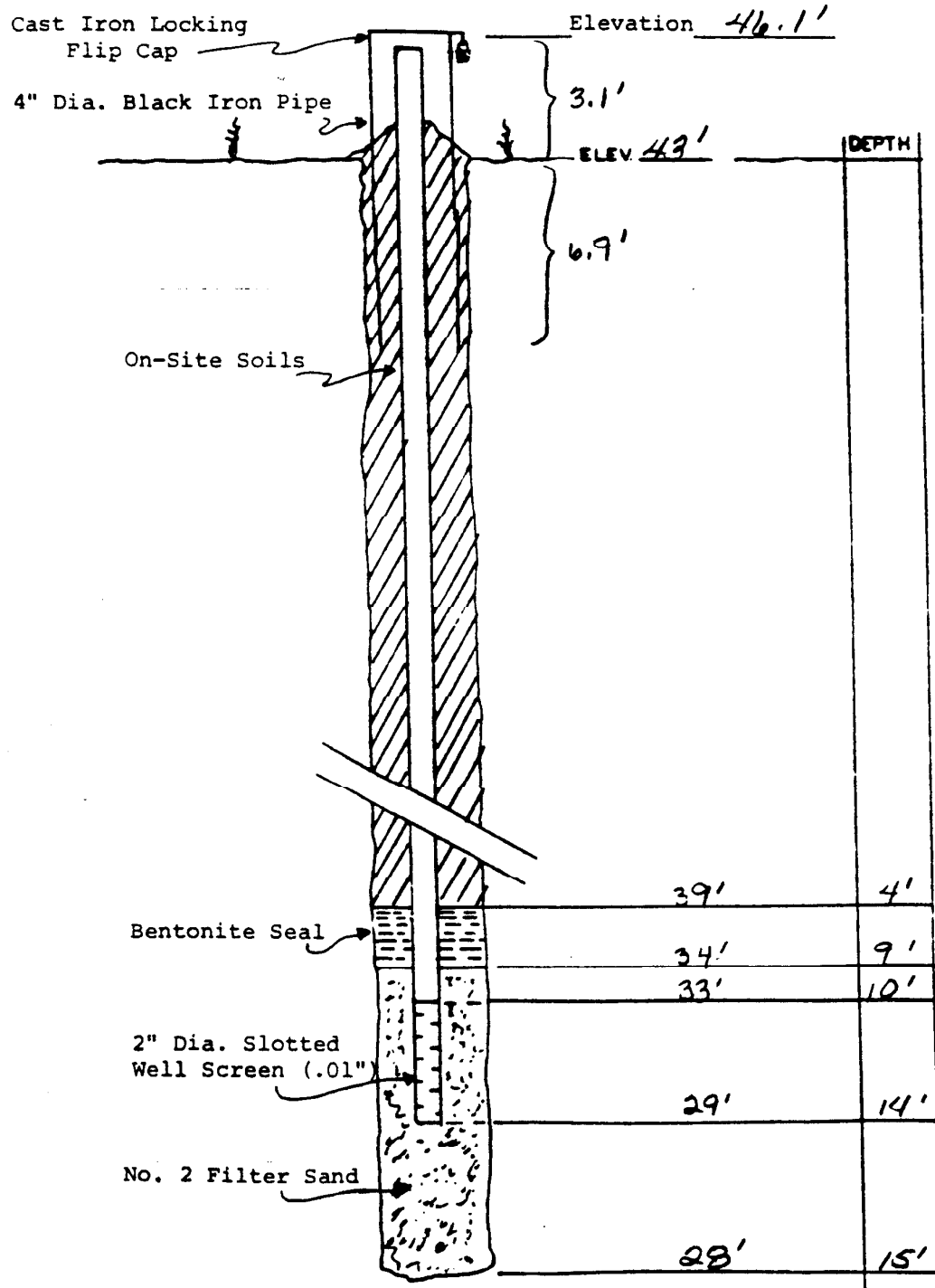
## OBSERVATION WELL INSTALLATION DETAIL

**Client:** ARMY CORPS OF ENGINEERS, NED

**Project No.** DACW-33-85-D-0011  
D.O.#0003

**Project:** Aberjona River, Wells G&H  
Woburn MA

**Well No.** FD85-23  
Cluster No. S-93





CLUSTER 5-93

FD-35-23

CORPS OF ENGINEERS, U. S. ARMY  
NEW ENGLAND DIVISION  
FOUNDATION AND MATERIALS BRANCH  
FIELD LOG OF TEST BORING

ABERDEEN RIVER PROJECT NO. DACW-33-85-D-0011  
Site WELLS G+H, WILBURN MA DO. #3  
Mole No. FD-85-23 Diam. (Casing) 4 Page 1 of 2 Pages  
Co-ordinates: N SEE E DRAWING Boring Started 10/29/85  
Drilled by CAMAROCK & BOYER Boring Completed 10/29/85  
Report Submitted

Purpose of Exploration PIEZOMETER INSTALLATION

Elevation Top of Hole 43 M.S.L.  
Total Overburden Drilled 15 Feet  
Elevation Top of Rock M.S.L.  
Elevation Bottom of Hole 28 M.S.L.  
Total Rock Drilled 0 Feet  
Total Depth of Hole 15 Feet  
Core Recovered %  
Core Recovered FT: Diam. In.  
Soil Samples In. Diam. No.  
Soil Samples In. Diam. No.

Casing Left in Place TOTAL 10 Feet

SEE FD-85-19 FOR SOIL LOG

Water Table Depth 0.21'

Depth From To	Method of Drilling and Type of Bit Used	18002	
		Ground Water	Back of Page
0 15	4" ID AUGER	Boring Location Sketch	Back of Page
	HYDRANT WATER USED DURING	Overburden Record	Page
	ALL DRILLING	Rock Drilling	Page
			Page
			Page
			Page

Prepared by PAUL FISHER  
Field Data

Submitted by ATLANTIC TESTING LAB  
Lab Data

# PIEZOMETER INSTALLATION REPORT

PROJECT: ABEJONA R. WOBURN DATE: 10/29/85  
 LOCATION (STA): SEE DRAWING OFFSET FROM CENTER LINE: — PIEZ NO.: FD-BS-23  
 PIEZ TYPE: 2"  $\phi$  SLOTTED .010" DEPTH OF PIEZ: 14 RISER PIPE DIAM: 2"  
 PIEZ TIP SET IN SOIL FD-BS-19  
 (SOIL TYPE): MF SAND (SP) SAMPLE NO.: 53 BORING DIAM: 8"  
 METHOD OF INSTALLATION: 4" ID AUGER  
 TYPE OF PROTECTION FOR PIEZ: 4"  $\phi$  X 10' LONG PIPE VENT: LOCK CAP  
 GROUND ELEV.: 43' ELEV. TOP OF RISER: 46.1' ELEV. PIEZ TIP: 29'  
 FILTER: #2 SAND FROM ELEV: 28' TO ELEV: 34'  
 SEAL: 3/8 PELTONITE FROM ELEV: 34' TO ELEV: 39'  
 INSTALLED BY: CAMBRIDGE + BOYER CONTRACT NO.: D.O. 3 FOREMAN: FISHER  
 DATE OF INSTALLATION: 10/29/85 DATE OF OBSERVATIONS: 10/30/85

METHOD OF TESTING PIEZ.: FALLING HEAD TEST

TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET	TIME	ELAPSED TIME MINUTES	DEPTH TO WATER FEET
0930	—	3.31						
0945	0	0						
	1/2	3.24						
0946	1	3.31						

REMARKS: 3.1 RISER STICK UP  
2 - 2' SLOTTED SCREEN USED FOR PIEZO

FISHER  
INSPECTOR