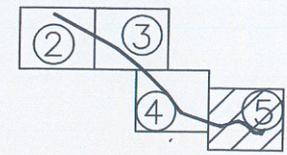
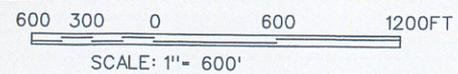


CHANNEL COORDINATES		
	X	Y
6	438881.86	1515010.88
7	440166.47	1515440.52
8	440425.69	1515440.52
9	440604.21	1515377.16
10	440953.23	1515158.15
11	441575.49	1514565.92
12	442049.66	1514537.01
13	442190.96	1514467.00
14	442449.26	1514879.79
15	442275.63	1514763.24
16	441892.87	1514627.04
17	441755.64	1514635.36
18	441497.56	1514750.54
19	440836.64	1515379.56
20	440300.30	1515567.18
21	439054.94	1515152.99
22	438651.20	1515172.77

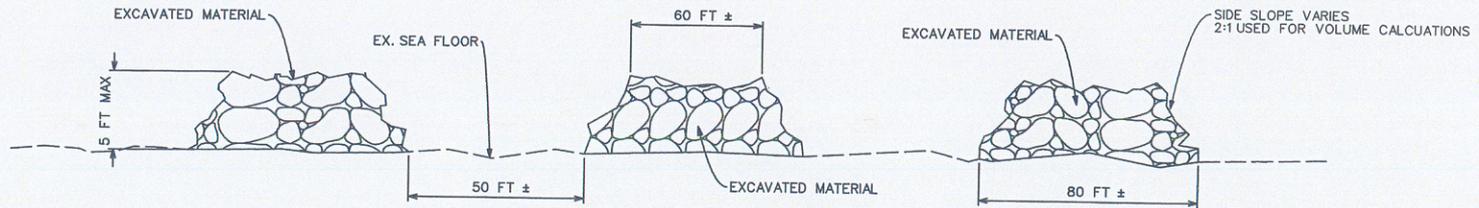
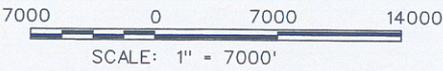
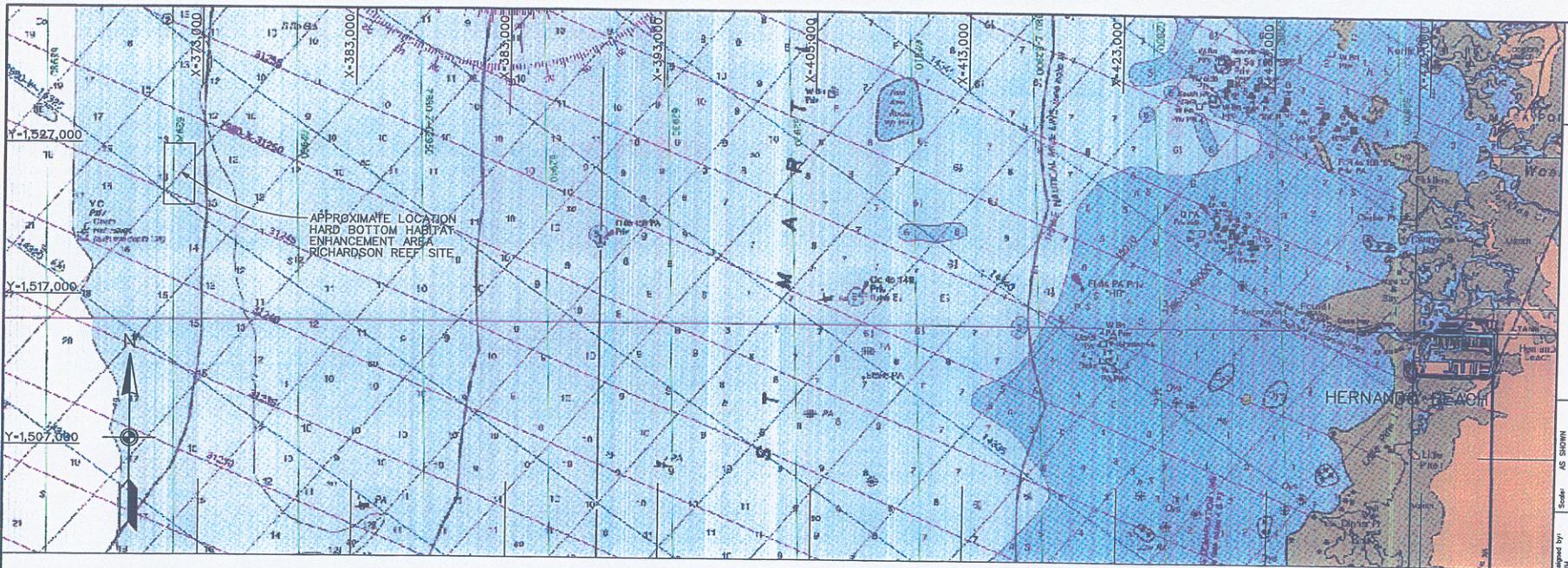


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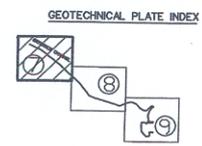
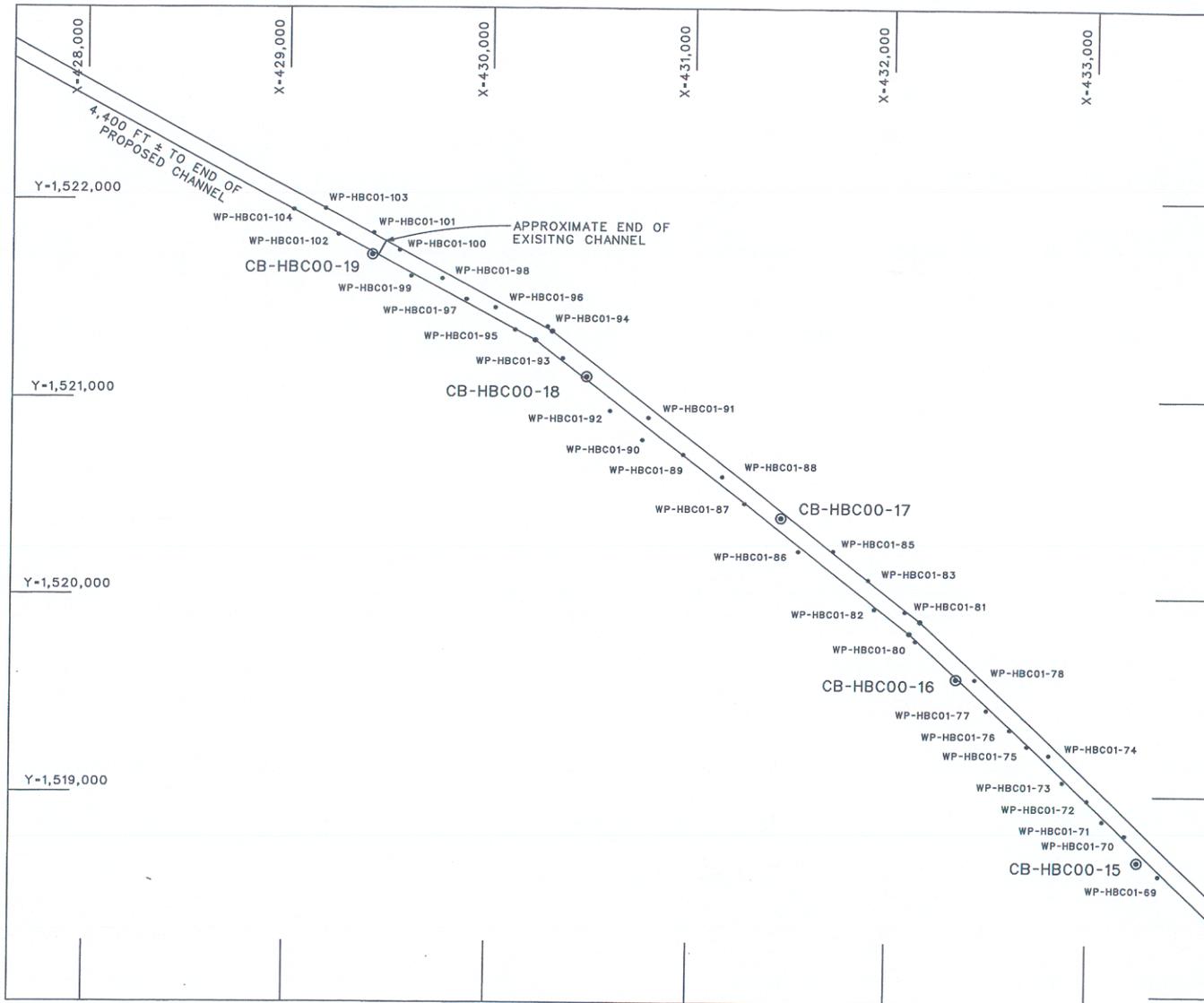
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HERNANDO BEACH, FLORIDA  
 SECTION 07 - NAVIGATION STUDY  
**RECOMMENDED PLAN**  
 ENGINEERING APPENDIX

PLATE  
 B-5



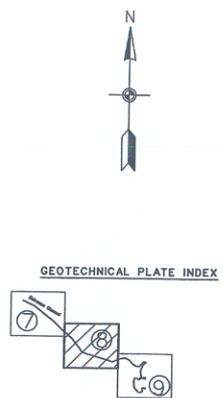
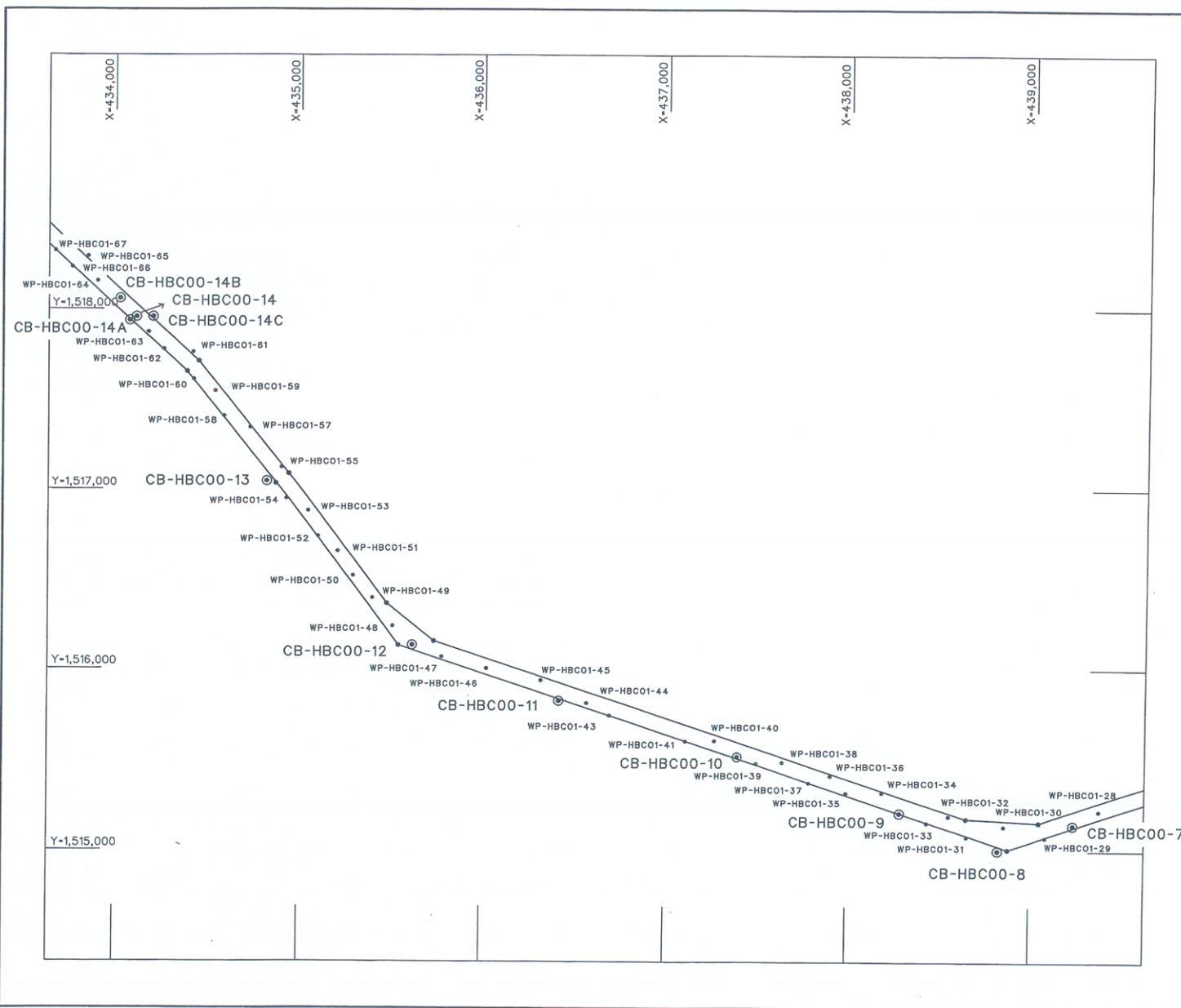
HARD BOTTOM HABITAT  
TYPICAL SECTION  
N.T.S.



**SURVEY NOTES:**  
 1. REFER TO SURVEY NO. 1 00-008  
 2. SEE SHEET 1 FOR NOTES.

**GRAPHIC SCALE**  
 200 0 200 400 FT

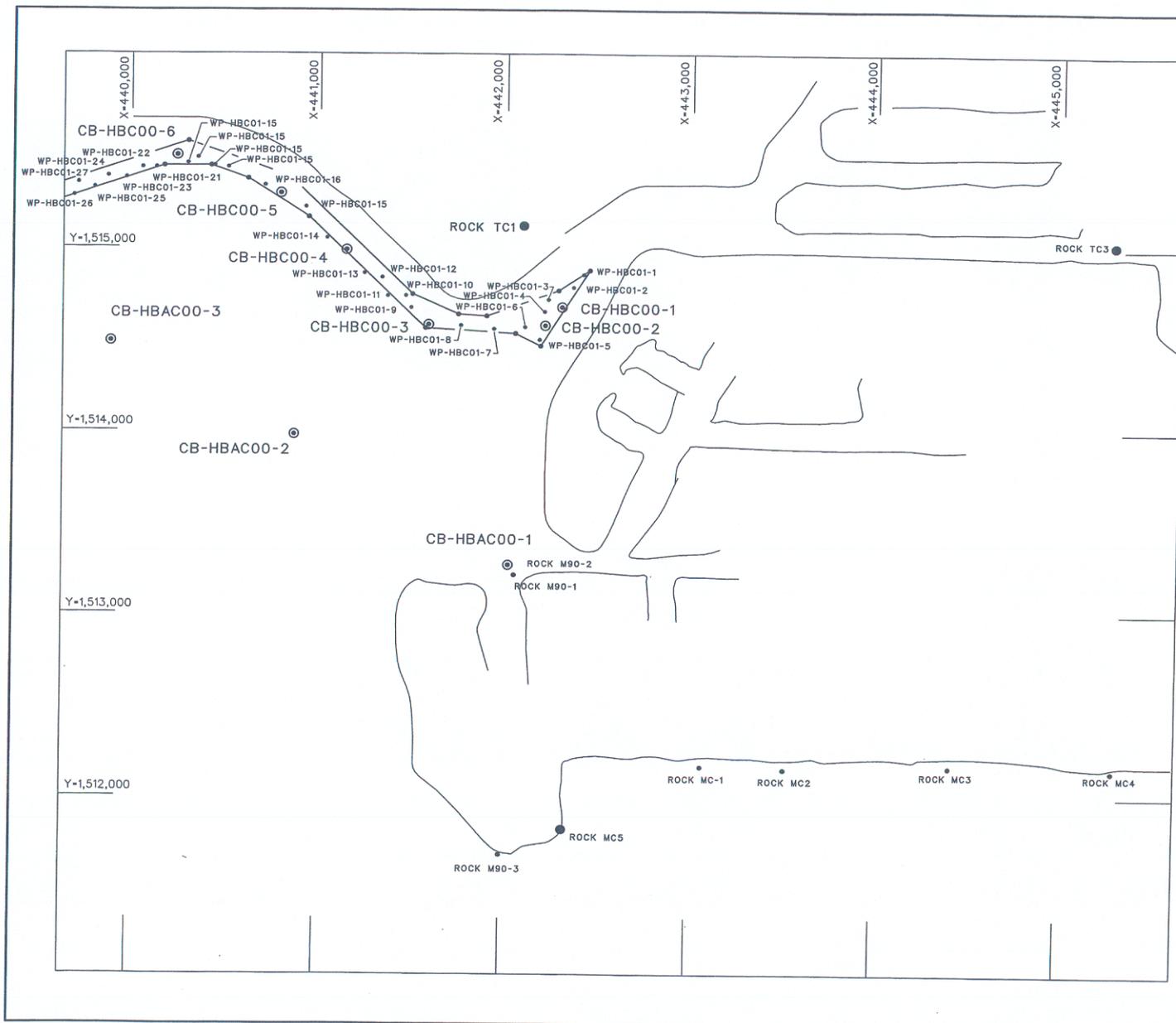
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		ENGINEERING APPENDIX	
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Reference files:	Plot scale:	Drawn by:	Date: February 2003
HERNANDO BEACH, FLORIDA SECTION 107 - NAVIGATION STUDY LOCATION OF BORINGS AND PROBINGS ENGINEERING APPENDIX		ENGINEERING APPENDIX	
PLATE B-7			



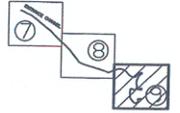
**SURVEY NOTES:**  
 1. REFER TO SURVEY NO.: 00-008  
 2. SEE SHEET 1 FOR NOTES.

**GRAPHIC SCALE**  
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DEPARTMENT OF THE ARMY JACKSONVILLE DISTRICT, CORPS OF ENGINEERS JACKSONVILLE, FLORIDA	
File Name: JWH	Scale: AS SHOWN
Drawn by: JWH	Checked by: JWH
Date: February 2003	Project: ENGINEERING APPENDIX
HERNANDO BEACH, FLORIDA SECTION 107 - NAVIGATION STUDY LOCATION FOR BORINGS AND PROBINGS ENGINEERING APPENDIX	
<b>PLATE</b> <b>B-8</b>	



GEOTECHNICAL PLATE INDEX



- SURVEY NOTES:**
1. REFER TO SURVEY NO. 1 00-008
  2. SEE SHEET 1 FOR NOTES.



DEPARTMENT OF THE ARMY  
 JACKSONVILLE DISTRICT, CORPS OF ENGINEERS  
 JACKSONVILLE, FLORIDA

File name: AS SHOWN  
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 Drawn by: [ ]  
 Date: February 2003  
 Reference files: [ ]  
 ENGINEERING APPENDIX

HERNANDO BEACH, FLORIDA  
 SECTION 107 - NAVIGATION STUDY  
 LOCATION OF BORINGS AND PROBINGS  
 ENGINEERING APPENDIX

PLATE  
 B - 10

**ATTACHMENT**

Geotechnical Information  
Core Boring Logs and Grain Size Distribution Reports

# GEOTECHNICAL INFORMATION

## TABLE OF CONTENTS

1.1.	SCOPE .....	1
1.2.	GEOLOGY .....	1
1.2.1.	REGIONAL GEOLOGY .....	1
1.2.2.	SITE GEOLOGY .....	2
1.3.	SUMMERY OF BORINGS AND WASHPROBES .....	2
1.4.	ESTIMATED PERCENTAGE CALCULATIONS .....	4

ENCLOSURES:

CORE BORING LOGS

## GEOTECHNICAL INFORMATION

### 1.1 SCOPE

This information is for study purposes only and the actual geotechnical data and percentage estimates will be determined after additional supporting investigations are conducted during detailed planning. The information provided in this section covers the geotechnical information collected in the field relevant to this project. The investigations consisted of 26 borings and 103 washprobes. The logs for these borings are included in the final pages of this appendix. This report was produced from the most recent investigations and from historical knowledge of the area. Any questions that pertain to the information provided in this section should be addressed to the District's Geotechnical Branch.

### 1.2 GEOLOGY

#### 1.2.1 REGIONAL GEOLOGY

The undifferentiated sand and clay deposits of the Pleistocene and Recent age form the uppermost deposits noticed in the Hernando County. Overlying the Tampa Limestone, these sediments consist of interbedded sands and clays, which in some areas reach a thickness of 250 feet.

The Tampa Limestone is of Miocene age and is a white to gray, sandy and fossiliferous. The thickness is erratic because both the upper and bottom surfaces are irregular erosional surfaces.

The Tampa Limestone is underlain by the Suwannee Limestone of the Oligocene age and is generally a white to yellow, fine grained, fossiliferous limestone. The lower part of the formation is generally harder, denser and less fossiliferous than the upper part.

The Crystal River Formation underlies the Suwannee Limestone and in turn the Williston Formation is found below them. These two formations are lithologically similar and are white to tan, soft, chalky, coquinoid limestones, composed of foraminifers and other fossils cemented in a calcareous matrix. The formations attain a depth of 100 to 150 feet. Below these two formations, the Inglis Formation, which attains a depth up to 60 feet, is seen. These are brown to gray, fossiliferous, hard dolomitic limestones. These three formations, the Crystal River Formation, Williston Formation, and the Inglis Formation, together form the Ocala Group of the late Eocene age.

Below the Ocala group, the Avon Park Limestone Formation is present which in turn is underlain by the Lake City Limestone. These two formations are of the Eocene age and lithologically are also similar. They are soft to hard, fossiliferous, brown limestones with dark brown beds of dolomitic limestone. The Lake City Formation is about 500 feet thick while the Avon Park ranges between 50 to 500 feet depending upon the location.

#### 1.2.2. SITE GEOLOGY

Locally, the shallow surficial deposits in the study area are reported as poorly graded fine to medium sands with a small shell content but in many places the rock itself is exposed at the surface with minimal sand deposits.

The material encountered during the investigation consists of unconsolidated sediments and limestone. The unconsolidated material in the alternate channel near the shore consists of poorly graded, fine to medium grained sands with traces of shell. In the outer reaches, silty sand with nonplastic fines was encountered. In the main channel, depending upon the location and depth, poorly graded, fine to medium sized (SP) sands with traces of shell, silty sands (SM) with some nonplastic fines, peat with fine sands (PT), and sandy clay (CL) with medium to low plasticity and with some fine to medium sands were encountered. Depending upon the location and depth, the limestone is soft to moderately hard, jointed, thin to medium bedded, pitted or vuggy and in the upper depths slightly decomposed or moderately weathered. In some places the limestone has weathered and has harder pieces of limestone intermixed.

### 1.3 SUMMERY OF BORINGS AND WASHPROBES

The three borings CB-HBAC00-1, CB-HBAC00-2 and CB-HBAC00-3 were drilled in the alternate channel. Borings CB-HBC00-1 through CB-HBC00-19 were drilled in the main channel and turning basin area. The following table describes the boring names, depths and their location in the project area.

BORING #	X	Y	LOCATION	TOTAL DEPTH
CB-HBAC00-1	442028	1513266	ALT. CHANNEL	15.0
CB-HBAC00-2	440872	1513980	ALT. CHANNEL	15.0
CB-HBAC00-3	439894	1514490	ALT. CHANNEL	15.0
CB-HBC00-1	442304	1514679	MAIN CHANNEL	15.0
CB-HBC00-2	442214	1514578	MAIN CHANNEL	15.0
CB-HBC00-3	441590	1514582	MAIN CHANNEL	15.0
CB-HBC00-4	441146	1514988	MAIN CHANNEL	15.0
CB-HBC00-5	440791	1515293	MAIN CHANNEL	15.0
CB-HBC00-6	440256	1515498	MAIN CHANNEL	15.0
CB-HBC00-7	439273	1515201	MAIN CHANNEL	15.0
CB-HBC00-8	438826	1515001	MAIN CHANNEL	15.0
CB-HBC00-9	438292	1515206	MAIN CHANNEL	15.0
CB-HBC00-10	437401	1515514	MAIN CHANNEL	15.0
CB-HBC00-11	436421	1515823	MAIN CHANNEL	15.0
CB-HBC00-12	435620	1516131	MAIN CHANNEL	15.0
CB-HBC00-13	434823	1517044	MAIN CHANNEL	15.0
CB-HBC00-14	434114	1517957	MAIN CHANNEL	15.0
CB-HBC00-14A	434078	1517937	MAIN CHANNEL	12.0
CB-HBC00-14B	434025	1518059	MAIN CHANNEL	6.0
CB-HBC00-14C	434203	1517957	MAIN CHANNEL	6.5
CB-HBC00-15	433245	1518745	MAIN CHANNEL	15.0
CB-HBC00-16	432339	1519584	MAIN CHANNEL	15.0
CB-HBC00-17	431452	1520397	MAIN CHANNEL	15.0
CB-HBC00-18	430475	1521110	MAIN CHANNEL	15.0
CB-HBC00-19	429408	1521722	MAIN CHANNEL	15.0

The following table describes the location, surface elevation and depth of refusal of the washprobes.

Probe Designation	X	Y	Surface Elevation (MLLW)	Refusal Elevation (MLLW)
WP-HBC01-1	442418	1514856	-1.7	-2.3
WP-HBC01-2	442364	1514786	-1.0	-1.7
WP-HBC01-3	442230	1514720	0.8	-4.9
WP-HBC01-4	442210	1514654	0.8	-6.6
WP-HBC01-5	442185	1514501	-1.3	-2.7
WP-HBC01-6	442106	1514570	0.0	-4.0
WP-HBC01-7	441938	1514559	0.0	-1.8
WP-HBC01-8	441763	1514578	-0.5	-1.8
WP-HBC01-9	441498	1514675	-0.1	-3.7
WP-HBC01-10	441468	1514740	-4.3	-6.5
WP-HBC01-11	441370	1514739	0.5	-4.1
WP-HBC01-12	441339	1514839	-5.3	-6.0
WP-HBC01-13	441243	1514862	-0.3	-2.3
WP-HBC01-14	441041	1515053	0.4	-1.5
WP-HBC01-15	440925	1515220	0.3	-0.2
WP-HBC01-16	440705	1515336	0.7	0.1
WP-HBC01-17	440510	1515433	-0.5	-1.5
WP-HBC01-18	440438	1515441	0.2	-1.5
WP-HBC01-19	440351	1515485	0.4	-0.8
WP-HBC01-20	440299	1515455	0.7	-1.4
WP-HBC01-21	440133	1515433	0.9	-0.6
WP-HBC01-22	440059	1515433	0.4	-1.6
WP-HBC01-23	439972	1515378	0.6	-1.4
WP-HBC01-24	439873	1515385	0.1	-1.5
WP-HBC01-25	439801	1515324	0.4	-0.7
WP-HBC01-26	439689	1515280	0.4	-1.6
WP-HBC01-27	439712	1515350	0.0	-1.1
WP-HBC01-28	439387	1515219	-0.3	-1.8
WP-HBC01-29	439090	1515073	-0.3	-3.6
WP-HBC01-30	438859	1515133	-5.6	-6.8
WP-HBC01-31	438655	1515076	-0.2	-3.3
WP-HBC01-32	438557	1515189	-0.4	-1.9
WP-HBC01-33	438439	1515153	-0.8	-2.6
WP-HBC01-34	438196	1515318	-0.4	-3.3
WP-HBC01-35	438000	1515316	-0.9	-11.1
WP-HBC01-36	437913	1515410	-1.2	-3.8
WP-HBC01-37	437795	1515372	-1.5	-4.2
WP-HBC01-38	437648	1515484	-0.9	-7.3
WP-HBC01-39	437505	1515477	-1.6	-4.0
WP-HBC01-40	437274	1515603	-3.0	-7.2
WP-HBC01-41	437114	1515601	-0.1	-8.1
WP-HBC01-42	436698	1515742	-0.4	-4.6
WP-HBC01-43	436565	1515724	0.0	-6.5
WP-HBC01-44	436575	1515811	-1.5	-6.3
WP-HBC01-45	436325	1515936	-5.5	-7.0

Probe Designation	X	Y	Surface Elevation (MLLW)	Refusal Elevation (MLLW)
WP-HBC01-46	436030	1516002	-3.8	-6.3
WP-HBC01-47	435783	1516066	0.4	-2.3
WP-HBC01-48	435511	1516237	0.1	-1.2
WP-HBC01-49	435398	1516394	0.4	-2.0
WP-HBC01-50	435292	1516518	-0.3	-3.2
WP-HBC01-51	435208	1516654	-1.1	-2.9
WP-HBC01-52	435100	1516738	0.1	-2.8
WP-HBC01-53	435046	1516880	-0.4	-1.7
WP-HBC01-54	434929	1516948	-0.4	-1.1
WP-HBC01-55	434902	1517121	-1.7	-7.5
WP-HBC01-57	434732	1517343	-5.0	-5.5
WP-HBC01-58	434589	1517407	-1.1	-2.1
WP-HBC01-59	434541	1517546	-1.3	-3.7
WP-HBC01-60	434425	1517612	-1.3	-3.9
WP-HBC01-61	434421	1517762	-4.1	-8.6
WP-HBC01-62	434262	1517778	-1.1	-5.8
WP-HBC01-63	434179	1517873	-0.9	-3.1
WP-HBC01-64	433901	1518155	-1.3	-2.4
WP-HBC01-65	433848	1518292	-5.5	-10.3
WP-HBC01-66	433763	1518232	-1.2	-4.3
WP-HBC01-67	433668	1518323	-1.0	-2.9
WP-HBC01-68	433494	1518525	-1.8	-2.6
WP-HBC01-69	433364	1518602	-1.7	-2.6
WP-HBC01-70	433193	1518803	-2.1	-3.9
WP-HBC01-71	433078	1518873	-2.7	-3.5
WP-HBC01-72	433001	1518976	-1.2	-8.3
WP-HBC01-73	432874	1519067	-0.9	-4.2
WP-HBC01-74	432803	1519203	-3.7	-7.6
WP-HBC01-75	432694	1519248	-1.5	-5.2
WP-HBC01-76	432608	1519330	-1.8	-2.8
WP-HBC01-77	432491	1519428	-1.7	-2.4
WP-HBC01-78	432432	1519583	-5.3	-6.2
WP-HBC01-80	432137	1519777	-2.0	-3.0
WP-HBC01-81	432084	1519925	-5.1	-7.8
WP-HBC01-82	431932	1519937	-3.0	-3.5
WP-HBC01-83	431898	1520085	-6.2	-8.9
WP-HBC01-85	431720	1520230	-5.2	-5.4
WP-HBC01-86	431542	1520228	-2.5	-5.2
WP-HBC01-87	431266	1520470	-2.6	-3.8
WP-HBC01-88	431154	1520605	-5.5	-6.6
WP-HBC01-89	430958	1520718	-3.4	-3.9
WP-HBC01-90	430756	1520791	-1.8	-4.5
WP-HBC01-91	430784	1520904	-5.8	-11.4
WP-HBC01-92	430593	1520937	-2.9	-11.7
WP-HBC01-93	430356	1521202	-3.1	-5.9
WP-HBC01-94	430280	1521362	-6.8	-7.1
WP-HBC01-95	430119	1521346	-3.6	-5.5
WP-HBC01-96	430022	1521457	-6.0	-6.7
WP-HBC01-97	429877	1521497	-4.7	-5.2

Probe Designation	X	Y	Surface Elevation (MLLW)	Refusal Elevation (MLLW)
WP-HBC01-98	429757	1521602	-5.9	-7.1
WP-HBC01-99	429603	1521614	-3.5	-4.4
WP-HBC01-100	429544	1521745	-4.8	-5.9
WP-HBC01-101	429414	1521831	-4.5	-6.0
WP-HBC01-102	429239	1521822	-3.3	-4.3
WP-HBC01-103	429176	1521952	-4.4	-4.4
WP-HBC01-104	429022	1521947	-3.6	-4.0

#### 1.4. ESTIMATED PERCENTAGE CALCULATIONS

These volume percentages are estimated values only and were obtained from the information present in the core logs, which only cover a partial length of the channel. No geotechnical investigations were conducted beyond CB-HBC00-19 in the channel. This information is provided for study purposes only and actual percentage estimates will be determined after additional supporting investigations are conducted.

The volume provided for an 80-foot wide and 20,500 feet long channel was estimated as 333,000 cubic yards, which includes 45,000 cubic yards from the outer cut extension to -6 feet contour.

For the -8 feet proposed channel depth, approximately 62% (205920 cubic yards) rock, 38% (127080 cubic yards) sediment and other materials are estimated.

<b>DRILLING LOG</b>	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
1. PROJECT Hernando Beach Channel Improvement		10. SIZE AND TYPE OF BIT See Remarks	
2. LOCATION (Coordinates or Station) X=442,028 Y=1513,266		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW	
3. DRILLING AGENCY Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL CME 45C	
4. HOLE NO. (As shown on drawing title and file number) CB-HBAC00-1		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 4 undisturbed: 0	
5. NAME OF DRILLER L. Wooters		14. TOTAL NUMBER OF CORE BOXES 2	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		15. ELEVATION GROUND WATER Tidal	
7. THICKNESS OF BURDEN 2.0 Ft.		16. DATE HOLE STARTED COMPLETED 8/22/00 8/22/00	
8. DEPTH DRILLED INTO ROCK 13.0 Ft.		17. ELEVATION TOP OF HOLE -0.9 Ft.	
9. TOTAL DEPTH OF HOLE 15.0 Ft.		18. TOTAL CORE RECOVERY FOR BORING 81 %	
		19. SIGNATURE OF GEOLOGIST J. Sandoval	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC X	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/5'
-9	0						
			poorly graded SAND, mostly fine to medium sand, trace of shells and nonplastic fines, gray, wet, strong reaction with HCl. (SP)	27	S1 S1A	SPLIT SPOON	WOT WOT WOT
-2.9	2.0						
			LIMESTONE, sandy from 3.0 to 7.2, silty from 7.2 to 8.3 and 12.0 to 12.5, shelly from 8.3 to 12.0 and 12.5 to 15.0, moderately hard from 3.0 to 7.2, 8.3 to 12.0 and 12.0 to 12.0, decomposed from 2.0 to 3.0, moderately weathered from 3.0 to 15.0, slightly jointed, thin to medium bedding, tan, pitted to vuggy. (LM)	100	S2 S2A	SPLIT SPOON	1 6 10
				86		CORE BARREL DIA. 4 X 5 1/2 D.T. 14 MIN	
					BOX 1		
				100		CORE BARREL DIA. 4 X 5 1/2 D.T. 11 MIN	
				68	BOX 2	CORE BARREL DIA. 4 X 5 1/2 D.T. 15 MIN	
-15.9	15.0						
			NOTES: 1. Soils are field visually classified accordance with the Unified Soils Classification System			NOTES: 1. 140# Hammer with 30" drop used used with 2.0' split spoon (1 3/8" X 2.0" O.D.) 2. WOT= Weight of tools	



# Hole No. CB-HBAC00-3

<b>DRILLING LOG</b>	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
1. PROJECT Hernando Beach Channel Improvement	10. SIZE AND TYPE OF BIT See Remarks		
2. LOCATION (Coordinates or Station) X=439,894 Y=1514,490	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW		
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL CME 45C		
4. HOLE NO. (As shown on drawing title and file number) CB-HBAC00-3	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 2 undisturbed: 0		
5. NAME OF DRILLER L. Wooters	14. TOTAL NUMBER OF CORE BOXES 2		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED	15. ELEVATION GROUND WATER Tidal		
7. THICKNESS OF BURDEN 2.5 Ft.	16. DATE HOLE STARTED COMPLETED 8/29/00 8/29/00		
8. DEPTH DRILLED INTO ROCK 12.5 Ft.	17. ELEVATION TOP OF HOLE -3.1 Ft.		
9. TOTAL DEPTH OF HOLE 15.0 Ft.	18. TOTAL CORE RECOVERY FOR BORING 51 %		
19. SIGNATURE OF GEOLOGIST J. Sandoval			

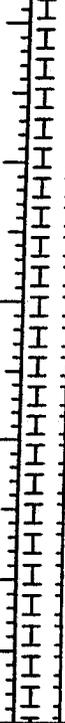
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/5'	
-3.1	.0					-3.1		
			silty SAND, mostly fine sand, trace to some nonplastic fines, gray to tan, wet, strong reaction with HCl. (SM)	87	S1	SPLIT SPOON	WOT	
						-4.6	WOT	
-5.8	2.5		LIMESTONE, sandy from 2.5 to 7.5, shelly from 7.5 to 15.0, soft to moderately hard from 2.5 to 7.5, moderately hard from 7.5 to 15.0, decomposed from 2.5 to 3.0, highly weathered from 3.0 to 7.5, moderately weathered from 7.5 to 15.0, thin to medium bedding, tan, pitted. (LM)	83	S2	SPLIT SPOON	WOT	
						-6.1	7	
					33		CORE BARREL DIA. 4 X 5 1/2 D.T. 6 MIN	
						-10.6		
				40	BOX 1	CORE BARREL DIA. 4 X 5 1/2 D.T. 11 MIN		
				56		-15.6		
						CORE BARREL DIA. 4 X 5 1/2 D.T. 4 MIN		
-18.1	15.0					-18.1		
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System				NOTES: 1. 140# Hammer with 30" drop used on 2.0' split spoon (1 3/8" I.D. X 2" O.D.) 2. WOT= Weight of tools	

Hole No. CB-HBC00-1

<b>DRILLING LOG</b>	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
1. PROJECT Hernando Beach Channel Improvement		10. SIZE AND TYPE OF BIT See Remarks	
2. LOCATION (Coordinates or Station) X=442,304 Y=1514,679		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW	
3. DRILLING AGENCY Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL CME 45C	
4. HOLE NO. (As shown on drawing title and file number) CB-HBC00-1		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 0 undisturbed: 0	
5. NAME OF DRILLER M. Whitson		14. TOTAL NUMBER OF CORE BOXES 1	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		15. ELEVATION GROUND WATER Tidal	
7. THICKNESS OF BURDEN 0 Ft.		16. DATE HOLE STARTED COMPLETED 8/1/00 8/1/00	
8. DEPTH DRILLED INTO ROCK 15.0 Ft.		17. ELEVATION TOP OF HOLE -2.1 Ft.	
9. TOTAL DEPTH OF HOLE 15.0 Ft.		18. TOTAL CORE RECOVERY FOR BORING 64 %	
		19. SIGNATURE OF GEOLOGIST J. Sandoval	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel
-2.1	0					-2.1
		I	LIMESTONE, silty to sandy, soft to very soft from 0.0 to 3.5, moderately hard to hard from 3.5 to 15.0, decomposed to highly weathered from 0.0 to 3.5, moderately weathered from 3.5 to 15.0, fine to medium grained, highly fractured, thin bedding, tan, pitted to vuggy. (LM)	44		CORE BARREL DIA. 4 X 5 1/2 D.T. 83 MIN
						-7.1
				92	BOX 1	CORE BARREL DIA. 4 X 5 1/2 D.T. 37 MIN
						-12.1
				80		CORE BARREL DIA. 4 X 5 1/2 D.T. 6 MIN
						-15.6
				0		CORE BARREL DIA. 4 X 5 1/2 D.T. 7 MIN
-17.1	15.0					-17.1

<b>DRILLING LOG</b>	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
	1. PROJECT Hernando Beach Channel Improvement		10. SIZE AND TYPE OF BIT See Remarks
2. LOCATION (Coordinates or Station) X=442,214 Y=1514,578		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW	
3. DRILLING AGENCY Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL CME 45C	
4. HOLE NO. (As shown on drawing title and file number) CB-HBC00-2		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 4 undisturbed: 0	
5. NAME OF DRILLER L. Wooters		14. TOTAL NUMBER OF CORE BOXES 1	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		15. ELEVATION GROUND WATER Tidal	
7. THICKNESS OF BURDEN 2.0 Ft.		16. DATE HOLE STARTED COMPLETED 8/23/00 8/23/00	
8. DEPTH DRILLED INTO ROCK 13.0 Ft.		17. ELEVATION TOP OF HOLE -2.5 Ft.	
9. TOTAL DEPTH OF HOLE 15.0 Ft.		18. TOTAL CORE RECOVERY FOR BORING 78 %	
19. SIGNATURE OF GEOLOGIST J. Sandoval			

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC X	SAMPLE NUMBER	REMARKS BR or Barrel	BLOWS/5'
-2.5	.0					-2.5	
			poorly graded SAND, mostly fine sand with trace of sand size shells and nonplastic fines, gray, wet, weak reaction with HCl. (SP)	80	S1 S1A	SPLIT SPOON	WOT WOT WOT
-4.5	2.0			100	S2 S2A	SPLIT SPOON	1 1 6
			LIMESTONE, shelly from 3.0 to 6.0 and 6.5 to 15.0, sandy from 6.0 to 6.5, soft from 2.0 to 3.0, moderately hard from 3.0 to 15.0, decomposed from 2.0 to 3.0, moderately weathered from 3.0 to 15.0 fine to medium grained, slightly jointed, thin to medium bedding, tan, pitted to vuggy. (LM)	82		CORE BARREL DIA. 4 X 5 1/2 D.T. 22 MIN	
				64	BOX 1	CORE BARREL DIA. 4 X 5 1/2 D.T. 10 MIN	
				80		CORE BARREL DIA. 4 X 5 1/2 D.T. 3 MIN	
-17.5	15.0					-17.5	
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System			NOTES: 1. 140# Hammer with 30" drop used on 2.0' split spoon (1 3/8 I.D. X 2" O.D.) 2. WOT= Weight of tools	

# Hole No. CB-HBC00-3

<b>DRILLING LOG</b>	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
1. PROJECT Hernando Beach Channel Improvement	10. SIZE AND TYPE OF BIT See Remarks		
2. LOCATION (Coordinates or Station) X=441,590 Y=1514,582	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW		
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL CME 45C		
4. HOLE NO. (As shown on drawing title and file number) CB-HBC00-3	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 2    undisturbed: 0		
5. NAME OF DRILLER L. Wooters	14. TOTAL NUMBER OF CORE BOXES 2		
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED	15. ELEVATION GROUND WATER Tidal		
7. THICKNESS OF BURDEN 3.0 Ft.	16. DATE HOLE STARTED COMPLETED 8/24/00 8/24/00		
8. DEPTH DRILLED INTO ROCK 12.0 Ft.	17. ELEVATION TOP OF HOLE -1.2 Ft.		
9. TOTAL DEPTH OF HOLE 15.0 Ft.	18. TOTAL CORE RECOVERY FOR BORING 89 %		
	19. SIGNATURE OF GEOLOGIST J. Sandoval		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/ft.
-1.2	.0					-1.2	
		[Dotted Pattern]	poorly graded SAND, mostly fine sand with trace roots and sand size shells, gray, wet, no reaction with HCl. (SP)	100	S1	SPLIT SPOON	WOT
						-2.7	WOT
				100	S2	SPLIT SPOON	WOT
-4.2	3.0					-4.2	1
		[Vertical Line Pattern]	LIMESTONE, shelly from 3.0 to 12.6, sandy from 12.6 to 15.0, moderately hard to hard, moderately weathered, moderately jointed from 3.0 to 11.5, highly jointed from 11.5 to 15.0, thin to medium bedding, tan, pitted to vuggy. (LM)	100		CORE BARREL DIA 4 X 5 1/2 D.T. 12 MIN	1
					BOX 1	-9.2	
				76		CORE BARREL DIA 4 X 5 1/2 D.T. 35 MIN	1
						-14.2	
				75	BOX 2	CORE BARREL DIA 4 X 5 1/2 D.T. 18 MIN	1
-16.2	15.0					-16.2	1
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System			NOTES: 1. 140# Hammer with 30" drop used on 2.0' split spoon (1 3/8" I.D. X 2" O.D.) 2. WOT= Weight of tools	

<b>DRILLING LOG</b>	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
	1. PROJECT Hernando Beach Channel Improvement	10. SIZE AND TYPE OF BIT - See Remarks	
	2. LOCATION (Coordinates or Station) X=441,146 Y=1514,988	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW	
	3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL CME 45C	
	4. HOLE NO. (As shown on drawing title and file number) CB-HBC00-4	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 3 undisturbed: 0	
	5. NAME OF DRILLER M. Whitson	14. TOTAL NUMBER OF CORE BOXES 1	
	6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED	15. ELEVATION GROUND WATER Tidal	
	7. THICKNESS OF BURDEN 7.0 Ft.	16. DATE HOLE STARTED COMPLETED 8/2/00 8/2/00	
	8. DEPTH DRILLED INTO ROCK 8.0 Ft.	17. ELEVATION TOP OF HOLE -4.7 Ft.	
9. TOTAL DEPTH OF HOLE 15.0 Ft.	18. TOTAL CORE RECOVERY FOR BORING 59 %		
		19. SIGNATURE OF GEOLOGIST J. Sandoval	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC X	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/5'
-4.7	.0		NO RECOVERY	0		-4.7 SPLIT SPOON	0
				0		-6.2 SPLIT SPOON	0
				0			2.5
-8.7	4.0		silty SAND, mostly fine sand with some nonplastic fines, gray, wet, weak reaction with HCl. (SM)	100	SI SIA	-8.7 SPLIT SPOON	0
-9.7	5.0		poorly graded SAND, mostly fine to medium sand with trace to some nonplastic fines, tan, moist, strong reaction with HCl. (SP)	100	S2	-10.2 SPLIT SPOON	5
-11.7	7.0		LIMESTONE, sandy to shelly, moderately hard to hard, slightly weathered, slightly jointed, thin to medium bedding, tan, pitted. (LM)	100		-11.7 CORE BARREL DIA 4 X 5 1/2 D.T. 14 MIN	7.5
				84	BOX 1	-15.9 CORE BARREL DIA 4 X 5 1/2 D.T. 8 MIN	12.5
-19.7	15.0		NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.			-19.7 NOTES: 1. 140# Hammer with 30" drop used on 2.0' split spoon (1 3/8" I.D. X 2.0" O.D.)	15
							17.5
							20



# Hole No. CB-HBC00-6

<b>DRILLING LOG</b>	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
1. PROJECT Hernando Beach Channel Improvement		10. SIZE AND TYPE OF BIT See Remarks	
2. LOCATION (Coordinates or Station) X=440,243 Y=1515,498		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW	
3. DRILLING AGENCY Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL CME 45C	
4. HOLE NO. (As shown on drawing title and file number) CB-HBC00-6		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 4 undisturbed: 0	
5. NAME OF DRILLER L. Wooters		14. TOTAL NUMBER OF CORE BOXES 2	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		15. ELEVATION GROUND WATER Tidal	
7. THICKNESS OF BURDEN 2.5 Ft.		16. DATE HOLE STARTED COMPLETED 8/15/00 8/15/00	
8. DEPTH DRILLED INTO ROCK 12.5 Ft.		17. ELEVATION TOP OF HOLE -3.0 Ft.	
9. TOTAL DEPTH OF HOLE 15.0 Ft.		18. TOTAL CORE RECOVERY FOR BORING 87 %	
		19. SIGNATURE OF GEOLOGIST J. Sandoval	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC X	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/ 5 ft.
-3.0	0.0					-3.0	
-4.0	1.0	[Symbol]	PEAT, mostly fine sand with trace nonplastic fines, black to brown, wet, weak reaction with HCl. (Pt)	83	S1 S1A	SPLIT SPOON	WOT 1 1
-5.5	2.5	[Symbol]	silty SAND, mostly fine to coarse sand with some low to no plasticity fines, gray, wet, strong reaction with HCl. (SM)	100	S2 S2A	SPLIT SPOON	1 1
		[Symbol]	LIMESTONE, sandy from 3.0 to 3.5 and 13.0 to 15.0, shelly from 3.5 to 13.0, soft from 2.5 to 3.0, 3.5 to 4.6 and 12.0 to 15.0, moderately hard from 3.0 to 3.5 and 4.6 to 12.0, moderately weathered, slightly jointed with vertical joint from 10.2 to 11.6, thin bedded, gray to tan, vuggy. (LM)	92		CORE BARREL DIA 4 X 5 1/2 D.T. 19 MIN	15
		[Symbol]			BOX 1	-10.0 CORE BARREL DIA 4 X 5 1/2 D.T. 41 MIN	7.5
		[Symbol]			100		10
		[Symbol]			100	-14.6 CORE BARREL DIA 4 X 5 1/2 D.T. 22 MIN	12.5
-18.0	15.0	[Symbol]			100	-18.0	15
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System			NOTES: 1. 140# Hammer with 30" drop used on 2' split spoon (1 3/8" I.D. 2.0" O.D.) 2. WOT= Weight of tools	17.5
							20

Hole No. CB-HBC00-7

<b>DRILLING LOG</b>	<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Jacksonville District	<b>SHEET 1</b> OF 1
<b>1. PROJECT</b> Hernando Beach Channel Improvement		<b>10. SIZE AND TYPE OF BIT</b> See Remarks	
<b>2. LOCATION (Coordinates or Station)</b> X=439,245 Y=1516,141		<b>11. DATUM FOR ELEVATION SHOWN (TBM or MSL)</b> MLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers		<b>12. MANUFACTURER'S DESIGNATION OF DRILL</b> CME 45C	
<b>4. HOLE NO. (As shown on drawing title and file number)</b> CB-HBC00-7		<b>13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN</b> disturbed: 2 undisturbed: 0	
<b>5. NAME OF DRILLER</b> M. Whitson		<b>14. TOTAL NUMBER OF CORE BOXES</b> 2	
<b>6. DIRECTION OF HOLE</b> <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		<b>15. ELEVATION GROUND WATER</b> Tidal	
<b>7. THICKNESS OF BURDEN</b> 1.5 Ft.		<b>16. DATE HOLE STARTED COMPLETED</b> 8/4/00 8/4/00	
<b>8. DEPTH DRILLED INTO ROCK</b> 14.0 Ft.		<b>17. ELEVATION TOP OF HOLE</b> -0.6 Ft.	
<b>9. TOTAL DEPTH OF HOLE</b> 15.5 Ft.		<b>18. TOTAL CORE RECOVERY FOR BORING</b> 89 %	
		<b>19. SIGNATURE OF GEOLOGIST</b> J. Sandoval	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC X	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/5'
-0.6	0.0					-0.6	
			poorly graded SAND, mostly fine to coarse sand with trace to some nonplastic fines, gray, wet, strong reaction with HCl. (SP)	80	SI SIA	SPLIT SPOON	WOT 1 1
-2.1	1.5		LIMESTONE, silty to shelly, moderately hard, slightly weathered, intensely to highly jointed from 1.5 to 6.5, moderately jointed from 6.5 to 15.0, medium to thick bedding, tan, pitted. (LM)	84		CORE BARREL DIA 4 X 5 1/2 D.T. 45 MIN	2.5
					BOX 1	-7.1	
				92		CORE BARREL DIA 4 X 5 1/2 D.T. 16 MIN	7.5
						-12.1	
				100	BOX 2	CORE BARREL DIA 4 X 5 1/2 D.T. 11 MIN	12.5
-16.1	15.5					-16.1	15
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System			1. 140# Hammer with 30" drop used on 2' split spoon (1 3/8" I.D. 2" O.D.) 2. WOT= Weight of tools	17.5
							20

<b>DRILLING LOG</b>	<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Jacksonville District	<b>SHEET 1</b> OF 1
<b>1. PROJECT</b> Hernando Beach Channel Improvement		<b>10. SIZE AND TYPE OF BIT</b> See Remarks	
<b>2. LOCATION (Coordinates or Station)</b> X=438,826 Y=1515,001		<b>11. DATUM FOR ELEVATION SHOWN (TBM or MSL)</b> MLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers		<b>12. MANUFACTURER'S DESIGNATION OF DRILL</b> CME 45C	
<b>4. HOLE NO. (As shown on drawing title and file number)</b> CB-HBC00-8		<b>13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN</b> disturbed: 2 undisturbed: 0	
<b>5. NAME OF DRILLER</b> L. Wooters		<b>14. TOTAL NUMBER OF CORE BOXES</b> 2	
<b>6. DIRECTION OF HOLE</b> <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		<b>15. ELEVATION GROUND WATER</b> Tidal	
<b>7. THICKNESS OF BURDEN</b> 1.0 Ft.		<b>16. DATE HOLE STARTED COMPLETED</b> 8/15/00 8/15/00	
<b>8. DEPTH DRILLED INTO ROCK</b> 14.0 Ft.		<b>17. ELEVATION TOP OF HOLE</b> -2.4 Ft.	
<b>9. TOTAL DEPTH OF HOLE</b> 15.0 Ft.		<b>18. TOTAL CORE RECOVERY FOR BORING</b> 80 %	
<b>19. SIGNATURE OF GEOLOGIST</b> J. Sandoval			

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/5'
-2.4	0					-2.4	0
-3.4	1.0		poorly graded SAND, mostly fine sand with trace nonplastic fines, some sand size shells, gray, wet, strong reaction with HCl. (SP)	100	SI SIA	SPLIT SPOON	WOT
			LIMESTONE, sandy from 1.0 to 1.5 and 11.5 to 15.0, silty from 1.5 to 10.0, shelly from 10.0 to 11.5, moderately hard to hard from 1.0 to 2.9, soft from 2.9 to 6.3, 9.5 to 10.0 and 13.0 to 15.0, moderately hard from 6.3 to 9.5 and 10.0 to 13.0, moderately weathered, slightly jointed, thin bedding, tan, pitted to vuggy. (LM)	70		CORE BARREL DIA 4 X 5 1/2 D.T. 24 MIN	2.5
				75	BOX 1	-8.4 CORE BARREL DIA 4 X 5 1/2 D.T. 16 MIN	7.5
				90	BOX 2	-12.4 CORE BARREL DIA 4 X 5 1/2 D.T. 21 MIN	10
-17.4	15.0					-17.4	15
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.			NOTES: 1. 140# Hammer with 30" drop used on 2' split spoon (1 3/8" I.D. X 2" O.D.) 2. WOT= Weight of tools	17.5
							20

# Hole No. CB-HBC00-9

<b>DRILLING LOG</b>	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
1. PROJECT Hernando Beach Channel Improvement		10. SIZE AND TYPE OF BIT See Remarks	
2. LOCATION (Coordinates or Station) X=438,292 Y=1515,206		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW	
3. DRILLING AGENCY Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL CME 45C	
4. HOLE NO. (As shown on drawing title and file number) CB-HBC00-9		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 6 undisturbed: 0	
5. NAME OF DRILLER L. Wooters		14. TOTAL NUMBER OF CORE BOXES 1	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		15. ELEVATION GROUND WATER Tidal	
7. THICKNESS OF BURDEN 4.0 Ft.		16. DATE HOLE STARTED COMPLETED 8/22/00 8/22/00	
8. DEPTH DRILLED INTO ROCK 10.5 Ft.		17. ELEVATION TOP OF HOLE -0.9 Ft.	
9. TOTAL DEPTH OF HOLE 14.5 Ft.		18. TOTAL CORE RECOVERY FOR BORING 58 %	
		19. SIGNATURE OF GEOLOGIST J. Sandoval	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/ ft.
-0.9	0					-0.9	0
		[Dotted Pattern]	poorly graded SAND, mostly fine to medium sand with trace nonplastics fines and sand size shells, gray, wet, roots, strong reaction with HCl. (SP)	33	S1 S1A	SPLIT SPOON	WOT
						-2.4	WOT
				50	S2 S2A	SPLIT SPOON	WOT
						-3.9	WOT
						SPLIT SPOON	WOT
-4.9	4.0			100	S3 S3A		2
		[Vertical Line Pattern]	LIMESTONE, shelly from 4.5 to 14.0, sandy from 14.0 to 14.5, soft from 4.0 to 4.5, moderately hard from 4.5 to 14.5, decomposed from 4.0 to 4.5, moderately weathered from 4.5 to 14.5, slightly jointed with vertical joint from 13.5 to 14.5, thin to medium bedding, tan, pitted to vuggy. (LM)			-5.4	12
				64	BOX 1	CORE BARREL DIA 4 X 5 1/2 D.T. 15 MIN	5
						-10.4	7.5
				56	BOX 2	CORE BARREL DIA 4 X 5 1/2 D.T. 19 MIN	10
						-15.4	12.5
-15.4	14.5					-15.4	15
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System			NOTES: 1. 140# Hammer with 30" drop used ON 2' split spoon (1 3/8" I.D. X 2" O.D.) 2. WOT= Weight of tools	17.5
							20

<b>DRILLING LOG</b>	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
1. PROJECT Hernando Beach Channel Improvement		10. SIZE AND TYPE OF BIT See Remarks	
2. LOCATION (Coordinates or Station) X=437,401 Y=1515,514		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW	
3. DRILLING AGENCY Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL CME 45C	
4. HOLE NO. (As shown on drawing title and file number) CB-HBC00-10		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 6 undisturbed: 0	
5. NAME OF DRILLER M. Whitson		14. TOTAL NUMBER OF CORE BOXES 1	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		15. ELEVATION GROUND WATER Tidal	
7. THICKNESS OF BURDEN 4.5 Ft.		16. DATE HOLE STARTED COMPLETED 8/7/00 8/7/00	
8. DEPTH DRILLED INTO ROCK 10.5 Ft.		17. ELEVATION TOP OF HOLE -5.7 Ft.	
9. TOTAL DEPTH OF HOLE 15.0 Ft.		18. TOTAL CORE RECOVERY FOR BORING 49 %	
		19. SIGNATURE OF GEOLOGIST J. Sandoval	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	LI SAMPLER NUMBER	REMARKS Bit or Barret	BLOWS/5'
-5.7	.0					-5.7	
		[Dotted pattern]	poorly graded SAND, mostly fine to medium sand with trace nonplastic fines and sand size shells, gray, wet, roots, strong reaction with HCl. (SP)	66	S1 SIA	SPLIT SPOON	WOT
				80	S2 S2A	SPLIT SPOON	1
				93	S3 S3A	SPLIT SPOON	WOT
-10.2	4.5		LIMESTONE, silty to shelly, soft from 4.5 to 9.0 and 10.0 to 15.0, moderately hard from 9.0 to 10.0, highly to slightly weathered, intensely jointed from 4.5 to 9.0 and 10.0 to 15.0, slightly jointed from 9.0 to 10.0, thin bedding, tan, vuggy. (LM)			-10.7	2
				32		CORE BARREL DIA 4 X 5 1/2 D.T. 19 MIN	
					BOX 1		-15.7
				44		CORE BARREL DIA 4 X 5 1/2 D.T. 13 MIN	
-20.7	15.0					-20.7	
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System			NOTES: 1. 140# Hammer with 30" drop used on 2' split spoon (1 3/8" I.D. X 2" O.D.) 2. WOT = Weight of tools	

# Hole No. CB-HBC00-11

<b>DRILLING LOG</b>	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
1. PROJECT Hernando Beach Channel Improvement		10. SIZE AND TYPE OF BIT See Remarks	
2. LOCATION (Coordinates or Station) X=436,422 Y=1515,823		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW	
3. DRILLING AGENCY Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL CME 45C	
4. HOLE NO. (As shown on drawing title and file number) CB-HBC00-11		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 6 undisturbed: 0	
5. NAME OF DRILLER L. Wooters		14. TOTAL NUMBER OF CORE BOXES 1	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		15. ELEVATION GROUND WATER Tidal	
7. THICKNESS OF BURDEN 3.5 Ft.		16. DATE HOLE STARTED COMPLETED 8/22/00 8/22/00	
8. DEPTH DRILLED INTO ROCK 11.5 Ft.		17. ELEVATION TOP OF HOLE -3.7 Ft.	
9. TOTAL DEPTH OF HOLE 15.0 Ft.		18. TOTAL CORE RECOVERY FOR BORING 79 %	
		19. SIGNATURE OF GEOLOGIST J.Sandoval	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/5'
-3.7	.0					-3.7	
		[Stippled Pattern]	poorly graded SAND, mostly fine sand with trace of nonplastic fines and sand size shells, gray, wet, strong reaction with HCl. (SP)	66	S1 S1A	SPLIT SPOON	WOT
						-5.2	WOT
				100	S2 S2A	SPLIT SPOON	1
						-6.7	1
							3
-7.2	3.5		LIMESTONE, silty to shelly, soft from 3.5 to 5.5, moderately hard from 5.5 to 15.0, decomposed from 3.5 to 4.5, moderately weathered from 4.5 to 15.0, intensely jointed 4.5 to 5.5, slightly jointed from 5.5 to 15.0, thin to medium bedding, tan, pitted to vuggy. (LM)	100	S3 S3A	SPLIT SPOON	3
						-8.2	3
							4
				73		CORE BARREL DIA 4 X 5 1/2 D.T. 27 MIN	
							5
							7.5
					BOX 1	-13.7	10
						CORE BARREL DIA 4 X 5 1/2 D.T. 16 MIN	
				76			12.5
-18.7	15.0					-18.7	15
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.			NOTES: 1. 140# Hammer with 30" drop used on 2' split spoon (1 3/8" I.D. x 2" O.D.) 2. WOT= Weight of tools	17.5
							20

# Hole No. CB-HBC00-12

<b>DRILLING LOG</b>	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
1. PROJECT Hernando Beach Channel Improvement	10. SIZE AND TYPE OF BIT See Remarks	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW	
2. LOCATION (Coordinates or Station) X=435,820 Y=1516,131	12. MANUFACTURER'S DESIGNATION OF DRILL CME 45C	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 2    undisturbed: 0	
3. DRILLING AGENCY Corps of Engineers	14. TOTAL NUMBER OF CORE BOXES 2	15. ELEVATION GROUND WATER Tidal	
4. HOLE NO. (As shown on drawing title and file number) CB-HBC00-12	16. DATE HOLE STARTED COMPLETED 8/21/00    8/21/00	17. ELEVATION TOP OF HOLE -1.4 Ft.	
5. NAME OF DRILLER L. Wooters	18. TOTAL CORE RECOVERY FOR BORING 83 %	19. SIGNATURE OF GEOLOGIST J. Sandoval	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED	7. THICKNESS OF BURDEN 0.6 Ft.		
8. DEPTH DRILLED INTO ROCK 14.4 Ft.			9. TOTAL DEPTH OF HOLE 15.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/ ft.
-1.4	0.0					-1.4	
-2.0	.6	●	poorly graded SAND, mostly fine sand with trace of sand size shells and nonplastic fines, gray, wet, weak reaction with HCl. (SP)	80	SI SIA	SPLIT SPOON	WOT 3 2
			LIMESTONE, sandy from 0.6 to 2.5 and 9.7 to 13.0, shelly from 2.5 to 3.2, 6.8 to 9.7 and 13.0 to 15.0, silty from 3.2 to 6.8, decomposed from 0.6 to 2.5, slightly weathered from 2.5 to 13.0, moderately weathered from 13.0 to 15.0, thin to medium bedding, tan to gray, pitted to vuggy. (LM)	66		CORE BARREL DIA 4 X 5 1/2 D.T. 22 MIN	2.5 5
				76	BOX 1	CORE BARREL DIA 4 X 5 1/2 D.T. 10 MIN	7.5 10
				100	BOX 2	CORE BARREL DIA 4 X 5 1/2 D.T. 3 MIN	12.5 15
-16.4	15.0		NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System			NOTES: 1. 140# Hammer with 30" drop used on 2' split spoon (1 3/8" I.D. X 2" O.D.) 2. WOT= Weight of tools	17.5 20

# Hole No. CB-HBC00-13

<b>DRILLING LOG</b>	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
1. PROJECT Hernando Beach Channel Improvement		10. SIZE AND TYPE OF BIT See Remarks	
2. LOCATION (Coordinates or Station) X=434,823 Y=1517,044		11. DATUM FOR ELEVATION SHOWN (T&M or MSL) MLW	
3. DRILLING AGENCY Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL CME 45C	
4. HOLE NO. (As shown on drawing title and file number) CB-HBC00-13		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 1    undisturbed: 0	
5. NAME OF DRILLER M. Whitson		14. TOTAL NUMBER OF CORE BOXES 2	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		15. ELEVATION GROUND WATER Tidal	
7. THICKNESS OF BURDEN 1.5 Ft.		16. DATE HOLE STARTED COMPLETED 8/10/00    8/10/00	
8. DEPTH DRILLED INTO ROCK 14.0 Ft.		17. ELEVATION TOP OF HOLE -3.1 Ft.	
9. TOTAL DEPTH OF HOLE 15.5 Ft.		18. TOTAL CORE RECOVERY FOR BORING 83 %	
19. SIGNATURE OF GEOLOGIST J. Sandoval			

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC X	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/ 5'
-3.1	.0					-3.1	
		[Dotted Pattern]	poorly graded SAND, mostly fine to medium sand with trace of sand size shells and trace to some nonplastic fines, gray, wet, weak reaction with HCl. (SP)	20	SI	SPLIT SPOON.	0
-4.6	1.5		LIMESTONE, sandy from 1.5 to 8.5, shelly from 8.5 to 11.0, silty from 11.0 to 15.5, moderately hard, moderately weathered, moderately jointed, medium bedding, tan to gray, pitted to vuggy. (LM)	92		CORE BARREL DIA 4 X 5 1/2 D.T. 11 MIN	2.5
					BOX 1	-9.6	
				90		CORE BARREL DIA 4 X 5 1/2 D.T. 13 MIN	7.5
					BOX 2	-14.6	
				75		CORE BARREL DIA 4 X 5 1/2 D.T. 17 MIN	12.5
-18.6	15.5					-18.6	15
			NOTES: NF I. Soils are field visually classified in accordance with the Unified Soils Classification System			NOTES: 1. 140# Hammer with 30" drop used on 2" split spoon (1 3/8" I.D. X 2" O.D.) 2. WOT= Weight of tools	17.5
							20

<b>DRILLING LOG</b>	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
1. PROJECT Hernando Beach Channel Improvement		10. SIZE AND TYPE OF BIT See Remarks	
2. LOCATION (Coordinates or Station) X=434,114 Y=1517,957		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW	
3. DRILLING AGENCY Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL CME 45C	
4. HOLE NO. (As shown on drawing title and file number) CB-HBC00-14		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 4 undisturbed: 0	
5. NAME OF DRILLER L. Wooters		14. TOTAL NUMBER OF CORE BOXES 1	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		15. ELEVATION GROUND WATER Tidal	
7. THICKNESS OF BURDEN 3.0 Ft.		16. DATE HOLE STARTED COMPLETED 8/17/00 8/17/00	
8. DEPTH DRILLED INTO ROCK 13.0 Ft.		17. ELEVATION TOP OF HOLE -3.8 Ft.	
9. TOTAL DEPTH OF HOLE 16.0 Ft.		18. TOTAL CORE RECOVERY FOR BORING 58 %	
		19. SIGNATURE OF GEOLOGIST J. Sandoval	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC X	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/5'
-3.8	.0					-3.8	
		[Dotted pattern]	poorly graded SAND, mostly fine to medium sand with some sand size shells, trace to no fines and fine, gray, wet, strong reaction with HCl. (SP)	53	S1 S1A	SPLIT SPOON	1
							-5.3
				87	S2 S2A	SPLIT SPOON	1
							2
-6.8	3.0		No recovery, probably saprolitic limestone.			-6.8	7
				0	BOX 1	CORE BARREL DIA 4 X 5 1/2 D.T. 6 MIN	
-11.8	8.0		LIMESTONE, silty to shelly, soft from 8.0 to 9.0, moderately hard from 9.0 to 16.0, decomposed from 8.0 to 9.0, moderately weathered from 9.0 to 16.0, intensely jointed from 9.0 to 14.2, slightly jointed from 14.2 to 16.0, thin to medium bedding, tan, pitted to vuggy. (LM)	100	S3 S3A	SPLIT SPOON	WOT
						-12.8	WOT
				70	BOX 1	CORE BARREL DIA 4 X 5 1/2 D.T. 14 MIN	
				75		-17.8	
						CORE BARREL DIA 4 x 5 1/2 D.T. 6 MIN	
-19.8	16.0					-19.8	
			NOTES: 1. Soil are field visually classified in accordance with the Unified Soils Classification System			NOTES: 1. 140# Hammer with 30" drop used on 2' split spoon (1 3/8" I.D. X 2" O.D.) 2. WOT= Weight of tools	

# Hole No. CB-HBC00-14A

<b>DRILLING LOG</b>	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
1. PROJECT Hernando Beach Channel Improvement		10. SIZE AND TYPE OF BIT See Remarks	
2. LOCATION (Coordinates or Station) X=434,078 Y=1517,937		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW	
3. DRILLING AGENCY Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL CME 45C	
4. HOLE NO. (As shown on drawing title and file number) CB-HBC00-14A		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 4 undisturbed: 0	
5. NAME OF DRILLER L. Wooters		14. TOTAL NUMBER OF CORE BOXES 1	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		15. ELEVATION GROUND WATER Tidal	
7. THICKNESS OF BURDEN 2.5 Ft.		16. DATE HOLE STARTED COMPLETED 8/29/00 8/29/00	
8. DEPTH DRILLED INTO ROCK 9.5 Ft.		17. ELEVATION TOP OF HOLE -1.9 Ft.	
9. TOTAL DEPTH OF HOLE 12.0 Ft.		18. TOTAL CORE RECOVERY FOR BORING 97 %	
19. SIGNATURE OF GEOLOGIST J. Sandoval			

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/5'
-1.9	0					-1.9	0
		[Dotted Pattern]	poorly graded SAND, mostly fine to medium sand with some sand size shells, trace of nonplastic fines, gray, wet, strong reaction with HCl. (SP)	93	S1 S1A	SPLIT SPOON	1 2
						-3.4	1
							1
-4.4	2.5			100	S2 S2A	SPLIT SPOON	3
-4.9	3.0	I	LIMESTONE, decomposed to mostly lean clay (CL) with trace of fine sand. (LM) No recovery, possibly saprolitic limestone.			-4.9	10
				0		CORE BARREL DIA 4 X 5 1/2 D.T. 6 MIN	5
					BOX 1		7.5
-9.9	8.0		LIMESTONE, shelly, soft to moderately hard, intensely weathered and fractured from 3.0 to 10.0, moderately fractured from 10.0 to 12.0, thin bedding, tan, pitted to vuggy. (LM)	66		-9.9 CORE BARREL DIA 4 X 5 1/2 D.T. 7 MIN	
						-10.9	
				100		CORE BARREL DIA 4 X 5 1/2 D.T. 28 MIN BLOCKED, HOLE TERMINATED	10
-13.9	12.0		NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System			-13.9	12.5
						NOTES: 1. 140# Hammer with 30" drop used on 2" split spoon (1 3/8" I.D. X 2" O.D.) 2. WOT= Weight of tools	15
							17.5
							20

<b>DRILLING LOG</b>	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
1. PROJECT Hernando Beach Channel Improvement		10. SIZE AND TYPE OF BIT See Remarks	
2. LOCATION (Coordinates or Station) X=434,025 Y=1518,059		11. DATUM FOR ELEVATION SHOWN (TBM or NSL) MLW	
3. DRILLING AGENCY Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL CME 45C	
4. HOLE NO. (As shown on drawing title and file number) CB-HBC00-14B		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 1 undisturbed: 0	
5. NAME OF DRILLER L. Wooters		14. TOTAL NUMBER OF CORE BOXES 1	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		15. ELEVATION GROUND WATER Tidal	
7. THICKNESS OF BURDEN 0.8 Ft.		16. DATE HOLE STARTED COMPLETED 8/30/00 8/30/00	
8. DEPTH DRILLED INTO ROCK 5.2 Ft.		17. ELEVATION TOP OF HOLE -4.2 Ft.	
9. TOTAL DEPTH OF HOLE 6.0 Ft.		18. TOTAL CORE RECOVERY FOR BORING 92 %	
		19. SIGNATURE OF GEOLOGIST J. Sandoval	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/5'
-4.2	.0					-4.2	
-5.0	.8		poorly graded SAND, mostly fine sand with some sand size shells, trace of nonplastic fines, gray, wet, weak to strong reaction with HCl. (SP)	100	SI	SPLIT SPOON	1
			LIMESTONE, sandy from 1.0 to 3.5 and 3.9 to 6.0, silty from 3.5 to 3.9, soft from 0.8 to 1.0 and 3.5 to 3.9, moderately hard from 1.0 to 3.5 and 3.9 to 6.0, decomposed from 0.8 to 1.0, moderately weathered from 1.0 to 6.0, slightly jointed, thin to medium bedding, tan, pitted. (LM)	90	BOX 1	CORE BARREL DIA 4 X 5 1/2 D.T. 22 MIN	10
-10.2	6.0					-10.2	
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System			NOTES: 1. 140# Hammer with 30" drop used on 2" split spoon (1 3/8" I.D. X 2" O.D.) 2. WOT= Weight of tools	

# Hole No. CB-HBC00-14C

<b>DRILLING LOG</b>	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
1. PROJECT Hernando Beach Channel Improvement		10. SIZE AND TYPE OF BIT See Remarks	
2. LOCATION (Coordinates or Station) X=434,203 Y=1517,957		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW	
3. DRILLING AGENCY Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL CME 45C	
4. HOLE NO. (As shown on drawing title and file number) CB-HBC00-14C		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 4 undisturbed: 0	
5. NAME OF DRILLER L. Wooters		14. TOTAL NUMBER OF CORE BOXES 1	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		15. ELEVATION GROUND WATER Tidal	
7. THICKNESS OF BURDEN 2.5 Ft.		16. DATE HOLE STARTED COMPLETED 8/30/00 8/30/00	
8. DEPTH DRILLED INTO ROCK 4.0 Ft.		17. ELEVATION TOP OF HOLE -5.9 Ft.	
9. TOTAL DEPTH OF HOLE 6.5 Ft.		18. TOTAL CORE RECOVERY FOR BORING 95 %	
		19. SIGNATURE OF GEOLOGIST J. Sandoyal	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC X	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/5'
-5.9	0.0					-5.9	
		[Dotted Pattern]	poorly graded SAND, mostly fine to medium sand with some sand size shells, trace of roots, gray, wet, weak to strong reaction with HCl. (SP)	53	S1	SPLIT SPOON	WOT
						-7.4	2
-8.4	2.5			93	S2	SPLIT SPOON	2
-8.9	3.0	I	LIMESTONE, sandy, hard, moderately weathered, thin bedding, tan, pitted. (LM)			-8.9	1
		CAVITY	CAVITY, infilled with sandy silty CLAY (CL/ML), mostly low to nonplastic fines, trace to some fine sand, tan, wet, strong reaction with HCl. (CAV)	100	S3	SPLIT SPOON	2
		CAVITY				-10.4	3
		CAVITY					2
-11.4	5.5	CAVITY		100	S4	SPLIT SPOON	5
		CAVITY				-11.4	12
-12.4	6.5	I	LIMESTONE, sandy to shelly, moderately hard, moderately weathered and moderately jointed, thin bedding, tan, pitted. (LM)	30	BOX 1	CORE BARREL DIA 4 X 5 1/2 D.T. 4 MIN	
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System				
						NOTES: 1. 140# Hammer with 30" drop used on 2' split spoon (1 3/8" I.D. X 2" O.D.) 2. WOT = Weight of tools	

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PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT Hernando Beach Channel Improvement	HOLE NUMBER CB-HBC00-14C
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<b>DRILLING LOG</b>	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
1. PROJECT Hernando Beach Channel Improvement	2. LOCATION (Coordinates or Station) X=433,256 Y=1518,669	10. SIZE AND TYPE OF BIT See Remarks	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW
3. DRILLING AGENCY Corps of Engineers	4. HOLE NO. (As shown on drawing title and file number) CB-HBC00-15	12. MANUFACTURER'S DESIGNATION OF DRILL CME 45C	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 2 undisturbed: 0
5. NAME OF DRILLER L. Wooters	6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED	14. TOTAL NUMBER OF CORE BOXES 1	15. ELEVATION GROUND WATER Tidal
7. THICKNESS OF BURDEN 0.5 Ft.	8. DEPTH DRILLED INTO ROCK 14.5 Ft.	16. DATE HOLE STARTED COMPLETED 8/17/00 8/17/00	17. ELEVATION TOP OF HOLE -3.3 Ft.
9. TOTAL DEPTH OF HOLE 15.0 Ft.		18. TOTAL CORE RECOVERY FOR BORING 66 %	19. SIGNATURE OF GEOLOGIST J. Sandoval

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC X	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/5'
-3.3	.0						
-3.8	.5		poorly graded SAND, mostly fine to medium sand with some coarse sand size shells, trace of nonplastic fines and roots, gray, wet, strong reaction with HCl. (SP)	100		-3.3 -3.8 CORE BARREL DIA 4 X 5 1/2 D.T. 13 MIN	0 GRAB
			LIMESTONE, sandy from 0.5 to 3.0, shelly from 3.0 to 6.8, soft from 0.5 to 2.2, moderately hard from 2.2 to 6.8, intensely weathered and jointed from 0.5 to 2.2, moderately weathered and slightly jointed from 2.2 to 6.8, medium bedding, tan, pitted to vuggy. (LM)	79		-8.1 CORE BARREL DIA 4 X 5 1/2 D.T. 26 MIN	2.5 5
-10.1	6.8		Sandy CLAY (CL) with limestone fragments, mostly low plasticity fines with trace to some fine to medium sand, trace of fine, hard gravel, tan, strong reaction with HCl.	53	BOX 1		7.5
-12.9	9.6		LIMESTONE, sandy from 9.6 TO 11.0, shelly from 11.0 TO 15.0, moderately hard from 9.6 to 11.0, soft from 11.0 to 15.0, moderately to highly weathered, slightly jointed from 9.6 to 11.0, highly jointed from 11.0 to 15.0, thin to medium bedding, tan, pitted to vuggy. (LM)	64		-13.3 CORE BARREL DIA 4 X 5 1/2 D.T. 23 MIN	10 12.5
-18.3	15.0					-18.3	15
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System			NOTES: 1. 140# Hammer with 30" drop used on 2 split spoon (1 3/8" I.D. X 2" O.D.) 2. WOT=Weight of tools 3. Grab sample taken with split spoon	17.5 20

<b>DRILLING LOG</b>	<b>DIVISION</b> South Atlantic	<b>INSTALLATION</b> Jacksonville District	<b>SHEET 1</b> OF 1
<b>1. PROJECT</b> Hernando Beach Channel Improvement		<b>10. SIZE AND TYPE OF BIT</b> See Remarks	
<b>2. LOCATION (Coordinates or Station)</b> X=432,339 Y=1519,584		<b>11. DATUM FOR ELEVATION SHOWN (TBM or MSL)</b> MLW	
<b>3. DRILLING AGENCY</b> Corps of Engineers		<b>12. MANUFACTURER'S DESIGNATION OF DRILL</b> CME 45C	
<b>4. HOLE NO. (As shown on drawing title and file number)</b> CB-HBC00-16		<b>13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN</b> disturbed: 0 undisturbed: 0	
<b>5. NAME OF DRILLER</b> L. Wooters		<b>14. TOTAL NUMBER OF CORE BOXES</b> 1	
<b>6. DIRECTION OF HOLE</b> <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		<b>15. ELEVATION GROUND WATER</b> Tidal	
<b>7. THICKNESS OF BURDEN</b> 0.2 Ft.		<b>16. DATE HOLE STARTED COMPLETED</b> 8/09/00 8/09/00	
<b>8. DEPTH DRILLED INTO ROCK</b> 15.0 Ft.		<b>17. ELEVATION TOP OF HOLE</b> -4.6 Ft.	
<b>9. TOTAL DEPTH OF HOLE</b> 15.0 Ft.		<b>18. TOTAL CORE RECOVERY FOR BORING</b> 84 %	
		<b>19. SIGNATURE OF GEOLOGIST</b> J. Sandoval	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC X	SAMPLE NUMBER	REMARKS Bit or Barrel
-4.6	0		ROOTS AND SEAGRASS			-4.6
			LIMESTONE, sandy from 0.0 to 1.2 and 9.4 to 12.0, shelly from 1.2 to 3.7 and 12.0 to 13.6, silty from 3.7 to 9.4 and 13.6 to 15.0, moderately hard from 0.2 to 5.0 and 9.4 to 13.6, soft from 5.0 to 7.8, soft to moderately hard from 7.8 to 9.4 and 13.6 to 15.0, moderately weathered, moderately to highly jointed, thin to thick bedding, tan, pitted to vuggy. (LM)	98		CORE BARREL DIA 4 X 5 1/2 D.T. 14 MIN
					BOX 1	
				44		-9.6 CORE BARREL DIA 4 X 5 1/2 D.T. 83 MIN CORE WASHED FROM 5.0 TO 7.8
				100		-14.6 CORE BARREL DIA 4 X 5 1/2 D.T. 18 MIN
					BOX 2	
-19.6	15.0		NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System			-19.6 NOTES: 1. 140# Hammer with 30" drop used with 2.0' split spoon (1 3/8" I.D. 2.0" O.D.) 2. WOT=Weight of tools

<b>DRILLING LOG</b>	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
1. PROJECT Hernando Beach Channel Improvement		10. SIZE AND TYPE OF BIT See Remarks	
2. LOCATION (Coordinates or Station) X=431,452 Y=1520,397		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW	
3. DRILLING AGENCY Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL CME 45C	
4. HOLE NO. (As shown on drawing title and file number) CB-HBC00-17		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 2 undisturbed: 0	
5. NAME OF DRILLER L. Wooters		14. TOTAL NUMBER OF CORE BOXES 2	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		15. ELEVATION GROUND WATER Tidal	
7. THICKNESS OF BURDEN 1.5 Ft.		16. DATE HOLE STARTED COMPLETED 8/16/00 8/16/00	
8. DEPTH DRILLED INTO ROCK 13.5 Ft.		17. ELEVATION TOP OF HOLE -0.1 Ft.	
9. TOTAL DEPTH OF HOLE 15.0 Ft.		18. TOTAL CORE RECOVERY FOR BORING 93 %	
		19. SIGNATURE OF GEOLOGIST J. Sandoval	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC X	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/5'
-1	0.0					-1	
-1.6	1.5		poorly graded SAND, mostly fine sand with some sand size shells, trace of nonplastic fines, gray, wet, strong reaction with HCl. (SP)	60		SPLIT SPOON	WOT 1 4
			LIMESTONE, sandy from 1.5 to 2.1 and 12.3 to 15.0, shelly from 2.1 to 8.0, silty from 8.0 to 12.3, moderately hard from 1.5 to 8.0 and 12.3 to 15.0, soft from 8.0 to 12.3, moderately to slightly weathered, slightly jointed with near vertical joint from 4.4 to 8.0 and 9.5 to 12.3, tan, pitted to vuggy. (LM)	96	BOX 1	CORE BARREL DIA 4 X 5 1/2 D.T. 20 MIN	
				93		CORE BARREL DIA 4 X 5 1/2 D.T. 25 MIN	
				100	BOX 2	CORE BARREL DIA 4 X 5 1/2 D.T. 14 MIN	
-15.1	15.0		NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System			-15.1	
						NOTES: 1. 140# Hammer with 30" drop used on 2' split spoon (1 3/8" I.D. X 2" O.D.) 2. WOT= Weight of tools	

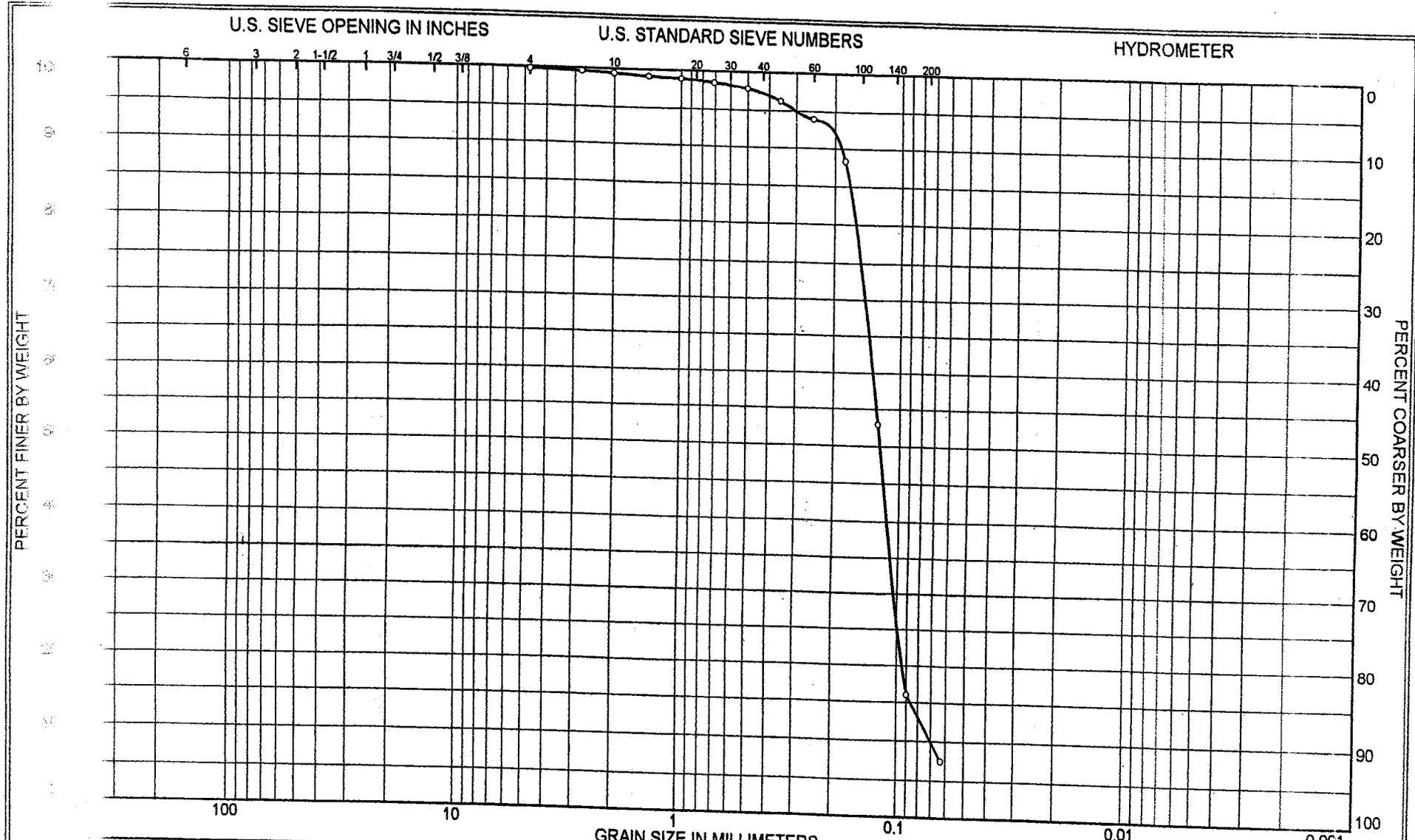
# Hole No. CB-HBC00-18

<b>DRILLING LOG</b>	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
1. PROJECT Hernando Beach Channel Improvement		10. SIZE AND TYPE OF BIT See Remarks	
2. LOCATION (Coordinates or Station) X=430,474 Y=1521,110		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW	
3. DRILLING AGENCY Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL CME 45C	
4. HOLE NO. (As shown on drawing title and file number) CB-HBC00-18		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 3 undisturbed: 0	
5. NAME OF DRILLER L. Wooters		14. TOTAL NUMBER OF CORE BOXES 2	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		15. ELEVATION GROUND WATER Tidal	
7. THICKNESS OF BURDEN 2.0 Ft.		16. DATE HOLE STARTED COMPLETED 8/16/00 8/16/00	
8. DEPTH DRILLED INTO ROCK 13.0 Ft.		17. ELEVATION TOP OF HOLE -3.8 Ft.	
9. TOTAL DEPTH OF HOLE 15.0 Ft.		18. TOTAL CORE RECOVERY FOR BORING 85 %	
		19. SIGNATURE OF GEOLOGIST J. Sandoval	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/ 5'
-3.8	.0					-3.8	
		●	poorly graded SAND, mostly fine to medium sand with some coarse sand size shells, trace of nonplastic fines, gray, wet, strong reaction with HCl. (SP)	60	S1	SPLIT SPOON	WOT
						-5.3	WOT
-5.8	2.0	●		80	S2	SPLIT SPOON	WOT
			LIMESTONE, sandy from 2.0 to 2.8 and 12.4 to 15.0, shelly from 2.8 to 12.4, soft from 3.8 to 5.8 and 9.0 to 10.2, moderately hard from 2.0 3.8, 5.8 to 9.0 and 10.2 to 15.0, moderately to slightly weathered, slightly jointed where soft, intensely jointed from 9.0 to 10.2, tan, pitted to vuggy. (LM)	100		CORE BARREL DIA 4 X 5 1/2 D.T. 25 MIN	2.5
						-9.8	
					BOX 1	CORE BARREL DIA 4 X 5 1/2 D.T. 19 MIN	7.5
				87			10
						-14.3	
						CORE BARREL DIA 4 X 5 1/2 D.T. 14 MIN	12.5
				80	BOX 2		15
-18.8	15.0					-18.8	15
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System			NOTES: 1. 140# Hammer with 30" drop used on 2' split spoon (1 3/8" I.D. X 2" O.D.) 2. WOT = Weight of tools	17.5
							20

<b>DRILLING LOG</b>	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1
1. PROJECT Hernando Beach Channel Improvement		10. SIZE AND TYPE OF BIT See Remarks	
2. LOCATION (Coordinates or Station) X=429,408 Y=1521,722		11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW	
3. DRILLING AGENCY Corps of Engineers		12. MANUFACTURER'S DESIGNATION OF DRILL CME 45C	
4. HOLE NO. (As shown on drawing title and file number) CB-HBC00-19		13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 4 undisturbed: 0	
5. NAME OF DRILLER L. Wooters		14. TOTAL NUMBER OF CORE BOXES 2	
6. DIRECTION OF HOLE <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		15. ELEVATION GROUND WATER Tidal	
7. THICKNESS OF BURDEN 3.0 Ft.		16. DATE HOLE STARTED COMPLETED 8/08/00 8/08/00	
8. DEPTH DRILLED INTO ROCK 12.0 Ft.		17. ELEVATION TOP OF HOLE -6.4 Ft.	
9. TOTAL DEPTH OF HOLE 15.0 Ft.		18. TOTAL CORE RECOVERY FOR BORING 84 %	
		19. SIGNATURE OF GEOLOGIST J. Sandoval	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/5'
-6.4	0					-6.4	
			poorly graded SAND, mostly fine sand with some coarse sand size shells, trace of nonplastic fines, gray, wet, strong reaction with HCl. (SP)	47	S1 S1A	SPLIT SPOON	4 3 1
-8.4	2.0		sandy CLAY, mostly low to medium plasticity fines, some fine to medium sand, tan, strong reaction with HCl. (CL)	100	S2 S2A	SPLIT SPOON	1 3 6
-9.4	3.0		LIMESTONE, silty, soft from 3.0 to 7.0, moderately hard from 7.0 to 13.0, soft from 13.0 to 15.0, decomposed from 3.0 to 7.0, highly to moderately weathered from 7.0 to 10.0, moderately weathered from 10.0 to 13.0 and highly weathered from 13.0 to 15.0, medium bedding, tan, pitted to vuggy. (LM)	63		CORE BARREL DIA 4 X 5 1/2 D.T. 32 MIN	
				85	BOX 1	-12.4 CORE BARREL DIA 4 X 5 1/2 D.T. 43 MIN	
				93	BOX 2	-16.9 CORE BARREL DIA 4 X 5 1/2 D.T. 24 MIN	
-21.4	15.0					-21.4	
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System				NOTES: 1. 140# Hammer with 30" drop used on 2" split spoon (1 3/8" I.D. X 2" O.D.) 2. WOT= Weight of tools



COBBLES	GRAVEL	SAND	SILT	CLAY
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No.	Elev or Depth	Classification	Nat w%	LL	PL	PI	
0	-8.7/-9.7 (MLW)	Sand, fine quartz, trace silt, dark brown					Project Hernando Beach
		SP-SM					Area
							Boring No. CB-HBCOO-4
							Date: 7/16/01
							Law Engineering and Environmental s, Inc.

Grain Size Distribution Report

ENG 2087

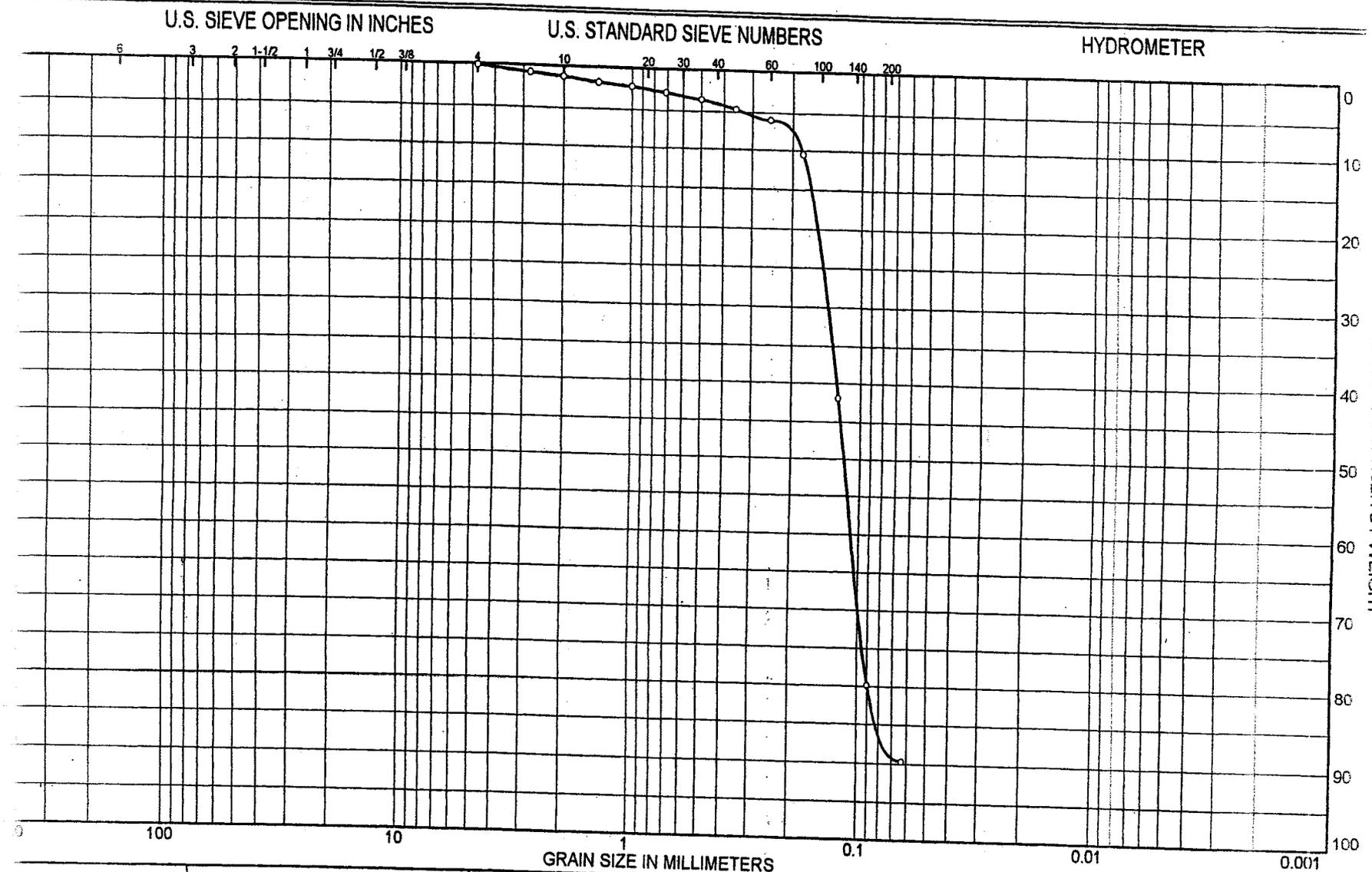


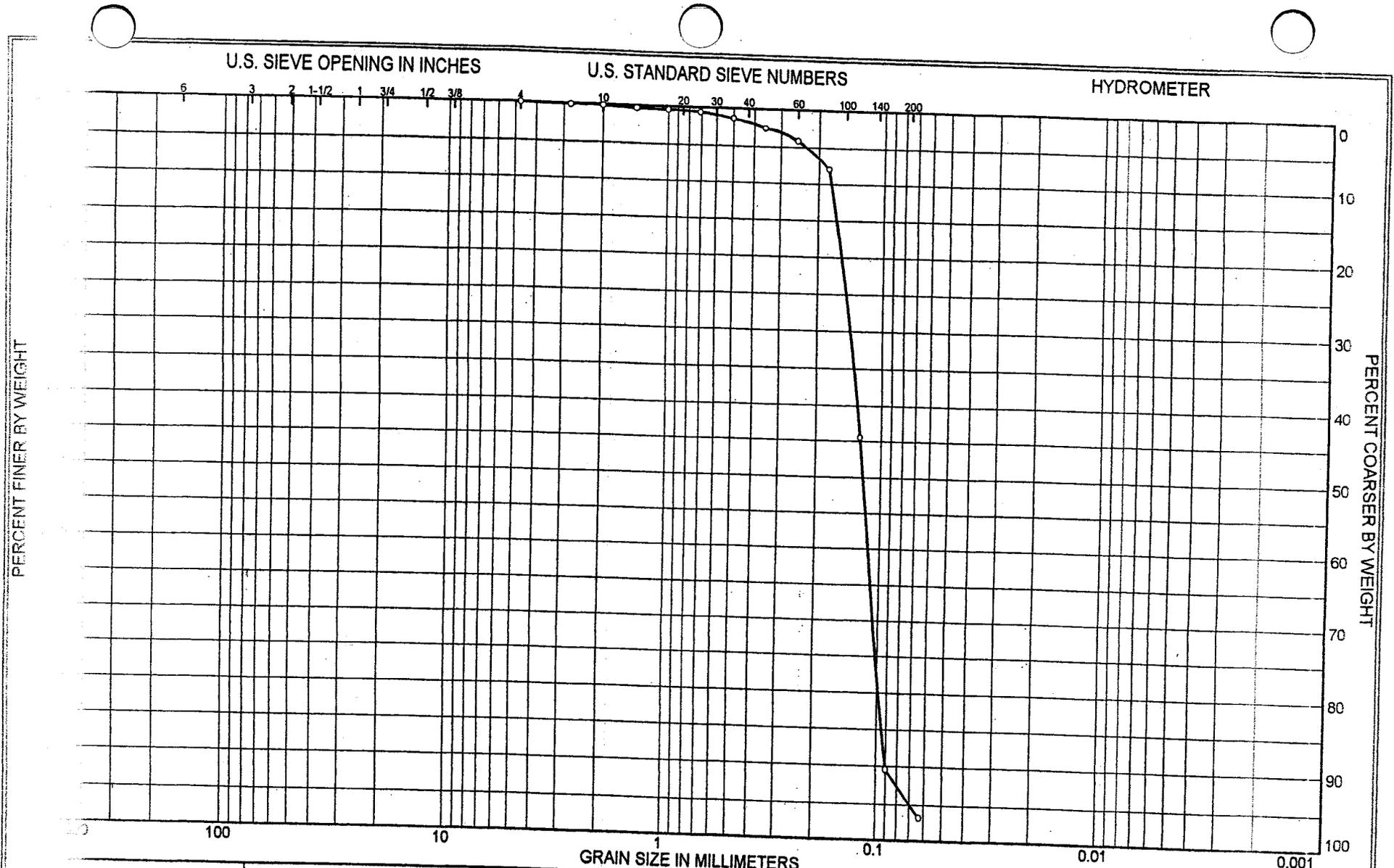




PERCENT FINER BY WEIGHT

PERCENT COARSER BY WEIGHT





COBBLES	GRAVEL	SAND	SILT	CLAY
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Sample No.	Elev or Depth	Classification	Nat w%	LL	PL	PI	Project	
02	-5.2'/-7.2' (MLW)	Sand, fine quartz, trace silt, brown					Hernando Beach	
		SP-SM					Area	
Grain Size Distribution Report							Boring No. CB-HBC00-11	
							Date: 7/16/01	Law Engineering and Environmental Services, Inc.

PERCENT FINER BY WEIGHT

PERCENT COARSER BY WEIGHT



COBBLES	GRAVEL	SAND	SILT	CLAY
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No.	Elev or Depth	Classification	Nat w%	LL	PL	PI	
	-6.4'-8.4' (MLW)	Sand, fine quartz, some sand sized shell fragments, trace silt, brown					Project Hernando Beach
		SP-SM					Area
							Boring No. CB-HBCOO-19

### Grain Size Distribution Report

Date: 7/16/01

Law Engineering and Environmental Services, Inc.

2087