Hole No.CB-PBH95-5

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1

1. PROJECT Palm Beach Harbor	10. SIZE AND TYPE OF BIT See Remarks
2. LOCATION *(Coordinates or Station)* X=816,636 Y=887,707	11. DATUM FOR ELEVATION SHOWN *(TBM or MSL)* MLW (FEET)
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. *(As shown on drawing title and file number)* CB-PBH95-5	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 3 undisturbed: 0
5. NAME OF DRILLER C. Robbins	14. TOTAL NUMBER OF CORE BOXES 1
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED	15. ELEVATION GROUND WATER TIDAL
	16. DATE HOLE STARTED 8/9/95 COMPLETED 8/9/95
7. THICKNESS OF BURDEN Ft.	17. ELEVATION TOP OF HOLE -36.5 Ft.
8. DEPTH DRILLED INTO ROCK 0 Ft.	18. TOTAL CORE RECOVERY FOR BORING 56 %
9. TOTAL DEPTH OF HOLE 4.5 Ft.	19. SIGNATURE OF Geologist Jim Arthur

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/.5'
-36.5	.0					-36.5	
			SAND, gray fine poorly graded quartz sand, trace small shell fragments (SP)	47	1	SPLIT SPOON	3, 6, 8
						-38.0	
				60	2	SPLIT SPOON	15, 20, 23
-39.5	3.0		below elevation -39.5, some shell fragments up to 1/2"			-39.5	
				60	3	SPLIT SPOON	12, 24, 24
-41.0	4.5					-41.0	

NOTE:
Soils are field visually classified in accordance with the Unified Soils Classification System.

Samples recovered using a 140# hammer with 30" drop used on a 2 foot split spoon (1-3/8" ID x 2" OD)

SAMPLE ELEVATION	LABORATORY CLASSIFICATION
-36.5 to -38.0	(SP-SM)*

* Visual classification based on gradation curve. No Atterberg Limits.

Set 6 inch casing to depth 1.9 feet, drilled using Basco salt water drilling mud.

0, 2.5, 5, 7.5, 10, 12.5, 15, 17.5, 20, 22.5

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT	HOLE NUMBER
Palm Beach Harbor	CB-PBH95-5

Hole No.CB-LWI-SB01-1

DRILLING LOG

DIVISION South Atlantic	INSTALLATION Jacksonville District
	SHEET 1 OF 2
1. PROJECT Lake Worth Inlet, Palm Beach Harbor	10. SIZE AND TYPE OF BIT See Remarks
2. LOCATION (Coordinates or Station) X=816,353 Y=887,881	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLLW NAD-27 FL-E
3. DRILLING AGENCY Corps of Engineers - Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 1500
4. HOLE NO. (As shown on drawing title and file number) CB-LWI-SB01-1	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 20 undisturbed: 0
5. NAME OF DRILLER Pickett	14. TOTAL NUMBER OF CORE BOXES 3
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED	15. ELEVATION GROUND WATER n/a
	16. DATE HOLE STARTED 03/31/01 COMPLETED 03/31/01
7. THICKNESS OF BURDEN 30.0 Ft.	17. ELEVATION TOP OF HOLE -5.70 Ft.
8. DEPTH DRILLED INTO ROCK 0.0 Ft.	18. TOTAL CORE RECOVERY FOR BORING 67 %
9. TOTAL DEPTH OF HOLE 30.0 Ft.	19. SIGNATURE OF INSPECTOR C. Moores

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit & Barrel
-5.7	0.0					-5.7
			SAND, poorly graded, fine to medium grained, few shell fragments, calcareous, reddish tan, (SP).	100	1	SPT -7.2
				100	2	SPT -8.7
				40	3	SPT -10.2
			At -10.2 layers reddish tan sand with gray sand	37	4	SPT -11.7
			From -11.7 greyish tan, little shells at -11.7'	40	5	SPT -13.2
				57	6	SPT -14.7
				47	7	SPT -16.2
				47	8	SPT -17.7
			At -17.7 fine grained, few shell fragments, gray	47	9	SPT -19.2
			From -19.2 trace medium grained sand, grayish tan	47	10	SPT -20.7
				60	11	SPT -22.2
				60	12	SPT -23.7
			From -23.7 all fine grained, gray	60	13	SPT -25.2
			At -25.2 trace medium grained, with thin layers of shells	57	14	SPT -26.7
				53	15	SPT -28.2
						(continued)

0, 2.5, 5, 7.5, 10, 12.5, 15, 17.5, 20, 22.5

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT Lake Worth Inlet, Palm Beach Harbor

HOLE NUMBER CB-LWI-SB01-1

Hole No.CB-LWI-SB01-1

DRILLING LOG (Cont. Sheet)

ELEVATION TOP OF HOLE -5.70 Ft.

SHEET 2 OF 2

PROJECT: Lake Worth Inlet, Palm Beach Harbor

INSTALLATION: Jacksonville District

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit & Barrel
-28.2	22.5					-28.2
			From -28.2 all fine grained,	80	16	SPT -29.7
				100	17	SPT -31.2
				100	18	SPT -32.7
				100	19	SPT -34.2
				100	20	SPT -35.7
-35.7	30.0					

Notes:

1. Soils are field visually classified in accordance with the Unified Soils Clasification System.

2. Blow counts not recorded for this boring.

140# hammer w/30" drop used with 2.0' split spoon (1 3/8" I.D. X 2" O.D.).

22.5 25 27.5 30 32.5 35 37.5 40 42.5 45 47.5 50

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT: Lake Worth Inlet, Palm Beach Harbor

HOLE NUMBER: CB-LWI-SB01-1

Hole No.CB-LWI-SB01-2

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 2

1. PROJECT Lake Worth Inlet, Palm Beach Harbor	10. SIZE AND TYPE OF BIT See Remarks
2. LOCATION (Coordinates or Station) X=816,535 Y=887,880	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLLW NAD-27 FI-E
3. DRILLING AGENCY Corps of Engineers - Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 1500
4. HOLE NO. (As shown on drawing title and file number) CB-LWI-SB01-2	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 17 undisturbed: 0
5. NAME OF DRILLER Pickett	14. TOTAL NUMBER OF CORE BOXES 0 of 0
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED	15. ELEVATION GROUND WATER n/a
	16. DATE HOLE STARTED 03/23/01 COMPLETED 03/23/01
7. THICKNESS OF BURDEN 25.5 Ft.	17. ELEVATION TOP OF HOLE -10.4 Ft.
8. DEPTH DRILLED INTO ROCK 0.0 Ft.	18. TOTAL CORE RECOVERY FOR BORING 51 %
9. TOTAL DEPTH OF HOLE 25.5 Ft.	19. SIGNATURE OF INSPECTOR J. Arthur, PG

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit & Barrel	BLOWS/ .5'
-10.4	0.0					-10.4	
			SAND, poorly graded, fine to medium, trace of small shell fragments, calcareous, brownish gray (SP).	53	1	SPT -11.9	8, 9, 5
				53	2	SPT -13.4	3, 5, 10
			From -13.4 brownish grey and grey.	40	3	SPT -14.9	8, 8, 13
			From -14.9 some small shell fragments, gray.	40	4	SPT -16.4	10, 14, 16
				40	5	SPT -17.9	8, 19, 21
				47	6	SPT -19.4	8, 18, 23
				47	7	SPT -20.9	16, 24, 27
				53	8	SPT -22.4	18, 21, 22
			From -22.9 to -23.4 layer of small shell fragments.	67	9	SPT -23.9	13, 22, 30
				67	10	SPT -25.4	21, 18, 31
			At -25.4 trace of silt and small shell fragments.	53	11	SPT -26.9	19, 30, 40
				60	12	SPT -28.4	10, 36, 43
				60	13	SPT -29.9	22, 41, 45
			At -32.9 some small shell fragments, trace of fine limestone gravel.	60	14	SPT -31.4	23, 23, 16
				53	15	SPT -32.9	4, 6, 12
						(continued)	

Depth scale: 0, 2.5, 5, 7.5, 10, 12.5, 15, 17.5, 20, 22.5

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT: Lake Worth Inlet, Palm Beach Harbor

HOLE NUMBER: CB-LWI-SB01-2

Hole No.CB-LWI-SB01-2

DRILLING LOG (Cont. Sheet)

ELEVATION TOP OF HOLE -10.4 Ft.

SHEET 2 OF 2

PROJECT: Lake Worth Inlet, Palm Beach Harbor

INSTALLATION: Jacksonville District

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit & Barrel	BLOWS/ .5'
-32.9	22.5					-32.9	
			At -34.4 no gravel.	27	16	SPT	8 8 10
						-34.4	
				47	17	SPT	15 21 23
-35.9	25.5					-35.9	

Notes:

1. Soils are field visually classified in accordance with the Unified Soils Clasification System.

140# hammer w/30" drop used with 2.0' split spoon (1 3/8" I.D. X 2" O.D.).

22.5 25 27.5 30 32.5 35 37.5 40 42.5 45 47.5 50

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT: Lake Worth Inlet, Palm Beach Harbor

HOLE NUMBER: CB-LWI-SB01-2

DRILLING LOG

DIVISION South Atlantic	INSTALLATION Jacksonville District
SHEET 1 OF 1	
1. PROJECT Lake Worth Inlet, Palm Beach Harbor	10. SIZE AND TYPE OF BIT See Remarks
2. LOCATION (Coordinates or Station) X=816,703 Y=887,879	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLLW NAD-27 FL-E
3. DRILLING AGENCY Corps of Engineers - Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 1500
4. HOLE NO. (As shown on drawing title and file number) CB-LWI-SB01-3	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 10 undisturbed: 0
5. NAME OF DRILLER Pickett	14. TOTAL NUMBER OF CORE BOXES n/a
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED	15. ELEVATION GROUND WATER n/a
	16. DATE HOLE STARTED 03/22/01 COMPLETED 03/22/01
7. THICKNESS OF BURDEN 15.0 Ft.	17. ELEVATION TOP OF HOLE -19.9 Ft.
8. DEPTH DRILLED INTO ROCK 0.0 Ft.	18. TOTAL CORE RECOVERY FOR BORING 25.5 %
9. TOTAL DEPTH OF HOLE 15.0 Ft.	19. SIGNATURE OF INSPECTOR J. Arthur, PG

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit & Barrel	BLOWS/.5'
-19.9	0.0					-19.9	
			SAND, poorly graded, fine to medium grained, some small shell fragments, gray (SP). From -21.4 trace of small shell fragments.	40	1	SPT -21.4	10, 9, 5
				40	2	SPT -22.9	4, 6, 11
				60	3	SPT -24.4	10, 10, 12
				53	4	SPT -25.9	11, 13, 17
				53	5	SPT -27.4	8, 15, 20
				33	6	SPT -28.9	12, 17, 30
				33	7	SPT -30.4	10, 20, 33
			from -31.9 some small shell fragments.	40	8	SPT -31.9	16, 20, 29
				40	9	SPT -33.4	19, 23, 34
			At -34.9 trace of silt and small shell fragments.	40	10	SPT -34.9	18, 23, 27
-34.9	15.0						

Notes:

1. Soils are field visually classified in accordance with the Unified Soils Clasification System.

140# hammer w/30" drop used with 2.0' split spoon (1 3/8" I.D. X 2" O.D.).

0 2.5 5 7.5 10 12.5 15 17.5 20 22.5

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT Lake Worth Inlet, Palm Beach Harbor

HOLE NUMBER CB-LWI-SB01-3

DRILLING LOG

DIVISION South Atlantic	INSTALLATION Jacksonville District
SHEET 1 OF 1	
1. PROJECT Lake Worth Inlet, Palm Beach Harbor	10. SIZE AND TYPE OF BIT See Remarks
2. LOCATION (Coordinates or Station) X=816,891 Y=887,877	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLLW NAD-27 FL-E
3. DRILLING AGENCY Corps of Engineers - Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 1500
4. HOLE NO. (As shown on drawing title and file number) CB-LWI-SB01-4	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 1 undisturbed: 0
5. NAME OF DRILLER Pickett	14. TOTAL NUMBER OF CORE BOXES n/a
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED	15. ELEVATION GROUND WATER n/a
	16. DATE HOLE STARTED 03/22/01 COMPLETED 03/22/01
7. THICKNESS OF BURDEN 1.5 Ft.	17. ELEVATION TOP OF HOLE -33.7 Ft.
8. DEPTH DRILLED INTO ROCK 0.0 Ft.	18. TOTAL CORE RECOVERY FOR BORING 100 %
9. TOTAL DEPTH OF HOLE 1.5 Ft.	19. SIGNATURE OF INSPECTOR J. Arthur, PG

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit & Barrel	BLOWS/.5'
-33.7	0.0					-33.7	
-35.2	1.5		SAND, poorly graded, fine to medium, some small shell fragments, calcareous, gray, (SP).	100	1	SPT -35.2	3 4 9

Notes:

1. Soils are field visually classified in accordance with the Unified Soils Clasification System.

140# hammer w/30" drop used with 2.0' split spoon (1 3/8" I.D. X 2" O.D.).

0 2.5 5 7.5 10 12.5 15 17.5 20 22.5

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT	HOLE NUMBER
Lake Worth Inlet, Palm Beach Harbor	CB-LWI-SB01-4

DRILLING LOG

DIVISION	South Atlantic
INSTALLATION	Jacksonville District
SHEET	1 OF 2
1. PROJECT	Lake Worth Inlet, Palm Beach Harbor
2. LOCATION (Coordinates or Station)	X=816,502 Y=888,542
3. DRILLING AGENCY	Corps of Engineers - Savannah District
4. HOLE NO. (As shown on drawing title and file number)	CB-LWI-PSB01-1
5. NAME OF DRILLER	Pickett
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED
7. THICKNESS OF BURDEN	25.5 Ft.
8. DEPTH DRILLED INTO ROCK	4.0 Ft.
9. TOTAL DEPTH OF HOLE	29.5 Ft.
10. SIZE AND TYPE OF BIT	See Remarks
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MLLW NAD-27 FL-E
12. MANUFACTURER'S DESIGNATION OF DRILL	Failing 1500
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	disturbed: 9 undisturbed: 0
14. TOTAL NUMBER OF CORE BOXES	n/a
15. ELEVATION GROUND WATER	n/a
16. DATE HOLE STARTED / COMPLETED	04/01/01 04/01/01
17. ELEVATION TOP OF HOLE	-5.50 Ft.
18. TOTAL CORE RECOVERY FOR BORING	n/a %
19. SIGNATURE OF INSPECTOR	C. Moores

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit & Barrel	
-5.5	0.0					-5.5	0
			SAND, poorly graded, fine to medium grained, calcareous, grayish tan, (SP).	50	1,1d	5 Foot Sampler 56 blows for 5 feet	2.5
-10.5	5.0		Below -10.5, grey.			-10.5	5
				50	2,2d	5 Foot Sampler 138 blows for 5 feet	7.5
-15.5	10.0		below -15.5, fine grained.			-15.5	10
				58	3,3d	5 Foot Sampler 125 blows for 4.5 feet	12.5
						-19.0	
				50	4,4d	SPLITSPOON 146 blows for 2 feet	15
						-21.0	
				50	5,5d	SPLITSPOON 143 blows for 2 feet	
						-23.0	17.5
					6,6d	SPLITSPOON 179 blows for 2 feet	
-25.0	19.5		below -25.0, fine to medium grained.			-25.0	
-25.5	20.0		At -25.5 to -26.0, limestone layers.		7,7d	SPLITSPOON 307 blows for 2 feet	20
						-27.0	
					8,8d	SPLITSPOON 152 blows for 2 feet	22.5
						(continued)	

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT	HOLE NUMBER
Lake Worth Inlet, Palm Beach Harbor	CB-LWI-PSB01-1

Hole No.CB-LWI-PSB01-1

DRILLING LOG (Cont. Sheet)

ELEVATION TOP OF HOLE: -5.50 Ft.

SHEET 2 OF 2

PROJECT: Lake Worth Inlet, Palm Beach Harbor

INSTALLATION: Jacksonville District

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit & Barrel
-28.0	22.5					
					8,8d	SPLITSPOON -29.0 152 blows for 2 feet
					9,9d	SPLITSPOON 195 blows for 2 feet
-30.9	25.4					-30.9
			LIMESTONE, very hard to hard, moderately weathered, moderately vuggy, medium size vugs, pitted, dark gray/gray, fossiliferous	30	Box 1	Core Barrel Hyd. Press: 200 PSI H20 Return: 100% RQD = 25% D.T. = 4 min
-35.0	29.5					-35.0
			Notes: 1. Soils are field visually classified in accordance with the Unified Soils Clasification System. 2. Driller noted hard cap then very soft at Limestone.			300# hammer w/18" drop used with 5.0' sampler (24" I.D. X 2 1/2" O.D.). 140# hammer with 30" drop used on 2" splitspoon. (1 3/8" ID x 2" OD)

22.5 25 27.5 30 32.5 35 37.5 40 42.5 45 47.5 50

ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE. MAR 71

PROJECT: Lake Worth Inlet, Palm Beach Harbor

HOLE NUMBER: CB-LWI-PSB01-1

Hole No.CB-LWI-PSB01-2

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 2

1. PROJECT Lake Worth Inlet, Palm Beach Harbor	10. SIZE AND TYPE OF BIT See Remarks
2. LOCATION (Coordinates or Station) X=816,690 Y=888,531	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLLW NAD-27 FL-E
3. DRILLING AGENCY Corps of Engineers - Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 1500
4. HOLE NO. (As shown on drawing title and file number) CB-LWI-PSB01-2	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 4 undisturbed: 0
5. NAME OF DRILLER Pickett	14. TOTAL NUMBER OF CORE BOXES n/a
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED	15. ELEVATION GROUND WATER n/a
	16. DATE HOLE STARTED 03/26/01 COMPLETED 03/26/01
7. THICKNESS OF BURDEN 20.0 Ft.	17. ELEVATION TOP OF HOLE -14.8 Ft.
8. DEPTH DRILLED INTO ROCK 0.0 Ft.	18. TOTAL CORE RECOVERY FOR BORING 62 %
9. TOTAL DEPTH OF HOLE 20.0 Ft.	19. SIGNATURE OF INSPECTOR J. Arthur, PG

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit & Barrel	
-14.8	0.0					-14.8	0
			SAND, fine to medium, calcareous, gray (SP).	67	1	5 Foot Sampler 219 blows for 5 feet	2.5
						-19.8	5
				54	2	5 Foot Sampler 128 blows for 5 feet	7.5
-24.8	10.0		Below -24.8, trace of silt and small shell fragments.			-24.8	10
				64	3	5 Foot Sampler 188 blows for 5 feet	12.5
						-29.8	15
				66	4	5 Foot Sampler 210 blows for 5 feet	17.5
-34.8	20.0					-34.8	20
			Notes: 1. Soils are field visually classified in accordance with the Unified Soils Clasification System.			300# hammer w/18" drop used with 5.0' sampler (2" I.D. X 2 1/2" O.D.).	22.5
						(continued)	

ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE. MAR 71

PROJECT	HOLE NUMBER
Lake Worth Inlet, Palm Beach Harbor	CB-LWI-PSB0-2

Hole No.CB-LWI-PSB01-2

DRILLING LOG (Cont. Sheet)

ELEVATION TOP OF HOLE -14.8 Ft.

SHEET 2 OF 2

PROJECT: Lake Worth Inlet, Palm Beach Harbor

INSTALLATION: Jacksonville District

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit & Barrel
			SAMPLE ELEVATION / LABORATORY CLASSIFICATION -19.8 to -24.8 (SM) -29.8 to -34.8 (SM) NOTE: Laboratory classification based on gradation curve.			

22.5, 25, 27.5, 30, 32.5, 35, 37.5, 40, 42.5, 45, 47.5, 50

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT: Lake Worth Inlet, Palm Beach Harbor

HOLE NUMBER: CB-LWI-PSB01-2

DRILLING LOG

DIVISION	South Atlantic
INSTALLATION	Jacksonville District
SHEET 1 OF 2	
1. PROJECT	Lake Worth Inlet, Palm Beach Harbor
2. LOCATION (Coordinates or Station)	X=816,901 Y=888,531
3. DRILLING AGENCY	Corps of Engineers - Savannah District
4. HOLE NO. (As shown on drawing title and file number)	CB-LWI-PSB01-3
5. NAME OF DRILLER	Pickett
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED
7. THICKNESS OF BURDEN	20.0 Ft.
8. DEPTH DRILLED INTO ROCK	0.0 Ft.
9. TOTAL DEPTH OF HOLE	20.0 Ft.
10. SIZE AND TYPE OF BIT	See Remarks
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MLLW NAD-27 FL-E
12. MANUFACTURER'S DESIGNATION OF DRILL	Failing 1500
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	disturbed: 4 undisturbed: 0
14. TOTAL NUMBER OF CORE BOXES	n/a
15. ELEVATION GROUND WATER	n/a
16. DATE HOLE STARTED / COMPLETED	03/26/01 03/26/01
17. ELEVATION TOP OF HOLE	-14.7 Ft.
18. TOTAL CORE RECOVERY FOR BORING	46 %
19. SIGNATURE OF INSPECTOR	J. Arthur, PG

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit & Barrel	
-14.7	0.0					-14.7	0
			SAND, fine to medium, calcareous, gray (SP)	20	1	5 Foot Sampler 34 blows for 5 feet	2.5
-19.7	5.0		Belowm -19.7, some small shell fragments.			-19.7	5
				40	2	5 Foot Sampler 94 blows for 5 feet	7.5
-24.7	10.0		Below -24.7, trace of small shell fragments and silt.			-24.7	10
				64	3	5 Foot Sampler 225 blows for 5 feet	12.5
						-29.7	15
				60	4	5 Foot Sampler 180 blows for 5 feet	17.5
-34.7	20.0					-34.7	20
			Notes: 1. Soils are field visually classified in accordance with the Unified Soils Clasification System.			300# hammer w/18" drop used with 5.0' sampler (2" I.D. X 2 1/2" O.D.).	22.5
						(continued)	

ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE. MAR 71

PROJECT	HOLE NUMBER
Lake Worth Inlet, Palm Beach Harbor	CB-LWI-PSB0 -3

Hole No.CB-LWI-PSB01-3

DRILLING LOG (Cont. Sheet)

ELEVATION TOP OF HOLE -14.7 Ft.

SHEET 2 OF 2

PROJECT: Lake Worth Inlet, Palm Beach Harbor

INSTALLATION: Jacksonville District

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit & Barrel
			SAMPLE ELEVATION / LABORATORY CLASSIFICATION -14.7 to -19.7 (SP-SM) -24.7 to -29.7 (SM) NOTE: Laboratory Classification based on gradation curves.			

22.5, 25, 27.5, 30, 32.5, 35, 37.5, 40, 42.5, 45, 47.5, 50

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT: Lake Worth Inlet, Palm Beach Harbor

HOLE NUMBER: CB-LWI-PSB01-3

DRILLING LOG

DIVISION	South Atlantic
INSTALLATION	Jacksonville District
SHEET	1 OF 2
1. PROJECT	Lake Worth Inlet, Palm Beach Harbor
2. LOCATION (Coordinates or Station)	X=816,473 Y=888,289
3. DRILLING AGENCY	Corps of Engineers - Savannah District
4. HOLE NO. (As shown on drawing title and file number)	CB-LWI-PSB01-4
5. NAME OF DRILLER	Pickett
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED
7. THICKNESS OF BURDEN	30.0 Ft.
8. DEPTH DRILLED INTO ROCK	0.0 Ft.
9. TOTAL DEPTH OF HOLE	30.0 Ft.
10. SIZE AND TYPE OF BIT	See Remarks
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MLLW NAD-27 FL-E
12. MANUFACTURER'S DESIGNATION OF DRILL	Failing 1500
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	disturbed: 6 undisturbed: 0
14. TOTAL NUMBER OF CORE BOXES	n/a
15. ELEVATION GROUND WATER	n/a
16. DATE HOLE STARTED / COMPLETED	03/31/01 03/31/01
17. ELEVATION TOP OF HOLE	-5.17 Ft.
18. TOTAL CORE RECOVERY FOR BORING	35 %
19. SIGNATURE OF INSPECTOR	C. Moores

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit & Barrel
-5.2	0.0					-5.2
			SAND, fine to medium grained, calcareous, minor shell fragments, tan, (SP).	18	1,1d	5 Foot Sampler 51 blows for 5 feet
-10.2	5.0		Below -10.2 trace silt, gray			-10.2
				36	2,2d	5 Foot Sampler 141 blows for 5 feet
-15.2	10.0		SAND, fine to medium grained, calcareous, minor shell fragments, gray (SM).			-15.2
				42	3,3d	5 Foot Sampler 153 blows for 5 feet
-20.2	15.0		SAND, fine grained, calcareous, gray (SP)			-20.2
				52	4,4d	5 Foot Sampler 155 blows for 5 feet
-25.2	20.0		Below -25.2 trace wood fragments, few shell fragments			-25.2
				44	5,5d	5 Foot Sampler 161 blows for 5 feet
						(continued)

0 2.5 5 7.5 10 12.5 15 17.5 20 22.5

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT: Lake Worth Inlet, Palm Beach Harbor

HOLE NUMBER: CB-LWI-PSB01-4

Hole No.CB-LWI-PSB01-4

DRILLING LOG (Cont. Sheet)

ELEVATION TOP OF HOLE -5.17 Ft.

SHEET 2 OF 2

PROJECT: Lake Worth Inlet, Palm Beach Harbor

INSTALLATION: Jacksonville District

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit & Barrel
-27.7	22.5					
				44	5,5d	5 Foot Sampler 161 blows for 5 feet
						-30.2
				18	6,6d	5 Foot Sampler 164 blows for 5 feet
-34.9	29.7		At -34.9 large shell fragments, tan.			
-35.2	30.0					-35.2

Notes:

1. Soils are field visually classified in accordance with the Unified Soils Clasification System.

SAMPLE ELEVATION	LABORATORY CLASSIFICATION
-5.2 to -10.2	(SP-SM)
-15.2 to -20.2	(SM)
-25.2 to -30.2	(SM)

NOTE: Laboratory Classification based on gradation curve.

300# hammer w/18" drop used with 5.0' sampler (2" I.D. X 2 1/2" O.D.).

22.5 25 27.5 30 32.5 35 37.5 40 42.5 45 47.5 50

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT: Lake Worth Inlet, Palm Beach Harbor

HOLE NUMBER: CB-LWI-PSB01-4

Hole No.CB-LWI-PSB01-5

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 2

1. PROJECT Lake Worth Inlet, Palm Beach Harbor	10. SIZE AND TYPE OF BIT See Remarks
2. LOCATION (Coordinates or Station) X=816,676 Y=888,289	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLLW NAD-27 FL-E
3. DRILLING AGENCY Corps of Engineers - Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 1500
4. HOLE NO. (As shown on drawing title and file number) CB-LWI-PSB01-5	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 6 undisturbed: 0
5. NAME OF DRILLER Pickett	14. TOTAL NUMBER OF CORE BOXES n/a
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED	15. ELEVATION GROUND WATER n/a
	16. DATE HOLE STARTED 03/26/01 COMPLETED 03/26/01
7. THICKNESS OF BURDEN 24.0 Ft.	17. ELEVATION TOP OF HOLE -11.3 Ft.
8. DEPTH DRILLED INTO ROCK 0.0 Ft.	18. TOTAL CORE RECOVERY FOR BORING 60 %
9. TOTAL DEPTH OF HOLE 24.0 Ft.	19. SIGNATURE OF INSPECTOR J. Arthur, PG

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit & Barrel
-11.3	0.0					-11.3
			SAND, fine grained, calcareous, gray, (SP).	85	1	5 Foot Sampler 34 blows for 2 feet
-13.3	2.0		Below -13.3, fine to medium grained.			-13.3
				60	2	5 Foot Sampler 21 blows for 2 feet
						-15.3
				64	3	5 Foot Sampler 121 blows for 5 feet
						-20.3
				64	4	5 Foot Sampler 174 blows for 5 feet
						-25.3
				40	5	5 Foot Sampler 225 blows for 5 feet
						-30.3
				60	6	5 Foot Sampler 160 blows for 5 feet
						(continued)

0, 2.5, 5, 7.5, 10, 12.5, 15, 17.5, 20, 22.5

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT	HOLE NUMBER
Lake Worth Inlet, Palm Beach Harbor	CB-LWI-PSB01-5

DRILLING LOG (Cont. Sheet)

ELEVATION TOP OF HOLE -11.3 Ft.

SHEET 2 OF 2

PROJECT: Lake Worth Inlet, Palm Beach Harbor

INSTALLATION: Jacksonville District

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit & Barrel
-33.8	22.5					
-35.3	24.0			60	6	5 Foot Sampler 160 blows for 5 feet -35.3
			Notes: 1. Soils are field visually classified in accordance with the Unified Soils Clasification System. SAMPLE ELEVATION — LABORATORY CLASSIFICATION -15.3 to -20.3 — (SM) -25.3 to -30.3 — (SM) NOTE: Laboratory Classification based on gradation curve.			300# hammer w/18" drop used with 5.0' sampler (2" I.D. X 2 1/2" O.D.).

22.5 25 27.5 30 32.5 35 37.5 40 42.5 45 47.5 50

ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE. MAR 71

PROJECT: Lake Worth Inlet, Palm Beach Harbor

HOLE NUMBER: CB-LWI-PSB01-5

DRILLING LOG

DIVISION	South Atlantic
INSTALLATION	Jacksonville District
SHEET 1 OF 2	
1. PROJECT	Lake Worth Inlet, Palm Beach Harbor
2. LOCATION (Coordinates or Station)	X=816,893 Y=888,299
3. DRILLING AGENCY	Corps of Engineers - Savannah District
4. HOLE NO. (As shown on drawing title and file number)	CB-LWI-PSB01-6
5. NAME OF DRILLER	Pickett
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED
7. THICKNESS OF BURDEN	19.0 Ft.
8. DEPTH DRILLED INTO ROCK	0.0 Ft.
9. TOTAL DEPTH OF HOLE	19.0 Ft.
10. SIZE AND TYPE OF BIT	See Remarks
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MLLW NAD-27 FL-E
12. MANUFACTURER'S DESIGNATION OF DRILL	Failing 1500
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	disturbed: 5 undisturbed: 0
14. TOTAL NUMBER OF CORE BOXES	n/a
15. ELEVATION GROUND WATER	n/a
16. DATE HOLE STARTED COMPLETED	03/25/01 03/25/01
17. ELEVATION TOP OF HOLE	-16.3 Ft.
18. TOTAL CORE RECOVERY FOR BORING	52 %
19. SIGNATURE OF INSPECTOR	J. Arthur, PG

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit & Barrel
-16.3	0.0					-16.3
-18.3	2.0		SAND, fine grained, calcareous, gray, (SP).	70	1	5 Foot Sampler 19 blows for 2 feet -18.3
-23.3	7.0		Below -18.3, fine to medium grained.	46	2	5 Foot Sampler 125 blows for 5 feet -23.3
-28.3	12.0		Below -23.3, small shell fragments, gray and brownish gray.	26	3	5 Foot Sampler 107 blows for 5 feet -28.3
-35.3	19.0		Below -18.3, grey.	56	4	5 Foot Sampler 206 blows for 5 feet -33.3
				100	5	5 Foot Sampler 26 blows for 2 feet -35.3
			Notes: 1. Soils are field visually classified in accordance with the Unified Soils Clasification System.			300# hammer w/18" drop used with 5.0' sampler (2" I.D. X 2 1/2" O.D.).
						(continued)

0 2.5 5 7.5 10 12.5 15 17.5 20 22.5

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT: Lake Worth Inlet, Palm Beach Harbor

HOLE NUMBER: CB-LWI-PSB01-6

Hole No.CB-LWI-PSB01-6

DRILLING LOG (Cont. Sheet)

ELEVATION TOP OF HOLE -16.3 Ft.

SHEET 2 OF 2

PROJECT: Lake Worth Inlet, Palm Beach Harbor

INSTALLATION: Jacksonville District

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit & Barrel
			SAMPLE ELEVATION / LABORATORY CLASSIFICATION -18.3 to -23.3 (SP-SM) -28.3 to -33.3 (SM) NOTE: Laboratory Classification based on gradation curve.			

22.5, 25, 27.5, 30, 32.5, 35, 37.5, 40, 42.5, 45, 47.5, 50

ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE. MAR 71

PROJECT: Lake Worth Inlet, Palm Beach Harbor

HOLE NUMBER: CB-LWI-PSB01-6

Hole No.CB-LWI-PSB01-7

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 2

1. PROJECT Lake Worth Inlet, Palm Beach Harbor	10. SIZE AND TYPE OF BIT See Remarks
2. LOCATION (Coordinates or Station) X=816,471 Y=888,050	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLLW NAD-27 FL-E
3. DRILLING AGENCY Corps of Engineers - Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 1500
4. HOLE NO. (As shown on drawing title and file number) CB-LWI-PSB01-7	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 7 undisturbed: 0
5. NAME OF DRILLER Pickett	14. TOTAL NUMBER OF CORE BOXES n/a
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED	15. ELEVATION GROUND WATER n/a
	16. DATE HOLE STARTED 03/25/01 COMPLETED 03/25/01
7. THICKNESS OF BURDEN 27.4 Ft.	17. ELEVATION TOP OF HOLE -7.6 Ft.
8. DEPTH DRILLED INTO ROCK 0.0 Ft.	18. TOTAL CORE RECOVERY FOR BORING 44 %
9. TOTAL DEPTH OF HOLE 27.4 Ft.	19. SIGNATURE OF INSPECTOR J. Arthur, PG

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit & Barrel
-7.6	0.0					-7.6
			SAND, fine grained, calcareous, gray, (SP).	75	1	5 Foot Sampler 28 blows for 2 feet -9.6
-11.6	4.0			80	2	5 Foot Sampler 19 blows for 2 feet -11.6
			SAND, fine to medium grained, calcareous, gray, (SM).	28	3	5 Foot Sampler 112 blows for 5 feet
-16.6	9.0					-16.6
			SAND, fine to medium grained, trace of silt, calcareous, gray, (SP).	52	4	5 Foot Sampler 150 blows for 5 feet
-21.6	14.0					-21.6
			SAND, fine to medium grained, calcareous, gray, (SM).	38	5	5 Foot Sampler 89 blows for 5 feet
-26.6	19.0					-26.6
			Below -26.6, some small shell fragments.	40	6	5 Foot Sampler 86 blows for 5 feet
						(continued)

0 2.5 5 7.5 10 12.5 15 17.5 20 22.5

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT	HOLE NUMBER
Lake Worth Inlet, Palm Beach Harbor	CB-LWI-PSB01-7

Hole No.CB-LWI-PSB01-7

DRILLING LOG (Cont. Sheet)

ELEVATION TOP OF HOLE -7.6 Ft.

SHEET 2 OF 2

PROJECT: Lake Worth Inlet, Palm Beach Harbor

INSTALLATION: Jacksonville District

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit & Barrel
-30.1	22.5					
				40	6	5 Foot Sampler 86 blows for 5 feet -31.6
				32	7	5 Foot Sampler 80 blows for 5 feet
-35.0	27.4					-35.0

0 Notes:

1. Soils are field visually classified in accordance with the Unified Soils Clasification System.

SAMPLE ELEVATION	LABORATORY CLASSIFICATION
-7.6 to -9.6	(SP-SM)
-11.6 to -16.6	(SM)
-16.6 to -21.6	(SM)
-21.6 to -26.6	(SM)
-26.6 to -31.6	(SM)

NOTES: Laboratory classification based on gradation curves.

300# hammer w/18" drop used with 5.0' sampler (2" I.D. X 2 1/2" O.D.).

22.5 25 27.5 30 32.5 35 37.5 40 42.5 45 47.5 50

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT: Lake Worth Inlet, Palm Beach Harbor

HOLE NUMBER: CB-LWI-PSB01-7

Hole No.CB-LWI-PSB01-8

DRILLING LOG

DIVISION	South Atlantic
INSTALLATION	Jacksonville District
SHEET	1 OF 2
1. PROJECT	Lake Worth Inlet, Palm Beach Harbor
2. LOCATION (Coordinates or Station)	X=816,683 Y=888,058
3. DRILLING AGENCY	Corps of Engineers – Savannah District
4. HOLE NO. (As shown on drawing title and file number)	CB-LWI-PSB01-8
5. NAME OF DRILLER	Pickett
6. DIRECTION OF HOLE	☒ VERTICAL ☐ INCLINED
7. THICKNESS OF BURDEN	22.1 Ft.
8. DEPTH DRILLED INTO ROCK	0.0 Ft.
9. TOTAL DEPTH OF HOLE	22.1 Ft.
10. SIZE AND TYPE OF BIT	See Remarks
11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	MLLW NAD-27 FL-E
12. MANUFACTURER'S DESIGNATION OF DRILL	Failing 1500
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	disturbed: 7 undisturbed: 0
14. TOTAL NUMBER OF CORE BOXES	n/a
15. ELEVATION GROUND WATER	n/a
16. DATE HOLE STARTED / COMPLETED	03/24/01 03/24/01
17. ELEVATION TOP OF HOLE	-12.9 Ft.
18. TOTAL CORE RECOVERY FOR BORING	39 %
19. SIGNATURE OF INSPECTOR	J. Arthur, PG

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit & Barrel
-12.9	0.0					-12.9
			SAND, fine grained, calcareous, small shell fragments, gray, (SP).	20	1	5 Foot Sampler 0 blows for 1.5 feet -14.4
				60	2	5 Foot Sampler 0 blows for 2 feet -16.4
				60	3	5 Foot Sampler 33 blows for 5 feet -18.4
				23	4	5 Foot Sampler 72 blows for 5 feet -22.4
-22.4	9.5		Below -22.4, fine to medium grained.			
				28	5	5 Foot Sampler 135 blows for 5 feet -27.4
-27.4	14.5		SAND, fine to medium grained, calcareous, some small shell fragments and fine limestone gravel, gray, (SM).	30	6	5 Foot Sampler 190 blows for 5 feet -32.4
-32.4	19.5		SAND, fine to medium grained, calcareous, some small shell fragments, gray (SP).	80	7	5 Foot Sampler 115 blows for 2.6 feet -35.0
-35.0	22.1		Soils are field visually classified in accordance with the Unified Soils Classification System.			300# hammer, 18" drop, 5-foot samples (2" ID x 2 1/2 "OD) (continued)

0 -2.5 -5 -7.5 -10 -12.5 -15 -17.5 -20 -22.5

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT: Lake Worth Inlet, Palm Beach Harbor | HOLE NUMBER: CB-LWI-PSB0-8

Hole No.CB-LWI-PSB01-8

DRILLING LOG (Cont. Sheet)	ELEVATION TOP OF HOLE -12.9 Ft.	SHEET 2 OF 2
PROJECT Lake Worth Inlet, Palm Beach Harbor	INSTALLATION Jacksonville District	

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit & Barrel
			SAMPLE ELEVATION / LABORATORY CLASSIFICATION -18.4 to -22.4 (SM) -27.4 to -32.4 (SM) NOTES: Laboratory Classification based on gradation curves.			

22.5
25
27.5
30
32.5
35
37.5
40
42.5
45
47.5
50

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT	HOLE NUMBER
Lake Worth Inlet, Palm Beach Harbor	CB-LWI-PSB01-8

Hole No.CB-LWI-PSB01-9

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1

1. PROJECT Lake Worth Inlet, Palm Beach Harbor	10. SIZE AND TYPE OF BIT See Remarks
2. LOCATION (Coordinates or Station) X=816,892 Y=888,050	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLLW NAD-27 FL-E
3. DRILLING AGENCY Corps of Engineers - Savannah District	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 1500
4. HOLE NO. (As shown on drawing title and file number) CB-LWI-PSB01-9	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 5 undisturbed: 0
5. NAME OF DRILLER Pickett	14. TOTAL NUMBER OF CORE BOXES n/a
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED	15. ELEVATION GROUND WATER n/a
	16. DATE HOLE STARTED 03/24/01 COMPLETED 03/24/01
7. THICKNESS OF BURDEN 16.5 Ft.	17. ELEVATION TOP OF HOLE -18.5 Ft.
8. DEPTH DRILLED INTO ROCK 0.0 Ft.	18. TOTAL CORE RECOVERY FOR BORING 24 %
9. TOTAL DEPTH OF HOLE 16.5 Ft.	19. SIGNATURE OF INSPECTOR J. Arthur, PG

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit & Barrel
-18.5	0.0					-18.5
-20.5	2.0		SAND, fine to medium grained, calcareous, some small shell fragments, brownish gray, (SP).	15	1	5 Foot Sampler 6 blows for 2 feet -20.5
-26.5	8.0		Below -20.5, gray.	50	2	5 Foot Sampler -21.5 65 blows for 1 foot
				14	3	5 Foot Sampler 120 blows for 5 feet -26.5
-31.5	13.0		SAND, fine to medium grained, calcareous, some small shell fragments, gray, (SM)	18	4	5 Foot sampler 116 blows for 5 feet -31.5
-35.0	16.5		Below -31.5, fine grained, trace of small shell fragments.	43	5	5 Foot Sampler 166 blows for 3.5 feet -35.0
			Notes: 1. Soils are field visually classified in accordance with the Unified Soils Clasification System. SAMPLE ELEVATION / LABORATORY CLASSIFICATION: -20.5 to -21.5 (SP-SM); -21.5 to -35.0 (SM). NOTES: Laboratory Classification based on gradation curve.			300# hammer w/18" drop used with 5.0' sampler (2" I.D. X 2 1/2" O.D.).

0 2.5 5 7.5 10 12.5 15 17.5 20 22.5

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT	HOLE NUMBER
Lake Worth Inlet, Palm Beach Harbor	CB-LWI-PSB01-9

Hole No.WB-PBH95-11

DRILLING LOG

DIVISION South Atlantic	INSTALLATION Jacksonville District
SHEET 1 OF 1	
1. PROJECT Palm Beach Harbor	10. SIZE AND TYPE OF BIT See Remarks
2. LOCATION (Coordinates or Station) X=816,282 Y=887,701	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW (FEET)
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. (As shown on drawing title and file number) WB-PBH95-11	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 0 undisturbed: 0
5. NAME OF DRILLER C. Robbins	14. TOTAL NUMBER OF CORE BOXES
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED	15. ELEVATION GROUND WATER TIDAL
	16. DATE HOLE STARTED 8/6/95 COMPLETED 8/6/95
7. THICKNESS OF BURDEN Ft.	17. ELEVATION TOP OF HOLE -29.7 Ft.
8. DEPTH DRILLED INTO ROCK 0 Ft.	18. TOTAL CORE RECOVERY FOR BORING 0 %
9. TOTAL DEPTH OF HOLE 12.3 Ft.	19. SIGNATURE OF Geologist Jim Arthur

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel
-29.7	.0					-29.7
			SAND, grayish tan fine to medium poorly graded quartz sand, some small shell fragments (SP)			
				0		NX DRILL RODS
			Washed to elevation -42.0, no rock encountered			
-42.0	12.3					-42.0
			Note: Soils are field classified in accordance with the Unified Soils Classification System.			Set 6 inch casing to depth 5.0, then 9.3 feet.

0 2.5 5 7.5 10 12.5 15 17.5 20 22.5

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT Palm Beach Harbor

HOLE NUMBER WB-PBH95-11

Hole No.WB-PBH95-14

DRILLING LOG

DIVISION South Atlantic	INSTALLATION Jacksonville District
SHEET 1 OF 1	
1. PROJECT Palm Beach Harbor	10. SIZE AND TYPE OF BIT See Remarks
2. LOCATION *(Coordinates or Station)* X=816,527 Y=887,758	11. DATUM FOR ELEVATION SHOWN *(TBM or MSL)* MLW (FEET)
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. *(As shown on drawing title and file number)* WB-PBH95-14	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 0 undisturbed: 0
5. NAME OF DRILLER C. Robbins	14. TOTAL NUMBER OF CORE BOXES
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED	15. ELEVATION GROUND WATER TIDAL
	16. DATE HOLE STARTED 8/6/95 COMPLETED 8/6/95
7. THICKNESS OF BURDEN Ft.	17. ELEVATION TOP OF HOLE -26.4 Ft.
8. DEPTH DRILLED INTO ROCK 0 Ft.	18. TOTAL CORE RECOVERY FOR BORING 0 %
9. TOTAL DEPTH OF HOLE 17.5 Ft.	19. SIGNATURE OF Geologist Jim Arthur

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel
-26.4	.0					-26.4
			SAND, gray fine poorly graded quartz sand (SP)			
				0		NX DRILL RODS
			Washed to elevation -43.9, no rock encountered			
-43.9	17.5					-43.9
			Note: Soils are field classified in accordance with the Unified Soils Classification System.			Set 6 inch casing to depth 7.2 feet.

0 2.5 5 7.5 10 12.5 15 17.5 20 22.5

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT Palm Beach Harbor | HOLE NUMBER WB-PBH95-14

Hole No.WB-PBH95-16

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1

1. PROJECT Palm Beach Harbor	10. SIZE AND TYPE OF BIT See Remarks
2. LOCATION *(Coordinates or Station)* X=816,723 Y=887,755	11. DATUM FOR ELEVATION SHOWN *(TBM or MSL)* MLW (FEET)
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. *(As shown on drawing title and file number)* WB-PBH95-16	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 0 undisturbed: 0
5. NAME OF DRILLER C. Robbins	14. TOTAL NUMBER OF CORE BOXES
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED	15. ELEVATION GROUND WATER TIDAL
	16. DATE HOLE STARTED 8/7/95 COMPLETED 8/7/95
7. THICKNESS OF BURDEN Ft.	17. ELEVATION TOP OF HOLE -33.5 Ft.
8. DEPTH DRILLED INTO ROCK 0 Ft.	18. TOTAL CORE RECOVERY FOR BORING 0 %
9. TOTAL DEPTH OF HOLE 10.9 Ft.	19. SIGNATURE OF Geologist Jim Arthur

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel
-33.5	.0					-33.5
			SAND			
				0		NX DRILL RODS
			Washed to elevation -44.4, no rock encountered			
-44.4	10.9					-44.4
						Set 6 inch casing to depth 3.5 feet.

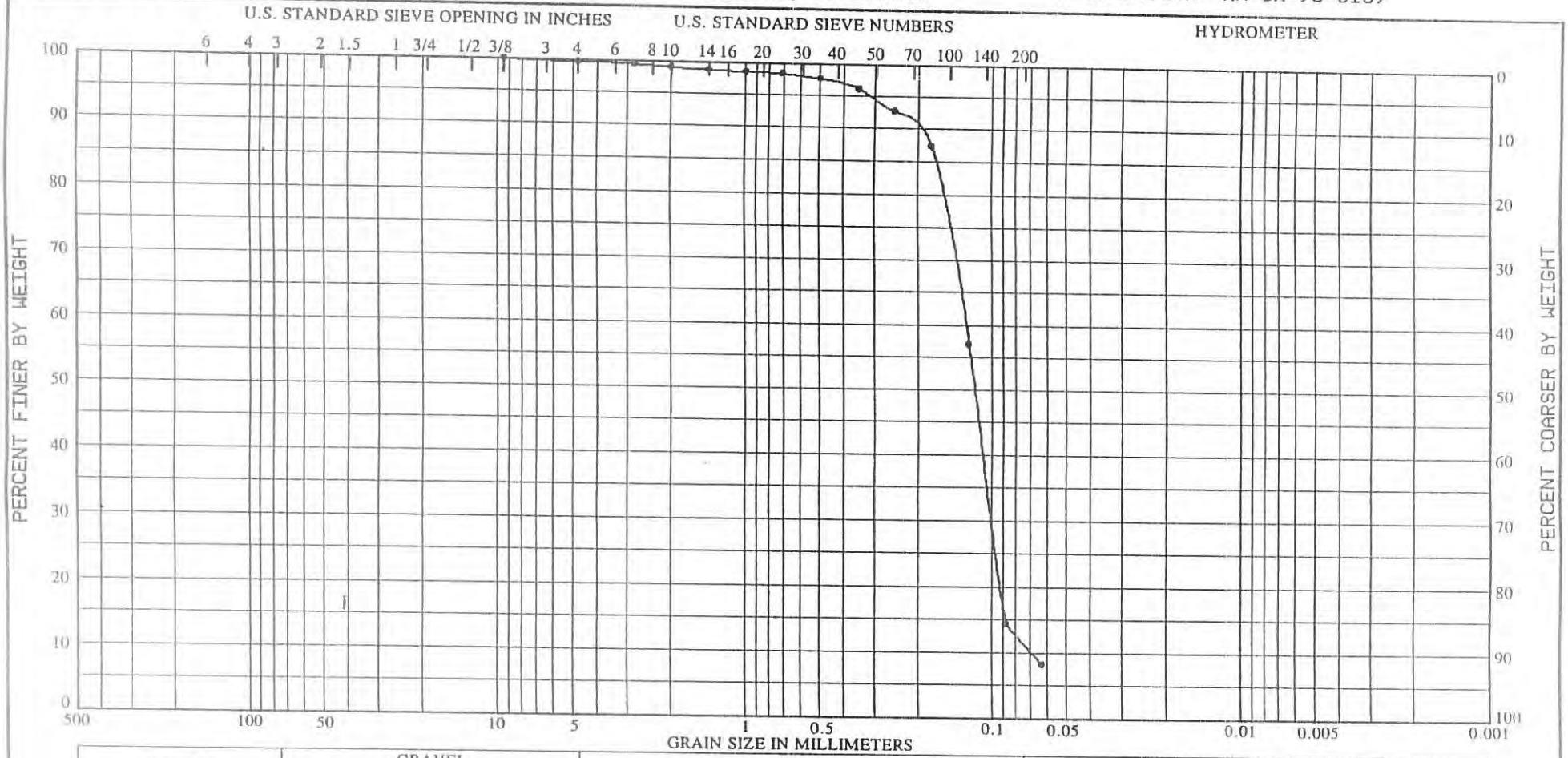
0, 2.5, 5, 7.5, 10, 12.5, 15, 17.5, 20, 22.5

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT	HOLE NUMBER
Palm Beach Harbor	WB-PBH95-16

DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY
CORPS OF ENGINEERS, 61[illegible] SOUTH COBB DRIVE, MARIETTA, GA. 30060

WORK ORDER: 7760
REQUISITION: RM-CW-95-0159



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elevation (ft)	Classification	Nat w%	LL	PL	PI
1	-33.6 to -35.1	(VISUAL) LT. GRAY, POORLY GRADED SILTY SAND (SP-SM), WITH A TRACE OF SAND SIZE SHELL FRAGMENTS. SPECIFIC GRAVITY = 2.70. VISUAL PERCENT SHELL IS APPROX. = 2%.				

Project PALM BEACH HARBOR MAINTENANCE DREDGING

Lab No. 73/7091

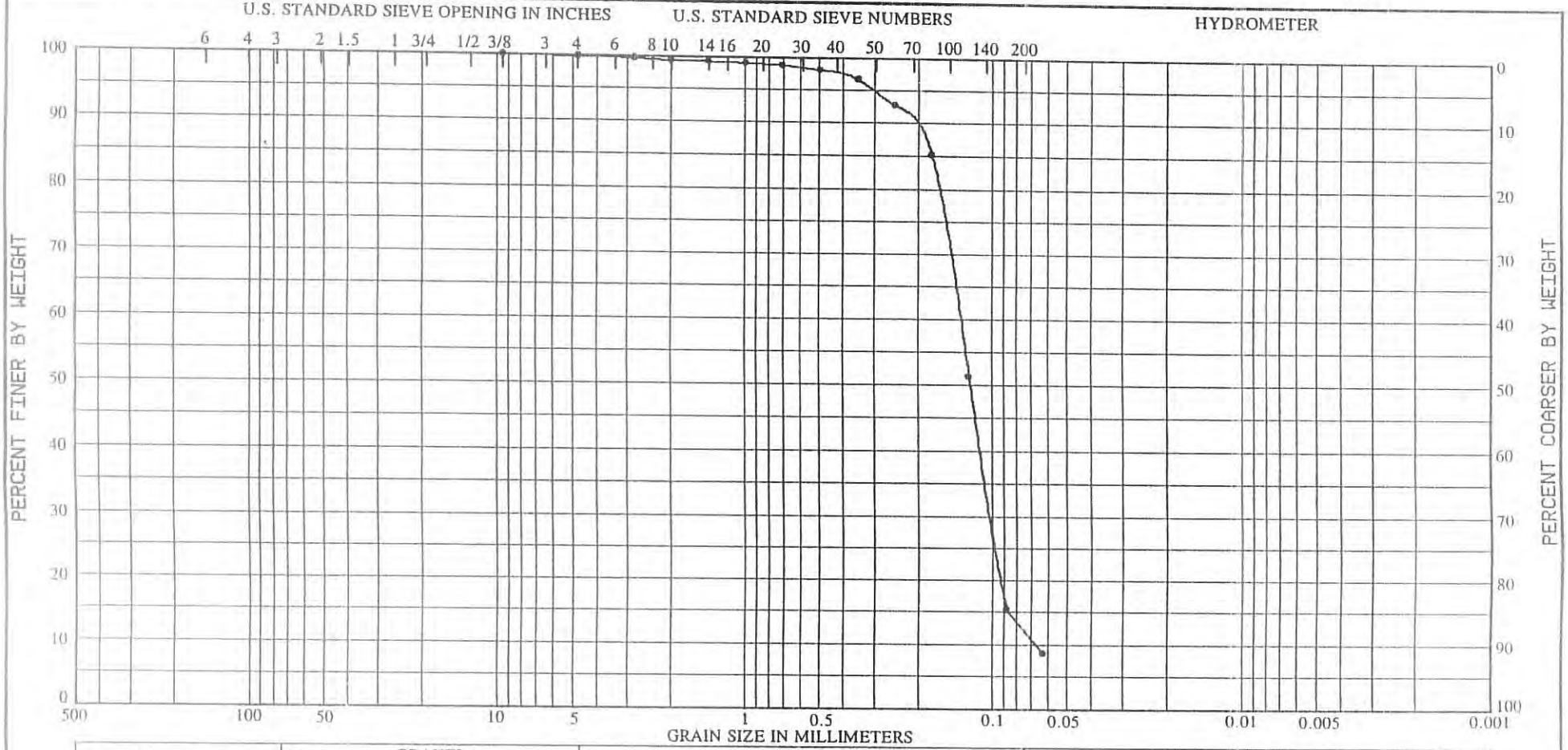
Boring No. CB-PBH-95-4

Date 08/26/95

GRADATION CURVES

DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY
CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30060

WORK ORDER: 7760
REQUISITION: RM-CW-95-0159



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elevation (ft)	Classification	Nat w%	LL	PL	PI
2	-35.1 to -36.6	(VISUAL) LT. GRAY, POORLY GRADED SILTY SAND (SP-SM), WITH A TRACE OF SAND SIZE SHELL FRAGMENTS. SPECIFIC GRAVITY = 2.70. VISUAL PERCENT SHELL IS APPROX. = 1%.				

Project PALM BEACH HARBOR MAINTENANCE DREDGING

Lab No. 73/7092

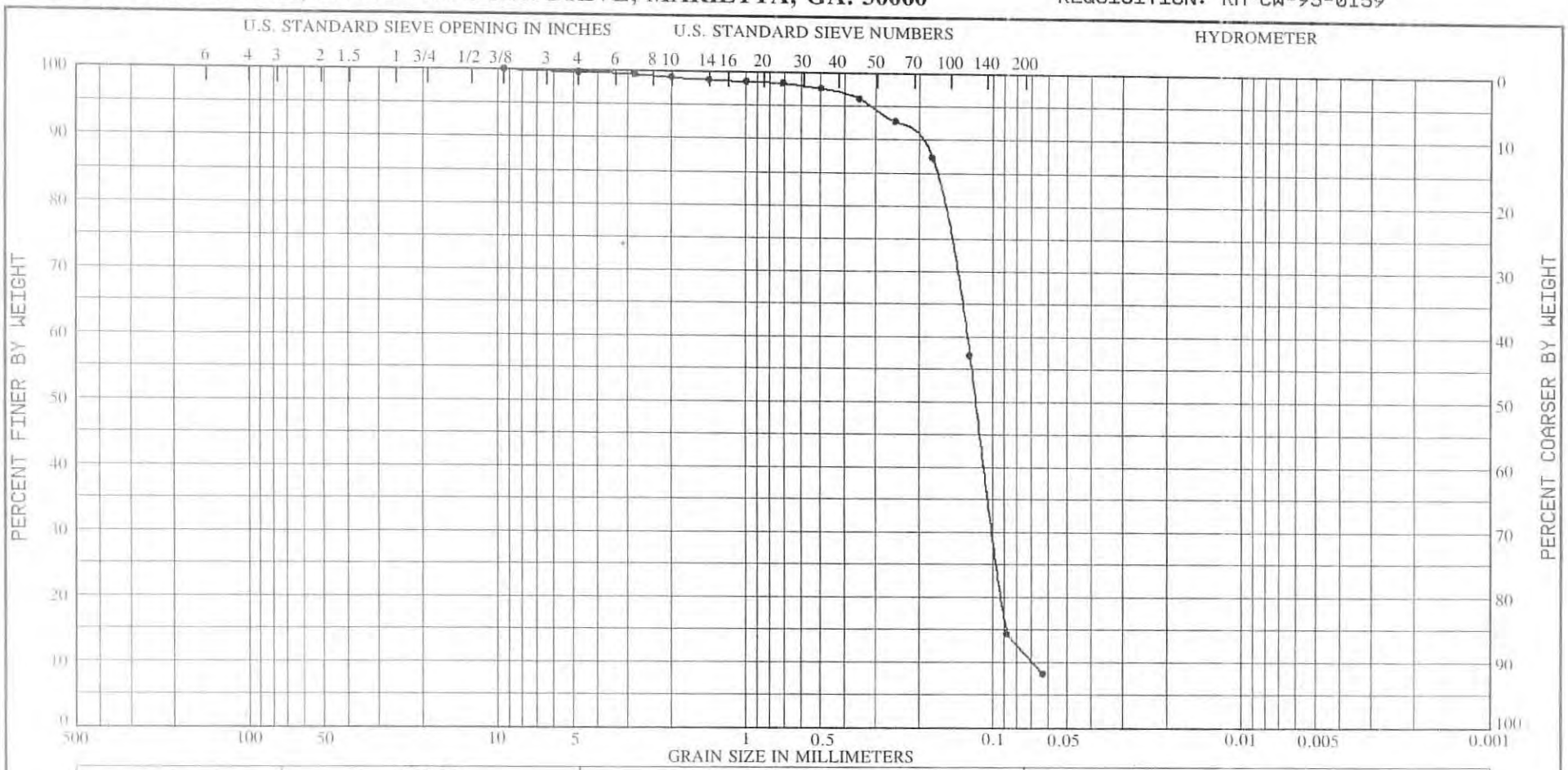
Boring No. CB-PBH-95-4

Date 08/26/95

GRADATION CURVES

DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY
CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30060

WORK ORDER: 7760
REQUISITION: RM-CW-95-0159



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

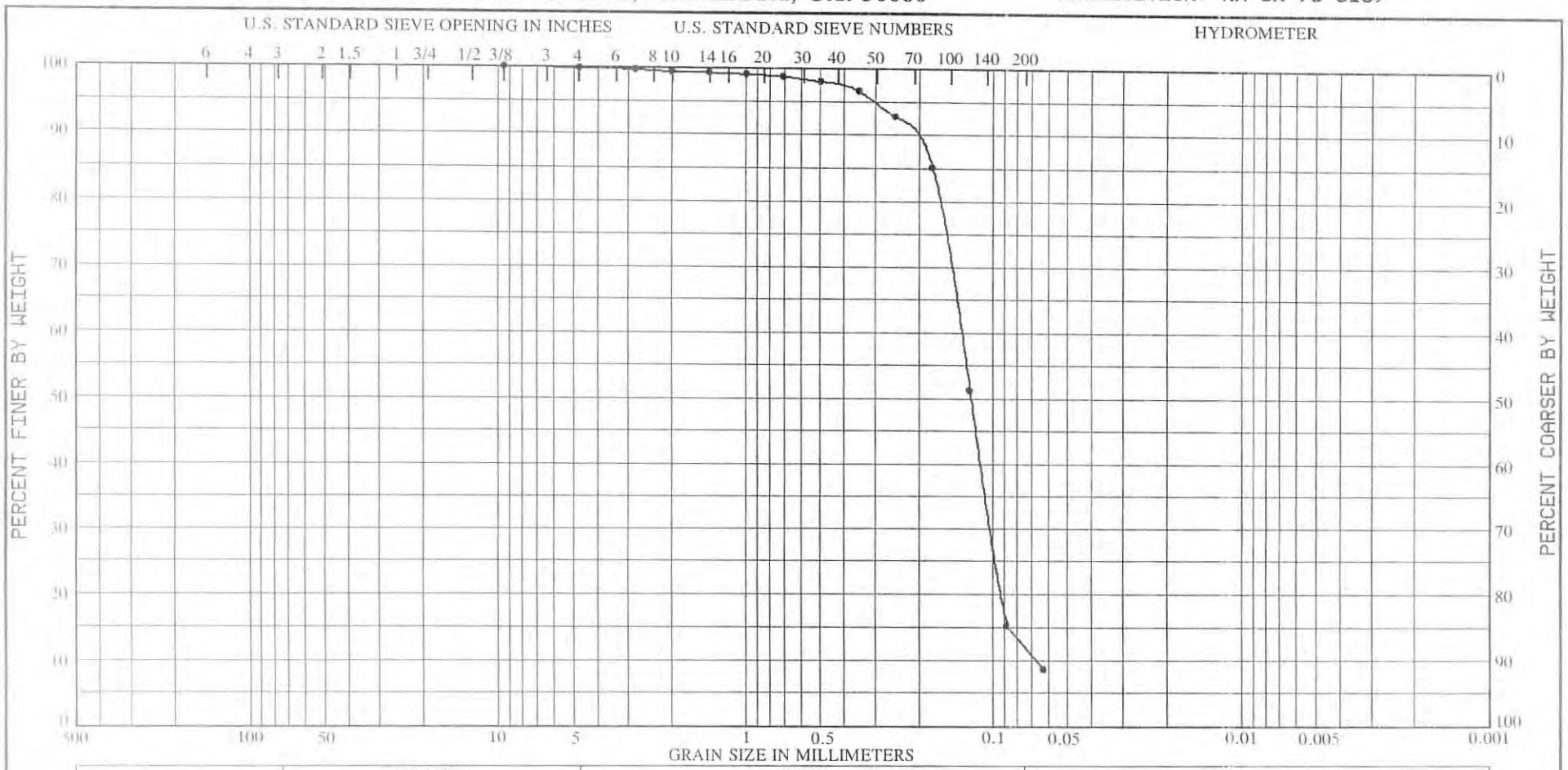
Sample No.	Elevation (ft)	Classification	Nat w%	LL	PL	PI
1	-33.6 to -35.1	(VISUAL) LT. GRAY, POORLY GRADED SILTY SAND (SP-SM), WITH A TRACE OF SAND SIZE SHELL FRAGMENTS. SPECIFIC GRAVITY = 2.70. VISUAL PERCENT SHELL IS APPROX. = 2%.				

Project PALM BEACH HARBOR MAINTENANCE DREDGING
Lab No. 73/7091
Boring No. CB-PBH-95-4
Date 08/26/95

GRADATION CURVES

DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY
CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30060

WORK ORDER: 7760
REQUISITION: RM-CW-95-0159



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elevation (ft)	Classification	Nat w%	LL	PL	PI
2	-35.1 to -36.6	(VISUAL) LT. GRAY, POORLY GRADED SILTY SAND (SP-SM), WITH A TRACE OF SAND SIZE SHELL FRAGMENTS. SPECIFIC GRAVITY = 2.70. VISUAL PERCENT SHELL IS APPROX. = 1%.				

Project PALM BEACH HARBOR MAINTENANCE DREDGING

Lab No. 73/7092

Boring No. CB-PBH-95-4

Date 08/26/95

GRADATION CURVES

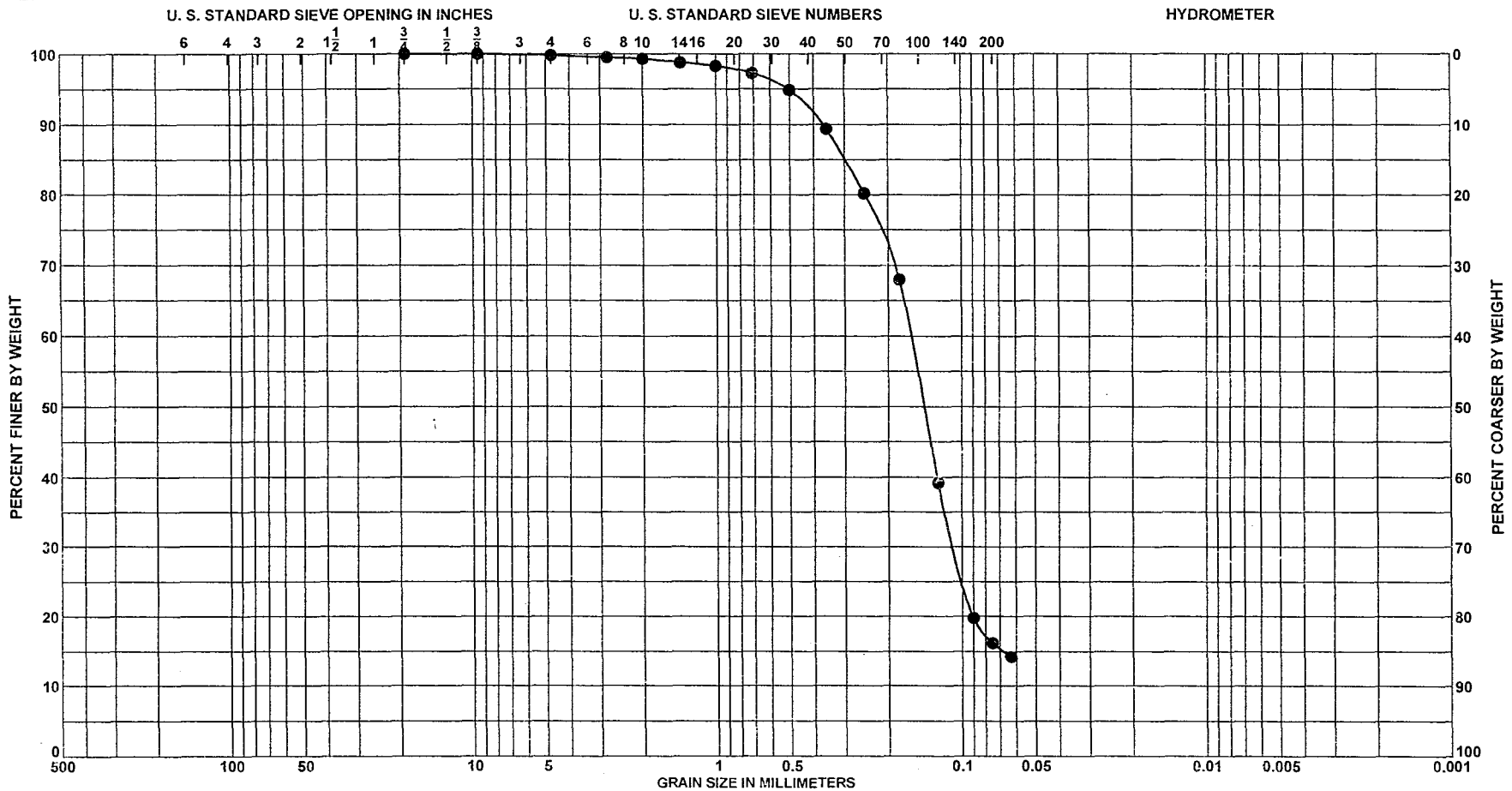
DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY
CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30060

WORK ORDER: 7760
REQUISITION: RM-CW-95-0159

Sample No.	Elevation (ft)	Classification	Nat w%	LL	PL	PI
1	-36.5 to -38.0	(VISUAL) LT. TAN, POORLY GRADED SILTY SAND (SP-SM), WITH A TRACE OF SAND SIZE SHELL FRAGMENTS. SPECIFIC GRAVITY = 2.71. VISUAL PERCENT SHELL IS APPROX. = 3%.				

Project PALM BEACH HARBOR MAINTENANCE DREDGING
Lab No. 73/7093
Boring No. CB-PBH-95-5
Date 08/26/95

GRADATION CURVES



Sample No.	Elev or Depth	Classification	% CO_3	G_s	Nat w %	LL	PL	PI
● 2	El. to	SAND, silty, mostly fine grained quartz, little silt, few medium grained carbonate, light gray (SM)						

Project Palm Beach Harbor

Area

Boring No. LWI-PSB01-2

Date 9/23/2002

GRADATION CURVES

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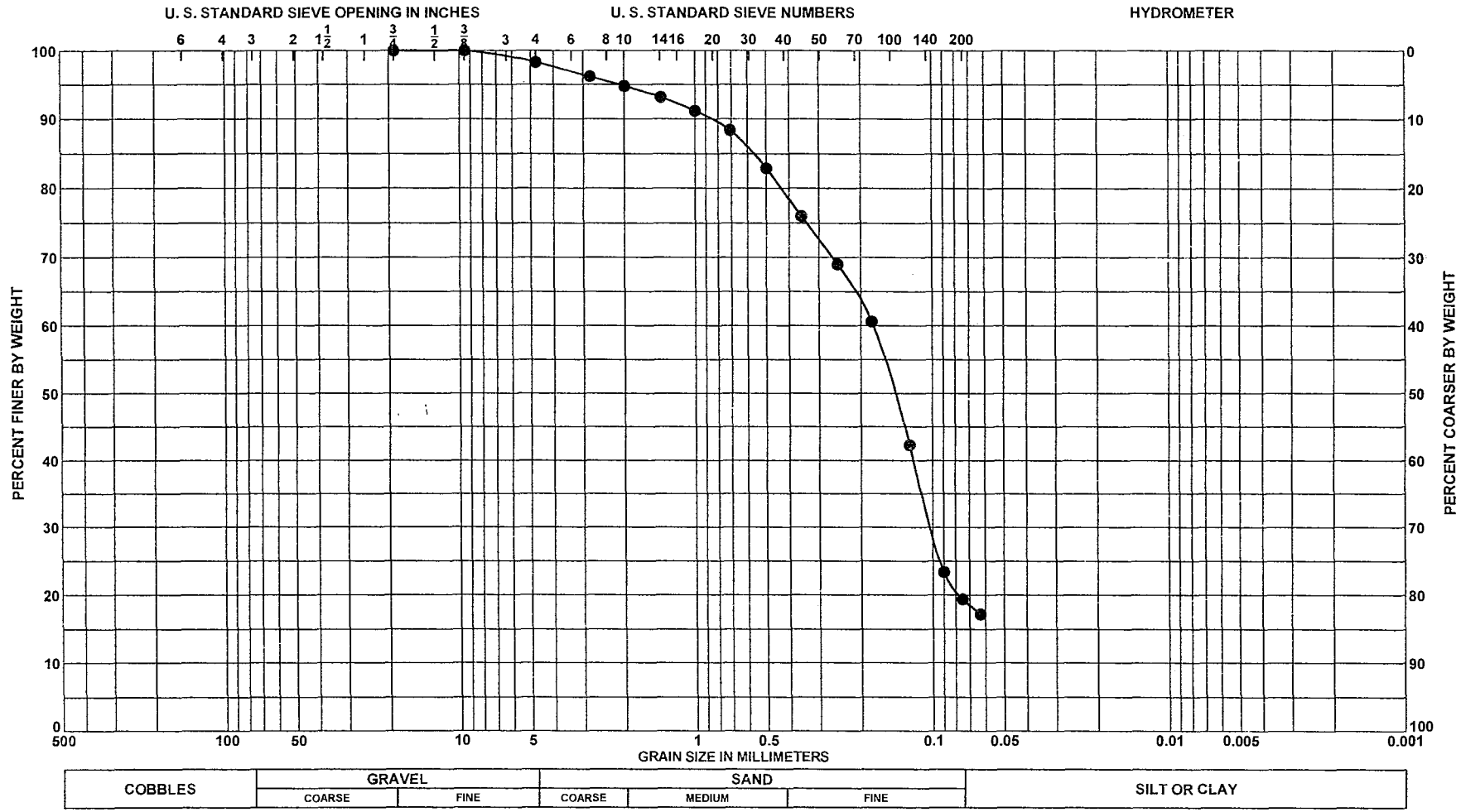


Sample No.	Elev or Depth	Classification	% CO_3	G_s	Nat w %	LL	PL	PI
● 4	El. to	SAND, silty, mostly fine						
		grained quartz, little silt, little						
		coarse to medium grained						
		carbonate, grayish brown						
		(SM)						

Project Palm Beach Harbor

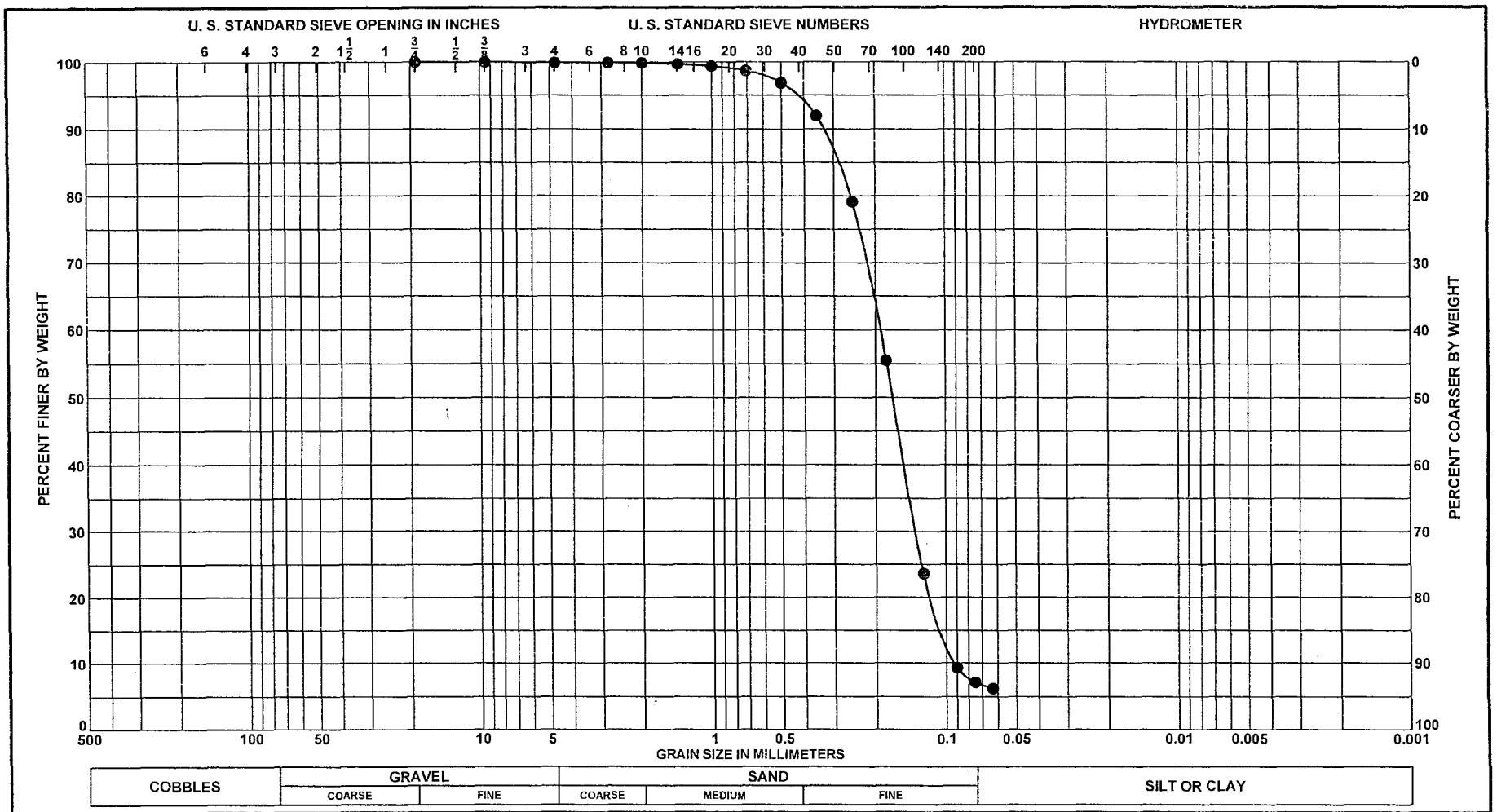
Area

Boring No. LWI-PSB01-2

Date 9/23/2002

GRADATION CURVES

ENG FORM 2087
MAY 63

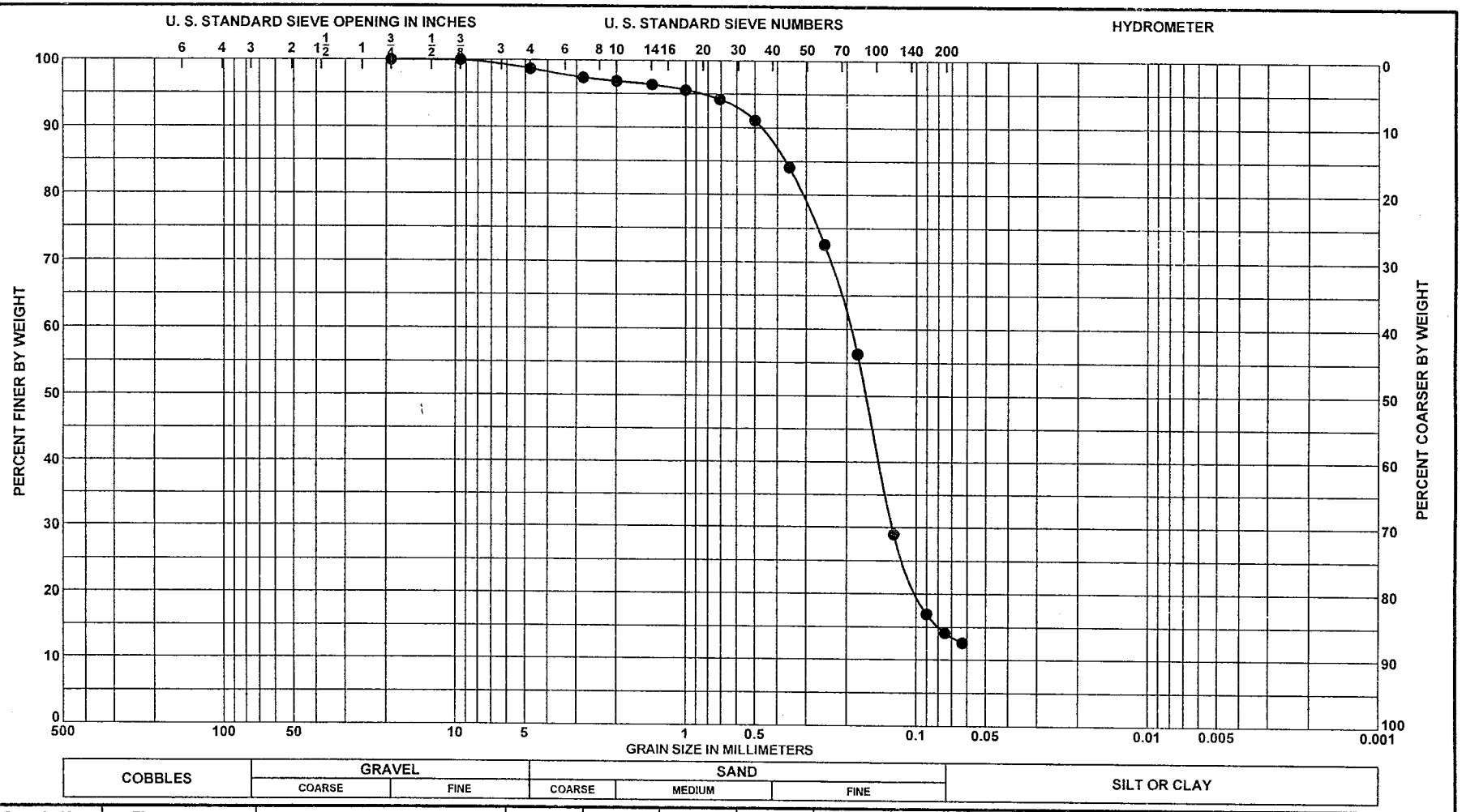


Sample No.	Elev or Depth	Classification	% CO_3	G_s	Nat w %	LL	PL	PI
● 1	El. to	SAND, poorly graded with silt,						
		mostly fine grained quartz, few						
		silt, trace medium grained						
		carbonate, brown (SP-SM)						

GRADATION CURVES

Project	Palm Beach Harbor
Area	
Boring No.	LWI-PSB01-3
Date	9/23/2002

ENG FORM 2087
MAY 63

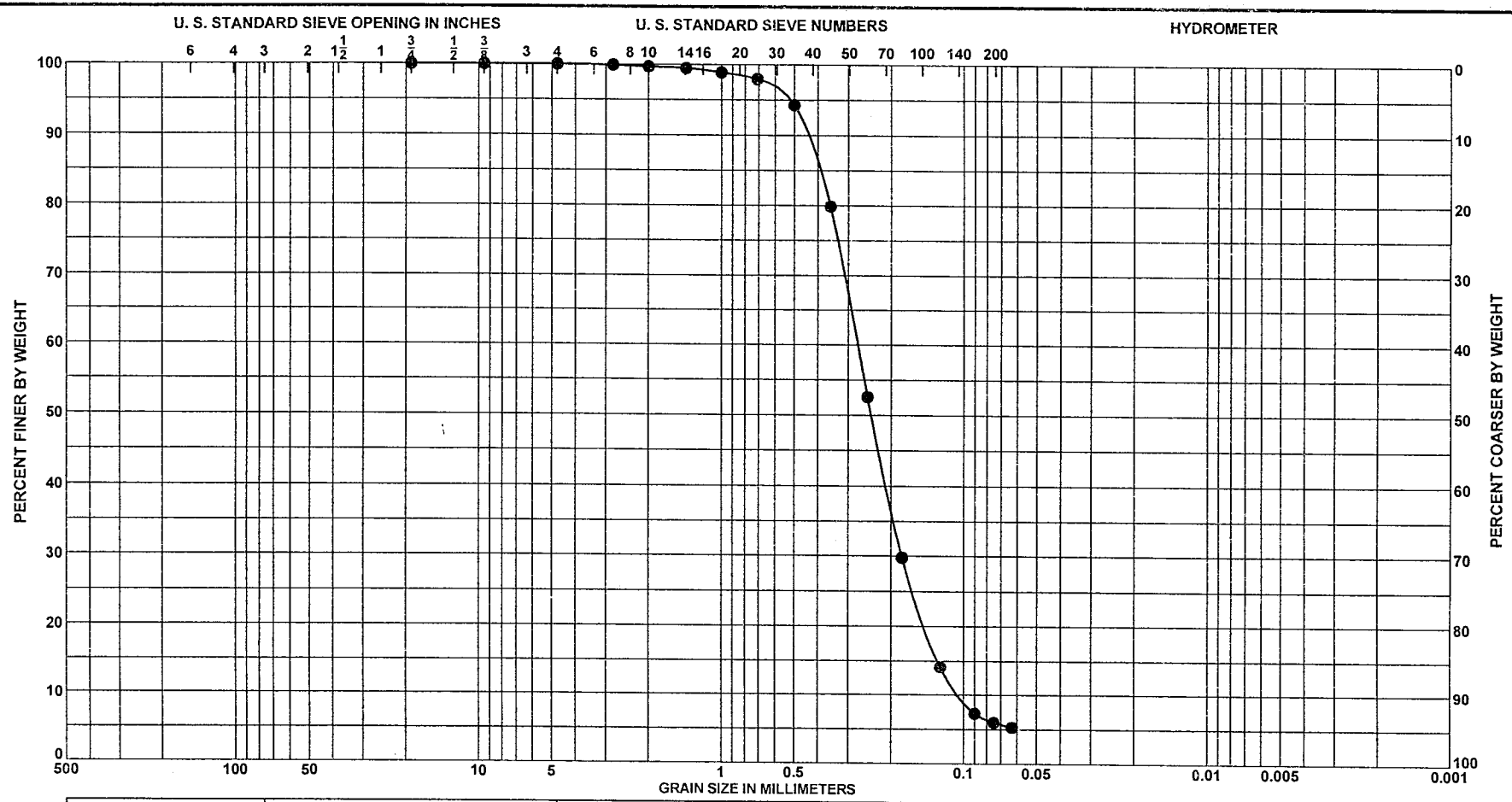


Sample No.	Elev or Depth	Classification	% CO_3	G_s	Nat w %	LL	PL	PI
● 3	El. to	SAND, silty, mostly fine						
		grained quartz, little silt, few						
		coarse to medium grained						
		carbonate, brown (SM)						

GRADATION CURVES

Project	Palm Beach Harbor
Area	
Boring No.	LWI-PSB01-3
Date	9/23/2002

ENG FORM 2087
MAY 63

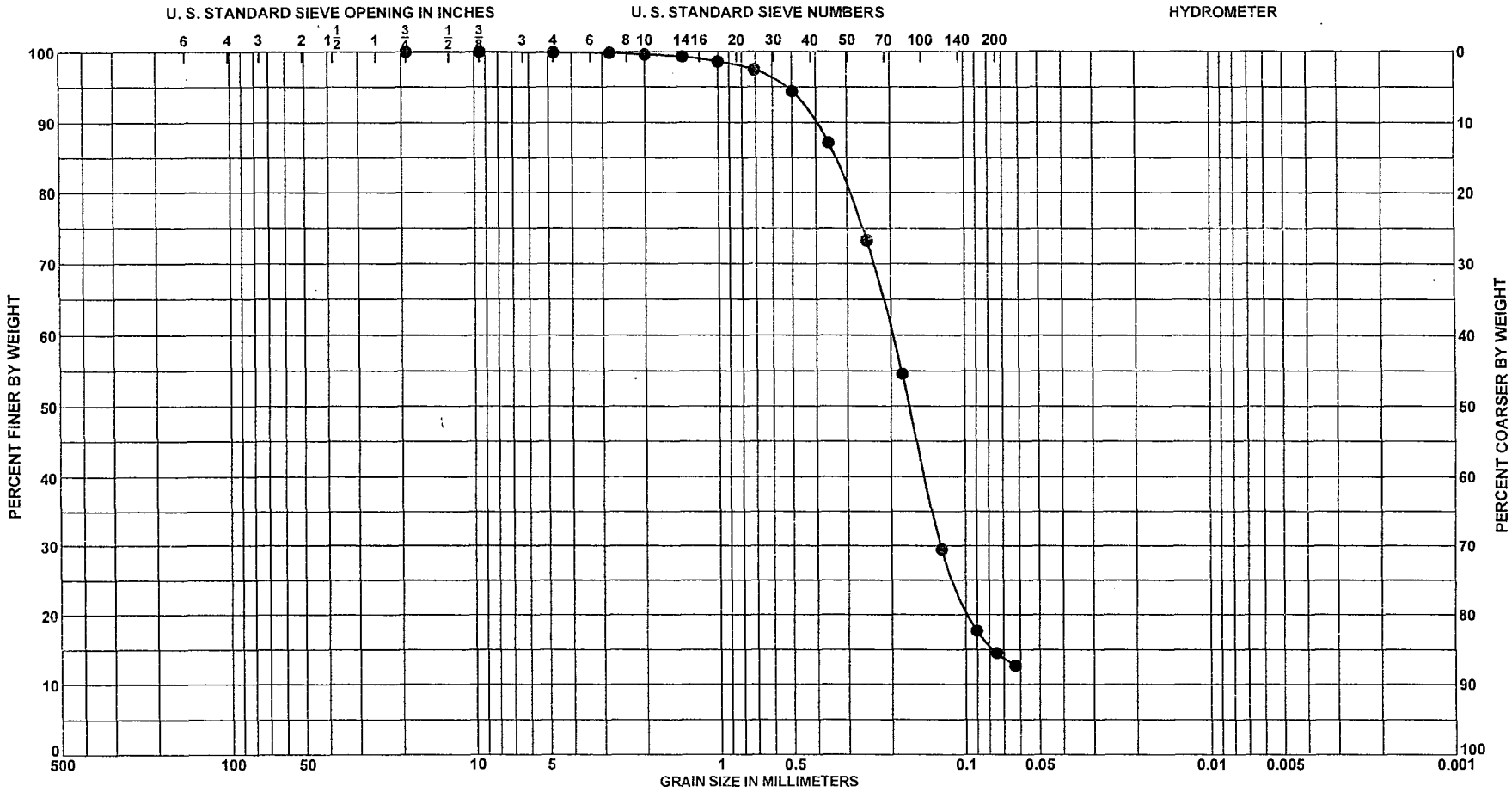


Sample No.	Elev or Depth	Classification	% CO_3	G_s	Nat w %	LL	PL	PI
● 1	El. to	SAND, poorly graded with silt,						
		mostly fine grained quartz, few						
		silt, few medium grained						
		carbonate, reddish brown						
		(SP-SM)						

GRADATION CURVES

Project	Palm Beach Harbor
Area	
Boring No.	LWI-PSB01-4
Date	9/23/2002

ENG FORM 2087
MAY 63

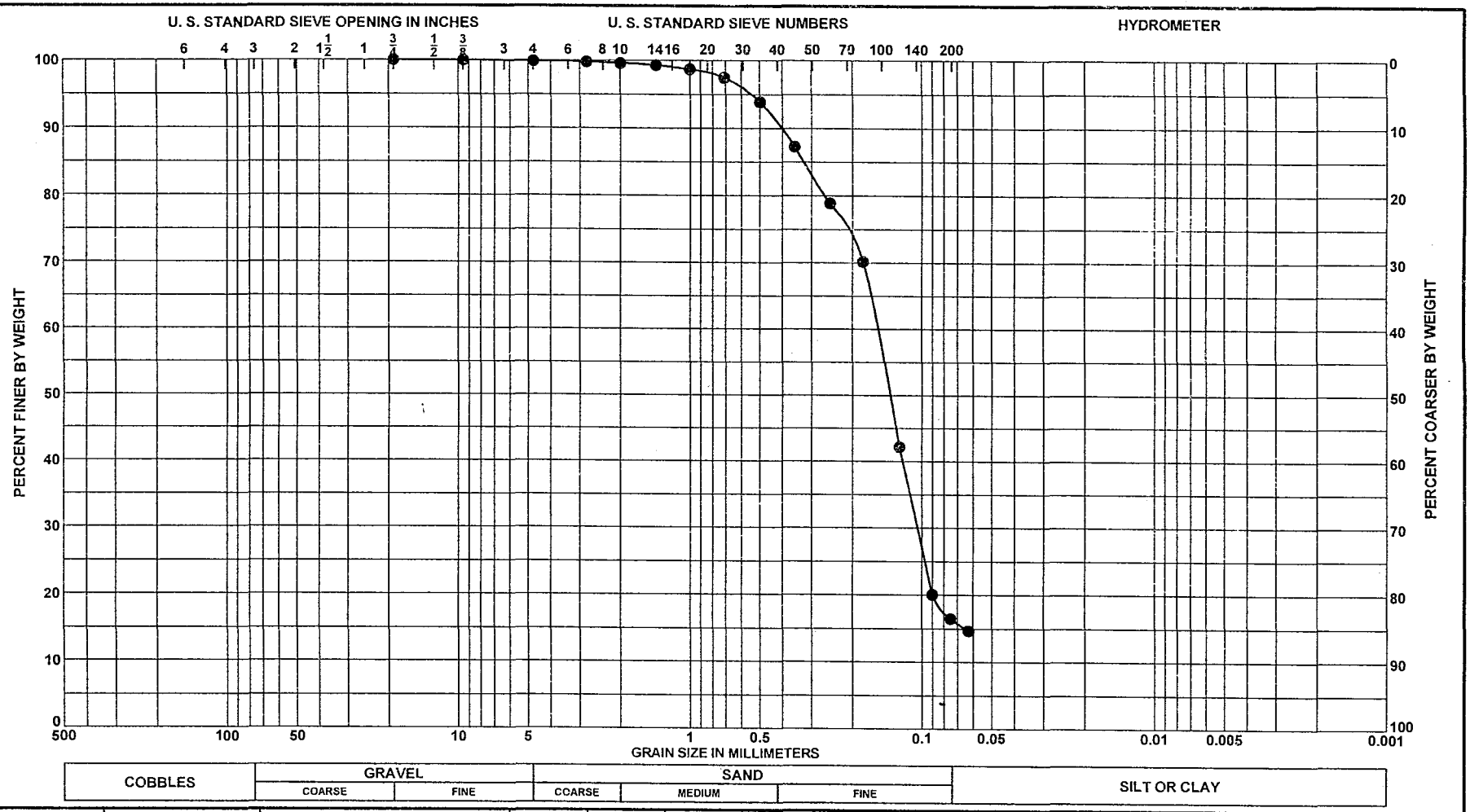


Sample No.	Elev or Depth	Classification	% CO_3	G_s	Nat w %	LL	PL	PI
● 3	El. to	SAND, silty, mostly medium to						
		fine grained quartz, little silt,						
		few medium grained						
		carbonate, gray (SM)						

GRADATION CURVES

Project	Palm Beach Harbor
Area	
Boring No.	LWI-PSB01-4
Date	9/23/2002

ENG FORM 2087
MAY 63

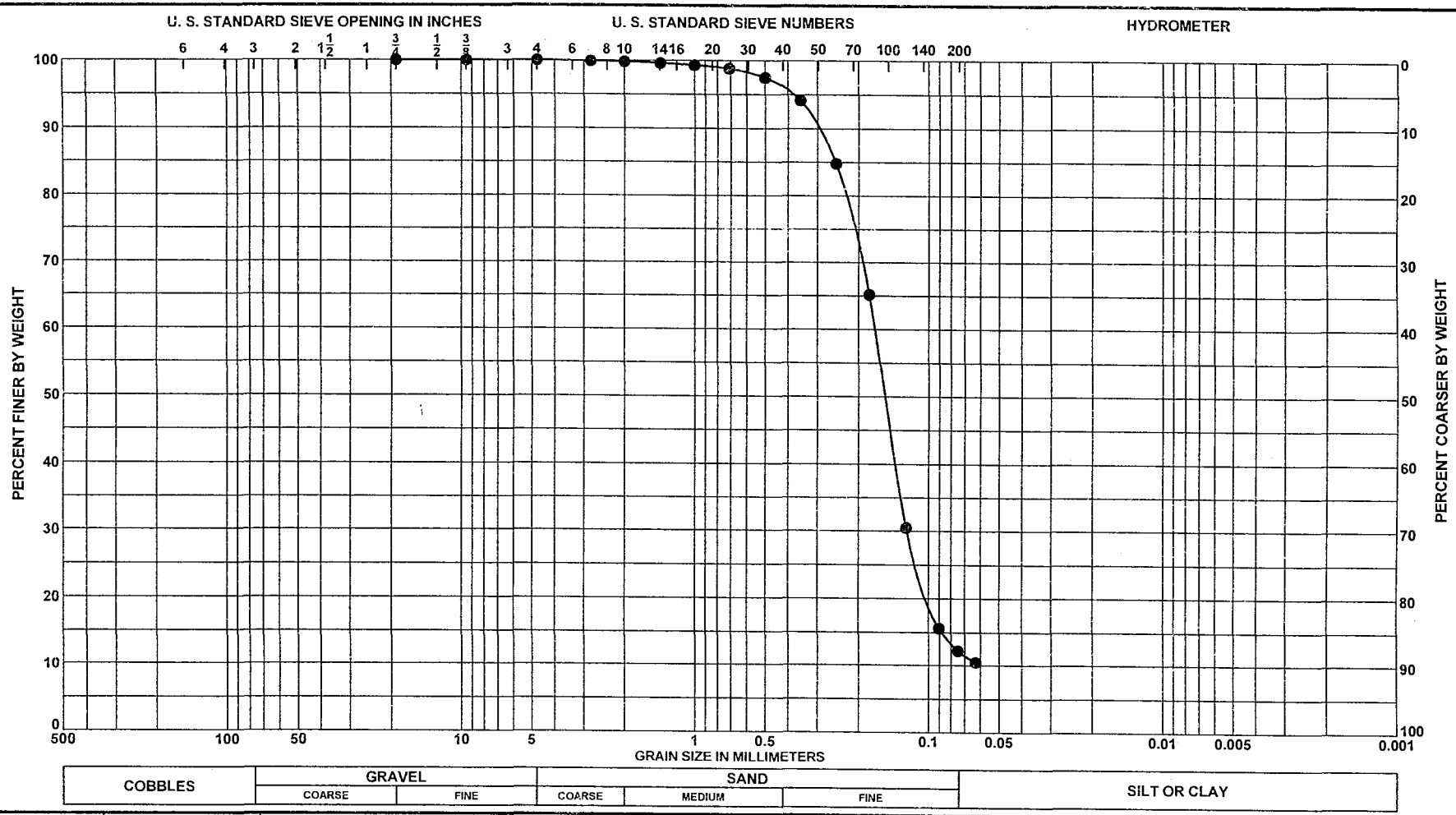


Sample No.	Elev or Depth	Classification	% CO_3	G_s	Nat w %	LL	PL	PI
● 5	El. to	SAND, silty, mostly fine grained quartz, little silt, few medium grained carbonate, gray (SM)						

GRADATION CURVES

Project	Palm Beach Harbor
Area	
Boring No.	LWI-PSB01-4
Date	9/23/2002

ENG FORM 2087
MAY 63

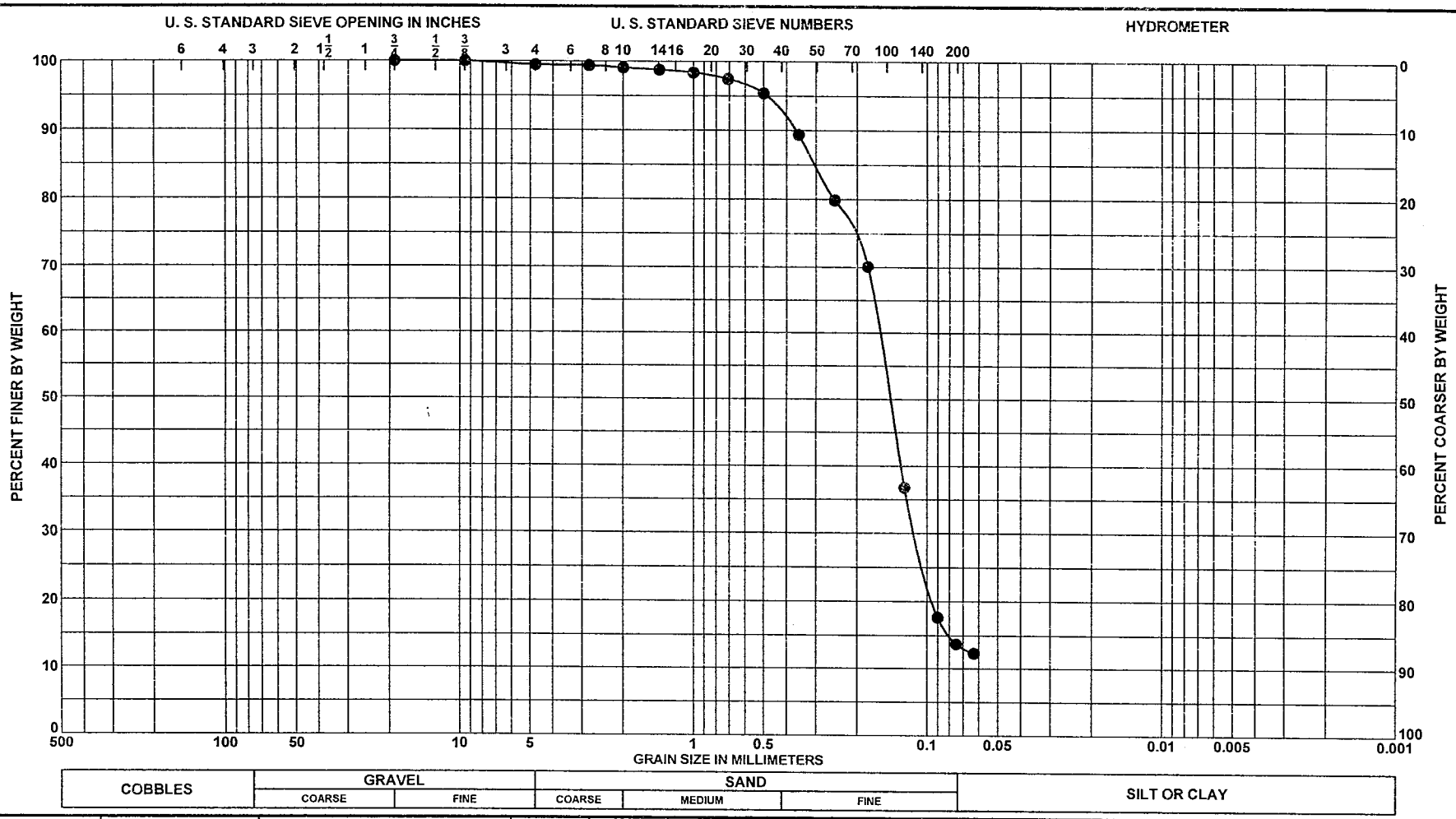


Sample No.	Elev or Depth	Classification	% CO_3	G_s	Nat w %	LL	PL	PI
● 3	El. to	SAND, silty, mostly fine grained quartz, little silt, few medium grained carbonate, gray (SM)						

GRADATION CURVES

Project	Palm Beach Harbor
Area	
Boring No.	LWI-PSB01-5
Date	9/23/2002

ENG FORM 2087
MAY 63

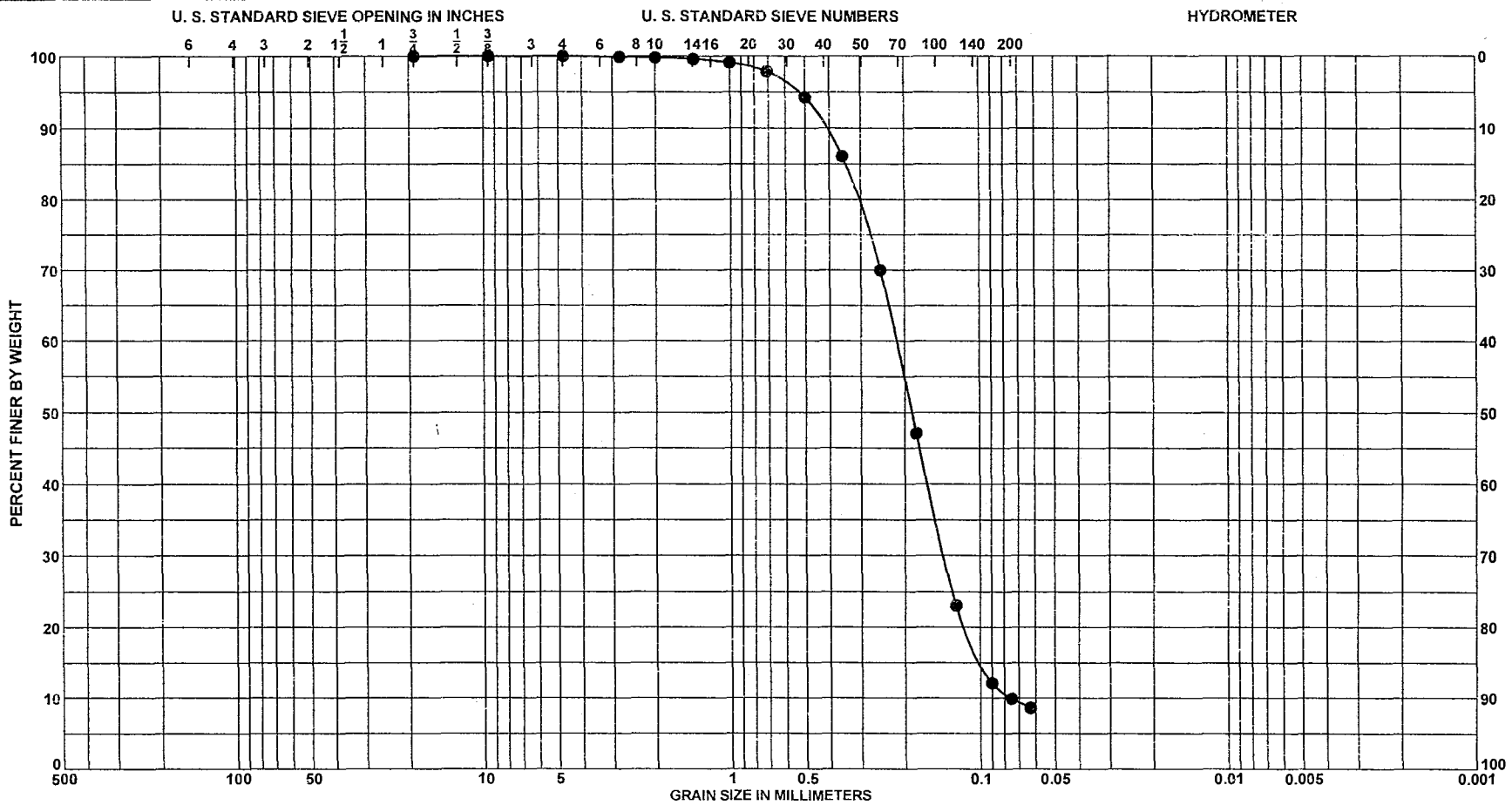


Sample No.	Elev or Depth	Classification	% CO_3	G_s	Nat w %	LL	PL	PI
● 5	El. to	SAND, silty, mostly fine						
		grained quartz, little silt, few						
		medium grained carbonate,						
		reddish brown and gray (SM)						

GRADATION CURVES

Project	Palm Beach Harbor
Area	
Boring No.	LWI-PSB01-5
Date	9/23/2002

ENG FORM 2087
MAY 63

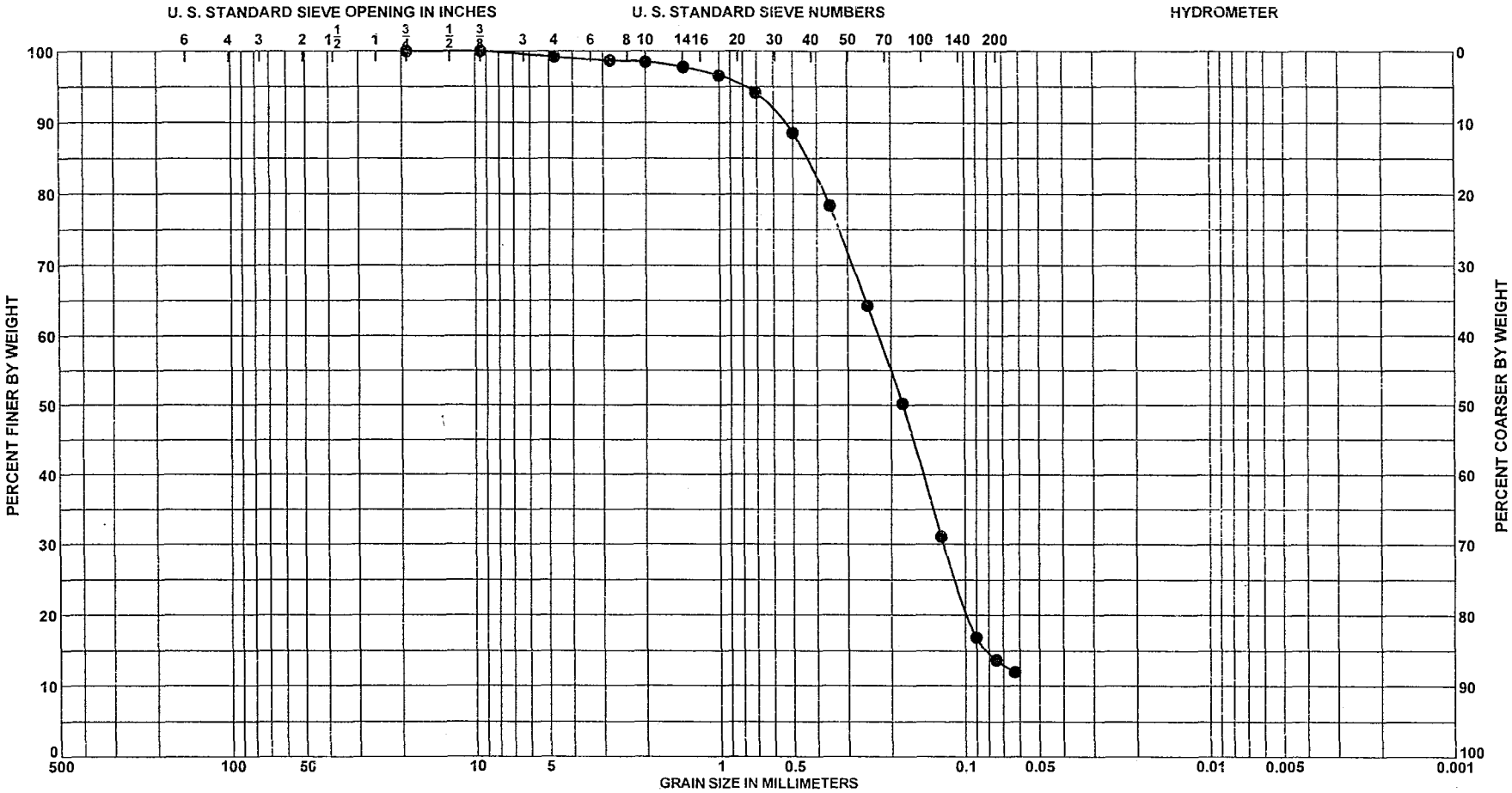


Sample No.	Elev or Depth	Classification	% CO_3	G_s	Nat w %	LL	PL	PI
● 2	El. to	SAND, poorly graded with silt,						
		mostly fine grained quartz, few						
		silt, few medium grained						
		carbonate, grayish brown						
		(SP-SM)						

GRADATION CURVES

Project	Palm Beach Harbor
Area	
Boring No.	LWI-PSB01-6
Date	9/23/2002

ENG FORM 2087
MAY 63

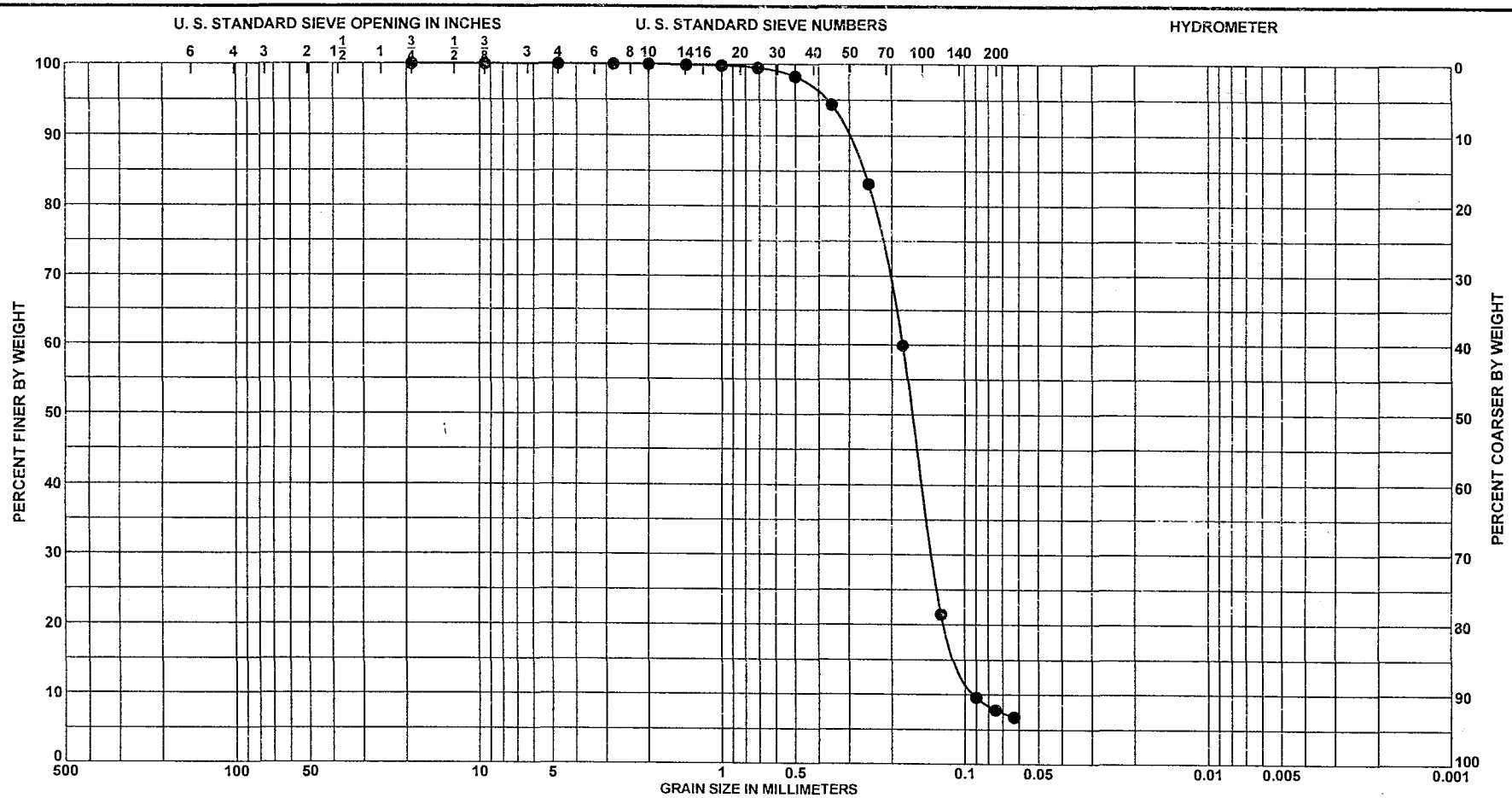


Sample No.	Elev or Depth	Classification	% CO_3	G_s	Nat w %	LL	PL	PI
● 4	El. to	SAND, silty, mostly fine						
		grained quartz, little silt, little						
		coarse to medium grained						
		carbonate, gray (SM)						

GRADATION CURVES

Project	Palm Beach Harbor
Area	
Boring No.	LWI-PSB01-6
Date	9/23/2002

ENG FORM 2087
MAY 63

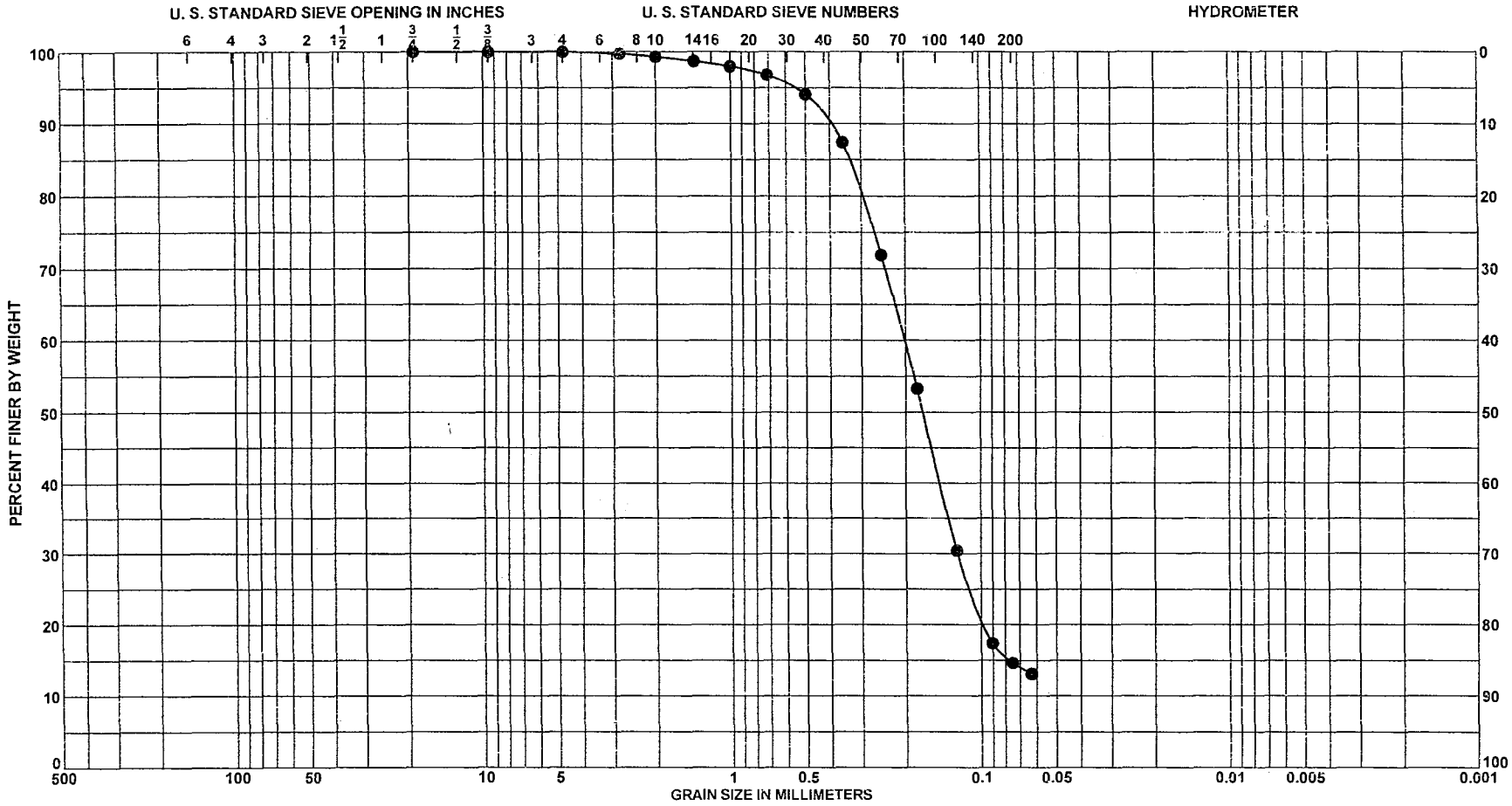


Sample No.	Elev or Depth	Classification	% CO_3	G_s	Nat w %	LL	PL	PI
● 1	El. to	SAND, poorly graded with silt,						
		mostly fine grained quartz, few						
		silt, trace medium grained						
		carbonate, brown (SP-SM)						

GRADATION CURVES

Project	Palm Beach Harbor
Area	
Boring No.	LWI-PSB01-7
Date	9/23/2002

ENG FORM 2087
MAY 63



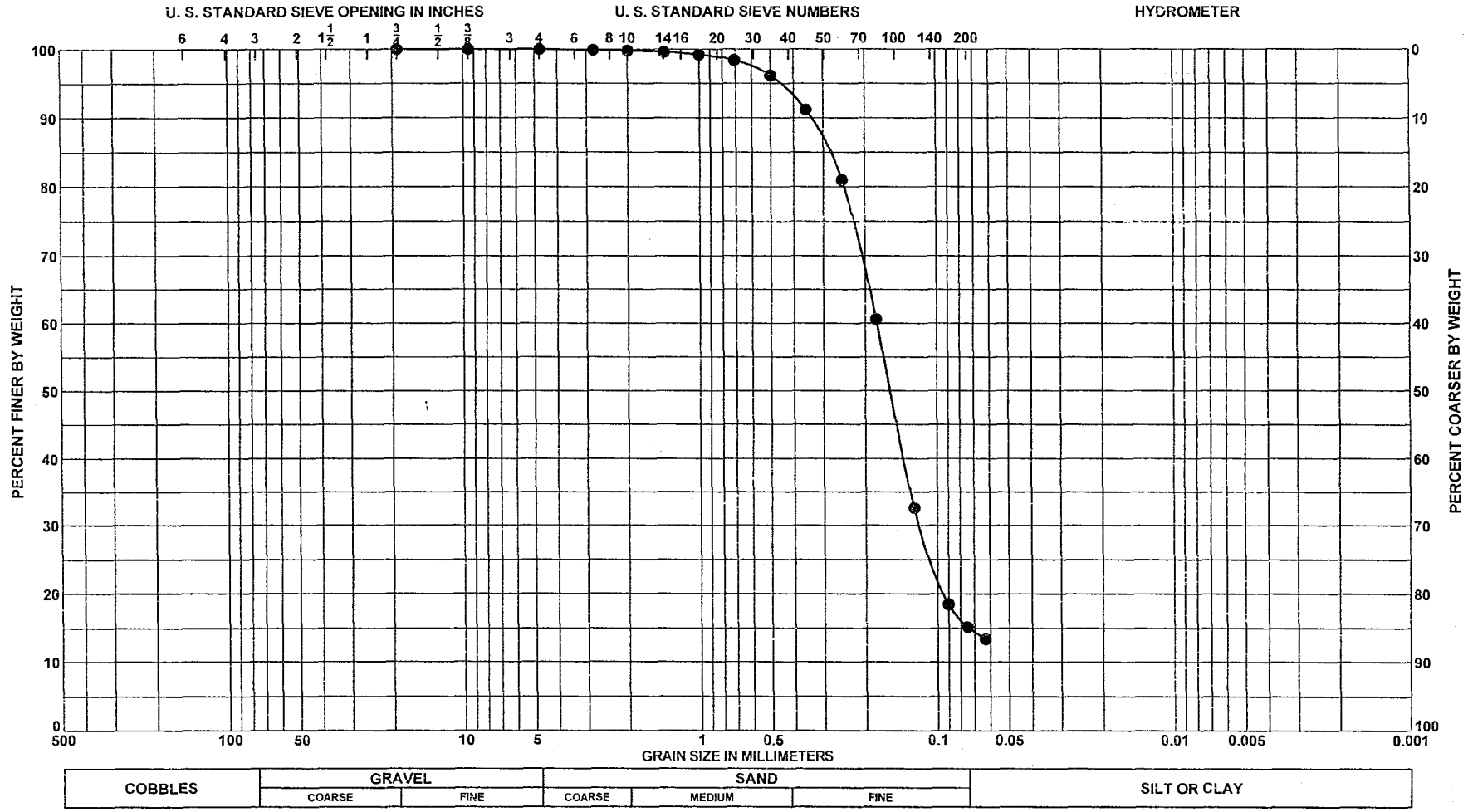
COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elev or Depth	Classification	% CO_3	G_s	Nat w %	LL	PL	PI
● 3	El. to	SAND, silty, mostly fine grained quartz, little silt, few medium grained carbonate, brown (SM)						

GRADATION CURVES

Project	Palm Beach Harbor
Area	
Boring No.	LWI-PSB01-7
Date	9/23/2002

ENG FORM 2087
MAY 63



Sample No.	Elev or Depth	Classification	% CO_3	G_s	Nat w %	LL	PL	PI
● 4	El. to	SAND, silty, mostly fine grained quartz, little silt, few medium grained carbonate, gray (SM)						

Project Palm Beach Harbor

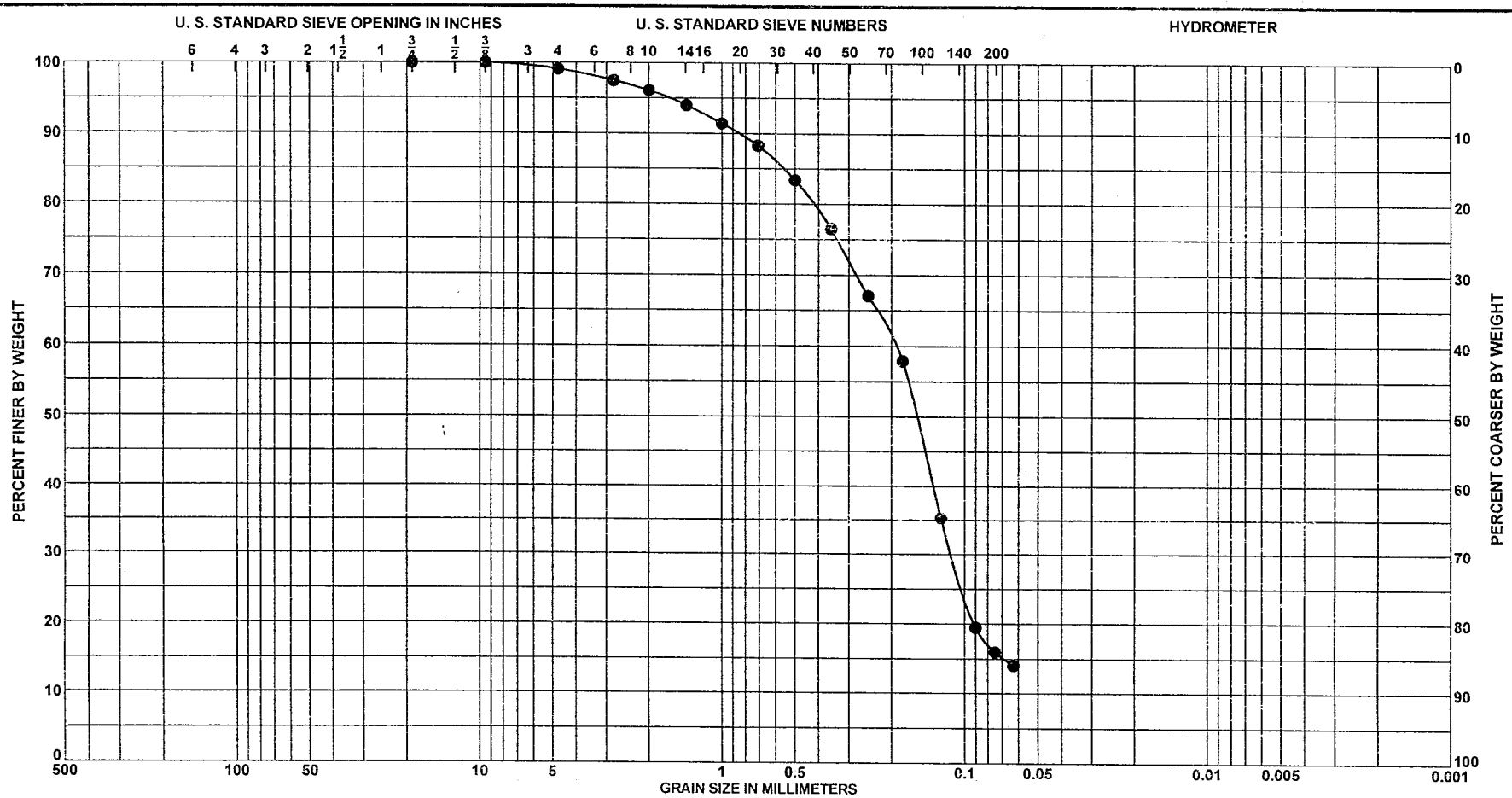
Area

Boring No. LWI-PSB01-7

Date 9/23/2002

GRADATION CURVES

ENG FORM 2087
MAY 63



Sample No.	Elev or Depth	Classification	% CO_3	G_s	Nat w %	LL	PL	PI
● 5	El. to	SAND, silty, mostly fine						
		grained quartz, little coarse to						
		medium grained carbonate,						
		little silt, gray (SM)						

Project Palm Beach Harbor

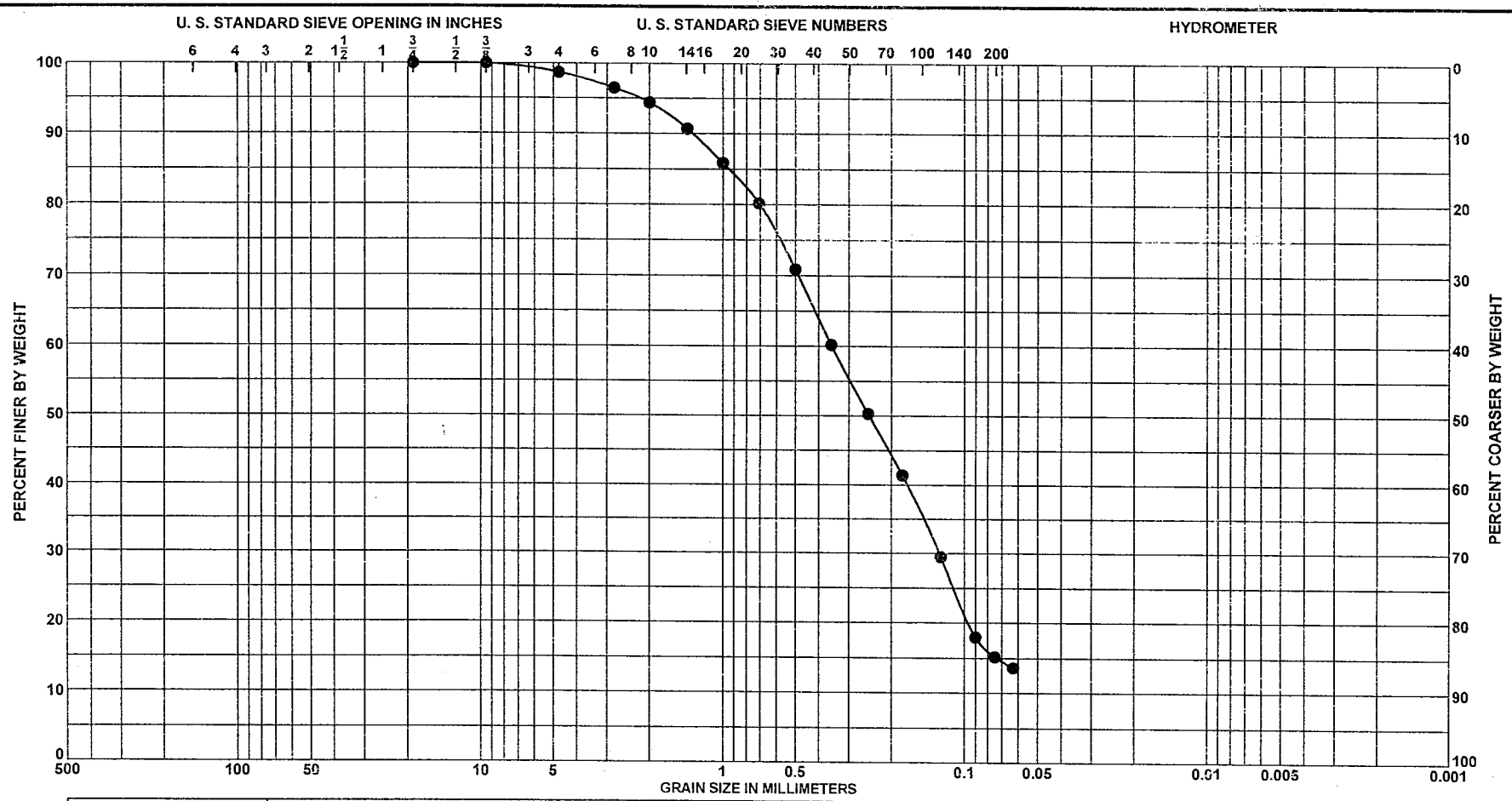
Area

Boring No. LWI-PSB01-7

Date 9/23/2002

GRADATION CURVES

ENG FORM 2087
MAY 63



Sample No.	Elev or Depth	Classification	% CO_3	G_s	Nat w %	LL	PL	PI
● 6	El. to	SAND, silty, mostly fine grained quartz, little coarse to medium grained carbonate, little silt, gray (SM)						

Project Palm Beach Harbor

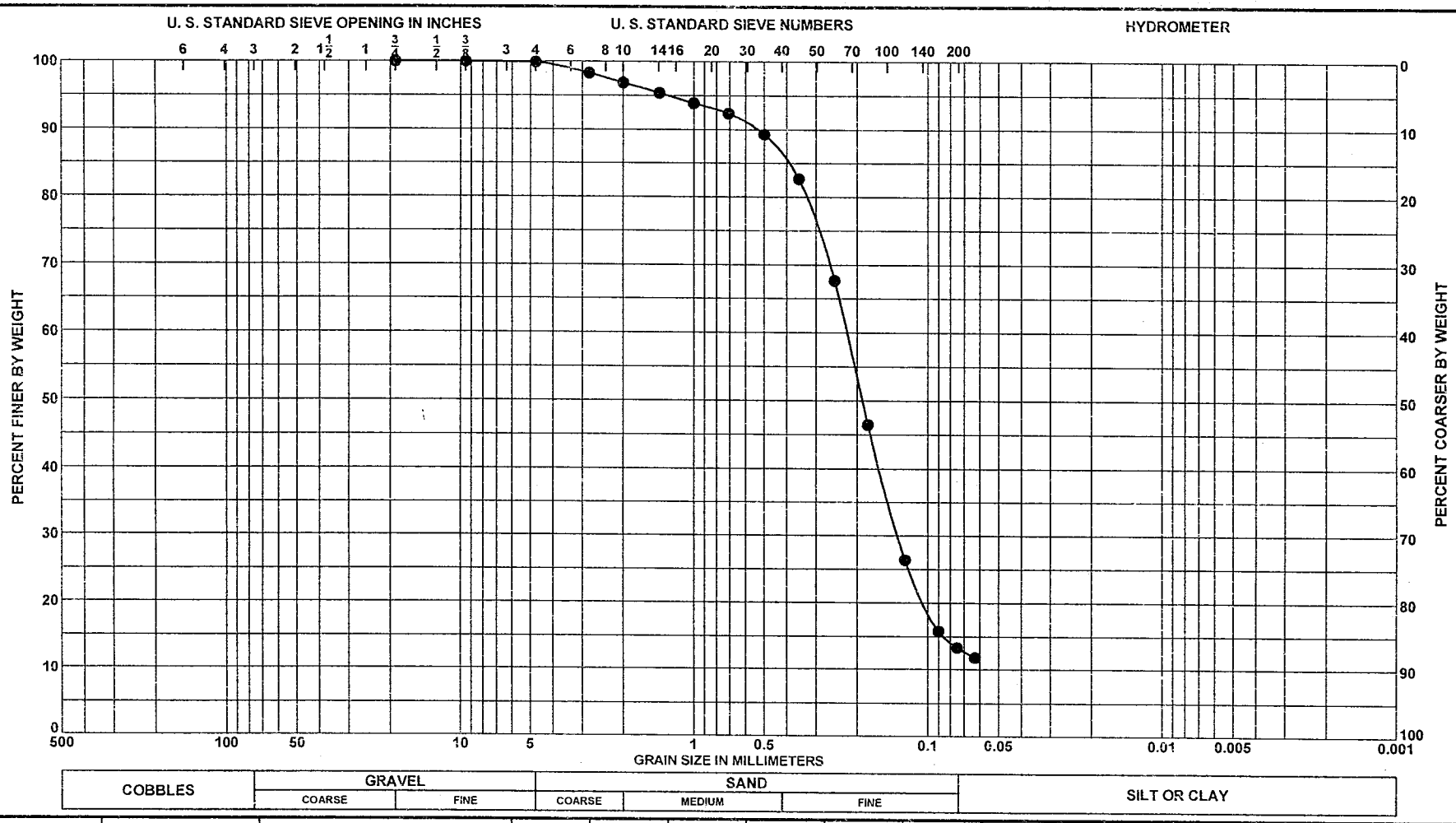
Area

Boring No. LWI-PSB01-7

Date 9/23/2002

GRADATION CURVES

ENG FORM 2087
MAY 63



Sample No.	Elev or Depth	Classification	% CO_3	G_s	Nat w %	LL	PL	PI
● 4	El. to	SAND, silty, mostly fine						
		grained quartz, little silt, little						
		coarse to medium grained						
		carbonate, brown (SM)						

Project Palm Beach Harbor

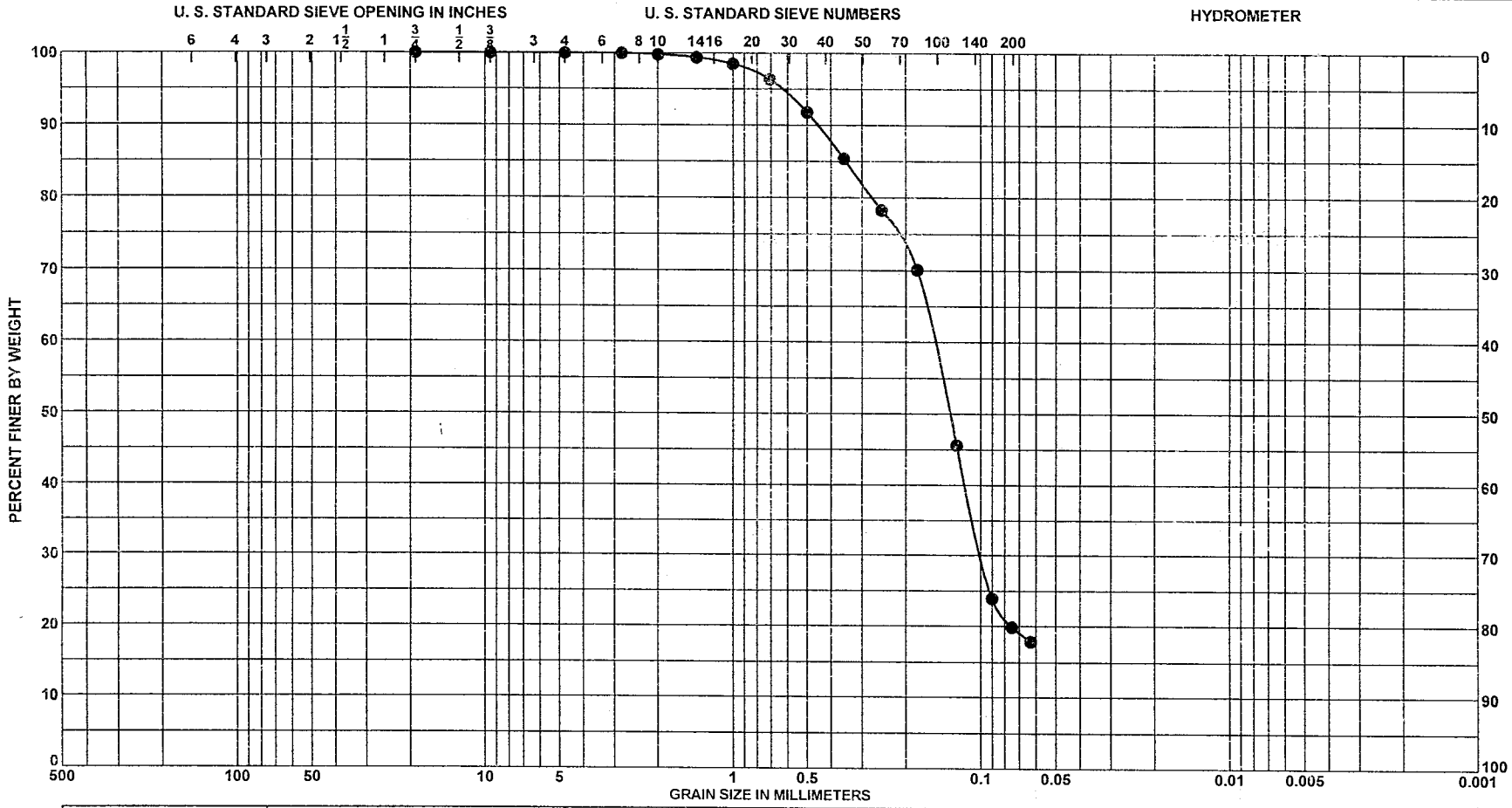
Area

Boring No. LWI-PSB01-8

Date 9/23/2002

GRADATION CURVES

ENG FORM 2087
MAY 63

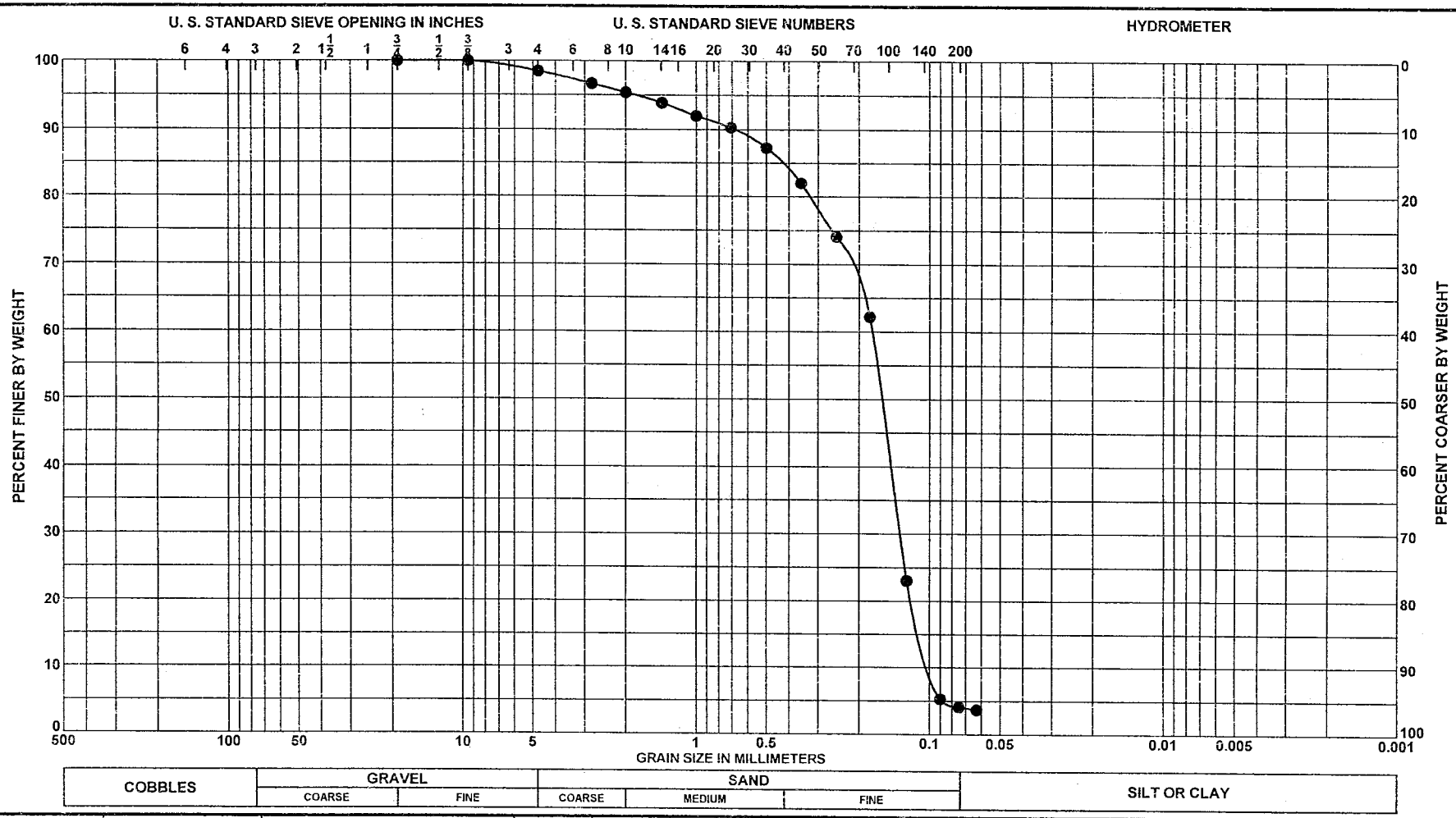


Sample No.	Elev or Depth	Classification	% CO_3	G_s	Nat w %	LL	PL	PI
● 6	El. to	SAND, silty, mostly fine						
		grained quartz, little silt, little						
		coarse to medium grained						
		carbonate, gray (SM)						

GRADATION CURVES

Project	Palm Beach Harbor
Area	
Boring No.	LWI-PSB01-8
Date	9/23/2002

ENG FORM 2087
MAY 63



Sample No.	Elev or Depth	Classification	% CO_3	G_s	Nat w %	LL	PL	PI
● 2	El. to	SAND, poorly graded with silt,						
		mostly fine grained quartz, little						
		medium grained carbonate,						
		few silt, brown (SP-SM)						

Project Palm Beach Harbor

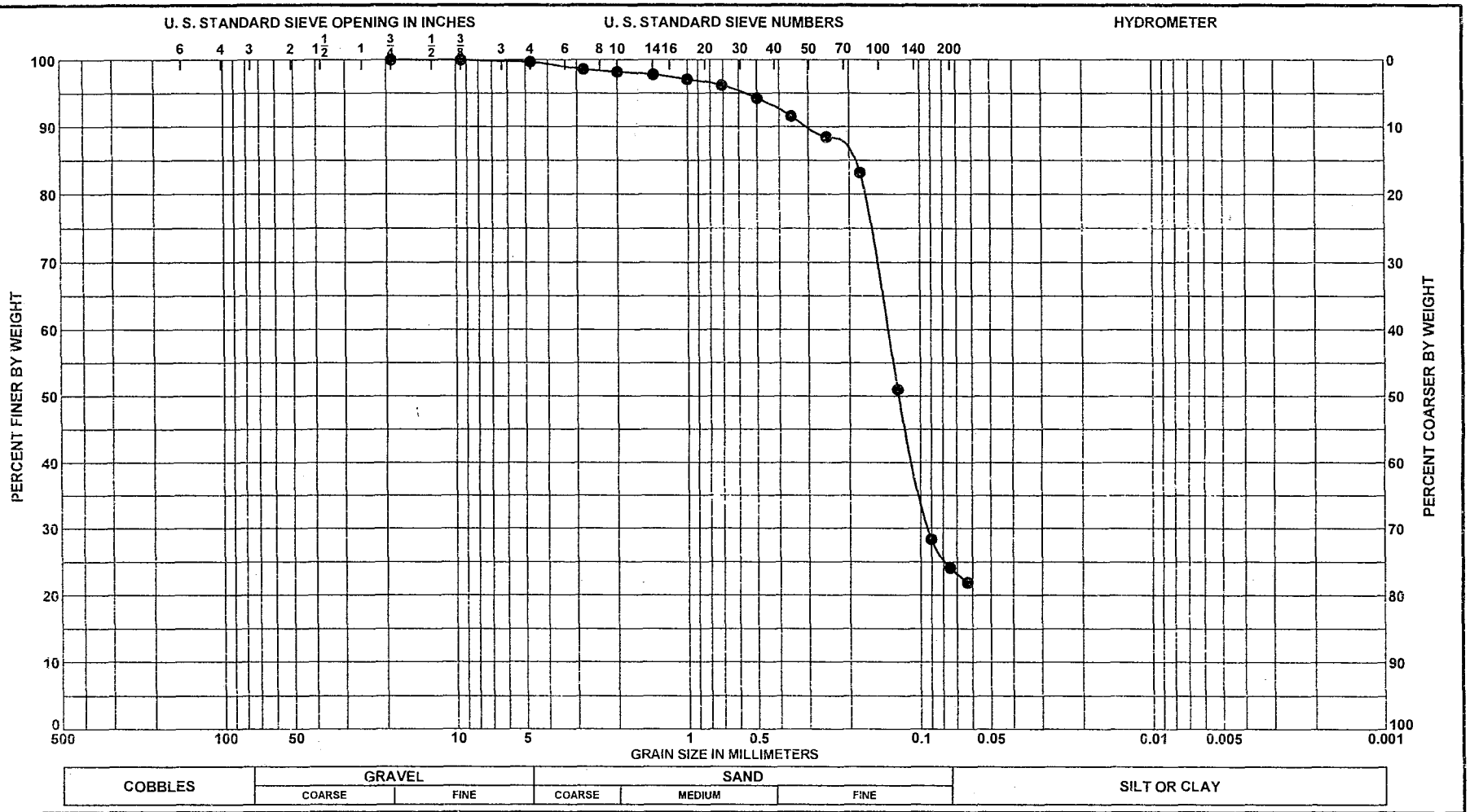
Area

Boring No. LWI-PSB01-9

Date 9/23/2002

GRADATION CURVES

ENG FORM 2087
MAY 63



Sample No.	Elev or Depth	Classification	% CO_3	G_s	Nat w %	LL	PL	PI
● 5	El. to	SAND, silty, mostly fine						
		grained quartz, little silt, few						
		coarse to medium grained						
		carbonate, gray (SM)						

GRADATION CURVES

Project	Palm Beach Harbor
Area	
Boring No.	LWI-PSB01-9
Date	9/23/2002

ENG FORM 2087
MAY 63

Sponsor Supplied

Boring Logs and Laboratory Results:

North Jetty and Area B-2

LAKE WORTH INLET

SAND TRANSFER PLANT

DISCHARGE PIPE

TOWN OF PALM BEACH

BID NO. 95-14

GEOTECHNICAL BORING

INFO.

APPENDIX B

SUBSURFACE EXPLORATION REPORT

ARDAMAN AND ASSOCIATES, INC.
FEBRUARY 15, 1995

Ardaman & Associates, Inc.

File No. 95-2007
February 15, 1995

Coastal Planning and Engineering, Inc.
2481 N.W. Boca Raton Blvd.
Boca Raton, Florida 33431

Attn: Douglas W. Mann, P.E.

SUBSURFACE EXPLORATION REPORT
LAKE WORTH INLET CORINGS
PALM BEACH COUNTY, FLORIDA

Ardaman & Associates, Inc. has completed the subsurface exploration and studies of the project site described in our proposal dated July 6, 1994. The work was requested by Mr. Douglas Mann of Coastal Planning & Engineering, Inc. and authorized by Robert Clinger of Palm Beach County Environmental Resources Management. Our work included two Standard Penetration Test (SPT) borings with cores, laboratory testing, and engineering analyses. This report describes our explorations and tests, reports their findings, and summarizes our conclusions. Our report has been prepared specifically for this project. It is intended for the exclusive use of Coastal Planning and Engineering, Inc. and their representatives.

FIELD EXPLORATION

Two Standard Penetration Test (SPT) borings were performed at the locations shown on the Boring Location Plan, Figure 1. The SPT borings were completed at depth 100 feet. The work was performed in accordance with the procedures recommended in ASTM D-1586. The boring logs and a description of our drilling and testing procedures are included in the Appendix.

In addition to the SPT borings, nine 5 foot coring runs were performed at the depths described in the boring logs.

The boring locations were laid out by our field crew by tape measurements from nearby jettys. We estimate that the actual boring locations are within about 10 feet of the locations shown in Figure 1. If you need to know the boring locations more accurately, we recommend that you retain a surveyor. Note that the drilling locations are not accessible to our standard tire-mounted equipment.

Our drillers examined the soil recovered from the SPT sampler and maintained a log for each boring. The soil samples were taken to our laboratory where they were inspected and classified using nomenclature consistent with the Unified Soil Classification System (ASTM D-2487). The soil classifications and other pertinent data obtained from our explorations and laboratory examinations and tests are reported on the boring logs in the Appendix.

[illegible] Suite 10 West Palm Beach, Florida 33401 Phone (407) 697-[illegible] FAX (407) 840-[illegible]
[illegible] Sarasota Tallahassee Tampa [illegible]

The soil samples recovered from our explorations will be kept in our laboratory for 60 days, then discarded unless you request otherwise.

SUBSURFACE CONDITIONS

The boring logs in the Appendix present a detailed description of the soils encountered at the locations and the depths explored. The soil stratification shown on the boring logs is based on examination of recovered soil samples and interpretation of the driller's field logs. It indicates only the approximate boundaries between soil types. The actual transitions between adjacent soil strata may be gradual and indistinct.

CORING

A total of nine, two-inch diameter, coring runs were attempted at different depths in Boring B-2 as directed by the engineers. Most of these runs were made at depth below 30 feet, which was not anticipated. The depths, descriptions, and percent recovery are described on the boring logs in the Appendix. Two core samples from each of the first six coring runs and one core sample from the seventh run were tested for compressive strength according ASTM D-2938. Core samples from coring runs 8 an 9 could not be tested. Table I shows the results of the compression tests.

TABLE I
COMPRESSION TESTS
FEBRUARY 13, 1995

SAMPLE I.D.	LOAD (lbs)	SURFACE AREA (in^2)	COMPRESSIVE STRENGTH (psi)
1st Core 7.5-14.5'	3700	3.142	1178
1st Core 7.5-14.5'	2850	3.142	907
2nd Core 14.5-24.5'	1500	3.142	477
2nd Core 14.5-24.5'	1600	3.142	509
3rd Core 30.0-35.0'	2300	3.142	732
3rd Core 30.0-35.0'	2030	3.142	646
4th Core 35.0-40.0'	2750	3.142	875
4th Core 35.0-40.0'	2900	3.142	923
5th Core 41.0'-46.0'	1000	3.142	318
5th Core 41.0'-46.0'	900	3.142	286
6th Core 47.5-52.5'	650	3.142	207
6th Core 47.5-52.5'	730	3.142	232
7th Core 52.5-57.5'	450	3.142	143

It has been a pleasure to assist you on this phase of your project. Please contact us whenever we may be of service to you, and please call if you have any questions concerning this report.

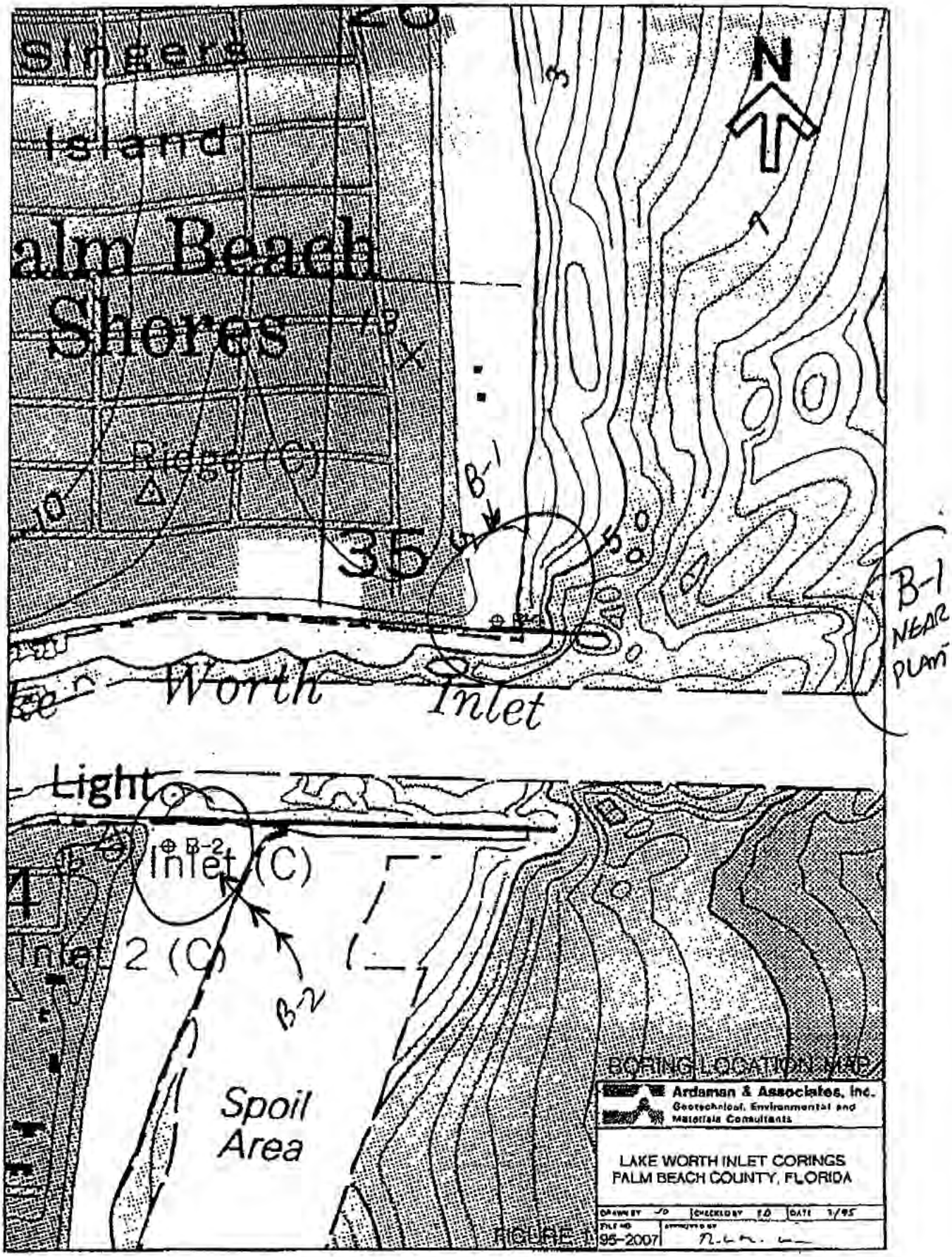
Sincerely,

ARDAMAN & ASSOCIATES, INC.

Sean C. Donahue, E.I.
Staff Engineer

Roberto E. Balbis, P.E.
Principal
Fla. Reg. No. 15832

SCD/REB:icm



B-2 WEST OF DISCHARGE ON BEACH

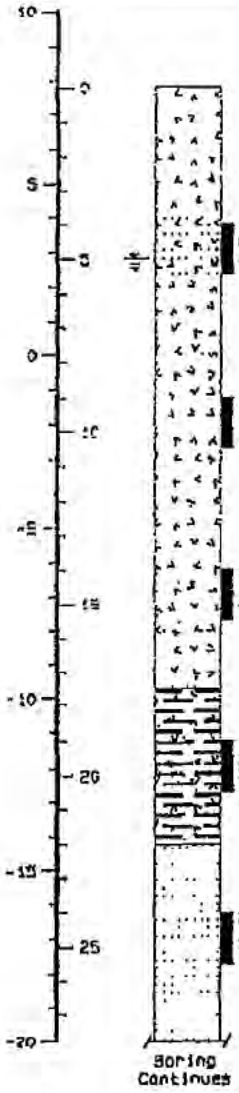
STANDARD PENETRATION TEST BORING LOG

BORING B-1

PROJECT: LAKE WORTH INLET
PIPELINE CROSSING
BORING LOCATION: NORTH JETTY

WATER OBSERVED AT DEPTH 5 FEET

FILE NO. 95-2007
BORING B-1
ELEV: 7.792
DRILLER: SG & PR
DATE DRILLED: 1-20-95



SOIL DESCRIPTION	SAMPLE NO	N VALUE
ORANGE BROWN FINE SAND WITH SHELL		
SAME	1	19
SAME, LARGER SHELL FRAGMENTS	2	21
SAME, GRADING GRAYISH AT 15 FEET	3	35
GRAY BROWN CEMENTED SAND AND SHELL	4	43
GRAY FINE SAND	5	51

BORING COMPLETED AT DEPTH 100.5 FEET

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN", 140-LB HAMMER, 30-INCH FALL.

Ardaman & Associates, Inc.

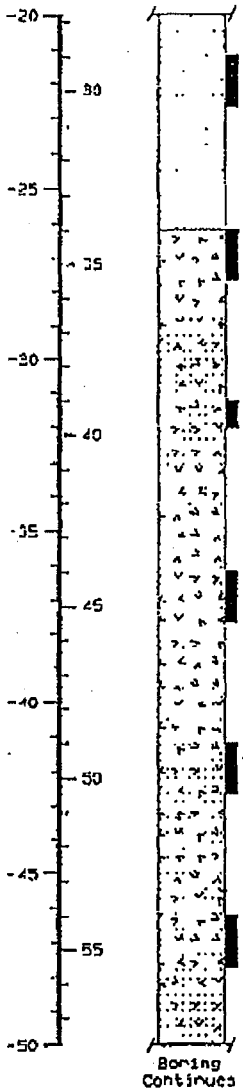
STANDARD PENETRATION TEST BORING LOG

BORING B-1

PROJECT: LAKE WORTH INLET
PIPELINE CROSSING
BORING LOCATION: NORTH JETTY

WATER OBSERVED AT DEPTH 5 FEET

FILE NO. 95-2007
BORING B-1
ELEV: 7.792
DRILLER: SG & PR
DATE DRILLED: 1-20-95



ELEVATION / DEPTH	SOIL SYMBOLS AND SAMPLER SYMBOLS	SOIL DESCRIPTION	SAMPLE NO	N VALUE
		SAME, VERY FINE SAND	6	57
		BROWN GRAY SAND WITH SHELL FRAGMENTS	7	45
		LIGHT BROWN SHELL FRAGMENTS AND SAND	8	50/4"
		SAME	9	26
		SAME	10	46
		SAME	11	82

BORING COMPLETED AT DEPTH 100.5 FEET

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN", 140-LB HAMMER, 30-INCH FALL.

Ardaman & Associates, Inc.

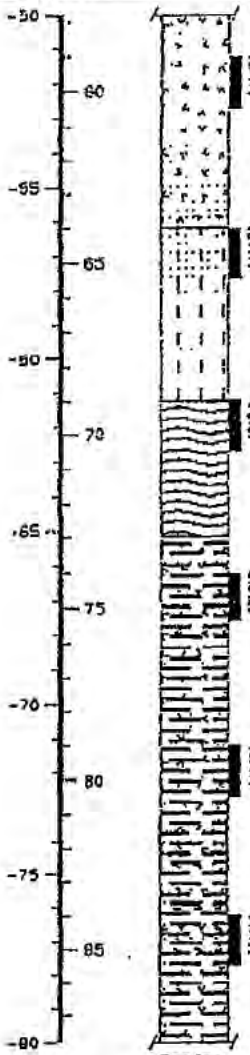
STANDARD PENETRATION TEST BORING LOG

BORING B-1

PROJECT: LAKE WORTH INLET
PIPELINE CROSSING
BORING LOCATION: NORTH JETTY

WATER OBSERVED AT DEPTH 5 FEET

FILE NO. 95-2007
BORING B-1
ELEV: 7.792
DRILLER: SG & PR
DATE DRILLED: 1-20-95



ELEVATION / DEPTH	SOIL SYMBOLS AND SAMPLER SYMBOLS	SOIL DESCRIPTION	SAMPLE NO	N VALUE
	25/6, 55/6, 32/2	SAME	12	87
	28/6, 16/6, 20/6	BROWN GRAY SLIGHTLY SILTY VERY FINE SAND WITH SHELL	13	28
	4/5, 9/5, 5/5	DARK BROWN SANDY PEAT	14	9
		LIGHT GRAY CEMENTED SAND AND SHELL		
	50/2, 50/2, 50/2, 50/2		15	100/11"
	15/6, 15/6, 12/6	SAME	16	27
		LOST CIRCULATION AT 81 TO 84 FEET		
	12/6, 13/6, 16/6	LIGHT BROWN	17	29

BORING COMPLETED AT DEPTH 100.5 FEET

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN". 140-LB HAMMER, 30-INCH FALL.

Ardaman & Associates, Inc.

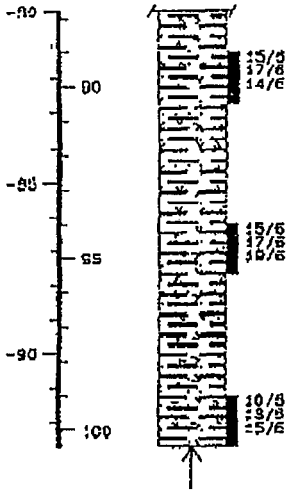
STANDARD PENETRATION TEST BORING LOG

BORING B-1

PROJECT: LAKE WORTH INLET
PIPELINE CROSSING
BORING LOCATION: NORTH JETTY

WATER OBSERVED AT DEPTH 5 FEET

FILE NO. 95-2007
BORING B-1
ELEV: 7.792
DRILLER: SG & PR
DATE DRILLED: 1-20-95



ELEVATION / DEPTH	SOIL SYMBOLS AND SAMPLER SYMBOLS	SOIL DESCRIPTION	SAMPLE NO	N VALUE
		LIGHT GRAY CEMENTED SAND AND SHELL	18	31
		SAME	19	36
		SAME	20	26

BORING COMPLETED AT DEPTH 100.5 FEET

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN". 140-LB HAMMER, 30-INCH FALL.

Ardaman & Associates, Inc.

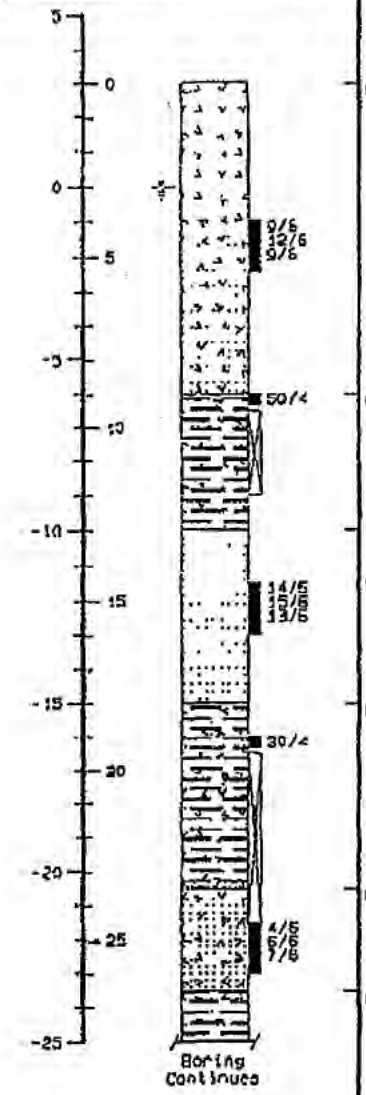
STANDARD PENETRATION TEST BORING LOG

BORING B-2

PROJECT: LAKE WORTH INLET
PIPELINE CROSSING
BORING LOCATION: SOUTH JETTY

WATER OBSERVED AT DEPTH 3 FEET

FILE NO. 95-2007
BORING B-2
ELEV: 2.99
DRILLER: SG & PR
DATE DRILLED: 1-26-95



SOIL DESCRIPTION	SAMPLE NO	N VALUE
BROWNISH GRAY FINE SAND WITH SHELL FRAGMENTS		
	1	21
CEMENTED SAND AND SHELL FIRST CORE RUN AT 9.5 TO 12 FEET RECOVERY-100% RQD-78% CEMENTED SAND AND SHELL. BROWN AT TOP, GRADING GRAY, FINER AND DENSER WITH DEPTH	2	50/4"
YELLOWISH BROWN FINE SAND. SOME CEMENTATION	3	28
LIGHT BROWN CEMENTED SAND AND FINE SHELL SECOND CORE RUN AT 19.5 TO 24.5 FEET RECOVERY-85% RQD-67% UPPER 2 FEET LIGHT BROWN CEMENTED SAND AND FINE SHELL; NEXT 2 FEET COARSER AND MORE SHELL	4	
LIGHT BROWN SHELL FRAGMENTS WITH SAND	5	13
LIGHT BROWN CEMENTED FINE SHELL AND SAND		

BORING COMPLETED AT DEPTH 100 FEET
CORING DONE WITH 2-INCH DOUBLE-TUBE BARREL
FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN". 140-LB HAMMER, 30-INCH FALL.

Ardaman & Associates, Inc.

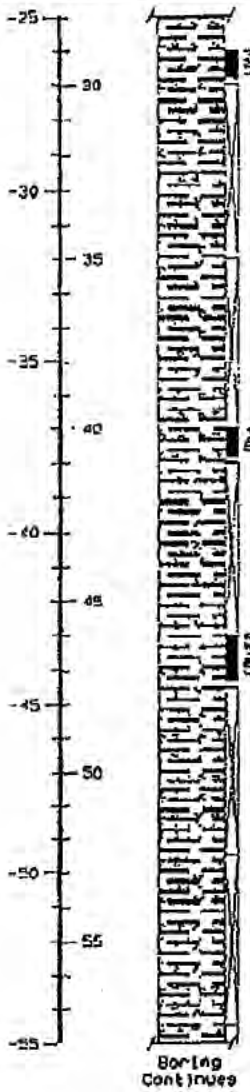
STANDARD PENETRATION TEST BORING LOG

BORING B-2

PROJECT: LAKE WORTH INLET
PIPELINE CROSSING
BORING LOCATION: SOUTH JETTY

WATER OBSERVED AT DEPTH 3 FEET

FILE NO. 95-2007
BORING B-2
ELEV: 2.99
DRILLER: SG & PR
DATE DRILLED: 1-26-95



SOIL DESCRIPTION	SAMPLE NO	N VALUE
THIRD CORE RUN AT 30 TO 35 FEET RECOVERY=100% RQD=83% WEAKLY CEMENTED AT TOP. GRADING BETTER CEMENTED WITH DEPTH	6	50/4"
LIGHT GRAY CEMENTED FINE SAND WITH SHELL		
FOURTH CORE RUN AT 35 TO 40 FEET RECOVERY=98% RQD=87% TOP 2 FEET MOSTLY CEMENTED FINE GRAY SAND; REMAINDER IS COARSER, MORE POROUS		
FIFTH CORE RUN AT 41 TO 46 FEET RECOVERY=100% RQD=83% FAIRLY POROUS SHELL AND GRAY FINE SAND	7	50/4"
SIXTH CORE RUN AT 47.5 TO 52.5 FEET RECOVERY=100% RQD=92% FIRST FOOT LARGE SHELLS AND POROUS LOWER 4 FEET MOSTLY CEMENTED GRAY FINE SAND	8	80/10"
SEVENTH CORE RUN AT 52.5 TO 57.5 FEET RECOVERY=100% RQD=92% GRAY CEMENTED SAND, SOME SHELL		
8TH CORE RUN AT 57.5 TO 62.5 FEET RECOVERY=30% NO PIECES LONGER THAN 4 INCHES. POROUS GRAY CEMENTED FINE SAND		

BORING COMPLETED AT DEPTH 100 FEET

CORING DONE WITH 2-INCH DOUBLE-TUBE BARREL

FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN". 140-LB HAMMER 30-INCH FALL.

Ardaman & Associates, Inc.

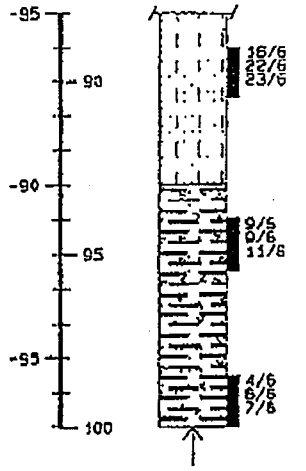
STANDARD PENETRATION TEST BORING LOG

BORING B-2

PROJECT: LAKE WORTH INLET
PIPELINE CROSSING
BORING LOCATION: SOUTH JETTY

WATER OBSERVED AT DEPTH 3 FEET

FILE NO. 95-2007
BORING B-2
ELEV: 2.99
DRILLER: SG & PR
DATE DRILLED: 1-26-95



ELEVATION / DEPTH	SOIL SYMBOLS AND SAMPLER SYMBOLS	SOIL DESCRIPTION	SAMPLE NO	N VALUE
			14	45
		LIGHT GRAY CEMENTED SAND, SOME SHELL	15	20
			16	12

BORING COMPLETED AT DEPTH 100 FEET
CORING DONE WITH 2-INCH DOUBLE-TUBE BARREL
FIELD TEST DATA ARE "BLOWS"/"INCHES DRIVEN". 140-LB HAMMER, 30-INCH FALL.

Ardaman & Associates, Inc.

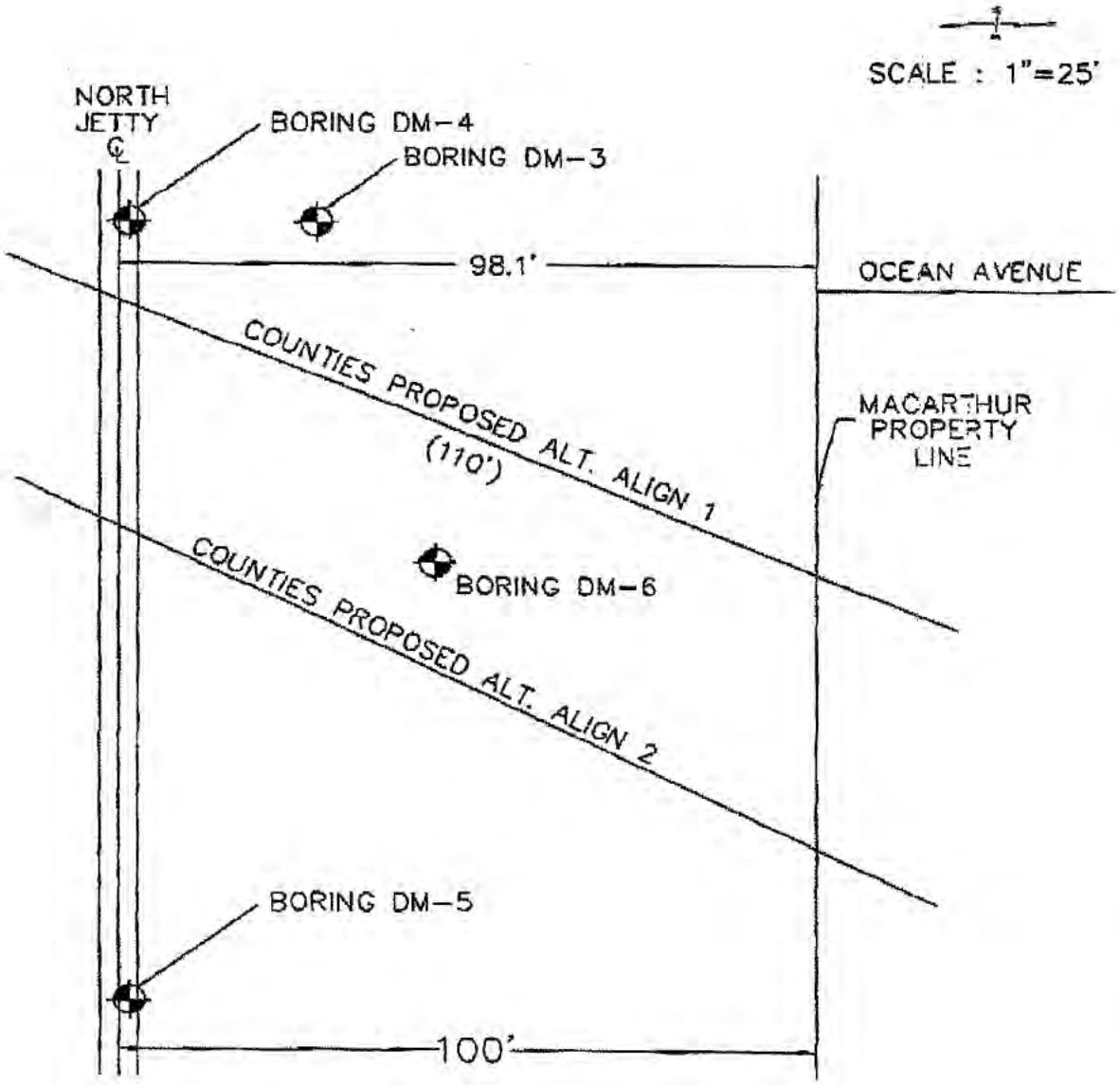
TOTAL P.15

ADDENDUM 1
BID NO. 95-14

APPENDIX A

C. Add new Dames & Moore Boring Log DM-3 and results of unconfined strength tests on selected core samples (attached) to Appendix A, Site Geotechnical Reports

DM-3 LOCATED APPROXIMATELY 520 FEET WEST OF DM-1 ON NORTH SIDE OF INLET



BORING LOCATION PLAN
PLATE 2

LAKE WORTH INLET PIPELINE
PALM BEACH COUNTY, FLORIDA

DAMES & MOORE

BORING DM-3

SURFACE ELEVATION 8.75 FT. MSL
WATER LEVEL NOT RECORDED

SAMPLING RESISTANCE (BLOWS/FOOT) NSPT	DEPTH (FEET)	UNIFIED SOIL CLASSIFICATION	DESCRIPTION
	0		BROWN FINE SAND WITH SOME SHELL (DENSE)
	5		
37	10	SP	– GRADES SHELLY
38	15		
84 / 11"	20	SP	GRAY FINE SAND WITH TRACE SHELL (VERY DENSE) – HARD DRILLING AT 23.7 FT.
25 / 6"	25	LS	LIGHT BROWN WEAKLY CEMENTED FINE SAND AND SHELL (COQUINA)
REC/RQD = 80/18	30		– GRADES GRAY IN COLOR – WELL CEMENTED FROM 30 TO 31 FT. – MODERATELY CEMENTED FROM 31 TO 37.5 FT.
REC/RQD = 100/62	35		
REC/RQD = 100/15	40		– VERY WEAKLY CEMENTED, MORE SANDY FROM 37.5 TO 40.5 FT. – MODERATELY TO WELL CEMENTED FROM 40.5 TO 49.5 FT.
REC/RQD = 100/43	45		
REC/RQD = 100/64	50		– WELL CEMENTED FROM 49 TO 52.5 FT. – WEAKLY CEMENTED, MORE SANDY FROM 52.5 TO 56.5 FT.
REC/RQD = 100/25	55		– MODERATELY TO WELL CEMENTED FROM 56.5 TO 65.5 FT.
REC/RQD = 96/62	60		

- ⊠ DISTURBED SAMPLE
- ■ UNDISTURBED SAMPLE
- □ NO SAMPLE RECOVERED
- ◪ STANDARD PENETRATION TEST
- ∓ WATER LEVEL

REC = 26 — PERCENT RECOVERED
RQD = 0 — ROCK QUALITY DESIGNATION
CORE RUN

LOG OF BORING

PROJECT: SAND TRANSFER REPLACEMENT PIPELINE
LOCATION: LAKE WORTH INLET, FLORIDA

DAMES & MOORE

REVISIONS BY DATE

BY TATA DATE 07/20/95
CHECKED BY MULLIN

D & M JOB NO. 14859-013-141

BORING DM-3 (CONTINUED)

SAMPLING RESISTANCE (BLOWS/FOOT) NSPT	DEPTH (FEET)	UNIFIED SOIL CLASSIFICATION	DESCRIPTION
	60		
REC/RQD = 100/20		LS	– MORE SANDY, WEAKLY CEMENTED FROM 65 TO 70.5 FT.
	65		
REC/RQD = 45/15			
	70		
REC/RQD = 15/0		SP LS	GRAY FINE SAND WITH OCCASSIONAL LAYERS OF CEMENTED SAND (UNCEMENTED TO OCCASSIONALLY WEAKLY CEMENTED)
	75		
REC/RQD = 17/0			
	80		

BORING COMPLETED AT 80.5 FT.

REVISIONS BY DATE

BY TATA DATE 07/20/95

CHECKED BY MULLIN

D & M JOB NO. 14859-013-141

- ⊠ DISTURBED SAMPLE
- ■ UNDISTURBED SAMPLE
- □ NO SAMPLE RECOVERED
- ◪ STANDARD PENETRATION TEST
- ∓ WATER LEVEL

REC/RQD = 26/0 — CORE RUN; PERCENT RECOVERED; ROCK QUALITY DESIGNATION

LOG OF BORING

PROJECT: SAND TRANSFER REPLACEMENT PIPELINE
LOCATION: LAKE WORTH INLET, FLORIDA

DAMES & MOORE

LAKE WORTH INLET
SAND TRANSFER PIPELINE
BID NO. 95-14

BORING DM-3 ROCK CORES UNCONFINED COMPRESSIVE STRENGTH TESTS		
Sample No.	Depth (Feet)	Qu (psi)
1	28 - 28.5	1893
2	30 - 30.5	4545
3	36 - 36.5	303
4	43 - 43.5	909
5	48 - 48.5	575
6	51.5 - 52	681
7	57 - 57.5	1893
8	60.5 - 61	590
9	65.5 - 66	681

14859\DM3Core.tbl

DAMES & MOORE
6400 CONGRESS AVENUE, SUITE 2500, BOCA RATON, FLORIDA 33487
(407) 994-6500 FAX: (407) 994-6524

February 12, 1996

Town of Palm Beach
951 Old Okeechobee Road
West Palm Beach, Florida 33401

Attention: Mr. Jim Bowser

Additional Borings
Directionally Drilled Pipeline
Lake Worth Inlet
Palm Beach County, Florida

Per our recommendation, the Town of Palm Beach subcontracted a subsurface drilling company to perform up to three additional borings at the reference project. The purpose of the borings was to further investigate the subsurface conditions in the area of alternative alignments proposed by Counties Corporation for the continuation of efforts to install the directional drilled pipeline beneath the inlet. The borings were also specifically performed to investigate and address the depth of the jetty in the alternate alignment area as the contractor, Counties Corporation, is claiming the jetty extends to a depth of 45 feet in this area.

The location of the borings performed is shown on the attached Site plan, Plate 1 and Boring Location plan, Plate 2. Boring DM-4 was drilled through the top of the concrete jetty cap at a location just south of previous boring DM-3. Boring DM-5 was also drilled down through the top of the jetty cap at an accessible location 125 feet east of DM-5. Boring DM-6 was drilled approximately 45 feet north and approximately 50 feet east of boring DM-4. Boring DM-6 was located north of the jetty, intermediate to the alternative alignments proposed by Counties Corporation. This boring was performed to locate the top of the underlying Coquina rock layer at that location. The results of the borings through the jetty at locations DM-4 and DM-5, indicates that the jetty material was found to a depth of 12 feet beneath the top of the jetty at both locations. The performance of the borings was observed by a representative of Counties Corporation. Summary generalized descriptions of the materials encountered in the borings are as follows:

Boring DM-4 (Elevation +6.2 feet NGVD)

Depth (feet)	Description
0 - 8	Concrete jetty cap

14859-013\Bowser16.ltr

DAMES & MOORE

8 - 12	Granite jetty rip rap and sand infilled voids
12 - 22	Brown fine to medium sand with shell fragments
22 - 23	Gray fine sand, (dense)
23 - 50	Gray, moderately to well cemented sand and shell (Coquina)

Boring DM-5 (Elevation +6.2 feet NGVD)

0 - 8.25	Concrete jetty cap
8.25 - 12	Granite jetty rip rap
12 - 23.5	Brown, medium to fine sand with shell fragments, (medium dense to very dense)
23.5 - 34	Gray, fine sand with fragmented shell, (medium dense to very dense)
34 - 40	Brown gray medium sand and shell, uncemented, (dense)
40 - 47	Gray fine sand with fragmented shell and trace of silt, (medium to very dense)
47 - 50	Gray brown and tan, cemented fine sand and shell (Coquina)

Boring DM-6 (Elevation 7.0 feet NGVD - Estimated)

0 - 17.5	Brown, fine to medium sand and shell, (dense)
17.5 -26.5	Gray fine sand, (dense)
26.5 - 35	Gray, moderately to well cemented sand and shell (Coquina)

DAMES & MOORE

Town of Palm Beach
February 12, 1996
Page 3

Detailed descriptions and the results of the borings are provided on the attached boring logs, Plates 3, 4 and 5.

Based on the above, there is factual boring data to contradict the reported assessment of the contractor's geophysical report which stated that the jetty rock was located to a depth of 45 feet at the DM-3 area. The jetty rock was found only to a depth of 12 feet below the top of the jetty in borings DM-4 and DM-5 indicating the rip rap was likely placed on the prevailing ground surface at the time the jetty was constructed in 1925 and that the geophysical report missed this layer altogether. Furthermore, the result of these borings indicate the geologic conditions encountered to be consistent with those reported by and reflected in the borings provided to the contractor at the time of the bid.

Respectfully Submitted,
DAMES & MOORE, INC.

Thomas F. Mullin, P.E.
Associate

TFM/cmc

Attachment

Plate 1	Site Location Plan
Plate 2	Boring Location Plan
Plate 3	Log of Boring DM-4
Plate 4	Log of Boring DM-5
Plate 5	Log of Boring DM-6

cc: Bob Clinger - PBC Dept. of Environmental Resources Mgmt.
Doug Mann - Coastal Planning & Engineering

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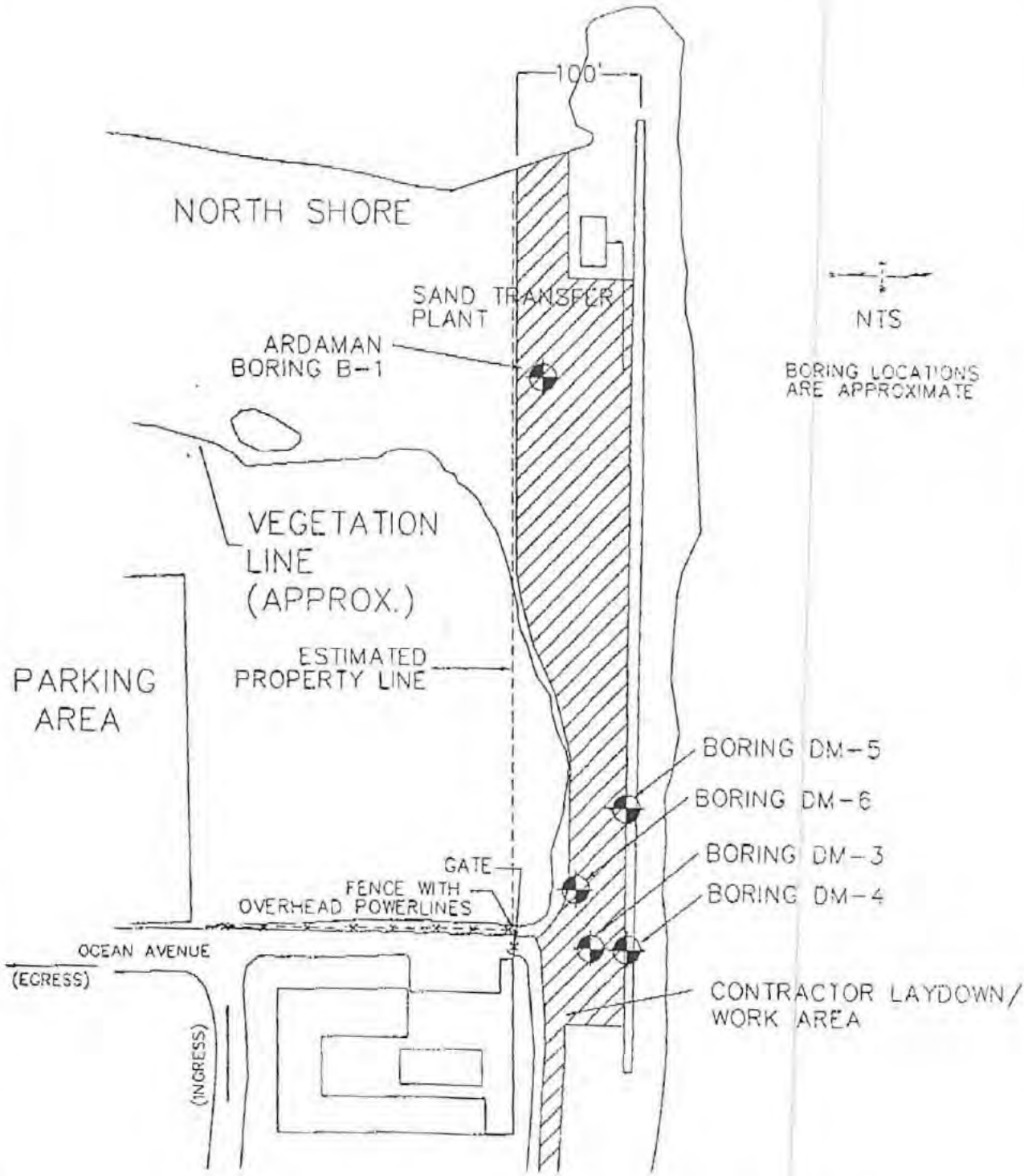
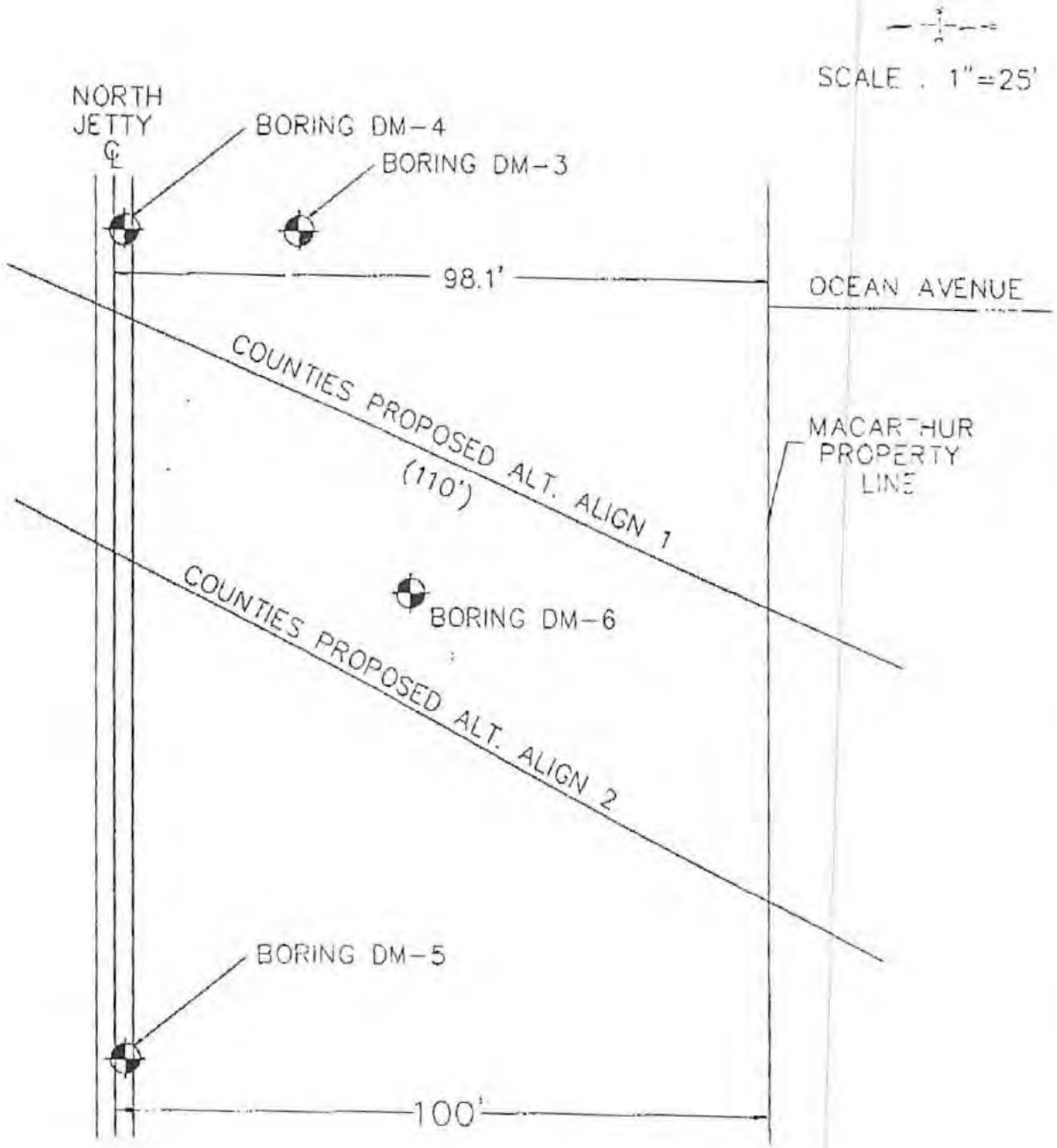
2/12/96



SITE PLAN
PLATE 1

LAKE WORTH INLET PIPELINE
PALM BEACH COUNTY, FLORIDA

DAMES & MOORE



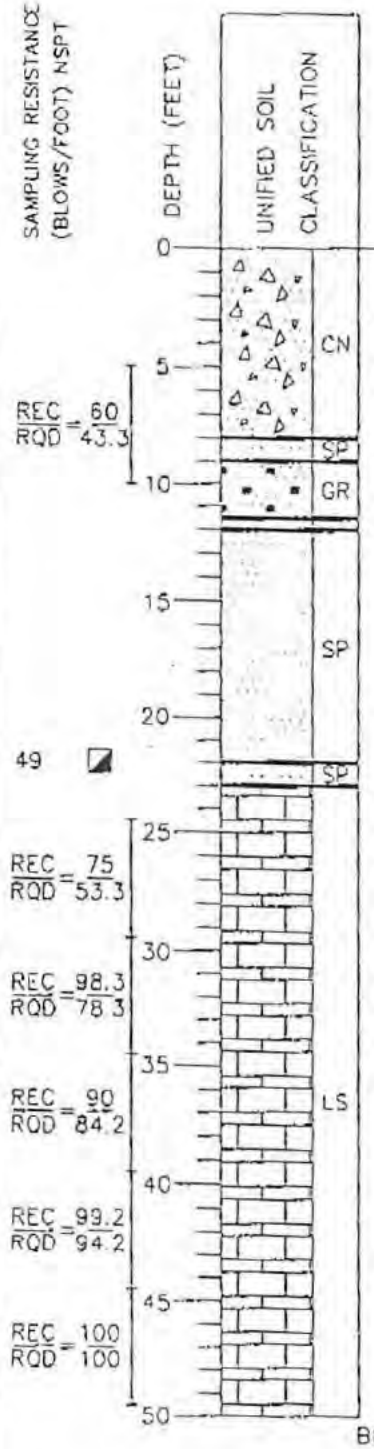
BORING LOCATION PLAN
PLATE 2

LAKE WORTH INLET PIPELINE
PALM BEACH COUNTY, FLORIDA

DAMES & MOORE

BORING DM-4

SURFACE ELEVATION +6.2 FT. (NGVD)
WATER LEVEL NOT RECORDED



DESCRIPTION
CONCRETE JETTY CAP
VOID – BROWN MEDIUM TO FINE SAND
GRANITE JETTY RIP RAP
VOID – BROWN MEDIUM TO FINE SAND
BROWN MEDIUM TO FINE SAND (DENSE)
LIGHT GRAY FINE SAND
LIGHT BROWN CEMENTED SAND AND SHELL (COQUINA)
– GRADES WEAKLY TO MODERATELY CEMENTED, GRAY IN COLOR
– GRADES MODERATE TO WELL CEMENTED
– MODERATELY CEMENTED
– MODERATELY TO WELL CEMENTED

BORING TERMINATED AT 50 FT. DEPTH ON 02/09/95 AT 4:30 PM

REVISIONS BY DATE

BY TATA DATE 02/12/95
CHECKED BY MULLIN

M JOB NO. 14859-013-141

- ⊠ DISTURBED SAMPLE
- ■ UNDISTURBED SAMPLE
- □ NO SAMPLE RECOVERED
- ◪ STANDARD PENETRATION TEST
- ⇶ WATER LEVEL

REC/RQD – 20/0 – CORE RUN INTERVAL; PERCENT RECOVERED; ROCK QUALITY DESIGNATION

LOG OF BORING

PROJECT: SAND TRANSFER REPLACEMENT PIPELINE
LOCATION: LAKE WORTH INLET, FLORIDA

DAMES & MOORE
PLATE 3

Lake Worth Inlet Feasibility Study, Transfer of Dredged Material Page 197 of 204

BORING DM-5

SURFACE ELEVATION +5.2 FT. (NGVD)
WATER LEVEL NOT RECORDED

SAMPLING RESISTANCE (BLOWS/FOOT) NSPT	DEPTH (FEET)	UNIFIED SOIL CLASSIFICATION	DESCRIPTION
	0		CONCRETE JETTY CAP
	5	CN	
	10	GR	GRANITE JETTY RIP RAP
53	15	SP	BROWN MEDIUM TO FINE SAND (VERY DENSE)
24	20		– GRADES WITH SHELL FRAGMENTS (MEDIUM DENSE)
50/6"	25	SP	GRAY FINE SAND (VERY DENSE)
20	30		– GRADES WITH SOME SHELL FRAGMENTS (MEDIUM DENSE)
40	35	SP	BROWN, GRAY MEDIUM SAND AND SHELL, UNCEMENTED (DENSE)
13	40	SP	GRAY FINE SAND WITH FRAGMENTED SHELL AND TRACE SILT (MEDIUM DENSE)
58	45		– GRADES VERY DENSE
50/2"	50	LS	GRAY, BROWN, AND TAN FINE SAND AND SHELL (CEMENTED)

BORING TERMINATED AT 50 FT. DEPTH ON 02/10/96 AT 6:00 PM

REVISIONS BY DATE

BY TATA DATE 02/12/96
CHECKED BY MULLIN

D & M JOB NO. 14859-013-141

- DISTURBED SAMPLE
- UNDISTURBED SAMPLE
- NO SAMPLE RECOVERED
- STANDARD PENETRATION TEST
- WATER LEVEL

CORE RUN INTERVAL
REC = 26 — PERCENT RECOVERED
RQD = 0 — ROCK QUALITY DESIGNATION

LOG OF BORING

PROJECT: SAND TRANSFER REPLACEMENT PIPELINE
LOCATION: LAKE WORTH INLET, FLORIDA

DAMES & MOORE

PLATE 4

Lake Worth Inlet Feasibility Study, Attachment C, Geotechnical

BORING DM-6

SURFACE ELEVATION +7.0 FT. (ESTIMATED)
WATER LEVEL NOT RECORDED

SAMPLING RESISTANCE (BLOWS/FOOT) #SPT	DEPTH (FEET)	UNIFIED SOIL CLASSIFICATION	DESCRIPTION
	0		BROWN FINE TO MEDIUM SAND AND SHELL (DENSE)
49	5	SP	
32	10		– GRADES MORE FINE AND LESS DENSE
39	15		– GRADES BROWNISH-GRAY WITH LESS SHELL
			GRAY FINE SAND (DENSE)
40	20	SP	
48	25		
			GRAY, MODERATELY TO WELL CEMENTED SAND AND SHELL (COQUINA)
REC 100 / RQD 100	30	LS	
			– GRADES MORE SHELLY
	35		

BORING TERMINATED AT 35 FT. DEPTH ON 02/11/96 AT 11:00 AM

REVISIONS DATE BY

BY TATA DATE 02/12/96
CHECKED BY MULLIN

D & M JOB NO. 14859-013-141

- DISTURBED SAMPLE
- UNDISTURBED SAMPLE
- NO SAMPLE RECOVERED
- STANDARD PENETRATION TEST
- WATER LEVEL

CORE RUN INTERVAL
REC 26 / RQD 0 — PERCENT RECOVERED / ROCK QUALITY DESIGNATION

LOG OF BORING

PROJECT: SAND TRANSFER REPLACEMENT PIPELINE
LOCATION: LAKE WORTH INLET, FLORIDA

DAMES & MOORE

PLATE 5

Boring Logs and Laboratory Results:

Cut-1

Cut-2

Area C

X = 813,880 Y = 887,350

HOLE NO. CB-6

DEPARTMENT OF THE ARMY DIVISION Corps of Engineers INSTALLATION Jacksonville, Florida DRILLING LOG	1. PROJECT Palm Beach Harbor SHEET 1 OF 1
	2. LOCATION (Coordinates or Station) Sta 62+25 Rge -100
	3. DRILLING AGENCY Corps of Engineers
4. HOLE NO. (As shown on drawing title and file No.) CB-6	5. NAME OF DRILLER G. M. Lineberger
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED; DEGREES WITH VERTICAL	7. THICKNESS OF OVER-BURDEN; 8. DEPTH DRILLED INTO ROCK; 9. TOTAL DEPTH OF HOLE 16.0
10. SIZE AND TYPE OF BIT 2" I.D. Spoon-SEE REMARKS	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW; 12. MANUFACTURER'S DESIGNATION OF DRILL Sprague & Henwood 40C
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED; UNDISTURBED	14. TOTAL NO. CORE BOXES 1; 15. ELEV. GROUND WATER Tidal; 16. DATE HOLE: STARTED 5/25/62, COMPLETED 5/25/62
17. ELEV. TOP OF HOLE -25.7	18. TOTAL CORE RECOVERY FOR BORING (%) 80; 19. SIGNATURE OF INSPECTOR R. G. Kretchman, Geologist

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
						Bit & Barrel Bls/Ft
-25.7	0.0					-25.7
			SAND, medium to fine, quartz, brown, wet, limestone fragments below -29.7 (SP)	Sample taken from wash	1	Washed Casing
						-29.7
				80	2	2" I.D. SPOON 16 14 14 7 7
-34.7	9.0					-34.7
-37.1	11.4		LIMESTONE, hard, gray, fossiliferous, friable, 80% to 90% shells 10% to 20% calcareous matrix	100 100		NX DIA -37.2
			SANDSTONE, hard gray, shelly, very porous, very permeable, friable, 90% sand, 10% calcareous matrix	80		NX DIA -39.7
-41.7	16.0			50		NX DIA -41.7

300# Hammer w/18" Drop
Used on 2" I.D. Spoon

ENG FORM 1 JUN 57 1836 (TRANSLUCENT) (EM 1110-2-1801) PREVIOUS EDITIONS ARE OBSOLETE

PROJECT Palm Beach Harbor HOLE NO. CB-6

X = 813,765 Y = 887,500

HOLE NO. CB-7

DEPARTMENT OF THE ARMY
DIVISION Corps of Engineers
INSTALLATION Jacksonville, Florida

DRILLING LOG

1. PROJECT: Palm Beach Harbor
SHEET 1 OF 1
2. LOCATION (Coordinates or Station): Sta-63+50 Rge-85 Ft. North of S.Jetty
3. DRILLING AGENCY: Corps of Engineers
4. HOLE NO. (As shown on drawing title and file No.): CB-7
5. NAME OF DRILLER: G. M. Lineberger
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED DEGREES WITH VERTICAL
7. THICKNESS OF OVERBURDEN:
8. DEPTH DRILLED INTO ROCK:
9. TOTAL DEPTH OF HOLE: 16.2
10. SIZE AND TYPE OF BIT: 2" I.D. Spoon - SEE REMARKS
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLW
12. MANUFACTURER'S DESIGNATION OF DRILL: CD-21
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED / UNDISTURBED
14. TOTAL NO. CORE BOXES: 1
15. ELEV. GROUND WATER: Tidal
16. DATE HOLE: STARTED 5/5/62 COMPLETED 5/5/62
17. ELEV. TOP OF HOLE: -26.4
18. TOTAL CORE RECOVERY FOR BORING (%): 83
19. SIGNATURE OF INSPECTOR: R. G. Kretchman, Geologist

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
						Bit & Barrel Bls/Ft
-26.4	0.0					-26.4
			SAND- fine to coarse, quartz, dark gray, slightly clayey, limestone fragments, slightly shelly, (SP)			-27.4 WASHED CASING
				78	1	Pushed 2" I.D. Spoon 4 / 7 / 11 / 7
						-32.4
-34.4	8.0				2	Pushed " " 16
			SAND, CLAYEY - fine to coarse quartz, dark gray, shelly, limestone fragments (SC)	82	3	11 / 9 / 4
-37.4	11.0					-37.4
-38.4	12.0		SANDSTONE - medium to hard, gray, porous, friable, permeable, shelly	50		-38.4 " " 90
			LIMESTONE - hard, gray, fossiliferous permeable, porous, friable very sandy, thin irregular layers of sandstone.	100		NX Dia
						-40.5
				100		NX Dia
-42.6	16.2					-42.6

300 lb. Hammer w/18" Drop Used on 2" I.D. Spoon

2

1 ENG FORM 1836 (TRANSLUCENT) PREVIOUS EDITIONS ARE OBSOLETE PROJECT Palm Beach Harbor HOLE NO. CB-7

X = 813,300 Y = 887,310

HOLE NO. CB-8

DEPARTMENT OF THE ARMY
DIVISION Corps of Engineers
INSTALLATION Jacksonville, Florida

DRILLING LOG

1. PROJECT: Palm Beach Harbor
SHEET 1 OF 1
2. LOCATION (Coordinates or Station): Sta-68+50 Rge-100
3. DRILLING AGENCY: Corps of Engineers
4. HOLE NO. (As shown on drawing title and file no.): CB-8
5. NAME OF DRILLER: G. M. Lineberger
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED; DEGREES WITH VERTICAL
7. THICKNESS OF OVER-BURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE: 23.5
10. SIZE AND TYPE OF BIT: See Remarks *
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLW
12. MANUFACTURER'S DESIGNATION OF DRILL: CD-21
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED; UNDISTURBED
14. TOTAL NO. CORE BOXES: 1
15. ELEV. GROUND WATER: Tidal
16. DATE HOLE: STARTED 5/2/62; COMPLETED 5/2/62
17. ELEV. TOP OF HOLE: -18.5 **
18. TOTAL CORE RECOVERY FOR BORING (%): 70
19. SIGNATURE OF INSPECTOR: R. G. Kretchman, Geologist

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
						Bit & Barrel Bls/Ft
-18.5	0.0					-18.5
-20.5	2.0		LIMESTONE-medium hard, gray, fossiliferous, very sandy, porous, permeable, friable.	50	-	-20.5 2" I.D. SPOON 25 80
			SANDSTONE-hard, gray, very porous, very permeable, very friable, slightly shelly, shelly bottom 6.0, dense layers from -37.2 to -37.5 and from -39.8 to -40.1, consists of 80% to 90% quartz and calcareous sand; and 10% to 20% calcareous matrix.	95	-	-22.7 NX DIA
				90	-	-24.9 NX DIA
				88	-	-27.4 NX DIA
				80	-	-29.9 NX DIA
				62	-	-32.5 NX DIA
				52	-	-35.0 NX DIA
				80	-	-37.5 NX DIA
				70		-40.0 NX DIA
-42.0	23.5			33	-	-42.0 NX DIA

*300# Hammer with 18" Drop used on 2" I.D. Spoon.

**(Bottom of Inlet)

ENG FORM JUN 55 1836 (TRANSLUCENT) PREVIOUS EDITIONS ARE OBSOLETE

PROJECT Palm Beach Harbor HOLE NO. CB-8

X = 813,340 Y = 887,190

HOLE NO. CB-9

DEPARTMENT OF THE ARMY
DIVISION Corps of Engineers
INSTALLATION Jacksonville, Florida

DRILLING LOG

1. PROJECT Palm Beach Harbor | SHEET 1 OF 1
2. LOCATION (Coordinates or Station) Sta- 68+50 Rge-220
3. DRILLING AGENCY Corps of Engineer
4. HOLE NO. (As shown on drawing title and file no.) CB-9
5. NAME OF DRILLER G. M. Lineberger
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED | DEGREES WITH VERTICAL
7. THICKNESS OF OVER-BURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE -14.0
10. SIZE AND TYPE OF BIT SEE REMARKS
11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW
12. MANUFACTURER'S DESIGNATION OF DRILL Sprague & Henwood 40C
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED | UNDISTURBED
14. TOTAL NO. CORE BOXES 1
15. ELEV. GROUND WATER Tidal
16. DATE HOLE: STARTED 5/8/62 | COMPLETED 5/8/62
17. ELEV. TOP OF HOLE -28.0
18. TOTAL CORE RECOVERY FOR BORING (%) 82
19. SIGNATURE OF INSPECTOR Geologist R. G. Kretchman

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (drilling time, water loss, depth of weathering, etc., if significant)
						Bit & Barrel Bls/Ft
-28.0	0.0					-28.0
-29.0	1.0		SAND - quartz, loose, brown			-29.0 WASHED CASING
			SANDSTONE - hard, gray, shelly, very porous, very permeable, very friable, 80% to 90% sand in a 10% to 20% calcareous matrix	80		NX Dia -31.5
				80		NX Dia -34.0
-34.4	6.4					
			LIMESTONE - hard, gray, fossiliferous, porous, permeable, friable, sandy to very sandy,	75		NX Dia -36.5
				75		NX Dia -39.5
				100		NX Dia -42.0
-42.0	14.0					

ENG FORM 1836 (TRANSLUCENT) PREVIOUS EDITIONS ARE OBSOLETE PROJECT Palm Beach Harbor HOLE NO. CB-9

Lake Worth Inlet Feasibility Study, Attachment E, Geotechnical

X = 812,850 Y = 887,150

HOLE NO. CB-10

DEPARTMENT OF THE ARMY DIVISION Corps of Engineers INSTALLATION Jacksonville, Florida DRILLING LOG	1. PROJECT PALM BEACH HARBOR — SHEET 1 OF 1 2. LOCATION (Coordinates or Station) STA: 73+00 RGE -100 3. DRILLING AGENCY Corps of Engineers
4. HOLE NO. (As shown on drawing title and file No.) CB-10	5. NAME OF DRILLER G. M. Lineberger
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED; DEGREES WITH VERTICAL	7. THICKNESS OF OVER-BURDEN; 8. DEPTH DRILLED INTO ROCK; 9. TOTAL DEPTH OF HOLE 38'
10. SIZE AND TYPE OF BIT 2" I.D. Spoon SEE REMARKS	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW; 12. MANUFACTURER'S DESIGNATION OF DRILL CD-21
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED; UNDISTURBED	14. TOTAL NO. CORE BOXES 2; 15. ELEV. GROUND WATER tidal; 16. DATE HOLE: STARTED 5/1/62, COMPLETED 5/1/62
17. ELEV. TOP OF HOLE -4.8	18. TOTAL CORE RECOVERY FOR BORING (%) 74%; 19. SIGNATURE OF ~~INSPECTOR~~ Geologist R. G. Kretchman

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	Blows/Ft
						Bit & Barrel	
-4.8	0.0					-4.8	
			SANDSTONE, medium hard, gray, very porous, very permeable, very friable, 80% to 90% quartz and calcareous sand, 10% to 20% calcareous matrix, samples look like NX DIA CORES	66		2" I.D. Spoon	24, 25, 88
						-7.8	
				100		2" I.D. Spoon	57, 81
				drive		-9.8	
				100		"2 I.D. Spoon	70, 75, 87
						-12.8	
				80		2" I.D. Spoon	18, 40, 64, 117, 90
-17.8	13.0		LIMESTONE, medium hard, gray fossiliferous, very porous and ~~permeable, friable, 90% shells~~, 10 matrix			-17.8	
-18.8	14.0			55		-18.8 2" I.D. Spoon	45
			LIMESTONE, hard, tan (except gray upper 0.5') fossiliferous dense, solution holes & permeable bottom 1.0', consists of shells and sand in calcareous matrix,	92		-21.3	NX DIA
				92		-23.8	NX DIA
				72		-26.3	NX DIA
				52		-28.8	NX dia
-28.8	24.0						
			SAND, medium to fine, gray, sandstone fragments, (SP)	80	1	2" I.D. Spoon	5, 20, 28, 36, 14
						-33.8	
				78	2	2" I.D. Spoon	6, 4, 8, 14, 9
						-38.8	
-40.8	36.0		LIMESTONE - medium hard, gray fossiliferous, sandy, slightly porous, slightly permeable, friable	75	3	2" I.D. Spoon	43, 12, 70
-42.8	38.0					-42.8	91

300# Hammer with 18" Drop
Used on 2" I.D. Spoon

ENG FORM 1836 (TRANSLUCENT) PREVIOUS EDITIONS ARE OBSOLETE — PROJECT PALM BEACH HARBOR HOLE NO. CB-10

X = 813,915 Y = 887,220

HOLE NO. CB-15

DEPARTMENT OF THE ARMY
DIVISION Corps of Engineers
INSTALLATION Jacksonville, Florida

DRILLING LOG

1. PROJECT: Palm Beach Harbor
SHEET 1 OF 1
2. LOCATION (Coordinates or Station): STA 62+90 RGE 350
3. DRILLING AGENCY: Corps of Engineers
4. HOLE NO. (As shown on drawing title and file No.): CB-15
5. NAME OF DRILLER: G. M. Lineberger
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED; DEGREES WITH VERTICAL
7. THICKNESS OF OVER-BURDEN:
8. DEPTH DRILLED INTO ROCK:
9. TOTAL DEPTH OF HOLE: 12'
10. SIZE AND TYPE OF BIT: See remarks
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLW
12. MANUFACTURER'S DESIGNATION OF DRILL: Sprague & Henwood 40C
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED / UNDISTURBED
14. TOTAL NO. CORE BOXES: 1/2
15. ELEV. GROUND WATER: Tidal
16. DATE HOLE: STARTED 2/10/64 COMPLETED 2/10/64
17. ELEV. TOP OF HOLE: -31.0
18. TOTAL CORE RECOVERY FOR BORING (%): 61
19. ~~SIGNATURE OF INSPECTOR~~: Geologist R. G. Kretchman

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
						Bit & Barrel Bls/Ft
-31.0	0.0					-31.0
-32.0	1.0		SAND, quartz, loose (SP)			-32.0 2"I.D. Spoon Washed
			SANDSTONE, hard, tan, fossiliferous, porous, permeable, very friable, consists of 50% quartz sand and 50% fine shell fragments in a calcareous matrix	34		NX DIAMOND -37.0
				97		" " -40.0
-43.0	12.0			71		" " -43.0
						300# Hammer w/18" Drop Used on 2" I.D. Spoon

ENG FORM 1836 JQ 1 MAR 61 (EM 1110-1-1801) TRANSLUCENT PREVIOUS EDITION MAY BE USED UNTIL EXHAUSTED.

PROJECT Palm Beach Harbor HOLE NO. CB-15

X = 813,665 Y = 887,320

HOLE NO. CB-16

DEPARTMENT OF THE ARMY
DIVISION Corps of Engineers
INSTALLATION Jacksonville, Florida

DRILLING LOG

1. PROJECT: Palm Beach Harbor
SHEET 1 OF 1
2. LOCATION (Coordinates or Station): STA 65+00 RGE 200
3. DRILLING AGENCY: Corps of Engineers
4. HOLE NO. (As shown on drawing title and file No.): CB-16
5. NAME OF DRILLER: G. M. Limeberger
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED — DEGREES WITH VERTICAL
7. THICKNESS OF OVER-BURDEN:
8. DEPTH DRILLED INTO ROCK:
9. TOTAL DEPTH OF HOLE: 12.5'
10. SIZE AND TYPE OF BIT: See remarks
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLW
12. MANUFACTURER'S DESIGNATION OF DRILL: Sprague & Henwood 400
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED / UNDISTURBED
14. TOTAL NO. CORE BOXES: 1/2
15. ELEV. GROUND WATER: Tidal
16. DATE HOLE: STARTED 2/7/64 COMPLETED 2/7/64
17. ELEV. TOP OF HOLE: -30.7
18. TOTAL CORE RECOVERY FOR BORING (%): 75
19. SIGNATURE OF INSPECTOR: R. G. Kretchman, Geologist

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
						Bit & Barrel Bls/Ft
-30.7	0.0					-30.7
			SANDSTONE, hard, gray, porous, permeable, friable, consists of 95% quartz sand with 5% calcareous matrix except 20% shells from -89.0 to -41.0	74		DIAMOND NX -35.7
				80		DIAMOND NX -40.7
-43.2	12.5			60		DIAMOND NX -43.2
						300# Hammer w/18" Drop Used on 2" I.D. Spoon

ENG FORM 1 MAR 61 1836 (EM 1110-1-1801) TRANSLUCENT PREVIOUS EDITION MAY BE USED UNTIL EXHAUSTED.

PROJECT Palm Beach Hbr. HOLE NO. CB-16

X = 813,190 Y = 887,140

HOLE NO. CB-17

DEPARTMENT OF THE ARMY
DIVISION Corps of Engineers
INSTALLATION Jacksonville, Florida

DRILLING LOG

1. PROJECT: Palm Beach Harbor
SHEET 1 OF 1
2. LOCATION (Coordinates or Station): STA 70+10 RGE 220
3. DRILLING AGENCY: Corps of Engineers
4. HOLE NO. (As shown on drawing title and file no.): CB-17
5. NAME OF DRILLER: G. M. Lineberger
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED — DEGREES WITH VERTICAL
7. THICKNESS OF OVER-BURDEN:
8. DEPTH DRILLED INTO ROCK:
9. TOTAL DEPTH OF HOLE: 12'
10. SIZE AND TYPE OF BIT: See remarks
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLW
12. MANUFACTURER'S DESIGNATION OF DRILL: Sprague & Henwood 40C
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED / UNDISTURBED
14. TOTAL NO. CORE BOXES: 1/2
15. ELEV. GROUND WATER: Tidal
16. DATE HOLE: STARTED 2/6/64 COMPLETED 2/6/64
17. ELEV. TOP OF HOLE: -29.3
18. TOTAL CORE RECOVERY FOR BORING (%): 83
19. SIGNATURE OF INSPECTOR: Geologist Robert G. Kretchman

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
						Bit & Barrel Bls/Ft
-29.3	0.0					-29.3
-30.3	1.0		SAND, medium to fine, quartz, gray, (SP)		1*	-30.3 2" I.D. Spoon washed
			SANDSTONE, hard, gray to tan, porous, permeable, friable, consists of approximately 75% quartz sand, 20% shell fragments and 5% calcareous matrix	80		NX DIAMOND
						-35.3
				90		" "
						-38.3
				77		" "
-41.3	12.0					-41.3
			*Wash sample			300# Hammer w/18" Drop Used on 2" I.D. Spoon

ENG FORM 1 MAR 61 1836 (EM 1110-1-1801) TRANSLUCENT PREVIOUS EDITION MAY BE USED UNTIL EXHAUSTED.

PROJECT Palm Beach Hbr. HOLE NO. CB-17

X = 812,400 Y = 886,775

HOLE NO. CB-18

DEPARTMENT OF THE ARMY
DIVISION Corps of Engineers
INSTALLATION Jacksonville, Florida

DRILLING LOG

1. PROJECT: Palm Beach Harbor
SHEET 1 OF 1
2. LOCATION (Coordinates or Station): STA 78+98 RGE 290
3. DRILLING AGENCY: Corps of Engineers
4. HOLE NO. (As shown on drawing title and file No.): CB-18
5. NAME OF DRILLER: G. Lineberger
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED; DEGREES WITH VERTICAL
7. THICKNESS OF OVER-BURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE: 12.1
10. SIZE AND TYPE OF BIT: See remarks
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLW
12. MANUFACTURER'S DESIGNATION OF DRILL: Sprague & Henwood 40C
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED; UNDISTURBED
14. TOTAL NO. CORE BOXES: 1/2
15. ELEV. GROUND WATER: Tidal
16. DATE HOLE: STARTED 2/4/64; COMPLETED 2/4/64
17. ELEV. TOP OF HOLE: -30.8
18. TOTAL CORE RECOVERY FOR BORING (%): 73
19. ~~SIGNATURE OF INSPECTOR~~: Geologist R. G. Kretchman

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	Bls/Ft
						Bit & Barrel	
-30.8	0.0					-30.8	
			SAND, medium to fine, quartz, gray, compact (SP)		1*	2" I.D. Spoon -32.9	Washed Casing
-35.4	4.6			60	2	" "	10 5 17
-38.2	7.4		LIMESTONE, medium hard, gray, fossiliferous, very sandy, shelly, porous, permeable			-37.9	31 32
			SAND, medium to fine, quartz, gray, shelly, compact (SP)	75	3	" "	10 19 19 5
-42.9	12.1					-42.9	2

*Wash sample

300# Hammer w/18" Drop
Used on 2" I.D. Spoon

ENG FORM 1836 1 MAR 65 (EM 1110-1-1801) PREVIOUS EDITION MAY BE USED TRANSLUCENT UNTIL EXHAUSTED

PROJECT Palm Beach Hbr. HOLE NO. CB-18

X=812,185 Y=886,800

HOLE NO. CB-19

DEPARTMENT OF THE ARMY
DIVISION Corps of Engineers
INSTALLATION Jacksonville, Florida

DRILLING LOG

1. PROJECT: Palm Beach Harbor
SHEET 1 OF 1
2. LOCATION (Coordinates or Station): STA 80+83 RGE 170
3. DRILLING AGENCY: Corps of Engineers
4. HOLE NO. (As shown on drawing title and file No.): CB-19
5. NAME OF DRILLER: C. R. Mason
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED; DEGREES WITH VERTICAL
7. THICKNESS OF OVER-BURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE: 11.5'
10. SIZE AND TYPE OF BIT: See remarks
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLW
12. MANUFACTURER'S DESIGNATION OF DRILL: Sprague & Henwood 40C
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED; UNDISTURBED
14. TOTAL NO. CORE BOXES: 1/2
15. ELEV. GROUND WATER: Tidal
16. DATE HOLE: STARTED 1/31/64; COMPLETED 1/31/64
17. ELEV. TOP OF HOLE: -29.3
18. TOTAL CORE RECOVERY FOR BORING (%): 71
19. SIGNATURE OF INSPECTOR: Geologist R. G. Kretchman

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)
-29.3	0.0					Bit & Barrel Bls/Ft -29.3
			SAND, medium to fine quartz, gray, compact, slightly shelly (SP)		1*	2" I.D. Spoon Washed -31.3
-34.3	5.0		LIMESTONE, medium hard, gray, 90% shell fragments with calcareous matrix	80	2	" " 5 13 11 65 111
-35.8	6.5					-35.8
			LIMESTONE, hard, gray, porous, friable, consists of 95% shell fragments in a calcareous matrix	50		NX DIAMOND
-40.8	11.5					-40.8

*wash sample

300# Hammer w/18" Drop
Used on 2" I.D. Spoon

ENG FORM 1836 1 MAR 61 (EM 1110-1-1801) TRANSLUCENT PREVIOUS EDITION MAY BE USED UNTIL EXHAUSTED. PROJECT Palm Beach Hbr. HOLE NO. CB-19

X = 811,750 Y = 886,595

HOLE NO. CB-20

DEPARTMENT OF THE ARMY
DIVISION Corps of Engineers
INSTALLATION Jacksonville, Florida

DRILLING LOG

1. PROJECT: Palm Beach Harbor
SHEET 1 OF 1
2. LOCATION (Coordinates or Station): STA 85+70 RGE 170
3. DRILLING AGENCY: Corps of Engineers
4. HOLE NO. (As shown on drawing title and file No.): CB-20
5. NAME OF DRILLER: C. R. Mason
6. DIRECTION OF HOLE: ☑ VERTICAL ☐ INCLINED; DEGREES WITH VERTICAL
7. THICKNESS OF OVER-BURDEN
8. DEPTH DRILLED INTO ROCK
9. TOTAL DEPTH OF HOLE: 10'
10. SIZE AND TYPE OF BIT: See remarks
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLW
12. MANUFACTURER'S DESIGNATION OF DRILL: Sprague & Henwood 40C
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED; UNDISTURBED
14. TOTAL NO. CORE BOXES: 1/2
15. ELEV. GROUND WATER: Tidal
16. DATE HOLE: STARTED 1/29/64; COMPLETED 1/29/64
17. ELEV. TOP OF HOLE: -30.8
18. TOTAL CORE RECOVERY FOR BORING (%): 80
19. SIGNATURE OF INSPECTOR: Geologist R. G. Kretchman

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant)	
						Bit & Barrel	Bls/Ft
-30.8	0.0					-30.8	
-31.8	1.0		SAND, fine, quartz, gray (SP)		1		5
							57
			SANDSTONE, medium hard, gray, fossiliferous, porous, permeable, friable, calcareous matrix	80		2" I.D. Spoon	16
-35.0	4.2						35
					2	-35.8	79
							62
			SAND, fine to coarse, 20% quartz, 80% calcareous (sand-sized shell fragments), compact, gray (SP)	80	3	" "	70
							41
							30
-40.8	10.0					-40.8	26
						300# Hammer w/18" Drop Used on 2" I.D. Spoon	

ENG FORM 1836 1 MAR 61 (EM 1110-1-1801) TRANSLUCENT PREVIOUS EDITION MAY BE USED UNTIL EXHAUSTED. PROJECT Palm Beach Hbr. HOLE NO. CB-20

X = 812,000 Y = 886,520

HOLE NO. CB-21

DIVISION: DEPARTMENT OF THE ARMY, Corps of Engineers	1. PROJECT: Palm Beach Harbor	SHEET 1 OF 1	
INSTALLATION: Jacksonville, Florida	2. LOCATION (Coordinates or Station): STA 83+70 RGE 350		
DRILLING LOG	3. DRILLING AGENCY: Corps of Engineers		
4. HOLE NO. (As shown on drawing title and file No.): CB-21	5. NAME OF DRILLER: C. R. Mason		
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED; DEGREES WITH VERTICAL	7. THICKNESS OF OVER-BURDEN	8. DEPTH DRILLED INTO ROCK	9. TOTAL DEPTH OF HOLE 22'
10. SIZE AND TYPE OF BIT: See remarks	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLW	12. MANUFACTURER'S DESIGNATION OF DRILL: Sprague & Henwood 40C	
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED / UNDISTURBED	14. TOTAL NO. CORE BOXES: 1/2	15. ELEV. GROUND WATER: Tidal	16. DATE HOLE: STARTED 1/28/64 COMPLETED 1/28/64
17. ELEV. TOP OF HOLE: -19.4	18. TOTAL CORE RECOVERY FOR BORING (%): 73	19. SIGNATURE OF INSPECTOR: R. G. Kretchman, Geologist	

ELEVATION	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (description)	% CORE RECOVERY	BOX OR SAMPLE NO.	REMARKS (drilling time, water loss, depth of weathering, etc., if significant)	Bls/Ft
-19.4	0.0					Bit & Barrel -19.4	
-21.4	2.0		PEAT, tan to brown, very compact	100	1	2" I.D. Spoon -21.4	2 2
			SAND, medium to fine, quartz, light gray, compact, (SP)	80	2	" " -26.4	5 5 15 15 11
				65	3	" " -31.4	12 12 15 17 17
				70	4	" " -36.4	11 27 65 22 22
-40.0	20.6		*LIMESTONE, medium hard,	70	5	" " -41.4	14 16 17 44 67
-41.4	22.0						

*Description of material between -40.0 & -41.4 mlw based on behavior of driver hammer; no sample recovery.

300# Hammer w/18" Drop Used on 2" I.D. Spoon

Boring Designation VB-LWI2012-09

DRILLING LOG	DIVISION South Atlantic	INSTALLATION	SHEET 1 OF 1 SHEETS

1. PROJECT	Lake Worth Inlet Snell Vibracoring 2012 Vibracore Borings
2. BORING DESIGNATION	VB-LWI2012-09
LOCATION COORDINATES	X = 969,657 Y = 887,693
3. DRILLING AGENCY	Corps of Engineers - Willmington
CONTRACTOR FILE NO.	
4. NAME OF DRILLER	
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	2.0 Ft.
9. SIZE AND TYPE OF BIT	See Remarks
10. COORDINATE SYSTEM/DATUM	State Plane, FLN (U.S. Ft.)
HORIZONTAL	NAD83
VERTICAL	MLLW
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 1 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	
15. DATE BORING	STARTED 06-13-12 / COMPLETED 06-13-12
16. ELEVATION TOP OF BORING	-22.3 Ft.
17. TOTAL RECOVERY FOR BORING	100 %
18. SIGNATURE AND TITLE OF INSPECTOR	Barbara Nist, Geologist

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
-22.3	0.0						-22.3		
		Slightly Weathered	LIMESTONE, soft, slightly weathered, fragmented, 2.5YR 6/3 light reddish brown	NR			Vibracore -23.3		
					1				
-24.3	2.0						-24.3		
			BORING TERMINATED IN REFUSAL				Abbreviations: NR = Not Recorded.		

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. 2 ft. ft. penetration

4. Laboratory Testing Results

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION
1	1.0/1.5	SP*

*Lab visual classification based on gradation curve. No Atterberg limits.

0 5 10 15

SAJ FORM 1836
JUN 02

Boring Designation VB-LWI2012-10

DRILLING LOG	DIVISION South Atlantic	INSTALLATION	SHEET 1 OF 1 SHEETS

1. PROJECT	Lake Worth Inlet Snell Vibracoring 2012 Vibracore Borings
2. BORING DESIGNATION	VB-LWI2012-10
LOCATION COORDINATES	X = 968,825 Y = 887,410
3. DRILLING AGENCY	Corps of Engineers - Willmington
CONTRACTOR FILE NO.	
4. NAME OF DRILLER	
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	3.5 Ft.
9. SIZE AND TYPE OF BIT	See Remarks
10. COORDINATE SYSTEM/DATUM	State Plane, FLN (U.S. Ft.)
HORIZONTAL	NAD83
VERTICAL	MLLW
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 1 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	
15. DATE BORING	STARTED 06-13-12 / COMPLETED 06-13-12
16. ELEVATION TOP OF BORING	-12.7 Ft.
17. TOTAL RECOVERY FOR BORING	100 %
18. SIGNATURE AND TITLE OF INSPECTOR	Barbara Nist, Geologist

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
-12.7	0.0						-12.7		
			SAND, silty, low plasticity, mostly fine to medium-grained sand-sized quartz, little silt, little fine to coarse gravel-sized shell, weak reaction with HCl, moist, N 3/ very dark gray (SM)	NR			Vibracore -13.7		
					1				
-14.7	2.0								
		Mod. Wea.	SANDSTONE, soft, moderately weathered, fragmented up to 2", few sand to gravel-sized shell, 2.5Y 4/1 dark gray						
-16.2	3.5						-16.2		
			BORING TERMINATED IN REFUSAL				Abbreviations: NR = Not Recorded.		

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. 5 ft. ft. penetration

4. Laboratory Testing Results

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION
1	1.0/1.5	SM*

*Lab visual classification based on gradation curve. No Atterberg limits.

0 5 10 15

SAJ FORM 1836
JUN 02

Boring Designation VB-LWI2012-11

DRILLING LOG	DIVISION South Atlantic	INSTALLATION	SHEET 1 OF 1 SHEETS

1. PROJECT	Lake Worth Inlet Snell Vibracoring 2012 Vibracore Borings
2. BORING DESIGNATION	VB-LWI2012-11
LOCATION COORDINATES	X = 968,517 Y = 886,930
3. DRILLING AGENCY	Corps of Engineers - Willmington
CONTRACTOR FILE NO.	
4. NAME OF DRILLER	
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	2.8 Ft.
9. SIZE AND TYPE OF BIT	See Remarks
10. COORDINATE SYSTEM/DATUM	State Plane, FLN (U.S. Ft.)
HORIZONTAL	NAD83
VERTICAL	MLLW
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 0 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	
15. DATE BORING	STARTED 06-13-12 / COMPLETED 06-13-12
16. ELEVATION TOP OF BORING	-38.6 Ft.
17. TOTAL RECOVERY FOR BORING	100 %
18. SIGNATURE AND TITLE OF INSPECTOR	Barbara Nist, Geologist

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
-38.6	0.0						-38.6		
-40.4	1.8		SAND, poorly-graded, mostly fine-grained sand-sized quartz, little shell, weak reaction with HCl, moist, 5Y 6/1 gray (SP)	NR			Vibracore		
-41.4	2.8	MW	LIMESTONE, moderately hard, moderately weathered, fragmented, 5Y 6/1 gray				-41.4		
			BORING TERMINATED IN REFUSAL				Abbreviations: NR = Not Recorded.		

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. 2.8 ft. ft. penetration

0 5 10 15

SAJ FORM 1836
JUN 02

Boring Designation VB-LWI2012-12

DRILLING LOG	DIVISION South Atlantic	INSTALLATION	SHEET 1 OF 2 SHEETS

1. PROJECT	Lake Worth Inlet Snell Vibracoring 2012 Vibracore Borings
2. BORING DESIGNATION	VB-LWI2012-12
LOCATION COORDINATES	X = 967,956 Y = 886,965
3. DRILLING AGENCY	Corps of Engineers - Willmington
CONTRACTOR FILE NO.	
4. NAME OF DRILLER	
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	19.0 Ft.
9. SIZE AND TYPE OF BIT	See Remarks
10. COORDINATE SYSTEM/DATUM	State Plane, FLN (U.S. Ft.)
HORIZONTAL	NAD83
VERTICAL	MLLW
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 4 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	
15. DATE BORING	STARTED 06-13-12 / COMPLETED 06-13-12
16. ELEVATION TOP OF BORING	-38.5 Ft.
17. TOTAL RECOVERY FOR BORING	95 %
18. SIGNATURE AND TITLE OF INSPECTOR	Barbara Nist, Geologist

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
-38.5	0.0						-38.5		
			SAND, poorly-graded, mostly fine to coarse-grained sand-sized shell, little fine-grained sand-sized quartz, little silt, strong reaction with HCl, wet, weak cementation, 5Y 7/3 pale yellow (SP)	NR			Vibracore		
							-40.5		
					1 -post		-40.5		
-42.1	3.6								
-42.3	3.8	M	LIMESTONE, hard, moderately weathered, fragmented, 5Y 6/1 gray						
			SAND, silty, mostly fine to coarse-grained sand-sized shell, little silt, little fine to medium-grained sand-sized quartz, strong reaction with HCl, moist, weak cementation, 2.5Y 7/2 light gray (SM)				-43.5		
					2				
-47.0	8.5								
			SAND, poorly-graded with silt, mostly fine to coarse-grained sand-sized shell, little fine to medium-grained sand-sized quartz, few silt, 2.5Y 7/2 light gray (SP-SM) At El. -47.5 Ft., some fine to medium-grained sand-sized shell, little fine to medium-grained sand-sized limestone				-47.5		
					3				
-51.9	13.4								
		Mod. Weathered	LIMESTONE, hard, moderately weathered, fragmented up to 3", interbedded layers of beachrock, 2.5Y 7/4 pale yellow						

0 5 10 15

SAJ FORM 1836
JUN 02

(Continued)

DRILLING LOG (Cont. Sheet)	INSTALLATION	SHEET 2 OF 2 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
Lake Worth Inlet Snell Vibracoring 2012	State Plane, FLN (U.S. Ft.)	NAD83	MLLW

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 967,956 Y = 886,965	-38.5 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
-55.3	16.8	Mod. Weathered	At El. -53.5 Ft., 5Y 7/1 light gray						
-57.2	18.7		SAND, poorly-graded, mostly fine-grained sand-sized quartz, few fine to coarse-grained sand-sized shell, weak reaction with HCl, moist, 5Y 7/1 light gray (SP) At El. -56.1 Ft., few limestone fragments						
-57.5	19.0	M	LIMESTONE, hard, moderately weathered, fragmented up to 2", interbedded layers of beachrock				-57.5		

Abbreviations:
NR = Not Recorded.

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. 20 ft. ft. penetration

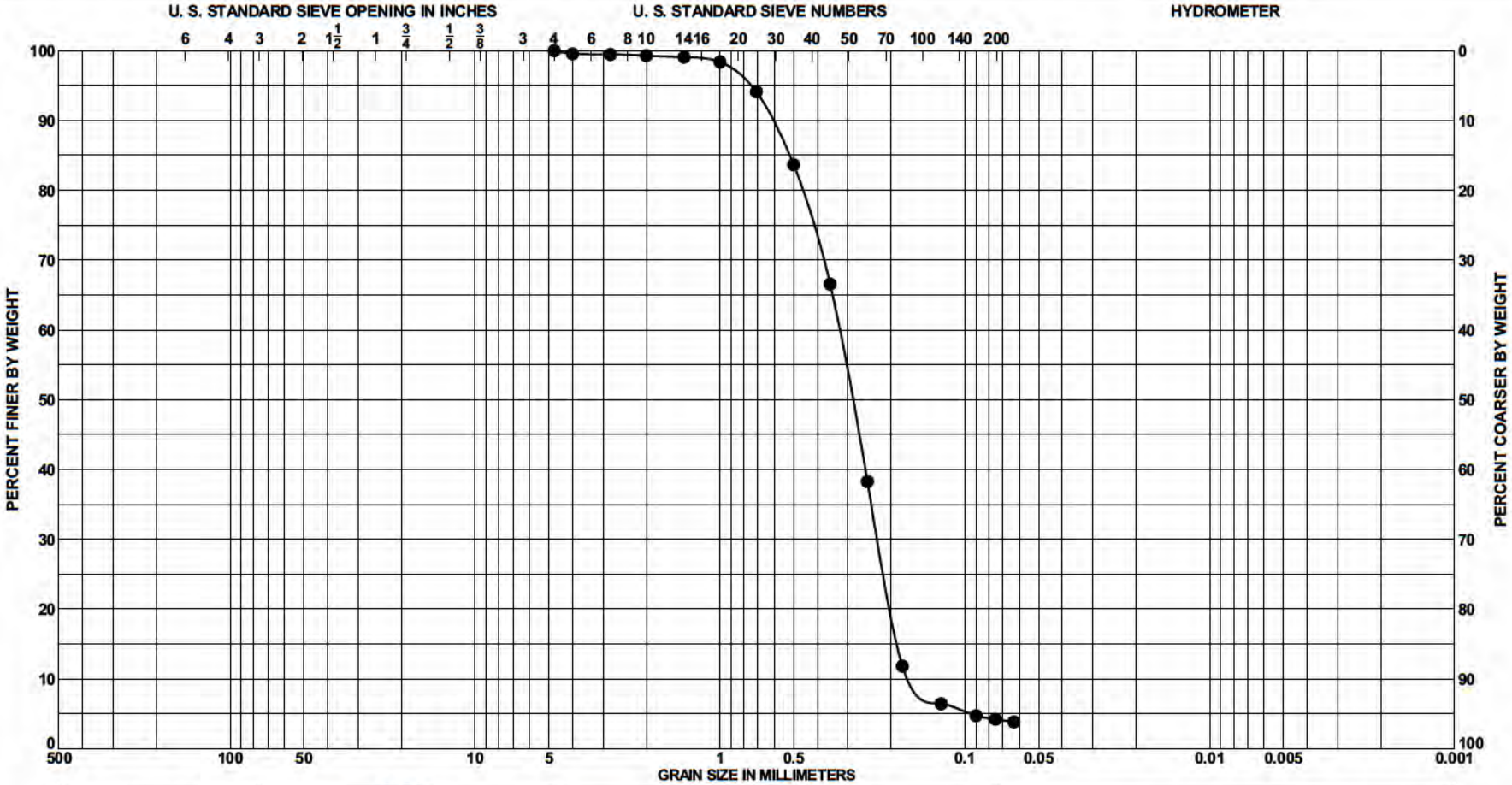
4. Laboratory Testing Results

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION
1	2.0/2.5	SP*
1-post	2.0/2.5	SP*
2	5.0/5.5	SM*
3	9.0/9.5	SP-SM*

*Lab visual classification based on gradation curve. No Atterberg limits.

15
20
25
30
35

SAJ FORM 1836-A
JUN 02

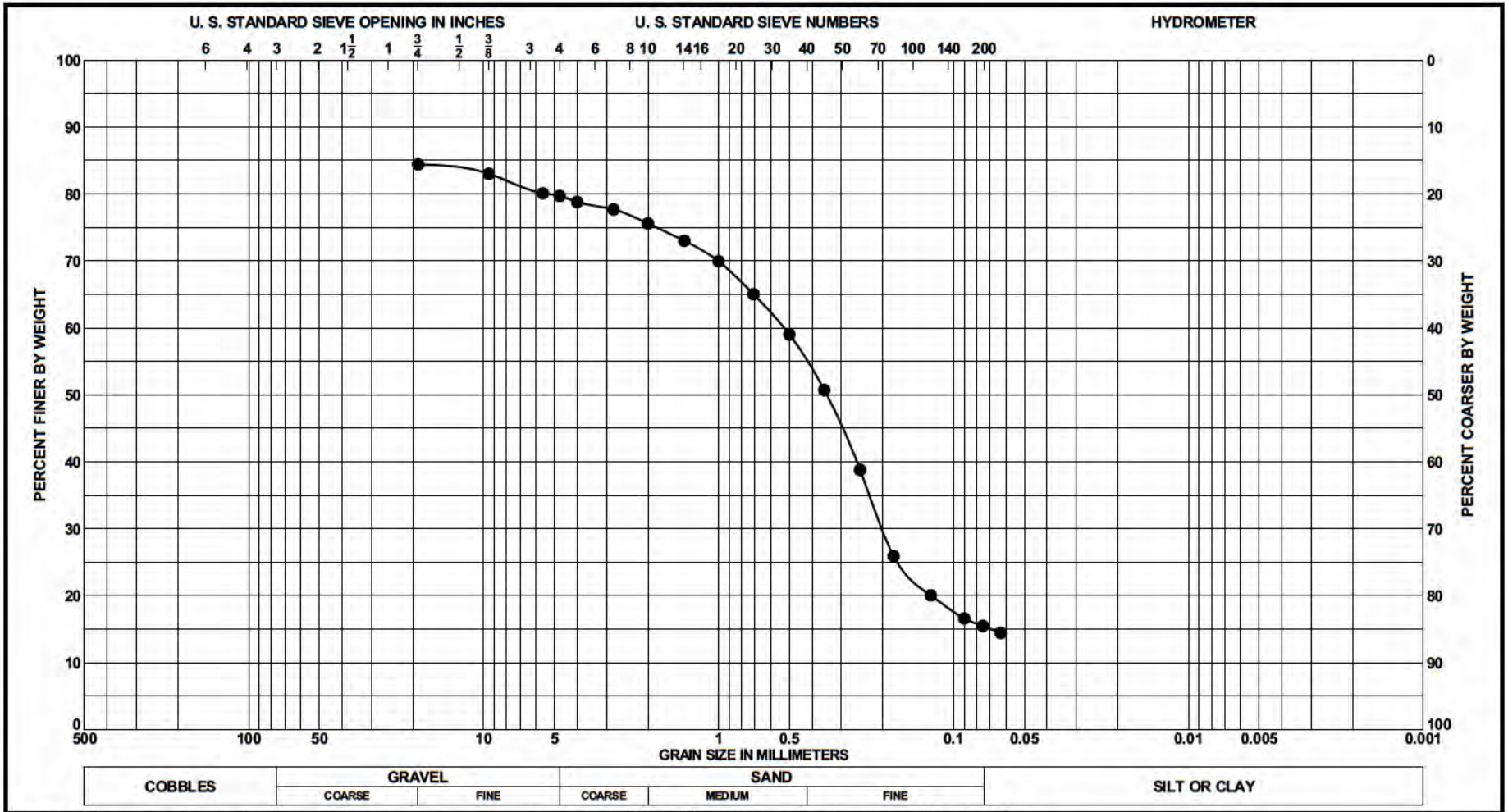


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 1	1.0 to 1.5 Ft.	SAND, poorly-graded, mostly fine-grained sand-sized quartz, little fine to medium-grained sand-sized limestone, few silt, trace fine to medium-grained sand-sized shell, light yellowi	2.5Y 6/3	2							

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-09
BORING ELEV.	-22.3 Ft., MLLW
DATE	9/20/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02

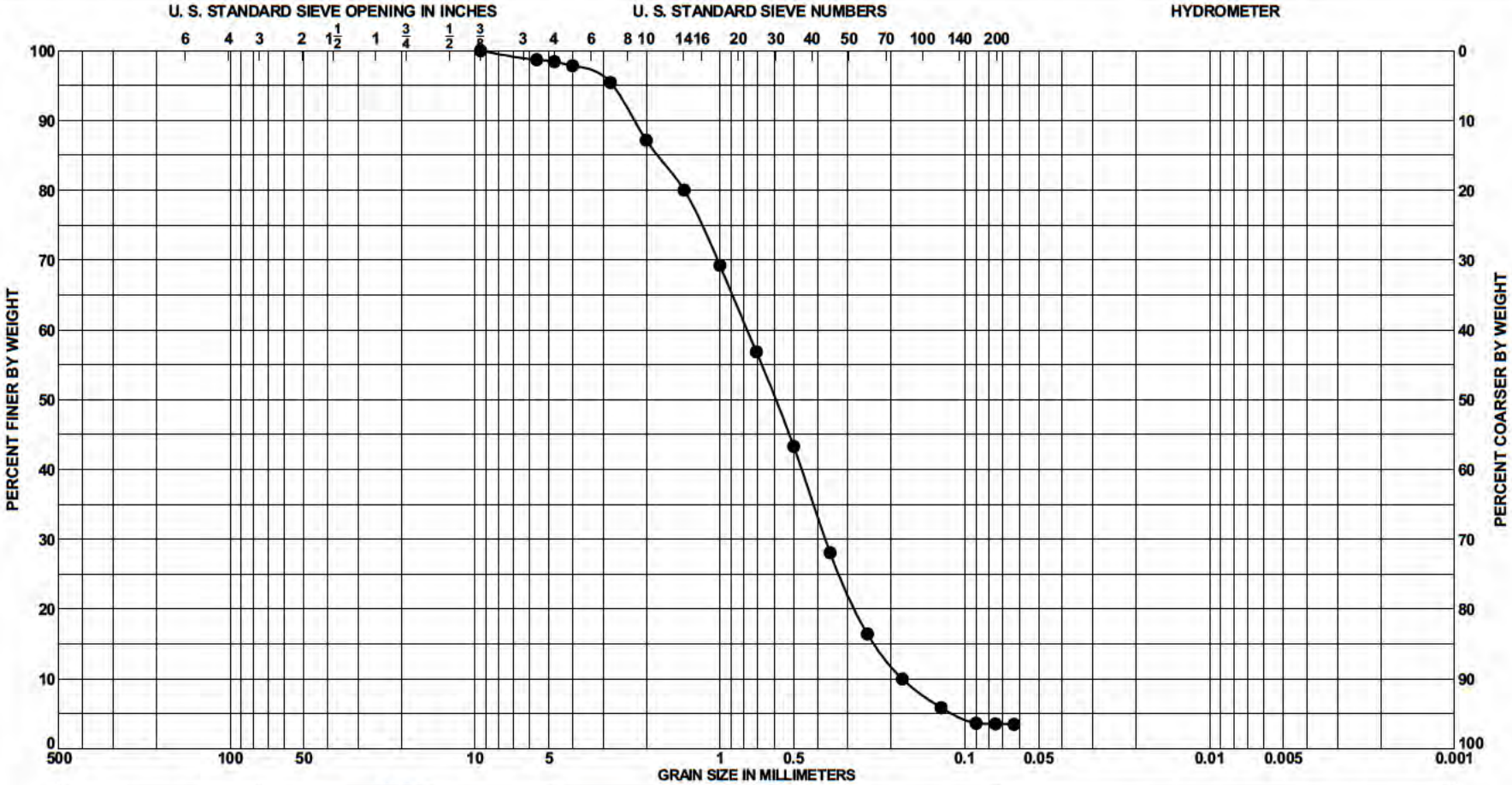


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 1	1.0 to 1.5 Ft.	SAND, silty, some fine-grained	N 3/	6							
		sand-sized quartz, some sand to									
		gravel-sized limestone, little silt, few									
		fine to medium-grained sand-sized									
		shell, very dark gray (SM)									

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-10
BORING ELEV.	-12.7 Ft., MLLW
DATE	9/20/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02

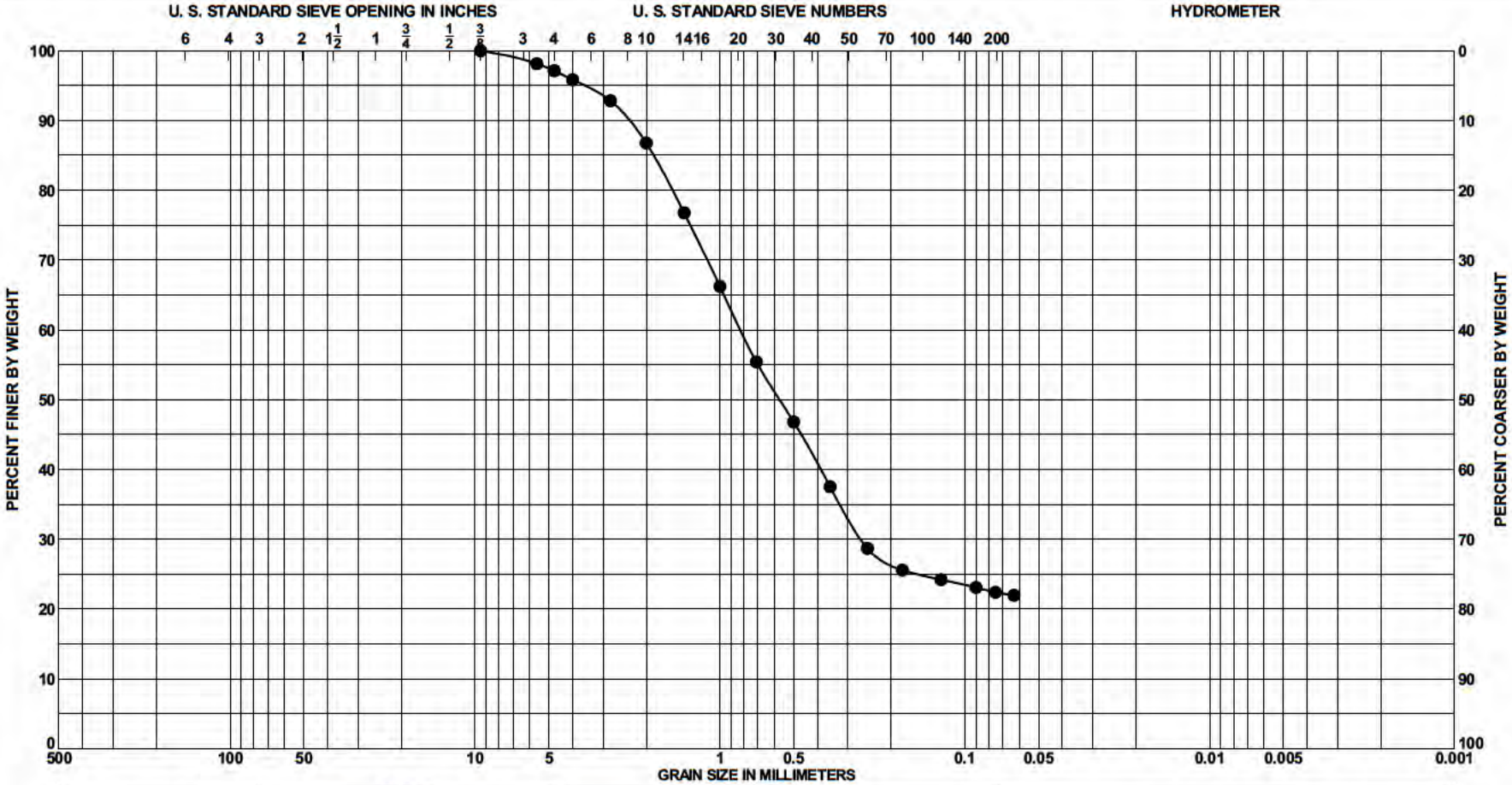


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 1	2.0 to 2.5 Ft.	SAND, poorly-graded, some fine to coarse-grained sand-sized shell, some fine-grained sand-sized quartz, little fine to medium-grained sand-sized limestone, pale yellow	5Y 7/3	47	65						

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-12
BORING ELEV.	-38.5 Ft., MLLW
DATE	9/20/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02

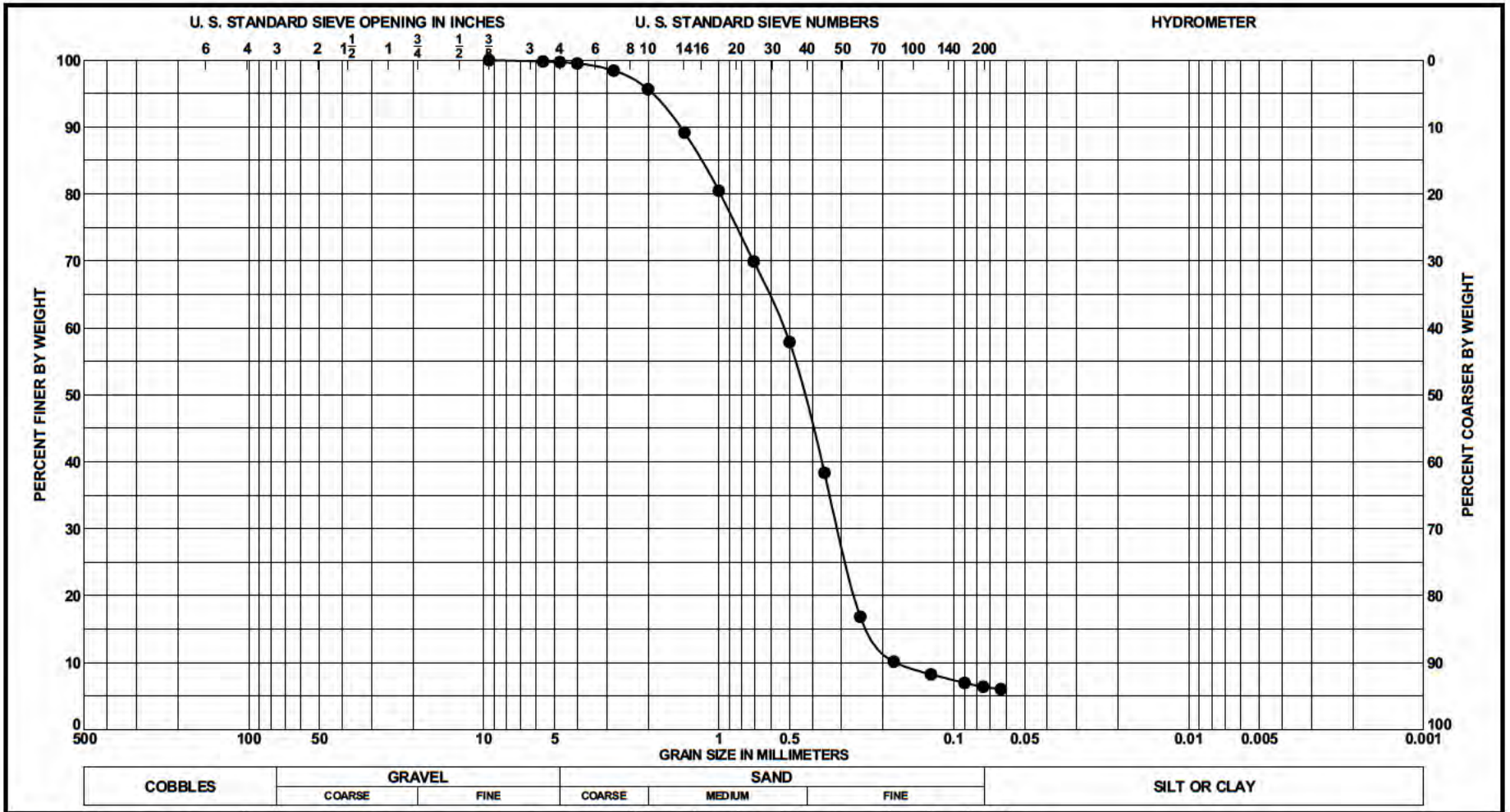


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 2	5.0 to 5.5 Ft.	SAND, silty, mostly fine to coarse-grained sand-sized shell, little silt, little fine to medium-grained sand-sized quartz, light gray (SM)	2.5Y 7/2	62							

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-12
BORING ELEV.	-38.5 Ft., MLLW
DATE	9/20/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02



Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 3	9.0 to 9.5 Ft.	SAND, poorly graded with silt, some fine to medium-grained sand-sized shell, little fine to medium-grained sand-sized quartz, little fine to medium-grained sand-sized limestone, fe (SP-SM)	2.5Y 7/2	40							

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-12
BORING ELEV.	-38.5 Ft., MLLW
DATE	9/20/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02

Boring Logs and Laboratory Results

Turning Basin

Area G

Area D

X = 810,135 Y = 885,480

Hole No. CB-24

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1 SHEETS

1. PROJECT Palm Beach Harbor	10. SIZE AND TYPE OF BIT see remarks
2. LOCATION (Coordinates or Station) Sta: 13+75 Rge: 1075	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL Joy
4. HOLE NO. (As shown on drawing title and file number) CB-24	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: —
5. NAME OF DRILLER B. J. Sealey	14. TOTAL NUMBER CORE BOXES 1/2
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER Tidal
	16. DATE HOLE — STARTED 11/21/65 — COMPLETED 11/21/65
7. THICKNESS OF OVERBURDEN	17. ELEVATION TOP OF HOLE -13.1
8. DEPTH DRILLED INTO ROCK	18. TOTAL CORE RECOVERY FOR BORING 58 %
9. TOTAL DEPTH OF HOLE 28.0'	19. ~~TOTAL NO. OF CORE BOXES~~ Geologist J. S. Gentile

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	Bls/ft.
						Bit & Barrel	
-13.1	0.0					-13.1	
-15.8	2.7		SAND, fine to medium, quartz, gray (SP)		1	2" I.D. spoon	Settled ↓
			LIMESTONE, medium hard, very porous, very sandy in composition, thin bedded, beds loose sand, light gray, slightly fossiliferous	86			19
							11
						-18.1	69
-19.5	6.4					" "	43
			SAND, fine to medium, quartz, riddled with thin beds limestone and calcareous sandstone, light gray (SP)	32	2		20
							8
							11
-23.2	10.1					-23.1	9
-25.1	12.0		LIMESTONE, medium hard, very porous, very sandy in composition, thin bedded, beds loose sand, light gray, slightly fossiliferous			" "	32
							33
				56			13
			SAND, fine to medium, quartz, riddled with thin beds limestone and calcareous sandstone light gray (SP)		3		12
						-28.1	12
-29.9	16.8				4	" "	19
-30.8	17.7		LIMESTONE, hard, very porous, sandy, fossiliferous, light gray	52			42
							86
					5		40
						-33.1	62
			SAND, fine to medium, quartz, thin beds limestone and calcareous sandstone, light gray, (SP)			" "	10
				64	6		17
							26
							35
						-38.1	45
						" "	36
-40.2	-27.1			60			35
-41.1	28.0		LIMESTONE, hard, porous, sandy, fossiliferous, light gray,			-41.1	75
						300# hammer with 18" drop used on 2" I.D. spoon	

3

15

ENG FORM 1836 PREVIOUS EDITIONS MAY BE USED (EM 1110-1-1801) PROJECT HOLE NO.

Lake Worth Inlet Feasibility Study, Geotechnical Appendix C Geotechnical

X=809,730 Y=886,585

Hole No. CB-26

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1 SHEETS

1. PROJECT: Palm Beach Harbor	10. SIZE AND TYPE OF BIT: see remarks
2. LOCATION (Coordinates or Station): Sta: 18+00 Rge: 25.0	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLW
3. DRILLING AGENCY: Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL: JOY
4. HOLE NO. (As shown on drawing title and file number): CB-26	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED: UNDISTURBED:
5. NAME OF DRILLER: L.D.Johnson	14. TOTAL NUMBER CORE BOXES: 1/2
6. DIRECTION OF HOLE: [X] VERTICAL [ ] INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: TIDAL
	16. DATE HOLE: STARTED 10/15/65 COMPLETED 10/15/65
7. THICKNESS OF OVERBURDEN	17. ELEVATION TOP OF HOLE: -21.0
8. DEPTH DRILLED INTO ROCK	18. TOTAL CORE RECOVERY FOR BORING: 43 %
9. TOTAL DEPTH OF HOLE: 20.0'	19. ~~SIGNATURE OF INSPECTOR~~ Geologist: J.S.Gentile

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	~~SIZE~~ SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
						BIT & BARREL Bls/ft.
-21.0	0.0					-21.0
			SAND, fine to medium quartz, gray, (SP) interspersed with thin beds medium hard limestone, light gray from -25.0 to -29.8	18	1	2" I.D.Spoon SETTLEI ↓ 2 2 7
						-26.0
				50	2	" " 6 5 3 8
-29.8	8.8					
-31.4	10.4		LIMESTONE, medium hard, thin bedded, sandy, light gray slightly fossiliferous.			-31.0 25
			SAND, fine to medium quartz, light gray, riddled with thin beds limestone and calcareous sandstone, 30 percent rock from -34.0 to -37.0	38	3	" " 10 4 10 54
						-36.0 46
-39.3	16.3				4	" " 38 164 192 212
			LIMESTONE, hard, very porous, very fossiliferous, sandy, thin bedded, light gray	66		
-40.3	19.3					
-41.0	20.0		SAND, fine to medium quartz (SP)			-41.0 55
						300# Hammer with 18" drop used on 2" I.D. spoon.

3

Lake Worth Inlet Feasibility Study, Attachment A, Geotechnical 225 of 304

X=809,860 Y=885,880

Hole No. CB-27

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1 SHEETS

1. PROJECT Palm Beach Harbor	10. SIZE AND TYPE OF BIT See remarks
2. LOCATION (Coordinates or Station) Sta:16+50 Rge: 675	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL Joy
4. HOLE NO. (As shown on drawing title and file number) CB-27	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: —
5. NAME OF DRILLER B. J. Sealey.	14. TOTAL NUMBER CORE BOXES 1/2
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER Tidal
	16. DATE HOLE — STARTED 10/20/65 — COMPLETED 10/20/65
7. THICKNESS OF OVERBURDEN	17. ELEVATION TOP OF HOLE -13.2
8. DEPTH DRILLED INTO ROCK	18. TOTAL CORE RECOVERY FOR BORING 56%
9. TOTAL DEPTH OF HOLE 28.0'	19. ~~SIGNATURE OF REPRESENTATIVE~~ Geologist J. S. Gentile

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
						Bit & Barrel Bls/ft.
-13.2	0.0					-13.2
			SAND, fine to medium, quartz and shelly, gray (SP)	74	1	2" I.D. spoon Settled 1 5 11 12
			Tan, slightly silty from -19.2 to-21.4			-18.2
-21.4	8.2			60	2	" " 10 8 4 33
-23.2	10.0		LIMESTONE, medium hard, porous, thin bedded, sandy in composition, light gray, fossiliferous			-23.2 28
			SAND, fine to medium, quartz, slightly silty, loose, tan (SP)	22	3	" " Pushed 1 3
			Light Gray, well compacted, riddled with thin beds of limestone and calcareous sandstone, from -29.4 to 41.2 (approximately 30% to 40% rock in this formation)			-28.2 3
				58	4	" " 3 14 29 42
						-33.2 38
				54	5	" " 5 22 38 33
						-38.2 29
-41.2	28.0			66	6	" " 32 40
						-41.2 38
						300# hammer with 18" drop used on 2" I.D. spoon

3

1/2 ENG FORM 1836 2 (PREVIOUS EDITIONS ARE OBSOLETE) (FEB 1961) PROJECT HOLE NO.

Lake Worth Lagoon Feasibility Study - Attachment C - Geotechnical

X=810,200 Y=886,540

Hole No. CB-28

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1 SHEETS

1. PROJECT PALM BEACH HARBOR	10. SIZE AND TYPE OF BIT SEE REMARKS
2. LOCATION (Coordinates or Station) STA: 13+25 Rge: 0.0	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL JOY
4. HOLE NO. (As shown on drawing title and file number) CB-28	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED:
5. NAME OF DRILLER L.D.Johnson	14. TOTAL NUMBER CORE BOXES 1/2
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER TIDAL
	16. DATE HOLE — STARTED 10/13/65 — COMPLETED 10/13/65
7. THICKNESS OF OVERBURDEN	17. ELEVATION TOP OF HOLE -29.1
8. DEPTH DRILLED INTO ROCK	18. TOTAL CORE RECOVERY FOR BORING 59 %
9. TOTAL DEPTH OF HOLE 12.0'	19. ~~SIGNATURE OF INSPECTOR~~ Geologist J.S.Gentile

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
-29.1	0.0					BIT & BARREL Bls/ft. -29.1
-32.9	3.8		SAND, fine to medium, quartz, slightly silty, gray, (SP)	38	1	2" I.D.Spoon SETTLED 2 7 13
-37.1	8.0		LIMESTONE, calcareous sandstone, medium hard, porous, sandy composition, thin bedded, fossiliferous, solution holes, Bed hard limestone from -37.1 to -38.1	44		-34.1 " " 17 25 30 45 80 -39.1 57
-38.1	9.0					
-38.8	9.7					
-41.1	12.0		SAND, fine to medium, quartz, tight, clean, light gray, thin lenses limestone (SP)	54		" " 36 -41.1 35

300# hammer with 18" drop used on 2" I.D. spoon.

3

ENG FORM 1836 PROJECT HOLE NO.

X = 810,180 Y = 886,050

Hole No. CB-29

DRILLING LOG	DIVISION SOUTH ATLANTIC	INSTALLATION Jacksonville District	SHEET 1 OF 1 SHEETS

1. PROJECT PALM BEACH HARBOR	10. SIZE AND TYPE OF BIT See remarks
2. LOCATION (Coordinates or Station) STA 13+25 Rge: 500	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL JOY
4. HOLE NO. (As shown on drawing title and file number) CB-29	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED:
5. NAME OF DRILLER L.D.Johnson	14. TOTAL NUMBER CORE BOXES 1/2
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER TIDAL
	16. DATE HOLE — STARTED 10/12/65 — COMPLETED 10/12/65
7. THICKNESS OF OVERBURDEN	17. ELEVATION TOP OF HOLE -29.0
8. DEPTH DRILLED INTO ROCK	18. TOTAL CORE RECOVERY FOR BORING 57 %
9. TOTAL DEPTH OF HOLE 42.0'	19. ~~MANUFACTURER'S DESIGNATION OF DRILL~~ Geologist J.S.Gentile

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	~~NUMBER~~ SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
-29.0	0.0					BIT & BARREL Bls/ft. -29.0	
-30.7	1.7		SAND, fine to medium, quartz, slightly silty, dark gray (SP)		1	2" I.D.Spoon	6
			LIMESTONE, medium hard, very porous, thin bedded, sandy, composition, lenses loose sand, light gray, slightly fossiliferous	56			9
							20
							34
-33.4	4.4					-34.0	42
			SAND, fine, quartz, very tight, clean, few isolated lenses calcareous sandstone, (SP)			" "	30
							74
				54	2		77
							70
-39.7	10.7					-39.0	55
				60		" "	36
-41.0	12.0		LIMESTONE, hard, porous, very sandy, thin bedded fossiliferous, light gray, lenses loose sand.			-41.0	95
						300# hammer with 18" drop used on 2" I.D. spoon.	

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X = 810,180 Y = 885,210

Hole No. CB-30

DRILLING LOG	DIVISION South Atlantic Division	INSTALLATION Jacksonville District	SHEET 1 OF 1 SHEETS

1. PROJECT: Palm Beach Harbor	10. SIZE AND TYPE OF BIT: see remarks
2. LOCATION (Coordinates or Station): Sta: 13+00 Rge: 1350	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MLW
3. DRILLING AGENCY: Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL: JOY
4. HOLE NO. (As shown on drawing title and file number): CB-30	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED / UNDISTURBED
5. NAME OF DRILLER: L.D.Johnson	14. TOTAL NUMBER CORE BOXES: 1/2
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER: TIDAL
7. THICKNESS OF OVERBURDEN	16. DATE HOLE: STARTED 10/12/65 COMPLETED 10/12/65
8. DEPTH DRILLED INTO ROCK	17. ELEVATION TOP OF HOLE: -7.4
9. TOTAL DEPTH OF HOLE: 34.0'	18. TOTAL CORE RECOVERY FOR BORING: 38 %
	19. ~~REPRESENTATIVE INSPECTOR~~ Geologist: J. S. Gentile

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
-7.4	0.0					BIT & BARREL Bls/ft.
-16.4	9.0		SAND, fine to medium, quartz, silty, gray, shelly, (SM)	38	1	2" I.D.Spoon SETTLED -12.4 1
				66	2	" " 2 1 3 5 -17.4 7
			SAND, fine to medium quartz, light gray, (SP) SILTY TO SLIGHTLY SILTY, non-compacted, grayish brown from -22.4 to -37.7	22	3	" " 5 9 11 8 -22.4 9
				30	4	" " SETTLED 1 2 -27.4 4
				26	5	" " 1 SETTLED -32.4
				0		" " 1 SETTLED 1 1 -37.4 1
-41.4	34.0		* Tight, clean, fine grained, riddled with lenses medium hard limestone and calcareous sandstone from -37.7 to -41.4	88	6	" " 30 43 49 -41.4 67
						300# Hammer with 18" drop used on 2" I.D. spoon.

3

ENG FORM 1836 PREVIOUS EDITIONS ARE OBSOLETE (EM 1110-1-1801) PROJECT PALM BEACH HARBOR HOLE NO. CB-30

Lake Worth Inlet Feasibility Study - Appendix D - Geotechnical

X = 810,700 Y = 886,280

Hole No. CB-31

1

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1 SHEETS

1. PROJECT Palm Beach Harbor	10. SIZE AND TYPE OF BIT see remarks
2. LOCATION (Coordinates or Station) STA: 8+00 RGE: 250	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL JOY
4. HOLE NO. (As shown on drawing title and file number) CB-31	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: —
5. NAME OF DRILLER L. D. Johnson	14. TOTAL NUMBER CORE BOXES 1/3
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER TIDAL
	16. DATE HOLE STARTED 10/18/65 COMPLETED 10/18/65
7. THICKNESS OF OVERBURDEN	17. ELEVATION TOP OF HOLE -31.2
8. DEPTH DRILLED INTO ROCK	18. TOTAL CORE RECOVERY FOR BORING 69 %
9. TOTAL DEPTH OF HOLE 10.0'	19. SIGNATURE OF INSPECTOR Geogolist J. S. Gentile

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
						BIT & BARREL Bls/ft.
-31.2	0.0					-31.2
-33.0	1.8		SAND-fine to medium, quartz, gray, slighly silty, (SP)		1	2" I.D.Spoon settled 4
-34.3	3.1		LIMESTONE-medium hard, very porous, thin bedded, very sandy, light gray, fossiliferous	76		33
					2	17 17 -36.2
			SAND-fine to medium, quartz, interspersed with thin lenses limestone and calcareous sandstone, light gray (SP)			18 25 26
-41.2	10.0			62	3	26 38 -41.2
						300# Hammer with 18" drop used on 2" I.D. Spoon

Lake Worth Inlet Feasibility Study, Appendix F Geotechnical 330 of 304

X = 810,700 Y = 885,840

Hole No. CB-32

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1 SHEETS

1. PROJECT Palm Beach Harbor	10. SIZE AND TYPE OF BIT see remarks
2. LOCATION (Coordinates or Station) STA: 8+00 RGE: 700	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL JOY
4. HOLE NO. (As shown on drawing title and file number) CB-32	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED:
5. NAME OF DRILLER L. D. Johnson	14. TOTAL NUMBER CORE BOXES 1/3
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER TIDAL
	16. DATE HOLE — STARTED 10/18/65 — COMPLETED 10/18/65
7. THICKNESS OF OVERBURDEN	17. ELEVATION TOP OF HOLE -30.8
8. DEPTH DRILLED INTO ROCK	18. TOTAL CORE RECOVERY FOR BORING 54 %
9. TOTAL DEPTH OF HOLE 10.0'	19. ~~[illegible]~~ Geologist J. S. Gentile

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	~~[illegible]~~ SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	
						BIT & BARREL bls/ft	
-30.8	0.0					-30.8	
			SAND-fine to medium, quartz slightly silty, gray, (SP)		1	2" I. D. SPOON	2
-32.4	1.6						15
			LIMESTONE-medium hard, very porous thin bedded, very sandy, light gray				17
-33.8	3.0						
			SAND-fine to medium quartz, light gray riddled with thin lenses limestone, (SP)	48	2	-35.8	14
							12
						" "	20
-37.8	7.0				3		23
			thin beds limestone interspersed with lenses loose sand (55% rock) from -37.8 to -39.5				30
-39.5	-8.7						26
-40.8	10.0			60		-40.8	22
						" "	
						300# Hammer with 18" drop used on 2" I. D. Spoon	

Lake Worth Inlet Feasibility Study, Attachment L, Geotechnical Page 231 of 304

X = 810,700 Y = 885,285

Hole No. CB-33

DRILLING LOG	DIVISION Corps of Engineers	INSTALLATION Jacksonville, Florida	SHEET 1 OF 1 SHEETS

1. PROJECT Palm Beach Harbor	10. SIZE AND TYPE OF BIT SEE REMARKS
2. LOCATION (Coordinates or Station) Sta. 8+00 Rge: 1250	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL Sprague & Henwood 40C
4. HOLE NO. (As shown on drawing title and file number) CB-33	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
5. NAME OF DRILLER C. R. Mason	14. TOTAL NUMBER CORE BOXES 1
6. DIRECTION OF HOLE ☑ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER Tidal
	16. DATE HOLE — STARTED 5-17-65 — COMPLETED 5-17-65
7. THICKNESS OF OVERBURDEN	17. ELEVATION TOP OF HOLE -27.1
8. DEPTH DRILLED INTO ROCK	18. TOTAL CORE RECOVERY FOR BORING 45 %
9. TOTAL DEPTH OF HOLE 19.0'	19. [redacted] Geologist G. J. Kraynak

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	[redacted] SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	Bls/Ft
						BIT & BARREL	
-27.1	0.0					-27.1	
			SAND, fine, slightly shelly, dark gray, calcite (SP)	24	1	2" I.D.Spoon	settled
-31.1	4.0					-31.1	9 6
			SAND, fine, white, with small limestone fragments or thin rock beds, calcite (SP)	65	2	" "	23 24 34 64 44
-37.1	10.0					-36.1	
-39.1	12.0		LIMESTONE, medium hard, white, with sand in solution channels	40		" "	26 38 31
			SAND, fine, slightly shelly, with small limestone fragments or thin rock beds, calcite (SP)			-41.1	15 10
				50	3	" "	7 4 9 12 13
-46.1	19.0					-46.1	
						300# Hammer with 18" Drop used on 2" I.D. Spoon	

3

Lake Worth Inlet Feasibility Study, Attachment 1 - Geotechnical

X = 811,235 Y = 886,480

Hole No. CB-34

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1 SHEETS

1. PROJECT Palm Beach Harbor	10. SIZE AND TYPE OF BIT see remarks
2. LOCATION (Coordinates or Station) Sta: 3+00 Rge: 40	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL Joy
4. HOLE NO. (As shown on drawing title and file number) CB-34	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: —
5. NAME OF DRILLER L. D. Johnson	14. TOTAL NUMBER CORE BOXES 1/2
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER Tidal
	16. DATE HOLE — STARTED 10/13/65 — COMPLETED 10/13/65
7. THICKNESS OF OVERBURDEN	17. ELEVATION TOP OF HOLE -17.6
8. DEPTH DRILLED INTO ROCK	18. TOTAL CORE RECOVERY FOR BORING 34%
9. TOTAL DEPTH OF HOLE 24.0'	19. SIGNATURE OF INSPECTOR Geologist J. S. Gentile

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
						Bit & Barrel Bls/ft.
-17.6	0.0					-17.6
-19.0	1.4		SAND, fine to medium, quartz, slightly silty, gray (SP)		1	2" I.D. spoon Settled
-21.6	4.0		LIMESTONE, medium hard, very porous, thin bedded, very sandy composition, solution holes, fossiliferous,	58		14 28 13 8
-22.7	5.1		Bed of sand from -21.6 to -22.7 (SP)			-22.6
-23.5	5.9		Bed of hard limestone from -22.7 to -23.5	36	2	" " 111 10 5 6 10
						-27.6
			SAND, fine to medium, quartz, clean, light gray, interspersed with thin lenses medium hard limestone and calcareous sandstone (SP)	0		" " 3 2 1 2 4
						-32.6
-36.9	19.3			40	3	" " 3 4 4 8 18
						-37.6
-41.6	24.0		LIMESTONE, (calcareous, sandstone) thin bedded, very porous, (easily broken with hammer), very sandy, beds of loose sand, light gray, slightly fossiliferous	36		" " 22 10 16 22
						-41.6
						300# hammer with 18" drop used on 2" I.D. spoon.

3

ENG FORM 1 OCT 62 PREVIOUS EDITIONS ARE OBSOLETE PROJECT HOLE NO.

X = 811,180 Y = 886,130

Hole No. CB-35

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1 SHEETS

1. PROJECT Palm Beach Harbor	10. SIZE AND TYPE OF BIT see remarks
2. LOCATION (Coordinates or Station) STA: 3+ 25 RGE: 500	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL JOY
4. HOLE NO. (As shown on drawing title and file number) CB-35	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED — UNDISTURBED
5. NAME OF DRILLER L. D. Johnson	14. TOTAL NUMBER CORE BOXES 1/2
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER TIDAL
	16. DATE HOLE — STARTED 10/12/65 — COMPLETED 10/12/65
7. THICKNESS OF OVERBURDEN	17. ELEVATION TOP OF HOLE -31.0
8. DEPTH DRILLED INTO ROCK	18. TOTAL CORE RECOVERY FOR BORING 61 %
9. TOTAL DEPTH OF HOLE 10.0'	19. SIGNATURE OF INSPECTOR Geologist J. S. Gentile

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
						BIT & BARREL Bls/ft.
-31.0	0.0					-31.0
-36.5	5.5		LIMESTONE-(calareous sandstone) medium hard, thin bedded, very porous, very sandy in composition, solution holes, riddled with thin beds loose sand, (30% loose sand), light gray	64		2" I.D. Spoon 10 14 12 15 13 -36.0
-41.0	10.0		SAND-fine to medium, quartz, tight, riddled with thin lenses of limestone, and calcareous sandstone, light gray, (25% rock) (SP)	58	1	18 20 19 19 23 -41.0
						300# hammer with 18" drop used on 2" I.D. Spoon

3

Lake Worth Inlet Feasibility Study, Attachment L, Geotechnical Page 234 of 304

X = 811,175 Y = 885,560

Hole No. CB-36

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1 SHEETS

1. PROJECT Palm Beach Harbor	10. SIZE AND TYPE OF BIT See remarks
2. LOCATION (Coordinates or Station) Sta: 3+25 Rge: 975	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL Joy
4. HOLE NO. (As shown on drawing title and file number) CB-36	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED: —
5. NAME OF DRILLER L. D. Johnson	14. TOTAL NUMBER CORE BOXES 1/2
6. DIRECTION OF HOLE XX VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER TIDAL
	16. DATE HOLE — STARTED 10/11/65 — COMPLETED 10/11/65
7. THICKNESS OF OVERBURDEN	17. ELEVATION TOP OF HOLE -29.6
8. DEPTH DRILLED INTO ROCK	18. TOTAL CORE RECOVERY FOR BORING 21 %
9. TOTAL DEPTH OF HOLE 12.0'	19. ~~XXXXXXXXXXXXXXXX~~ Geologist J. L. Gentile

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g	Blows/ft
						Bit & Barrel	
-29.6	0.0					-29.6	
			SAND, fine to medium, quartz, slightly silty, light gray (SP) silty, dark gray from -29.6 to -30.6.	24	1	2" I.D. spoon	5
							6
							11
							11
			riddled with thin lenses calcareous sandstone from -34.6 to -37.1			-34.6	11
						" "	7
-37.1	7.5						7
			LIMESTONE (calcareous sandstone), thin bedded, very porous, slightly fossiliferous, sandy, medium hard, riddled with beds loose sand, 55% rock, light gray, sandy composition,				9
							10
				18	2	-39.6	10
						" "	13
-41.6	12.0			10		-41.6	20
						300# hammer with 18" drop used on 2" I.D. spoon	

3

Lake Worth Inlet Feasibility Study, Attachment C, Geotechnical

X = 811,180 Y = 885,180

Hole No. CB-37

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1 SHEETS

1. PROJECT Palm Beach Harbor	10. SIZE AND TYPE OF BIT see remarks
2. LOCATION (Coordinates or Station) Sta: 3+00 Rge 1350	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL JOY
4. HOLE NO. (As shown on drawing title and file number) CB-37	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN — DISTURBED: — UNDISTURBED:
5. NAME OF DRILLER L.D.Johnson	14. TOTAL NUMBER CORE BOXES 1/2
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.	15. ELEVATION GROUND WATER TIDAL
	16. DATE HOLE — STARTED 10/8/65 — COMPLETED 10/8/65
7. THICKNESS OF OVERBURDEN	17. ELEVATION TOP OF HOLE -26.5
8. DEPTH DRILLED INTO ROCK	18. TOTAL CORE RECOVERY FOR BORING 59 %
9. TOTAL DEPTH OF HOLE 15.0'	19. ~~SIGNATURE OF INSPECTOR~~ Geologist J. S. Gentile

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
						BIT & BARREL Bls/ft.
-26.5	0.0					26.5
-28.6	2.1		SAND, fine to medium quartz, and calcareous material, silty, dark gray, (SM)		1	2" I.D.Spoon settled ↓
-29.8	3.3		LIMESTONE, hard, very porous, very fossiliferous, sandy, thin bedded, light gray.	76		82
						39
			SAND, fine to medium, quartz, riddled with thin lenses calcareous sandstone; light gray, slightly shelly (SP)		2	-31.5 22
						" " Washed
						16
				50		17
					3	12
						-36.5 10
-38.7	12.2					" " 9
						10
			LIMESTONE, medium hard, very porous, thin bedded, riddled with solution holes and thin beds loose (SP) sand, light gray, very sandy, 45% sand.	52	4	8
						6
-41.5	15.0					-41.5 7
						300# hammer with 18" drop used on 2" I.D.Spoon

ENG FORM 1836 PREVIOUS EDITIONS MAY BE USED (EAL 1110-1-1801) PROJECT [redacted] HOLE NO.

Hole No.CB-PBH95-9

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1

1. PROJECT Palm Beach Harbor	10. SIZE AND TYPE OF BIT See Remarks
2. LOCATION *(Coordinates or Station)* X=809,983 Y=887,033	11. DATUM FOR ELEVATION SHOWN *(TBM or MSL)* MLW (FEET)
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. *(As shown on drawing title and file number)* CB-PBH95-9	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 1 undisturbed: 0
5. NAME OF DRILLER C. Robbins	14. TOTAL NUMBER OF CORE BOXES 1
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED	15. ELEVATION GROUND WATER TIDAL
	16. DATE HOLE STARTED 8/9/95 COMPLETED 8/9/95
7. THICKNESS OF BURDEN Ft.	17. ELEVATION TOP OF HOLE -26.1 Ft.
8. DEPTH DRILLED INTO ROCK 0 Ft.	18. TOTAL CORE RECOVERY FOR BORING 47 %
9. TOTAL DEPTH OF HOLE 1.5 Ft.	19. SIGNATURE OF Geologist Jim Arthur

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/.5'
-26.1	.0					-26.1	
			SAND, dark gray fine to medium poorly graded quartz sand (SP)	47	1	SPLIT SPOON	4 27 16
-27.6	1.5		from elevation -27.4 to -27.6, some light gray fine to coarse shelly sandstone gravel			-27.6	

NOTE:
Soils are field visually classified in accordance with the Unified Soils Classification System.

Samples recovered using a 140# hammer with 30" drop used on a 2 foot split spoon (1-3/8" ID x 2" OD)

SAMPLE ELEVATION	LABORATORY CLASSIFICATION
-26.1 to -27.6	(SP)

Set 6 inch casing to depth 0.8 feet. Refusal with fishtail bit at 1.5 feet depth.

0 2.5 5 7.5 10 12.5 15 17.5 20 22.5

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT	HOLE NUMBER
Palm Beach Harbor	CB-PBH95-9

DRILLING LOG

DIVISION South Atlantic	INSTALLATION Jacksonville District
SHEET 1 OF 1	
1. PROJECT Palm Beach Harbor	10. SIZE AND TYPE OF BIT See Remarks
2. LOCATION *(Coordinates or Station)* X=809,924 Y=886,867	11. DATUM FOR ELEVATION SHOWN *(TBM or MSL)* MLW (FEET)
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. *(As shown on drawing title and file number)* CB-PBH95-11	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 1 undisturbed: 0
5. NAME OF DRILLER C. Robbins	14. TOTAL NUMBER OF CORE BOXES 1
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED	15. ELEVATION GROUND WATER TIDAL
	16. DATE HOLE STARTED 8/10/95 COMPLETED 8/10/95
7. THICKNESS OF BURDEN Ft.	17. ELEVATION TOP OF HOLE -25.3 Ft.
8. DEPTH DRILLED INTO ROCK 0 Ft.	18. TOTAL CORE RECOVERY FOR BORING 27 %
9. TOTAL DEPTH OF HOLE 3.0 Ft.	19. SIGNATURE OF Geologist Jim Arthur

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/.5'
-25.3	.0					-25.3	
			SAND, gray fine to medium poorly graded quartz sand, some small shell fragments (SP)	0		SPLIT SPOON	0, 3, 6
-26.8	1.5		below elevation -26.8, fine grained			-26.8	
			at elevation -28.0, trace of fine quartz gravel, white below elevation -28.0	53	1	SPLIT SPOON	8, 15, 18
-28.3	3.0					-28.3	

NOTE:
Soils are field visually classified in accordance with the Unified Soils Classification System.

Samples recovered using a 140# hammer with 30" drop used on a 2 foot split spoon (1-3/8" ID x 2" OD)

SAMPLE ELEVATION	LABORATORY CLASSIFICATION
-24.3 to -25.8	(SP)

Set 6 inch casing to depth 1.1 feet, drilled using Basco salt water drilling mud.

Material from elevation 25.3 to 26.8 described from wash water.

0, 2.5, 5, 7.5, 10, 12.5, 15, 17.5, 20, 22.5

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT	HOLE NUMBER
Palm Beach Harbor	CB-PBH95-11

Hole No.CB-PBH95-12

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1

1. PROJECT Palm Beach Harbor	10. SIZE AND TYPE OF BIT See Remarks
2. LOCATION *(Coordinates or Station)* X=810,046 Y=886,932	11. DATUM FOR ELEVATION SHOWN *(TBM or MSL)* MLW (FEET)
3. DRILLING AGENCY Corps of Engineers	12. MANUFACTURER'S DESIGNATION OF DRILL Failing 314
4. HOLE NO. *(As shown on drawing title and file number)* CB-PBH95-12	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 2 undisturbed: 0
5. NAME OF DRILLER C. Robbins	14. TOTAL NUMBER OF CORE BOXES 1
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED	15. ELEVATION GROUND WATER TIDAL
7. THICKNESS OF BURDEN Ft.	16. DATE HOLE STARTED 8/10/95 COMPLETED 8/10/95
8. DEPTH DRILLED INTO ROCK 0 Ft.	17. ELEVATION TOP OF HOLE -23.0 Ft.
9. TOTAL DEPTH OF HOLE 13.7 Ft.	18. TOTAL CORE RECOVERY FOR BORING 54 %
	19. SIGNATURE OF Geologist Jim Arthur

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel
-23.0	.0					-23.0
			SAND, No sample recovery, washed through sand to sample rock below.	0		WASHED
-29.5	6.5					-29.5
-31.3	8.3		Sandstone, light gray, some small shell fragments, slightly weathered, very hard, fine grained, highly pitted and vuggy with small to large vugs, badly broken and fragmented.	72 RQD 0		4 x 5 1 " Diamond HP = 100psi Drill Time 11 minutes Drill Water Return = 0%
-32.0	9.0		From elevation -31.1 to -32.0, core loss.			-32.0
-34.1	11.1		high angle break from depths 6.5 to 6.8 . low angle breaks at depths 6.9, 7.1, 7.3, 7.4, 7.6, 7.8, 9.8, 10.0, 10.2, 10.6, 10.7, 11.1.	45 RQD 17		4 x 5 1/2 " Diamond HP = 100 psi Drill Time 20 minutes Drill Watter Return = 0%
-36.7	13.7		from elevation -34.1 to -36.7, core loss			-36.7
			NOTE: Soils are field visually classified in accordance with the Unified Soils Classification System.			Set 6 inch casing to depth 3.8 feet, drilled using Basco salt water drilling mud.

0 2.5 5 7.5 10 12.5 15 17.5 20 22.5

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT	HOLE NUMBER
Palm Beach Harbor	CB-PBH95-12

Hole No.CB-WP97-2

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1

1. PROJECT Palm Beach Harbor Maintenance	10. SIZE AND TYPE OF BIT see remarks
2. LOCATION (Coordinates or Station) X=811,209 Y=886,545	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW (FEET)
3. DRILLING AGENCY Jacksonville District	12. MANUFACTURER'S DESIGNATION OF DRILL Acker on Work Boat #33
4. HOLE NO. (As shown on drawing title and file number) CB-WP97-2	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 1 undisturbed: 0
5. NAME OF DRILLER L.C. Gregory	14. TOTAL NUMBER OF CORE BOXES 1
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED	15. ELEVATION GROUND WATER TIDAL
7. THICKNESS OF BURDEN Ft.	16. DATE HOLE STARTED 6/3/97 COMPLETED 6/3/97
8. DEPTH DRILLED INTO ROCK Ft.	17. ELEVATION TOP OF HOLE -31.0 Ft.
9. TOTAL DEPTH OF HOLE 7.0 Ft.	18. TOTAL CORE RECOVERY FOR BORING 51 %
	19. SIGNATURE OF Geologist J. Hand

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/1'
-31.0	0.0					-31.0	
			SAND, fine grained quartz, trace silt, fine shell, gray (SP)				6
							8
				35	1	5' Spoon	18
							28
							27
						-36.0	
							21
-37.0	6.0			9	2	5' Spoon	
			SANDSTONE, hard, quartz, some fine sand and calcareous silt, light gray				110
-38.0	7.0					-38.0	

NOTES:

Soils are field visually classified in accordance with the Unified Soils Classification System.

SAMPLE ELEVATION	LABORATORY CLASSIFICATION
-31.0/-36.0	(SP-SM)

140# Hammer with 30 inch droped used on 5 foot Spoon.

0 2.5 5 7.5 10 12.5 15 17.5 20 22.5

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT	HOLE NUMBER
Palm Beach Harbor Maintenance	CB-WP97-2

Hole No.CB-WP97-2

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1

1. PROJECT Palm Beach Harbor Maintenance	10. SIZE AND TYPE OF BIT see remarks
2. LOCATION (Coordinates or Station) X=811,209 Y=886,545	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) MLW (FEET)
3. DRILLING AGENCY Jacksonville District	12. MANUFACTURER'S DESIGNATION OF DRILL Acker on Work Boat #33
4. HOLE NO. (As shown on drawing title and file number) CB-WP97-2	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 1 undisturbed: 0
5. NAME OF DRILLER L.C. Gregory	14. TOTAL NUMBER OF CORE BOXES 1
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED	15. ELEVATION GROUND WATER TIDAL
	16. DATE HOLE STARTED 6/3/97 COMPLETED 6/3/97
7. THICKNESS OF BURDEN Ft.	17. ELEVATION TOP OF HOLE -31.0 Ft.
8. DEPTH DRILLED INTO ROCK Ft.	18. TOTAL CORE RECOVERY FOR BORING 51 %
9. TOTAL DEPTH OF HOLE 7.0 Ft.	19. SIGNATURE OF Geologist J. Hand

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/1'
-31.0	0.0					-31.0	
			SAND, fine grained quartz, trace silt, fine shell, gray (SP)				6
							8
				35	1	5' Spoon	18
							28
							27
						-36.0	
							21
-37.0	6.0			9	2	5' Spoon	
			SANDSTONE, hard, quartz, some fine sand and calcareous silt, light gray				110
-38.0	7.0					-38.0	

NOTES:

Soils are field visually classified in accordance with the Unified Soils Classification System.

SAMPLE ELEVATION	LABORATORY CLASSIFICATION
-31.0/-36.0	(SP-SM)

140# Hammer with 30 inch droped used on 5 foot Spoon.

0 2.5 5 7.5 10 12.5 15 17.5 20 22.5

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT	HOLE NUMBER
Palm Beach Harbor Maintenance	CB-WP97-2

Boring Designation VB-LWI2012-13

DRILLING LOG	DIVISION South Atlantic	INSTALLATION	SHEET 1 OF 2 SHEETS

1. PROJECT	Lake Worth Inlet Snell Vibracoring 2012 Vibracore Borings
2. BORING DESIGNATION	VB-LWI2012-13
LOCATION COORDINATES	X = 967,727 Y = 886,421
3. DRILLING AGENCY	Corps of Engineers - Willmington
CONTRACTOR FILE NO.	
4. NAME OF DRILLER	
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	9.0 Ft.
9. SIZE AND TYPE OF BIT	See Remarks
10. COORDINATE SYSTEM/DATUM	State Plane, FLN (U.S. Ft.)
HORIZONTAL	NAD83
VERTICAL	MLLW
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 3 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	
15. DATE BORING	STARTED 06-13-12 / COMPLETED 06-13-12
16. ELEVATION TOP OF BORING	-40.0 Ft.
17. TOTAL RECOVERY FOR BORING	100 %
18. SIGNATURE AND TITLE OF INSPECTOR	Barbara Nist, Geologist

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
-40.0	0.0						-40.0		
-42.0	2.0		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, few fine to coarse-grained sand-sized shell, weak reaction with HCl, moist, 2.5Y 8/1 white (SP)	NR			Vibracore -42.0		
			SAND, poorly-graded with silt, mostly fine to coarse-grained sand-sized shell, little fine-grained sand-sized quartz, little fine to coarse-grained sand-sized limestone, few silt, 2.5Y 8/1 white (SP-SM)		1 1-post		-42.0 -45.0		
			At El. -45.0 Ft., some fine to medium-grained sand-sized quartz, some fine to medium-grained sand-sized shell, little fine to medium-grained sand-sized limestone		2				
-47.3	7.3		At El. -46.3 Ft., little sand to gravel-sized shell, weak cementation, 2.5Y 8/4 pale yellow						
-49.0	9.0	Mod. Weathered	LIMESTONE, hard, moderately weathered, limestone fragments up to 2" interbedded with sand layers, 2.5Y 8/1 white				-49.0		

BORING TERMINATED IN REFUSAL

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. 9 ft. ft. penetration

4. Laboratory Testing Results

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION
1	2.0/2.5	SW-SM*
1-post	2.0/2.5	SP*

Abbreviations:
NR = Not Recorded.

0 5 10 15

SAJ FORM 1836
JUN 02

(Continued)

DRILLING LOG (Cont. Sheet)	INSTALLATION	SHEET 2 OF 2 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
Lake Worth Inlet Snell Vibracoring 2012	State Plane, FLN (U.S. Ft.)	NAD83	MLLW

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 967,727 Y = 886,421	-40.0 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
			2 5.0/5.5 SP-SM* *Lab visual classification based on gradation curve. No Atterberg limits.						

15
20
25
30
35

SAJ FORM 1836-A
JUN 02

Boring Designation VB-LWI2012-14

DRILLING LOG	DIVISION South Atlantic	INSTALLATION	SHEET 1 OF 2 SHEETS

1. PROJECT	Lake Worth Inlet Snell Vibracoring 2012 Vibracore Borings
2. BORING DESIGNATION	VB-LWI2012-14
LOCATION COORDINATES	X = 966,953 Y = 886,602
3. DRILLING AGENCY	Corps of Engineers - Willmington
CONTRACTOR FILE NO.	
4. NAME OF DRILLER	
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	16.4 Ft.
9. SIZE AND TYPE OF BIT	See Remarks
10. COORDINATE SYSTEM/DATUM	State Plane, FLN (U.S. Ft.)
HORIZONTAL	NAD83
VERTICAL	MLLW
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 5 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	
15. DATE BORING	STARTED 06-13-12 / COMPLETED 06-13-12
16. ELEVATION TOP OF BORING	-25.7 Ft.
17. TOTAL RECOVERY FOR BORING	100 %
18. SIGNATURE AND TITLE OF INSPECTOR	Barbara Nist, Geologist

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
-25.7	0.0						-25.7		
-28.7	3.0		SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace shell, weak reaction with HCl, moist, 5Y 7/2 light gray (SP)	NR			Vibracore -28.7		
-31.7	6.0		SAND, silty, mostly fine to medium-grained sand-sized quartz, little fine to medium-grained sand-sized limestone, little - silt, trace shell, 5Y 7/2 light gray (SM) -		1 -post		-28.7 -31.7		
-36.9	11.2 -		SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, little fine to - medium-grained sand-sized limestone, few - silt, trace shell, 5Y 7/2 light gray (SP-SM) - At El. -33.4 Ft., 5Y 6/1 gray At El. -34.5 Ft., little fine to coarse-grained sand-sized limestone, weak reaction with HCl, moist, 5Y 5/1 gray -		2 3 - -post		-34.7 -34.7		
		Moderately Weathered	LIMESTONE, hard, moderately weathered, - fragmented up to 4", interbedded with weakly - cemented sand and shell layers, 5Y 7/2 light - gray -						

0 5 10 15

SAJ FORM 1836
JUN 02

(Continued)

DRILLING LOG (Cont. Sheet)	INSTALLATION	SHEET 2 OF 2 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
Lake Worth Inlet Snell Vibracoring 2012	State Plane, FLN (U.S. Ft.)	NAD83	MLLW

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 966,953 Y = 886,602	-25.7 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
-42.1	16.4						-42.1		
			BORING TERMINATED IN REFUSAL				Abbreviations: NR = Not Recorded.		

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. 20 ft. ft. penetration

4. Laboratory Testing Results

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION
1	3.0/3.5	SM*
1-post	3.0/3.5	SP*
2	6.0/6.5	SP-SM*
3	9.0/9.5	SP-SM*
3-post	9.0/9.5	SP*

*Lab visual classification based on gradation curve. No Atterberg limits.

15 20 25 30 35

SAJ FORM 1836-A
JUN 02

Boring Designation VB-LWI2012-15

DRILLING LOG	DIVISION South Atlantic	INSTALLATION	SHEET 1 OF 2 SHEETS

1. PROJECT	Lake Worth Inlet Snell Vibracoring 2012 Vibracore Borings
2. BORING DESIGNATION	VB-LWI2012-15
LOCATION COORDINATES	X = 967,297 Y = 886,040
3. DRILLING AGENCY	Corps of Engineers - Willmington
CONTRACTOR FILE NO.	
4. NAME OF DRILLER	
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	17.1 Ft.
9. SIZE AND TYPE OF BIT	See Remarks
10. COORDINATE SYSTEM/DATUM	State Plane, FLN (U.S. Ft.)
HORIZONTAL	NAD83
VERTICAL	MLLW
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 5 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	
15. DATE BORING	STARTED 06-14-12 / COMPLETED 06-14-12
16. ELEVATION TOP OF BORING	-40.9 Ft.
17. TOTAL RECOVERY FOR BORING	85 %
18. SIGNATURE AND TITLE OF INSPECTOR	Barbara Nist, Geologist

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
-40.9	0.0						-40.9		
			SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, some fine to medium-grained sand-sized shell, few silt, strong reaction with HCl, moist, 2.5Y 6/4 light yellowish brown (SP-SM) At El. -42.3 Ft., little fine gravel-sized shell	NR			Vibracore		
-43.9	3.0						-43.9		
			SAND, poorly-graded with silt, mostly fine to medium-grained sand-sized shell, little fine to medium-grained sand-sized quartz, little fine to medium-grained sand-sized limestone (SP-SM)		1 1-post		-43.9		
			At El. -45.9 Ft., some fine-grained sand-sized quartz, some fine to medium-grained sand-sized shell				-46.9		
			From El. -46.9 to -47.4 Ft., mostly fine to coarse-grained sand-sized shell, little fine to medium-grained sand-sized quartz		2		-48.9		
			From El. -48.9 to -49.4 Ft., mostly fine to coarse-grained sand-sized shell, some fine to medium-grained sand-sized limestone, few silt		3 3-post		-48.9		
-50.9	10.0								
		Highly Weathered	LIMESTONE, soft, highly weathered, fragmeted up to 2" some shell, 2.5Y 6/6 olive yellow						

0 5 10 15

SAJ FORM 1836
JUN 02

(Continued)

DRILLING LOG (Cont. Sheet)	INSTALLATION	SHEET 2 OF 2 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
Lake Worth Inlet Snell Vibracoring 2012	State Plane, FLN (U.S. Ft.)	NAD83	MLLW

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 967,297 Y = 886,040	-40.9 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
-56.2	15.3		SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, trace shell, weak reaction with HCl, moist, 2.5Y 6/4 light yellowish brown (SP)						
-57.9	17.0		LIMESTONE, soft, highly weathered, - fragmeted up to 2", 2.5Y 7/4 pale yellow -				-58.0		

Abbreviations:
NR = Not Recorded.

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. 20 ft. ft. penetration

4. Laboratory Testing Results

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION
1	3.0/3.5	SP-SM*
1-post	3.0/3.5	SP* -
2	6.0/6.5	SP-SM* -
3	8.0/8.5	SW-SM* -
3-post	8.0/8.5	SP*

*Lab visual classification based on gradation curve. No Atterberg limits.

SAJ FORM 1836-A
JUN 02

Boring Designation VB-LWI2012-16

DRILLING LOG	DIVISION South Atlantic	INSTALLATION	SHEET 1 OF 2 SHEETS

1. PROJECT	Lake Worth Inlet Snell Vibracoring 2012 Vibracore Borings
2. BORING DESIGNATION	VB-LWI2012-16
LOCATION COORDINATES	X = 966,405 Y = 886,335
3. DRILLING AGENCY	Corps of Engineers - Willmington
CONTRACTOR FILE NO.	
4. NAME OF DRILLER	
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	16.0 Ft.
9. SIZE AND TYPE OF BIT	See Remarks
10. COORDINATE SYSTEM/DATUM	State Plane, FLN (U.S. Ft.)
HORIZONTAL	NAD83
VERTICAL	MLLW
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 5 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	
15. DATE BORING	STARTED 06-14-12 / COMPLETED 06-14-12
16. ELEVATION TOP OF BORING	-37.7 Ft.
17. TOTAL RECOVERY FOR BORING	80 %
18. SIGNATURE AND TITLE OF INSPECTOR	Barbara Nist, Geologist

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
-37.7	0.0						-37.7		
			SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, little fine to coarse gravel-sized shell, trace silt, weak reaction with HCl, moist, 10Y 7/1 light greenish gray (SP)	NR			Vibracore		
							-40.7		
			At El. -40.7 Ft., little fine to medium-grained sand-sized limestone, few fine to medium-grained sand-sized shell		1 -post		-40.7		
-43.7	6.0						-43.7		
			SAND, poorly-graded with silt, mostly fine to medium-grained sand-sized quartz, little fine to medium-grained sand-sized limestone, few fine to medium-grained sand-sized shell, few silt, 2.5Y 4/1 dark gray (SP-SM)		2				
							-46.7		
					3				
			At El. -48.3 Ft., mostly fine-grained sand-sized quartz, few fine to coarse-grained sand-sized shell, weak reaction with HCl, moist				-48.7		
					4				
-49.7	12.0								
			SAND, poorly-graded, mostly fine to medium-grained sand-sized quartz, few fine to coarse-grained sand-sized shell, few fine to medium-grained sand-sized limestone, weak reaction with HCl, moist, 10Y 7/1 light greenish gray (SP)						
-51.7	14.0		At El. -51.2 Ft., some fine-grained sand-sized quartz, some medium to coarse-grained sand-sized limestone						
		MW	LIMESTONE, moderately hard, moderately						

0 5 10 15

SAJ FORM 1836
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(Continued)

DRILLING LOG (Cont. Sheet)	INSTALLATION	SHEET 2 OF 2 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
Lake Worth Inlet Snell Vibracoring 2012	State Plane, FLN (U.S. Ft.)	NAD83	MLLW

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 966,405 Y = 886,335	-37.7 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
-53.7	16.0 MW		weathered, fragmented up to 3", 10Y 7/1 light greenish gray				-53.7		

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. 16 ft. ft. penetration

4. Laboratory Testing Results

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION
1	3.0/3.5	SP*
1-post	3.0/3.5	SP*
2	6.0/6.5	SP-SM*
3	9.0/9.5	SP-SM*
4	11.0/11.5	SP-SM*

*Lab visual classification based on gradation curve. No Atterberg limits.

Abbreviations:
NR = Not Recorded.

15 20 25 30 35

SAJ FORM 1836-A
JUN 02

Boring Designation VB-LWI2012-17

DRILLING LOG	DIVISION South Atlantic	INSTALLATION	SHEET 1 OF 2 SHEETS

1. PROJECT	Lake Worth Inlet Snell Vibracoring 2012 Vibracore Borings
2. BORING DESIGNATION	VB-LWI2012-17
LOCATION COORDINATES	X = 966,630 Y = 885,712
3. DRILLING AGENCY	Corps of Engineers - Willmington
CONTRACTOR FILE NO.	
4. NAME OF DRILLER	
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	16.0 Ft.
9. SIZE AND TYPE OF BIT	See Remarks
10. COORDINATE SYSTEM/DATUM	State Plane, FLN (U.S. Ft.)
HORIZONTAL	NAD83
VERTICAL	MLLW
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 5 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	
15. DATE BORING	STARTED 06-14-12 / COMPLETED 06-14-12
16. ELEVATION TOP OF BORING	-37.1 Ft.
17. TOTAL RECOVERY FOR BORING	82 %
18. SIGNATURE AND TITLE OF INSPECTOR	Barbara Nist, Geologist

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
-37.1	0.0						-37.1		
			SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace shell, trace silt, weak reaction with HCl, moist, 5Y 5/1 gray (SP)	NR			Vibracore		
-39.1	2.0						-39.1		
			SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, little fine-grained sand-sized limestone, few silt, trace shell, 5Y 5/1 gray (SP-SM)		1 -post		-39.1		
			At El. -40.9 Ft., mostly fine to medium-grained sand-sized quartz, little fine to medium-grained sand-sized sandstone, 5Y 6/1 gray						
-42.1	5.0						-42.1		
			SANDSTONE, fragmented, 5Y 6/1 gray		2				
-44.1	7.0								
			SAND, poorly-graded, mostly fine-grained sand-sized quartz, few fine to medium-grained sand-sized shell, trace silt, little beachrock up to 2", 10Y 6/1 greenish gray (SP)				-45.1		
					3				
-48.8	11.7								
-49.5	12.4		SAND, poorly-graded, mostly fine to medium-grained sand-sized shell, little fine-grained sand-sized quartz, 5Y 7/6 yellow (SP)						
			At El. -49.1 Ft., some fine-grained sand-sized quartz, some fine to coarse-grained sand-sized shell, 10Y 7/1 light greenish gray				-50.1		
					4				
			SHELL, mostly fine gravel-sized shell, little coarse-grained sand-sized limestone, trace fine-grained sand-sized quartz, trace silt,						

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(Continued)

DRILLING LOG (Cont. Sheet)	INSTALLATION	SHEET 2 OF 2 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
Lake Worth Inlet Snell Vibracoring 2012	State Plane, FLN (U.S. Ft.)	NAD83	MLLW

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 966,630 Y = 885,712	-37.1 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
-53.1	16.0		strong reaction with HCl, moist, 5Y 8/2 pale yellow At El. -49.8 Ft., weakly cemented				-53.1		

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. 19.4 ft. ft. penetration

4. Laboratory Testing Results

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION
1	2.0/2.5	SP-SM*
1-post	2.0/2.5	SP*
2	5.0/5.5	SANDSTONE*
3	8.0/8.5	SP*
4	13.0/13.5	SHELL*

*Lab visual classification based on gradation curve. No Atterberg limits.

Abbreviations:
NR = Not Recorded.

15
20 -
25 -
30 -
35

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JUN 02

Boring Designation VB-LWI2012-18

DRILLING LOG	DIVISION South Atlantic	INSTALLATION	SHEET 1 OF 2 SHEETS

1. PROJECT	Lake Worth Inlet Snell Vibracoring 2012 - Vibracore Borings
2. BORING DESIGNATION	VB-LWI2012-18
LOCATION COORDINATES	X = 966,973 Y = 885,074
3. DRILLING AGENCY	Corps of Engineers - Willmington
CONTRACTOR FILE NO.	
4. NAME OF DRILLER	
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	19.0 Ft.
9. SIZE AND TYPE OF BIT	See Remarks -
10. COORDINATE SYSTEM/DATUM	State Plane, FLN (U.S. Ft.)
HORIZONTAL	NAD83
VERTICAL	MLLW
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 8 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	
15. DATE BORING	STARTED 06-14-12 / COMPLETED 06-14-12
16. ELEVATION TOP OF BORING	-18.1 Ft.
17. TOTAL RECOVERY FOR BORING	95 %
18. SIGNATURE AND TITLE OF INSPECTOR	Barbara Nist, Geologist

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
-18.1	0.0						-18.1		
			SAND, poorly-graded with silt, mostly fine to medium-grained sand-sized quartz, few silt, trace shell, weak reaction with HCl, moist, 2.5Y 5/6 light olive brown (SP-SM)	NR			Vibracore		
			At El. -20.1 Ft., some fine to coarse-grained sand-sized limestone		1 -post		-20.1		
-20.8	2.7								
-21.0	2.9		LIMESTONE, fossiliferous, soft, porous						
			SAND, poorly-graded with silt, mostly fine to medium-grained sand-sized quartz, few silt (SP-SM)						
-24.1	6.0						-24.1		
			SAND, silty, mostly fine to medium-grained sand-sized quartz, little silt, few fine to medium-grained sand-sized limestone, 2.5Y 5/6 light olive brown (SM)		2 -post		-24.1		
			At El. -25.4 Ft., some fine to medium-grained sand-sized limestone, 2.5Y 6/4 light yellowish brown						
-27.1	9.0						-27.1		
		Highly Weathered	SANDSTONE, soft, highly weathered, fragmented, 5Y 8/2 pale yellow		3				
							-31.1		
					4 -post		-31.1		

0
5
10
15

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(Continued)

DRILLING LOG (Cont. Sheet)	INSTALLATION	SHEET 2 OF 2 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
Lake Worth Inlet Snell Vibracoring 2012	State Plane, FLN (U.S. Ft.)	NAD83	MLLW

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 966,973 Y = 885,074	-18.1 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
		Highly Weathered					-34.1		
					5				
-37.1	19.0						-37.1		

NOTES:

1. USACE Jacksonville is the custodian for these original files.

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. 20 ft. ft. penetration

4. Laboratory Testing Results

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION
1	2.0/2.5	SP-SM*
1-post	2.0/2.5	SP*
2	6.0/6.5	SM*
2-post	6.0/6.5	SP*
3	9.0/9.5	SP-SM*
4	13.0/13.5	SP-SM*
4-post	13.0/13.5	SP*
5	16.0/16.5	SP-SM*

*Lab visual classification based on gradation curve. No Atterberg limits.

Abbreviations:
NR = Not Recorded.

15 20 25 30 35

SAJ FORM 1836-A
JUN 02

DRILLING LOG

DIVISION	South Atlantic
INSTALLATION	
SHEET	1 OF 2 SHEETS
1. PROJECT	Lake Worth Inlet Snell Vibracoring 2012 Vibracore Borings
2. BORING DESIGNATION	VB-LWI2012-19
LOCATION COORDINATES	X = 966,230 Y = 885,125
3. DRILLING AGENCY	Corps of Engineers - Willmington
CONTRACTOR FILE NO.	
4. NAME OF DRILLER	
5. DIRECTION OF BORING	☒ VERTICAL ☐ INCLINED
DEG. FROM VERTICAL	
BEARING	
6. THICKNESS OF OVERBURDEN	N/A
7. DEPTH DRILLED INTO ROCK	N/A
8. TOTAL DEPTH OF BORING	13.2 Ft.
9. SIZE AND TYPE OF BIT	See Remarks
10. COORDINATE SYSTEM/DATUM	State Plane, FLN (U.S. Ft.)
HORIZONTAL	NAD83
VERTICAL	MLLW
11. MANUFACTURER'S DESIGNATION OF DRILL	☐ AUTO HAMMER ☐ MANUAL HAMMER
12. TOTAL SAMPLES	DISTURBED 6 / UNDISTURBED (UD) 0
13. TOTAL NUMBER CORE BOXES	0
14. ELEVATION GROUND WATER	
15. DATE BORING	STARTED 06-14-12 / COMPLETED 06-14-12
16. ELEVATION TOP OF BORING	-26.5 Ft.
17. TOTAL RECOVERY FOR BORING	66 %
18. SIGNATURE AND TITLE OF INSPECTOR	Barbara Nist, Geologist

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE
-26.5	0.0						-26.5		
			SAND, poorly-graded, mostly fine-grained sand-sized quartz, trace silt, no reaction with HCl, moist, 5Y 5/1 gray (SP)	NR			Vibracore		
							-29.5		
			At El. -29.5 Ft., little fine-grained sand-sized shell		1 -post		-29.5		
-32.5	6.0						-32.5		
			SAND, poorly-graded with silt, mostly fine-grained sand-sized quartz, little fine-grained sand-sized shell, few silt, 5Y 5/1 gray (SP-SM)		2				
							-35.5		
					3 -post		-35.5		
			At El. -36.5 Ft., 5Y 7/1 light gray						
			At El. -37.7 Ft., mostly fine to medium-grained sand-sized quartz, some medium to coarse-grained sand-sized limestone, strong reaction with HCl, moist, 5Y 8/1 white		4				
-38.5	12.0						-38.5		
-39.7	13.2	Mod. Wea.	LIMESTONE, soft, moderately weathered, sandy, fragmented, 5Y 8/1 white				-39.7		

NOTES:

1. USACE Jacksonville is the custodian for these original files.

Abbreviations:
NR = Not Recorded.

0 5 10 15

SAJ FORM 1836
JUN 02

(Continued)

DRILLING LOG (Cont. Sheet)	INSTALLATION	SHEET 2 OF 2 SHEETS

PROJECT	COORDINATE SYSTEM/DATUM	HORIZONTAL	VERTICAL
Lake Worth Inlet Snell Vibracoring 2012	State Plane, FLN (U.S. Ft.)	NAD83	MLLW

LOCATION COORDINATES	ELEVATION TOP OF BORING
X = 966,230 Y = 885,125	-26.5 Ft.

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/ 1 FT.	N-VALUE

2. Soils are field visually classified in accordance with the Unified Soils Classification System.

3. 20 ft. ft. penetration

4. Laboratory Testing Results

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION
1	3.0/3.5	SP*
1-post	3.0/3.5	SP* -
2	6.0/6.5	SP-SM* -
3	9.0/9.5	SP-SM* -
3-post	9.0/9.5	SP* -
4	12.0/12.5	LIMESTONE* -

*Lab visual classification based on gradation curve. No Atterberg limits.

15 20 25 30 35

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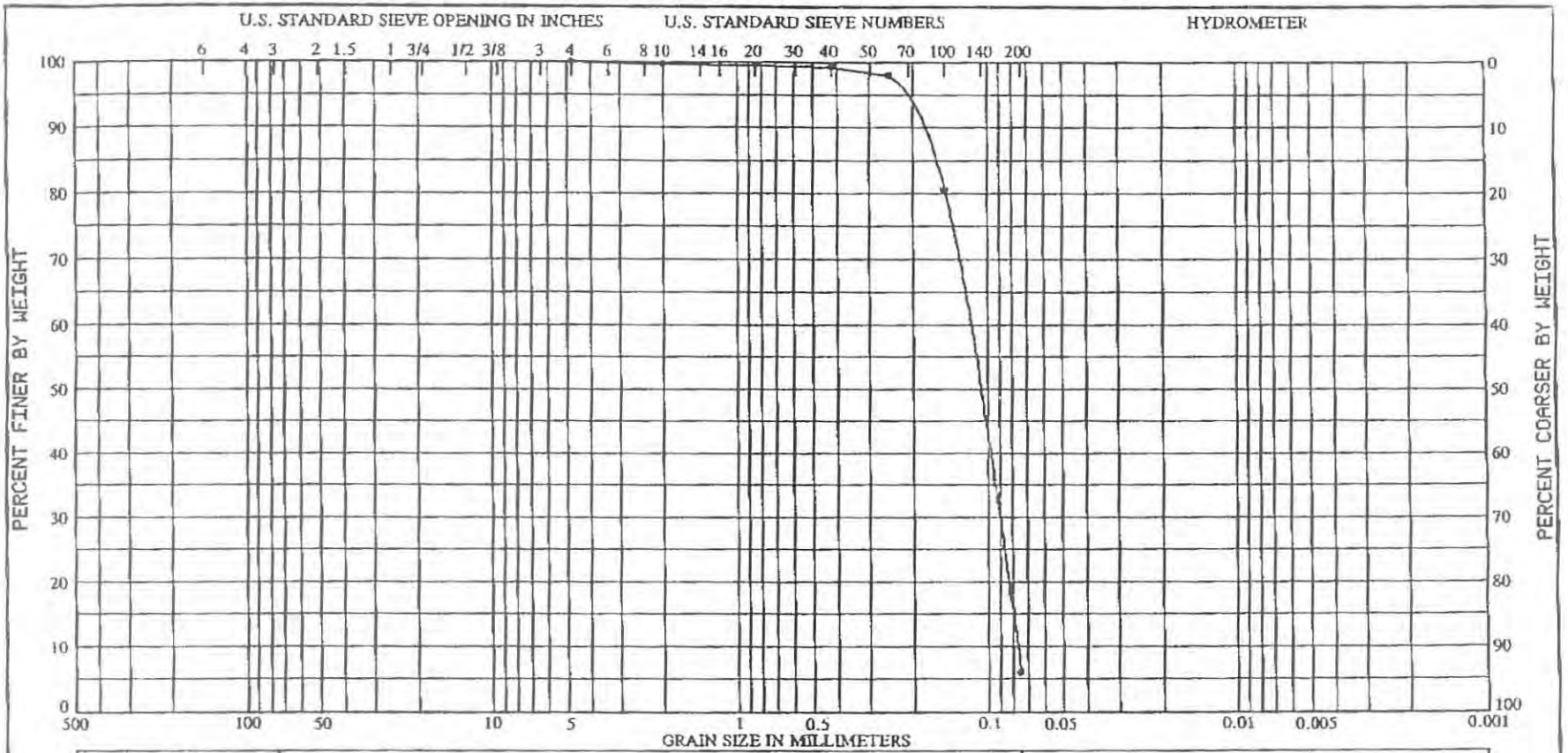
JUN 02

DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY
CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30060

WORK ORDER: G20.
REQUISITION: W32C8571690002



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

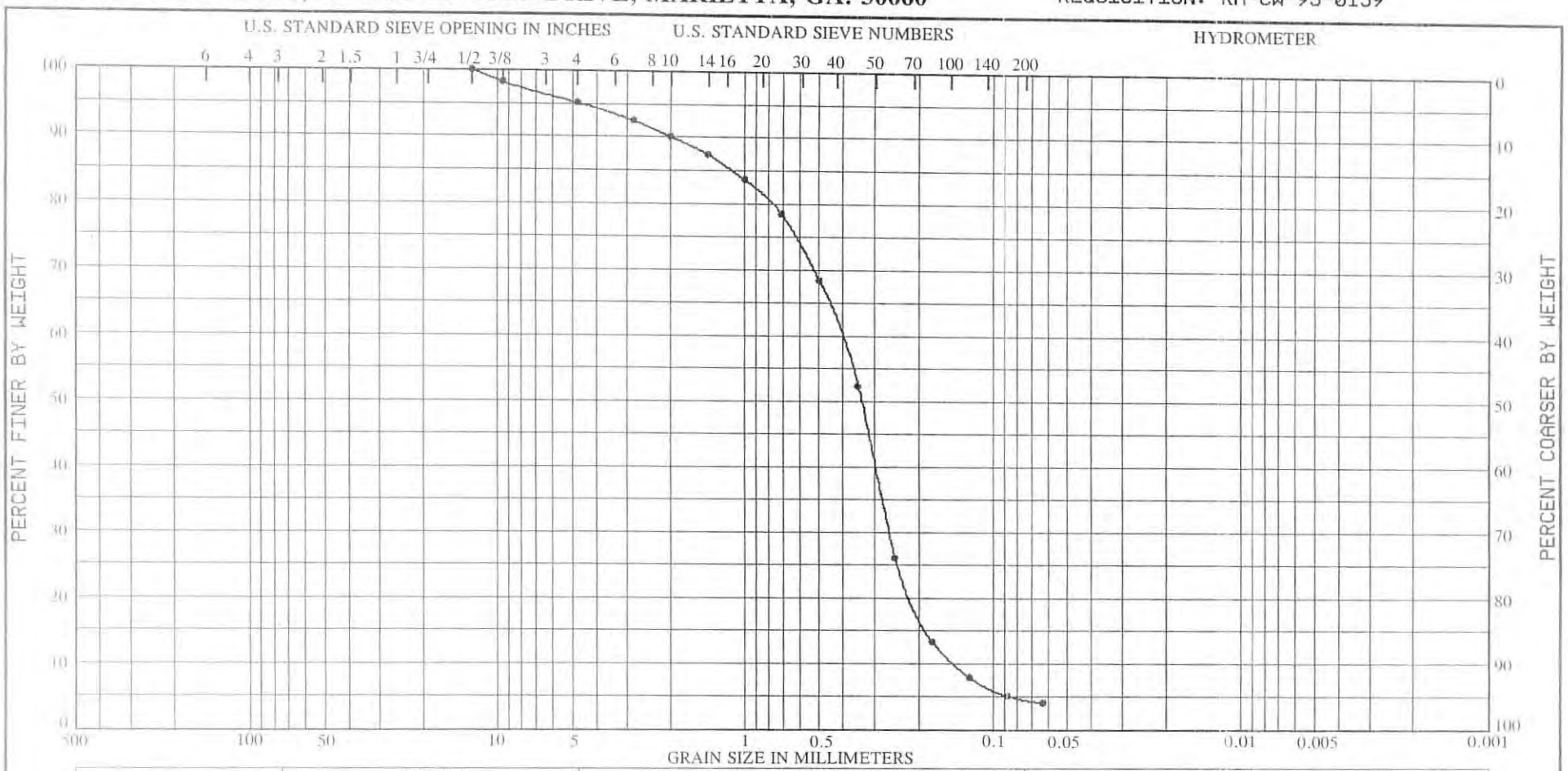
Sample No.	MLW (ft)	(VISUAL) Classification	Nat w%	LL	PL	PI
1	-31.0 / -36.0	GRAY, POORLY GRADED SILTY SAND (SP-SM),	27.8			
		WITH A TRACE OF MICA.				
		VISUAL PERCENT SHELL IS APPROX. = <1%.				

Project: WEST PALM BEACH HARBOR
Lab No. 73/7768
Boring No. CB-WP-97-2
Date: 07/15/97

GRADATION CURVES

DEPARTMENT OF THE ARMY, SOUTH ATLANTIC DIVISION LABORATORY
CORPS OF ENGINEERS, 611 SOUTH COBB DRIVE, MARIETTA, GA. 30060

WORK ORDER: 7760
REQUISITION: RM-CW-95-0159

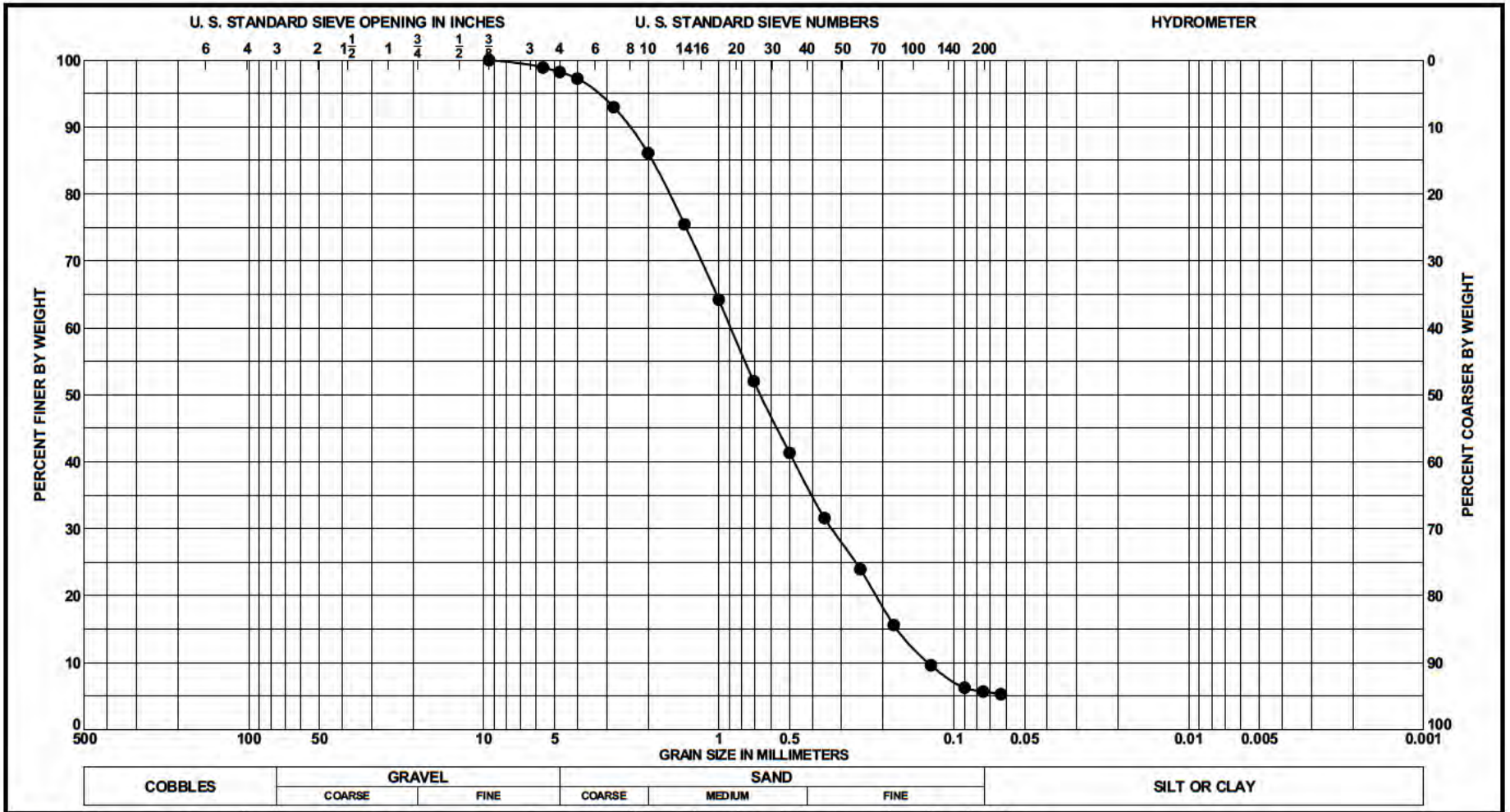


COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Sample No.	Elevation (ft)	Classification	Nat w%	LL	PL	PI
1	-26.1 to -27.6	(VISUAL) LT. GRAY, POORLY GRADED SAND				
		(SP), WITH A TRACE OF GRAVEL SIZE SHELL				
		AND A TRACE OF SAND SIZE SHELL FRAGMENTS				
		SPECIFIC GRAVITY = 2.73.				
		VISUAL PERCENT SHELL IS APPROX. = 12%.				

Project PALM BEACH HARBOR
MAINTENANCE DREDGING
Lab No. 73/7098
Boring No. CB-PBH-95-9
Date 08/26/95

GRADATION CURVES



Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 1	2.0 to 2.5 Ft.	SAND, well graded with silt, some	2.5Y 8/1	48	69						
		fine to coarse-grained sand-sized									
		shell, little fine-grained sand-sized									
		quartz, litte fine to coarse-grained									
		sand-sized limestone, few silt, white									

(SW)

GRADATION CURVES

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-13
BORING ELEV.	-40.0 Ft., MLLW
DATE	9/18/2012

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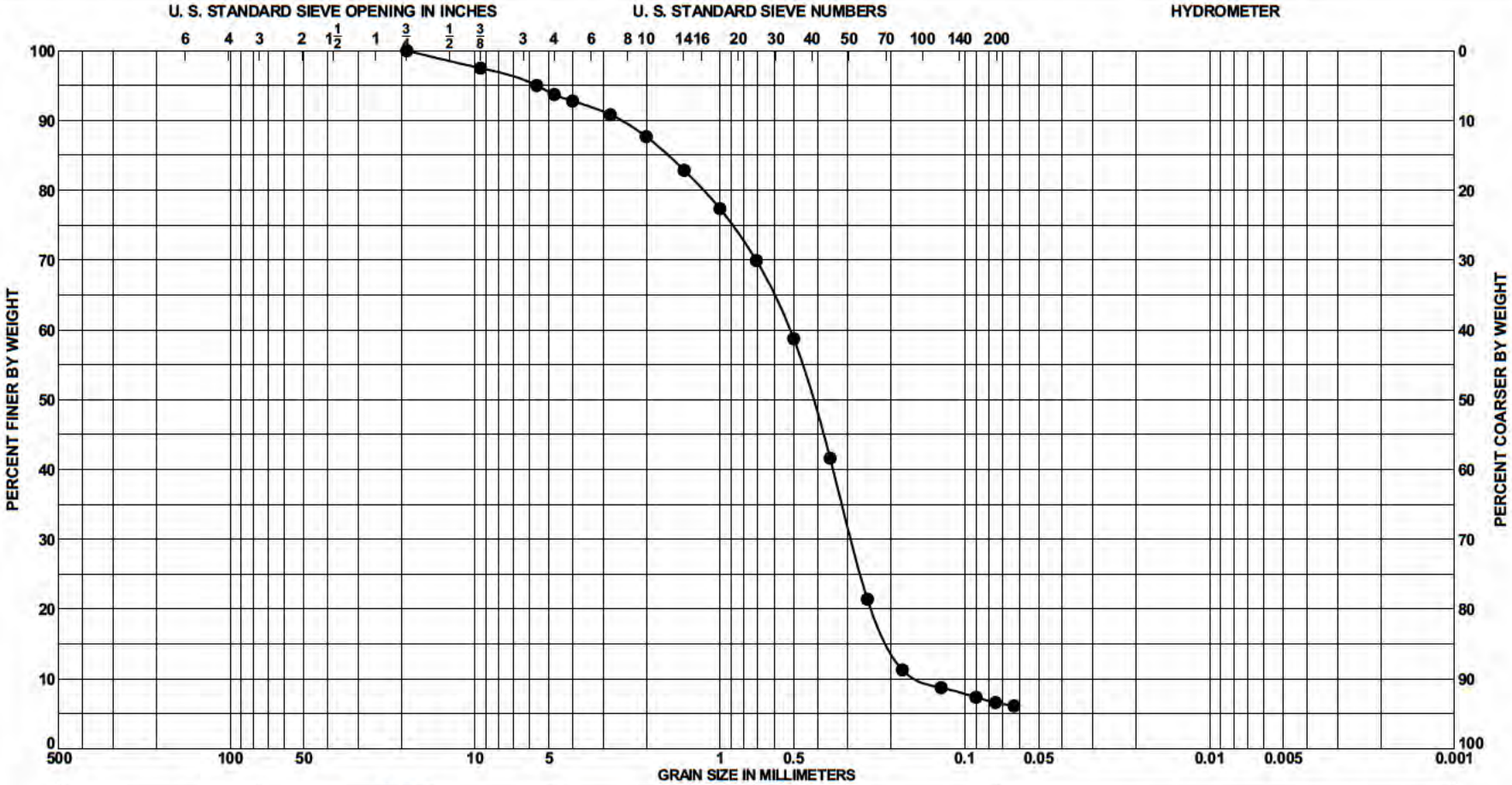
JUN 02

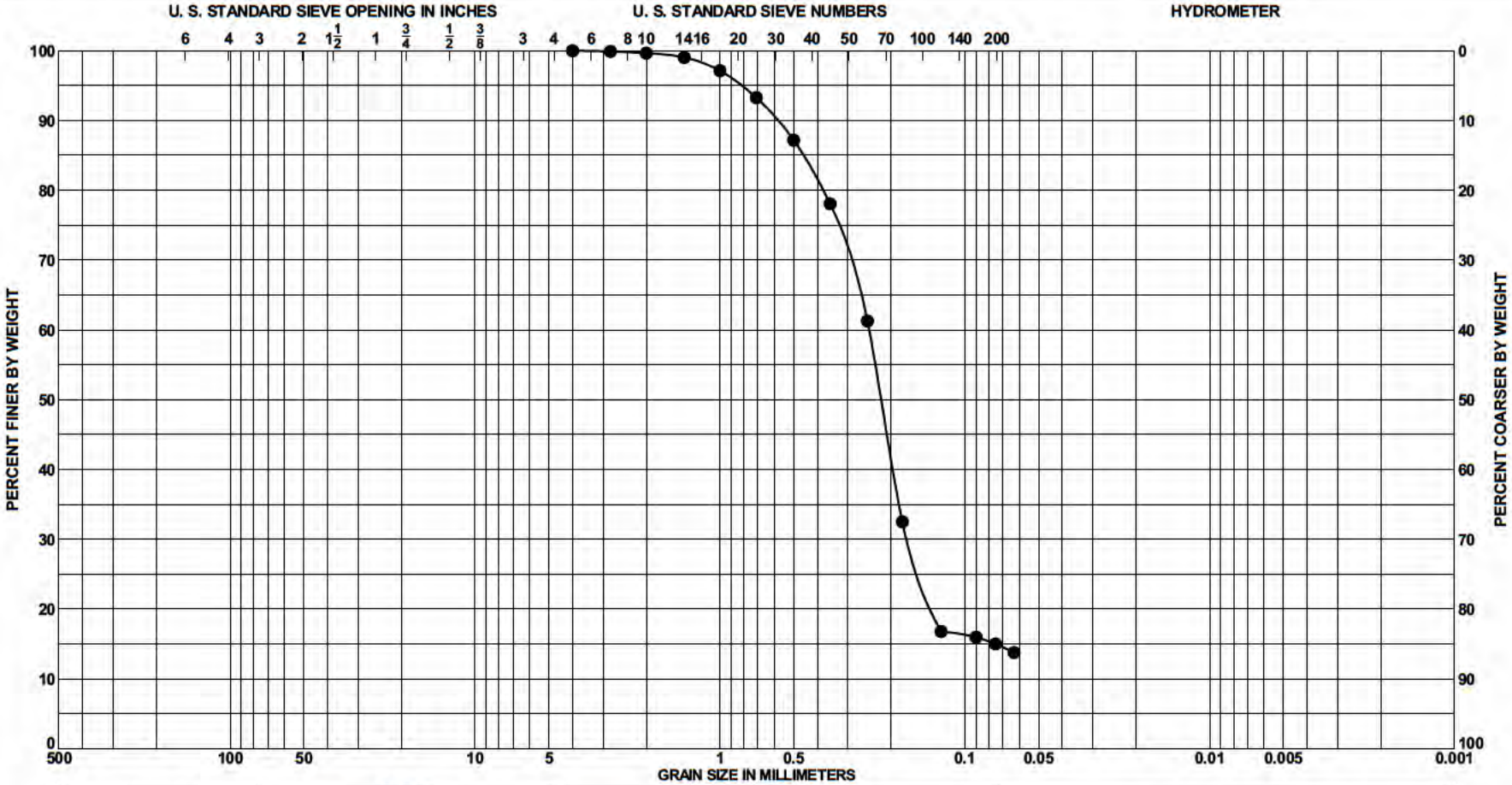


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 2	5.0 to 5.5 Ft.	SAND, poorly graded with silt, some fine to medium-grained sand-sized quartz, little fine to medium-grained sand-sized shell, little fine to medium-grained sand-sized limestone, few s	2.5Y 8/1	24							

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-13
BORING ELEV.	-40.0 Ft., MLLW
DATE	9/18/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02

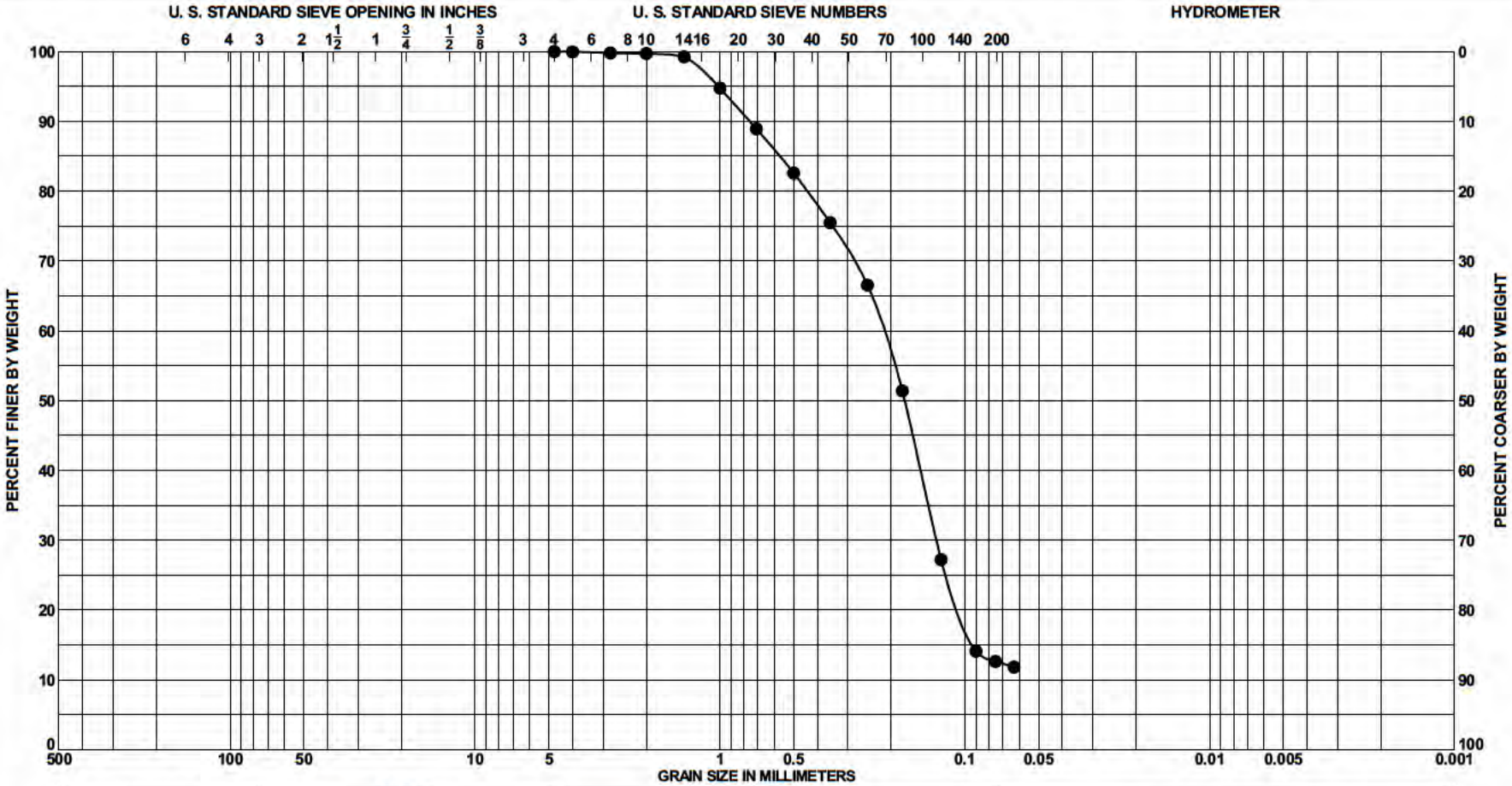


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 1	3.0 to 3.5 Ft.	SAND, silty, mostly fine to medium-grained sand-sized quartz, little fine to medium-grained sand-sized limestone, little silt, trace shell, light gray (SM)	5Y 7/2	3	25						

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-14
BORING ELEV.	-25.7 Ft., MLLW
DATE	9/18/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02

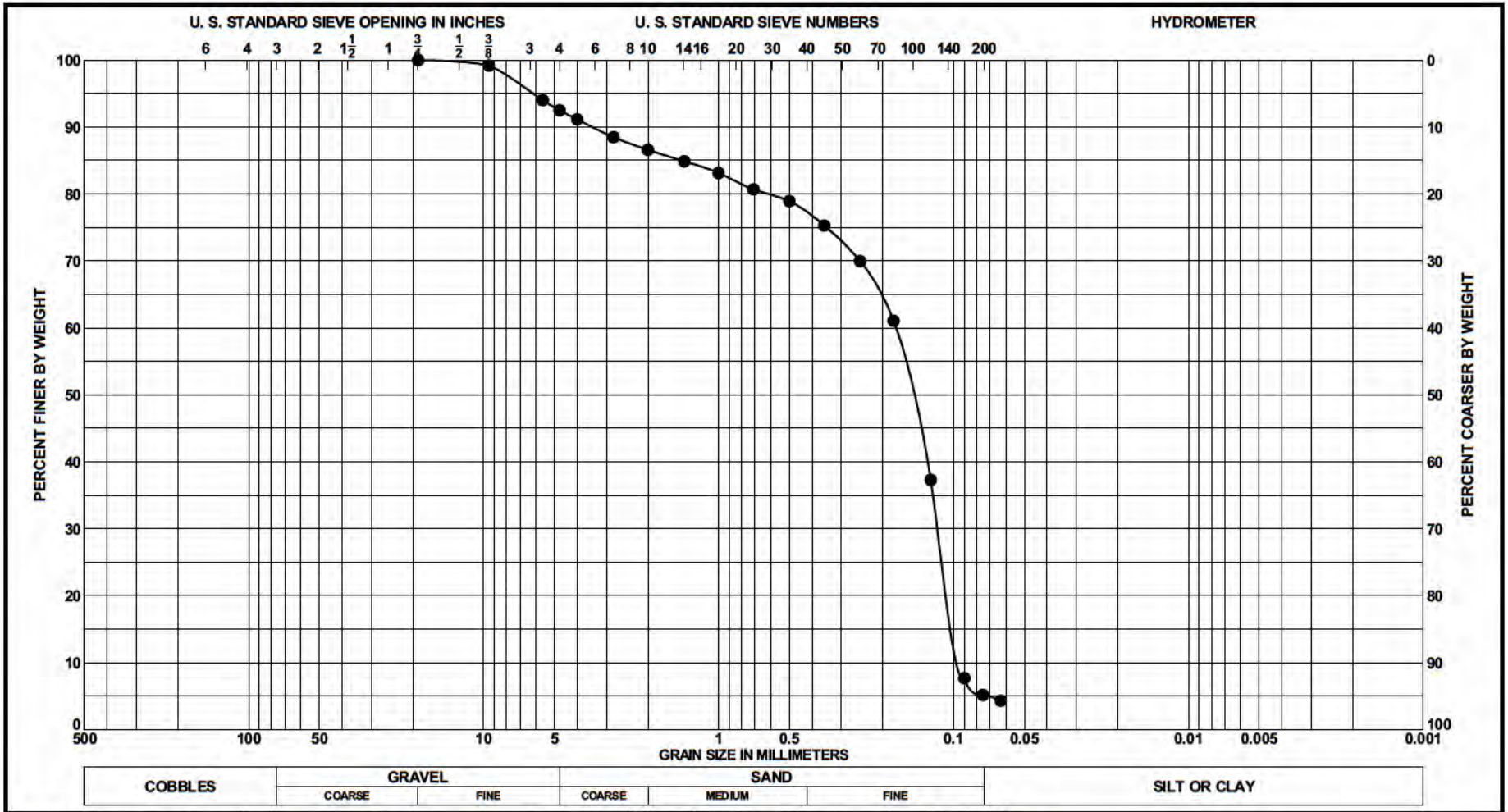


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 2	6.0 to 6.5 Ft.	SAND, poorly graded with silt,	5Y 7/2	4							
		mostly fine-grained sand-sized									
		quartz, little fine to medium-grained									
		sand-sized limestone, few silt, trace									
		shell, light gray (SP-SM)									

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-14
BORING ELEV.	-25.7 Ft., MLLW
DATE	9/18/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02

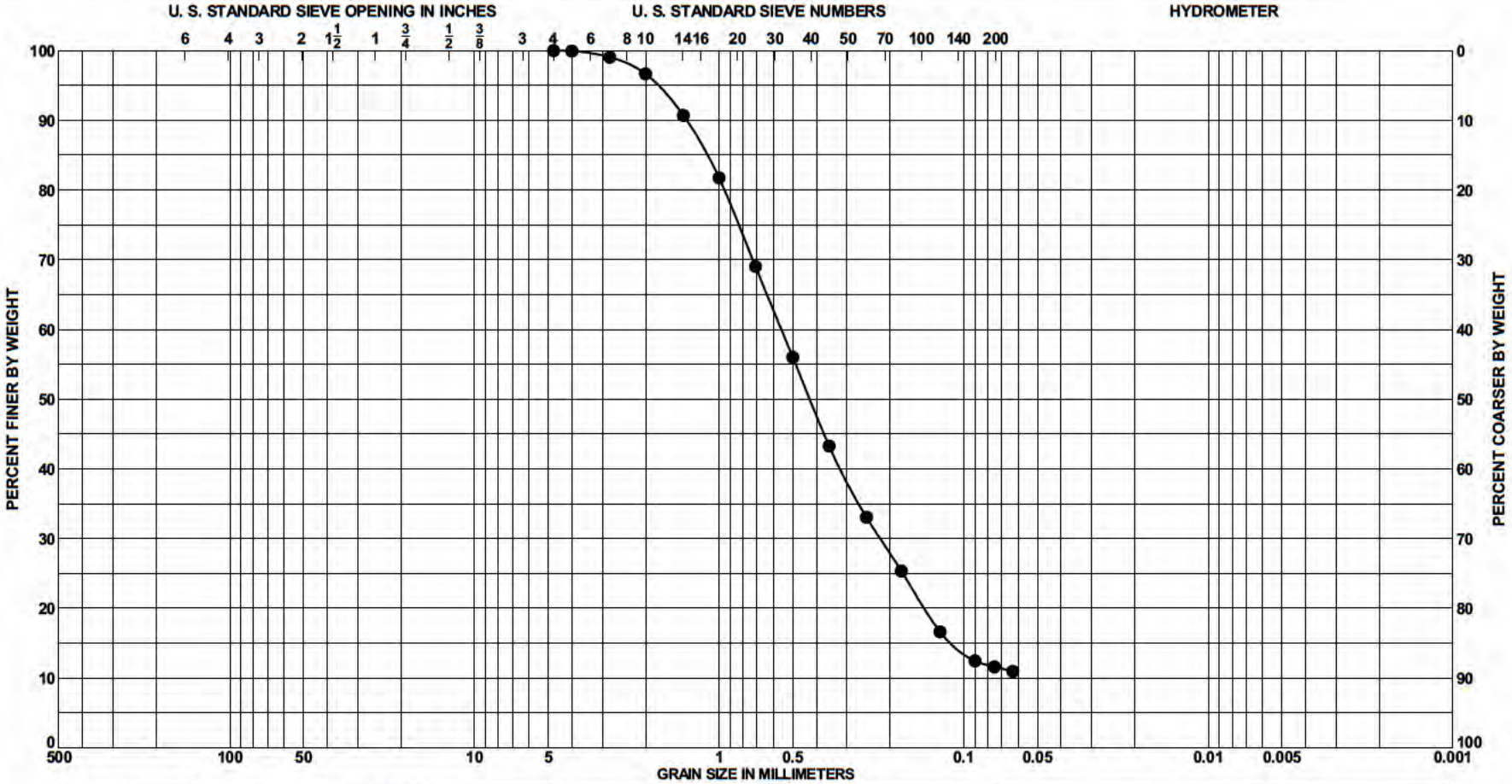


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 3	9.0 to 9.5 Ft.	SAND, poorly graded with silt,	5Y 5/1	2	27						
		mostly fine-grained sand-sized									
		quartz, little fine to coarse-grained									
		sand-sized limestone, few silt, trace									
		shell, gray (SP-SM)									

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-14
BORING ELEV.	-25.7 Ft., MLLW
DATE	9/18/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02

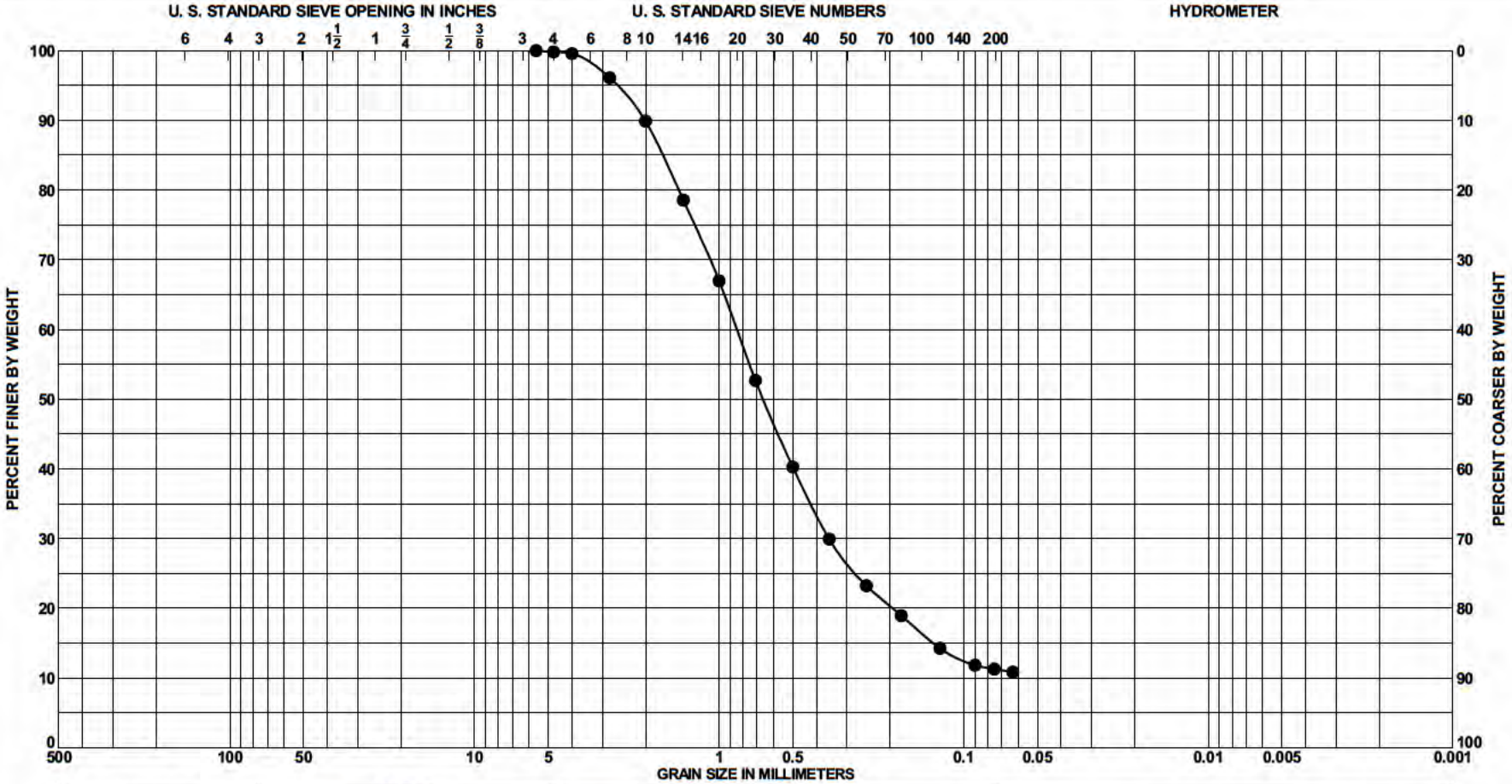


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 1	3.0 to 3.5 Ft.	SAND, poorly graded with silt,	2.5Y 6/4	50	63						
		mostly fine to medium-grained									
		sand-sized shell, little fine to									
		medium-grained sand-sized quartz,									
		little fine to medium-grained									
		sand-sized lime[illegible]									
		yellowish brown (SP-SM)									

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-15
BORING ELEV.	-40.9 Ft., MLLW
DATE	9/18/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02

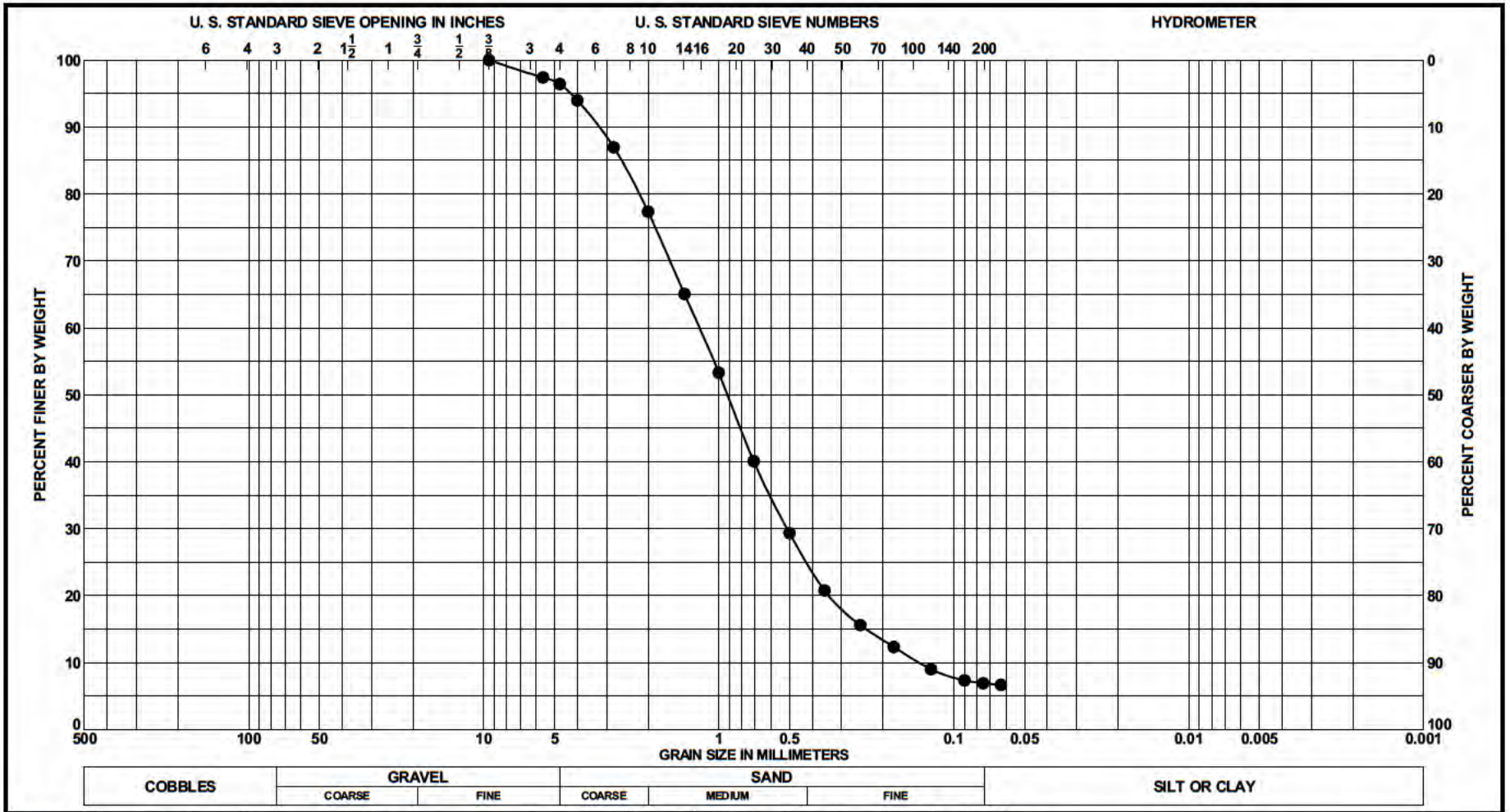


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 2	6.0 to 6.5 Ft.	SAND, poorly graded with silt,	2.5Y 6/4	51							
		mostly fine to coarse-grained									
		sand-sized shell, little fine to									
		medium-grained sand-sized quartz,									
		little fine to medium-grained									
		sand-sized lime[illegible]									
		yellowish brown (SP-SM)									

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-15
BORING ELEV.	-40.9 Ft., MLLW
DATE	9/18/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02

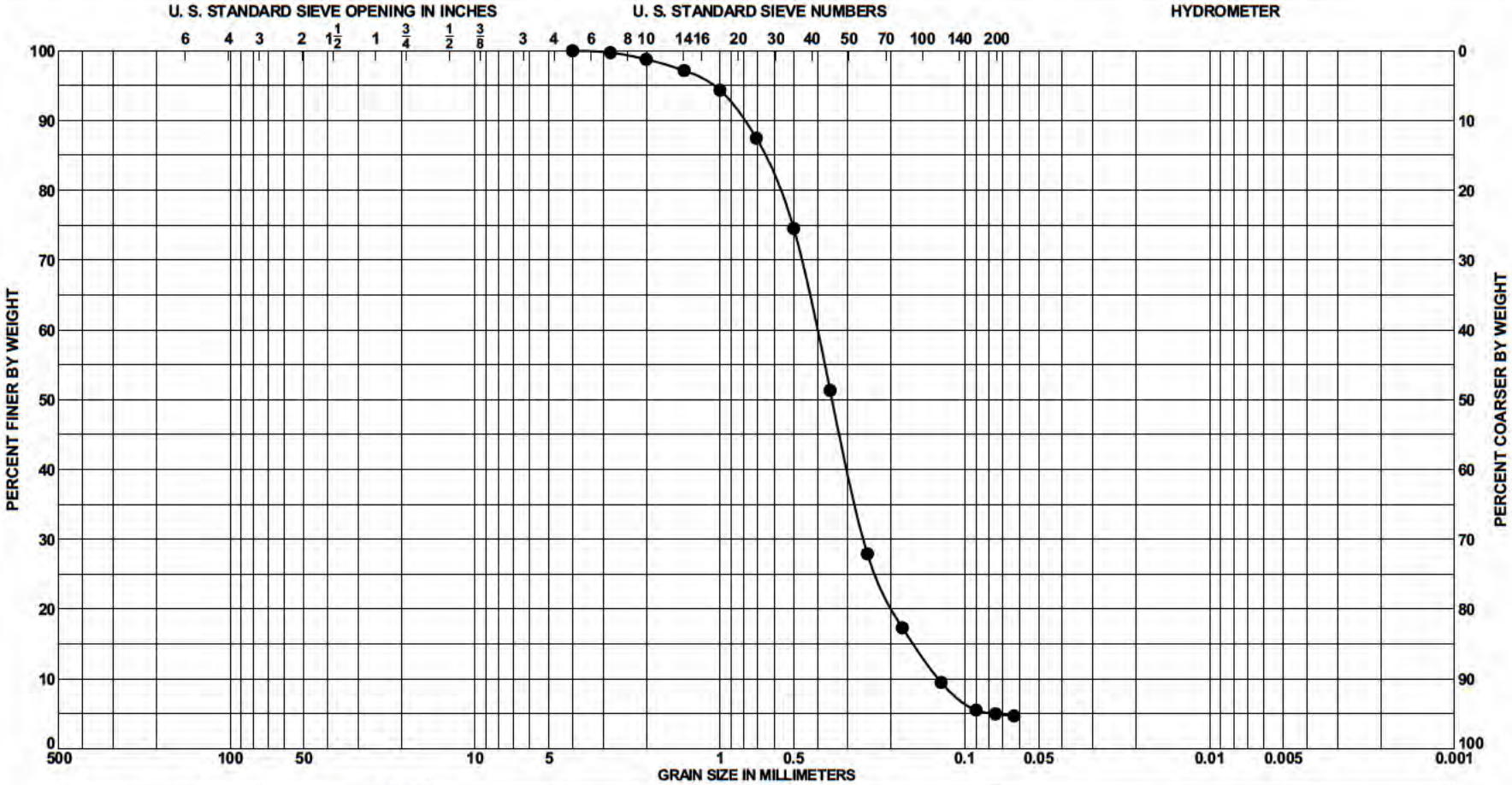


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 3	8.0 to 8.5 Ft.	SAND, well graded with silt, some fine to coarse-grained sand-sized shell, some fine to coarse-grained sand-sized limestone, little fine to medium-grained sand-sized quartz, few silt, light [illegible] (SW-SM)	2.5Y 6/4	41	70						

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-15
BORING ELEV.	-40.9 Ft., MLLW
DATE	9/18/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02

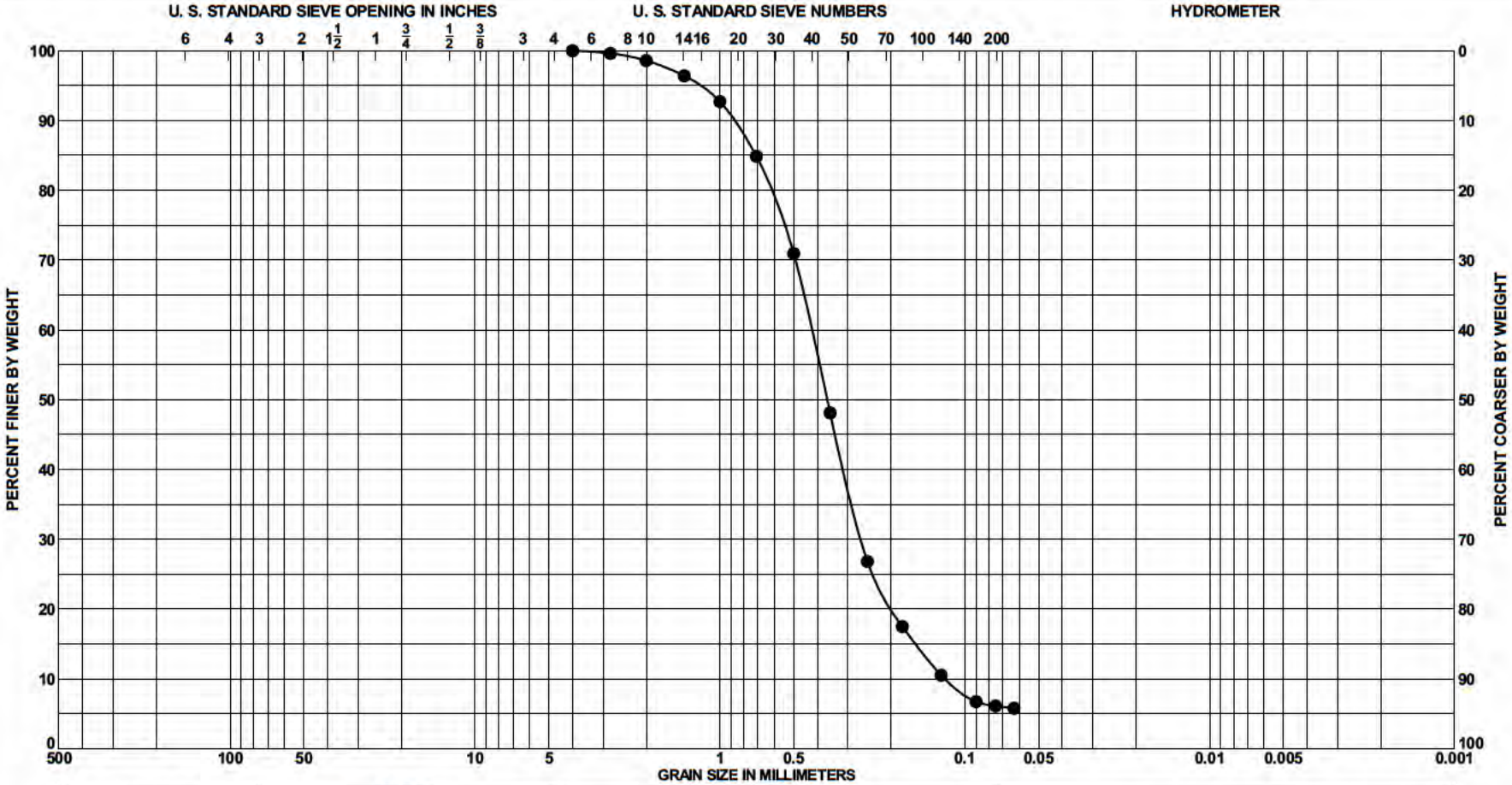


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 1	3.0 to 3.5 Ft.	SAND, poorly graded, mostly fine to medium-grained sand-sized quartz, little fine to medium-grained sand-sized limestone, few fine to medium-grained sand-sized shell, trace silt, light g	10Y 7/1	9	28						

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-16
BORING ELEV.	-37.7 Ft., MLLW
DATE	9/18/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02

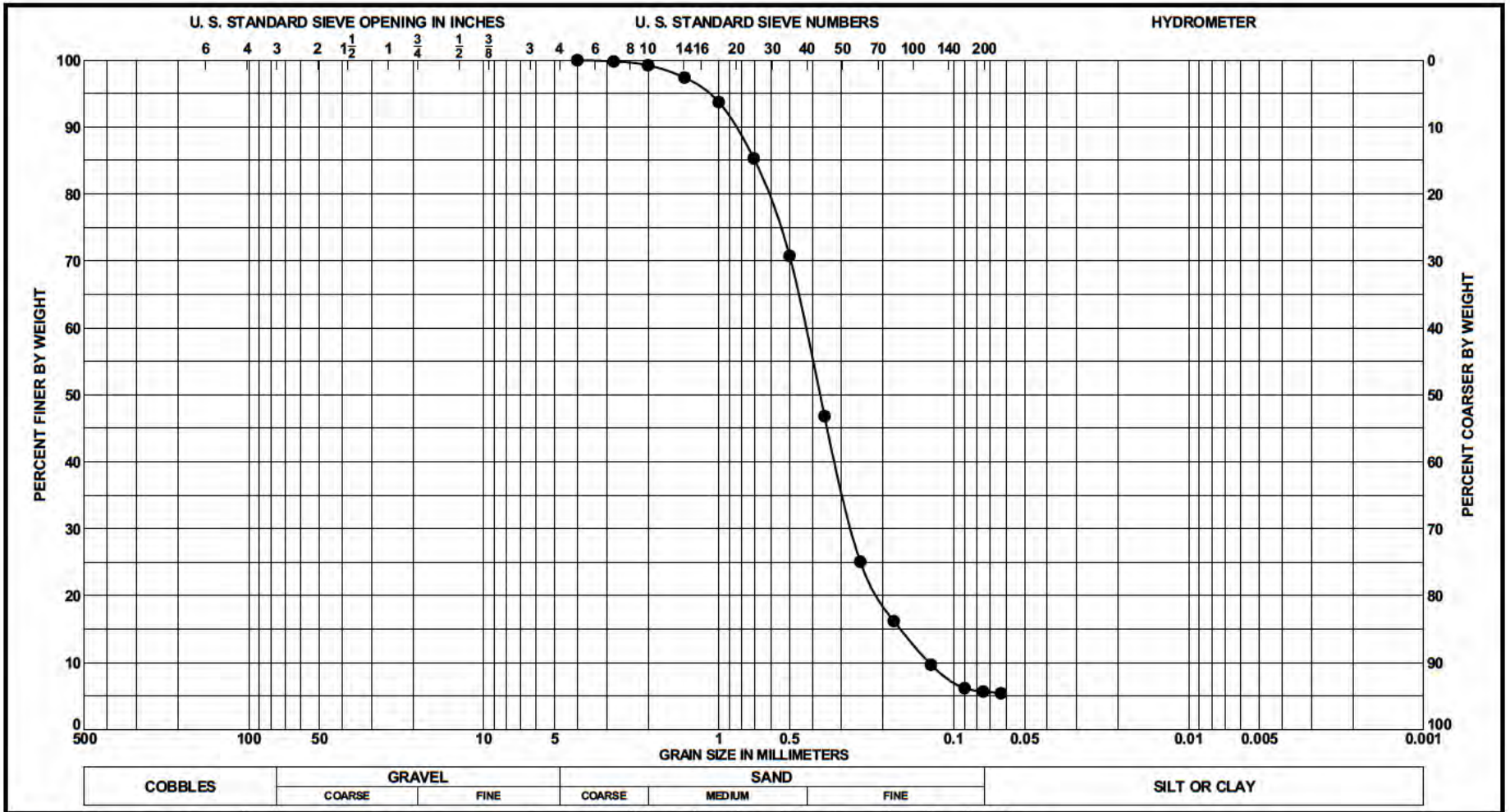


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 2	6.0 to 6.5 Ft.	SAND, poorly graded with silt, mostly fine to medium-grained sand-sized quartz, little fine to medium-grained sand-sized limestone, few fine to medium-graine[illegible] few silt, light greenish gray (SP-SM)	10Y 7/1	9							

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-16
BORING ELEV.	-37.7 Ft., MLLW
DATE	9/18/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02

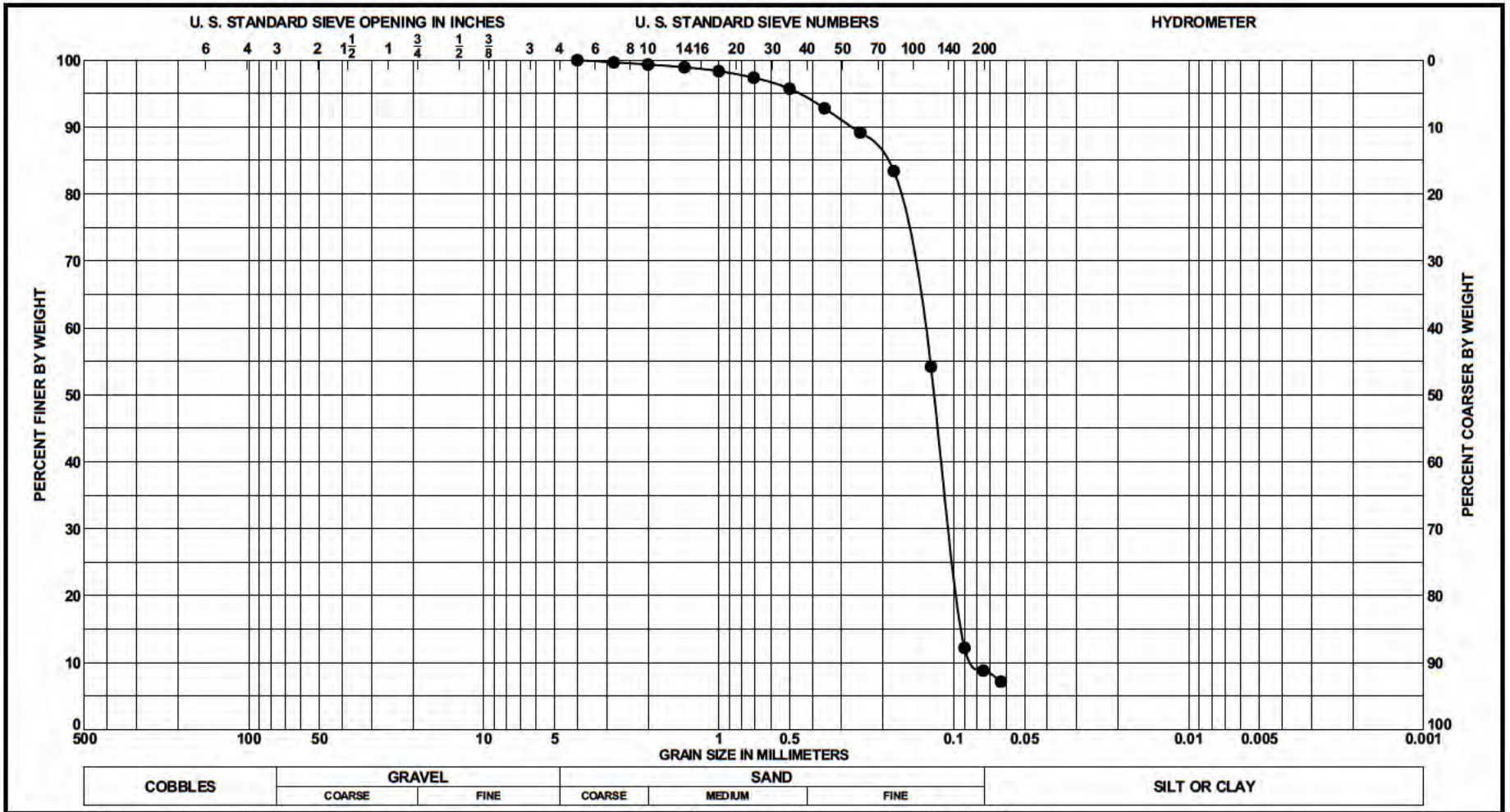


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 3	9.0 to 9.5 Ft.	SAND, poorly graded with silt, mostly fine to medium-grained sand-sized quartz, little fine to medium-grained sand-sized limestone, few fine to medium-graine[illegible] few silt, light greenish gray (SP-SM)	10Y 7/1	11							

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-16
BORING ELEV.	-37.7 Ft., MLLW
DATE	9/18/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02



Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 4	11.0 to 11.5 Ft.	SAND, poorly graded with silt,	2.57 4/1	1							
		mostly fine-grained sand-sized									
		quartz, little fine to medium-grained									
		sand-sized limestone, few silt, trace									
		shell, (SP-SM)									

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-16
BORING ELEV.	-37.7 Ft., MLLW
DATE	9/18/2012

GRADATION CURVES

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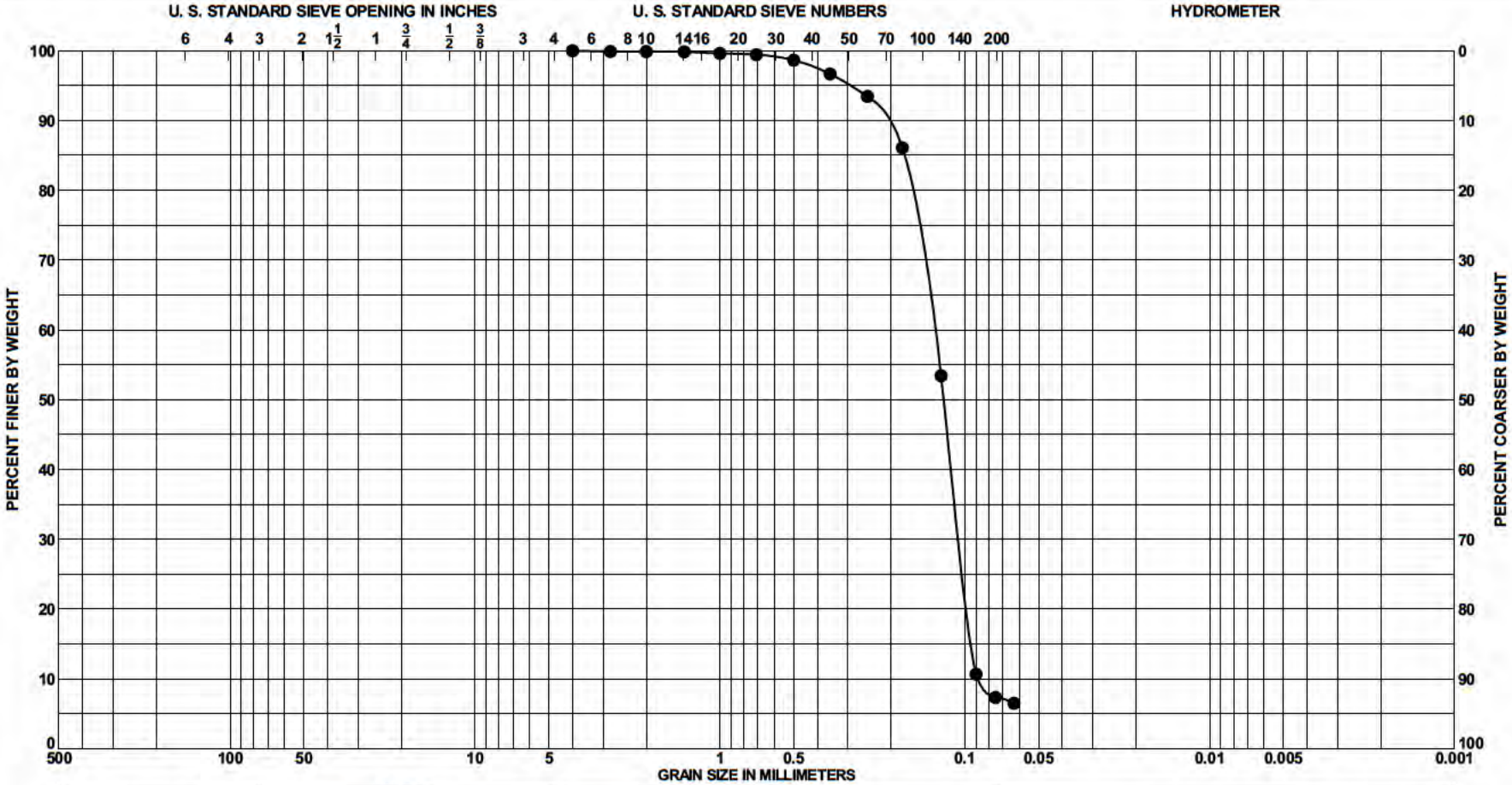
JUN 02

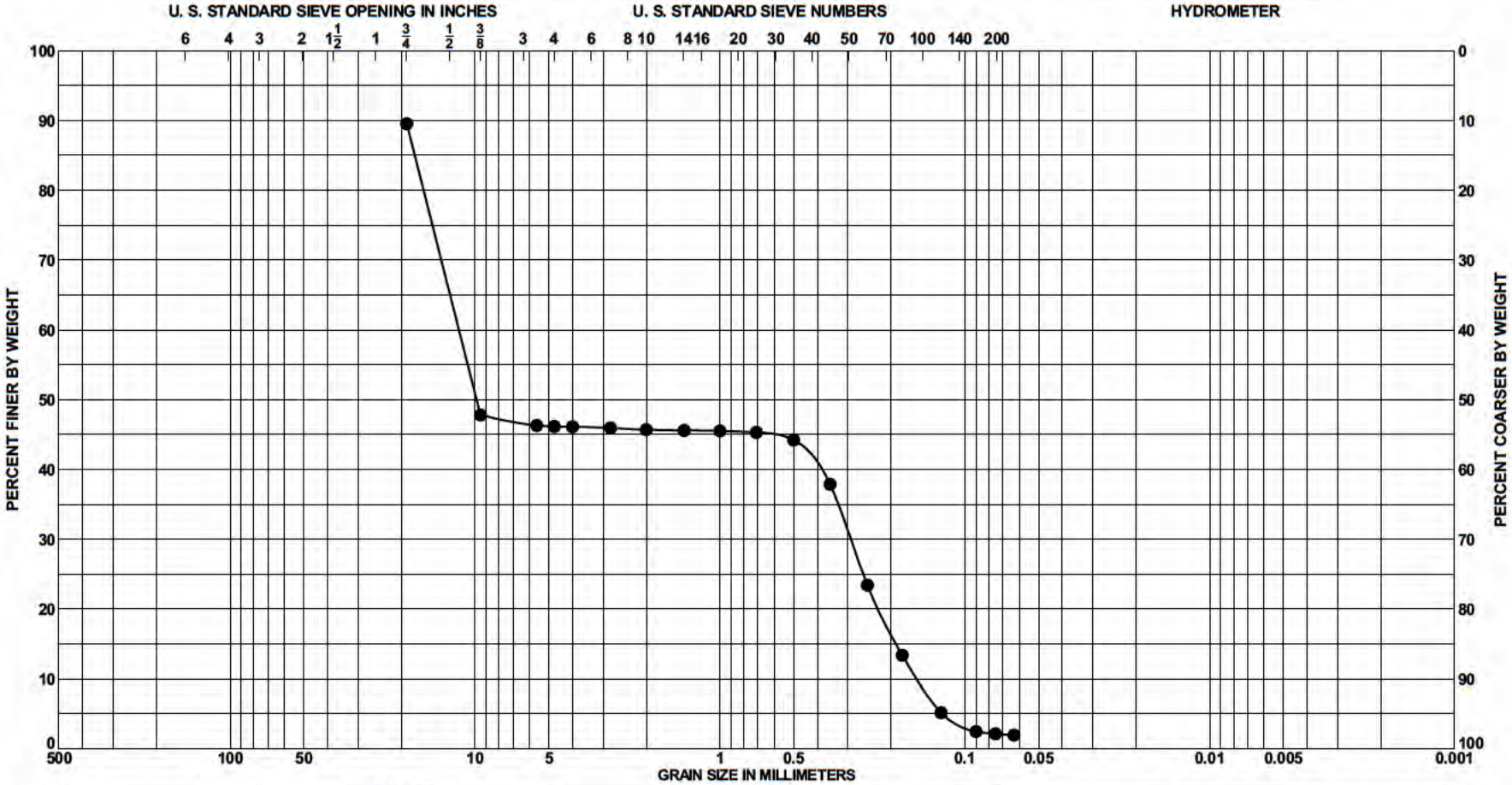


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 1	2.0 to 2.5 Ft.	SAND, poorly graded with silt,	5Y 5/1	1	19						
		mostly fine-grained sand-sized									
		quartz, little fine-grained sand-sized									
		limestone, few silt, trace shell, gray									
		(SP-SM)									

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-17
BORING ELEV.	-37.1 Ft., MLLW
DATE	9/20/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02

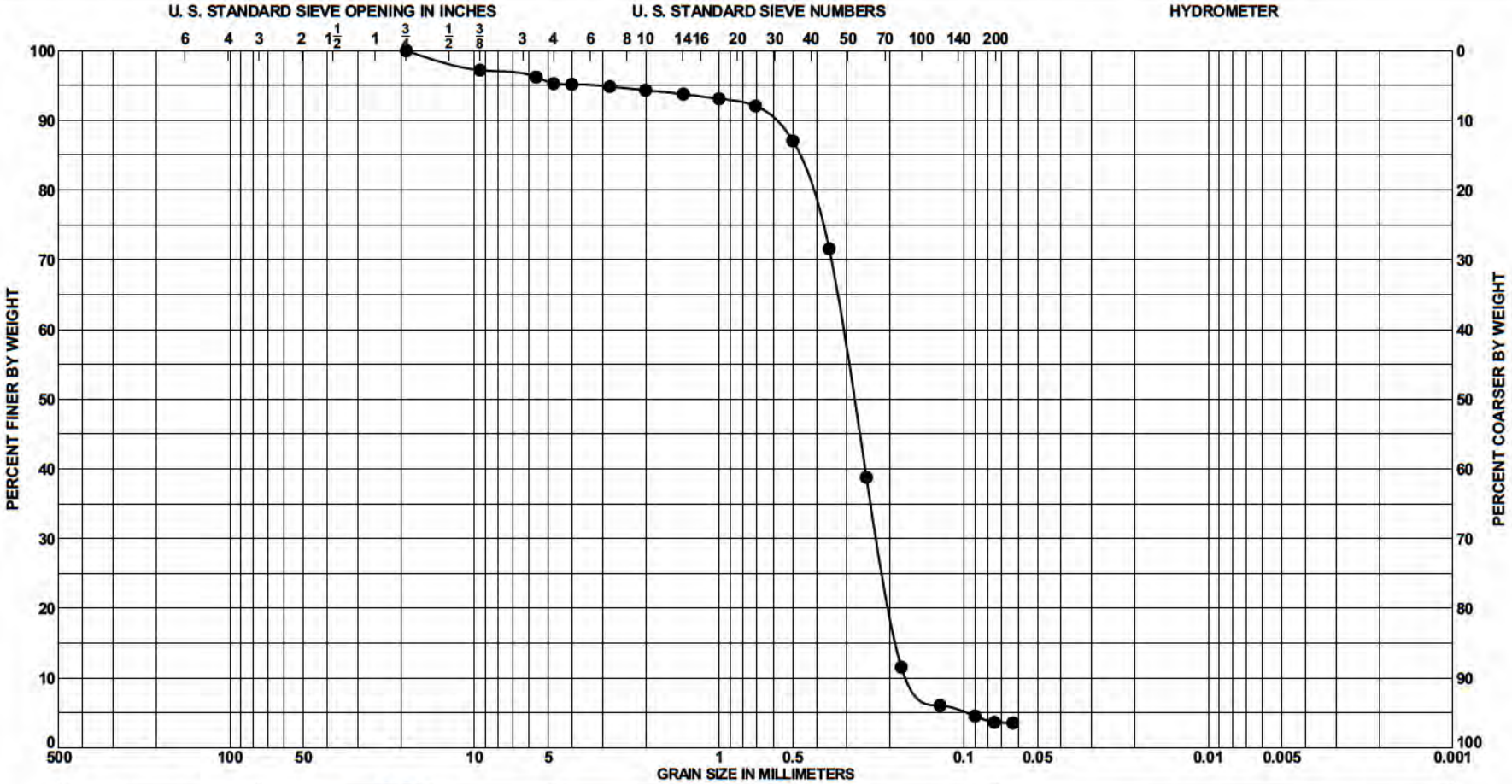


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 2	5.0 to 5.5 Ft.	SANDSTONE, some fine-grained sand-sized quartz, trace silt, trace shell, gray (SANDSTONE)	5Y 6/1	1							

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-17
BORING ELEV.	-37.1 Ft., MLLW
DATE	9/20/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02

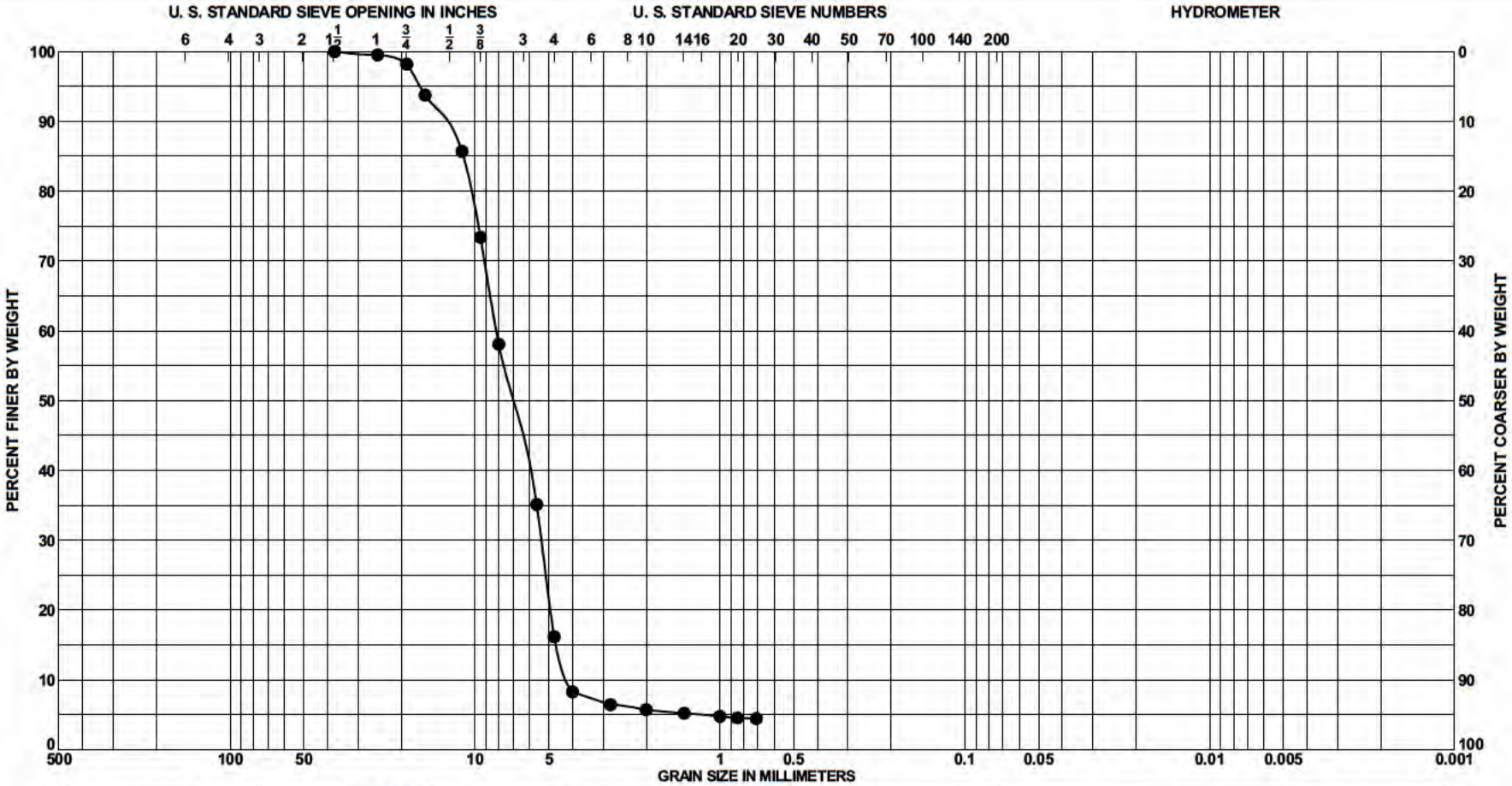


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 3	8.0 to 8.5 Ft.	SAND, poorly graded, mostly fine-grained sand-sized quartz, little fine to medium-grained sand-sized limestone, few fine to medium-grained sand-sized shell, trace silt, gre[illegible]	10Y 6/1	7							

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-17
BORING ELEV.	-37.1 Ft., MLLW
DATE	9/20/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02

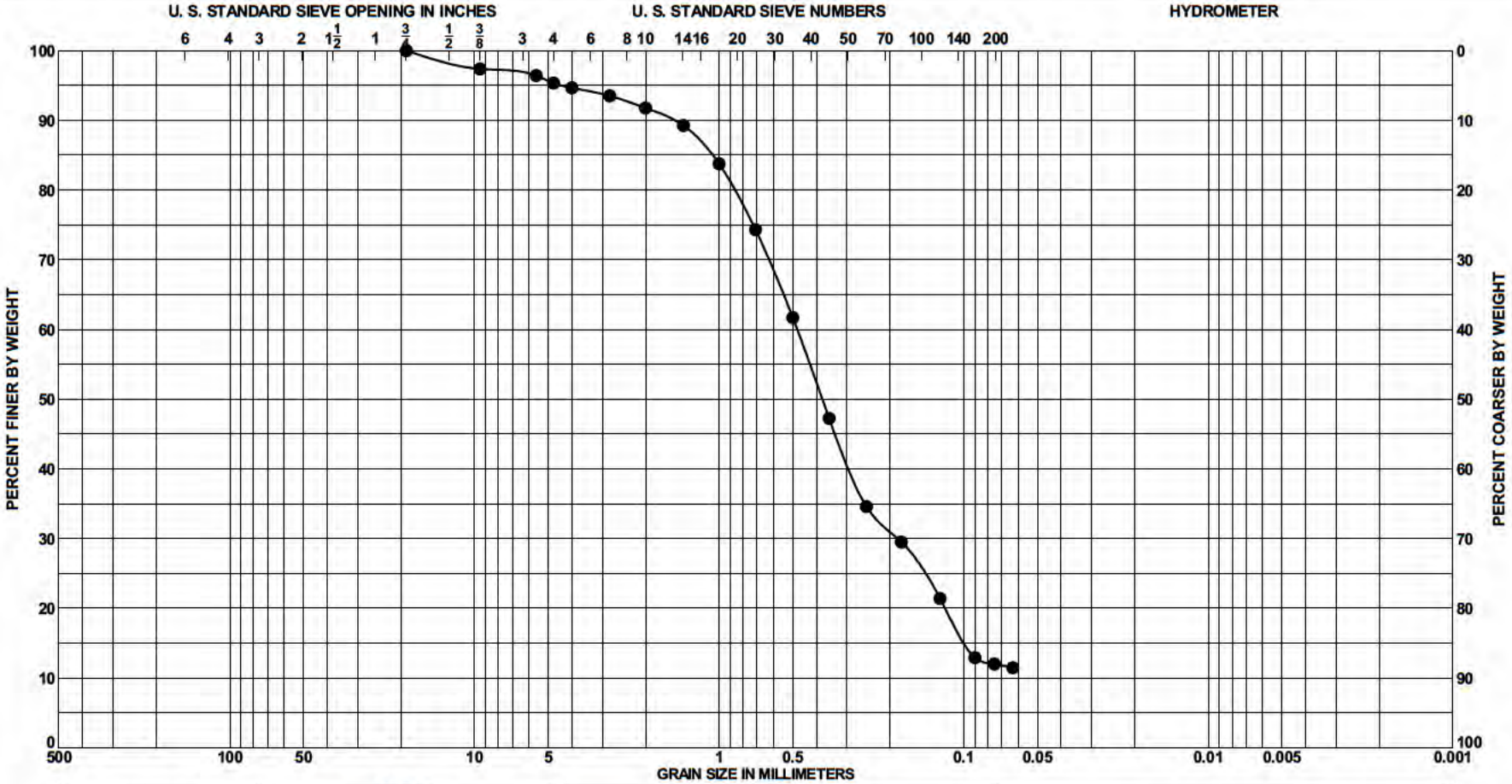


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 4	13.0 to 13.5 Ft.	SHELL, mostly fine gravel-sized	5Y 8/2	68							
		shell, little coarse-grained									
		sand-sized limestone, trace silt,									
		trace quartz, pale yellow (SHELL)									

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-17
BORING ELEV.	-37.1 Ft., MLLW
DATE	9/20/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02

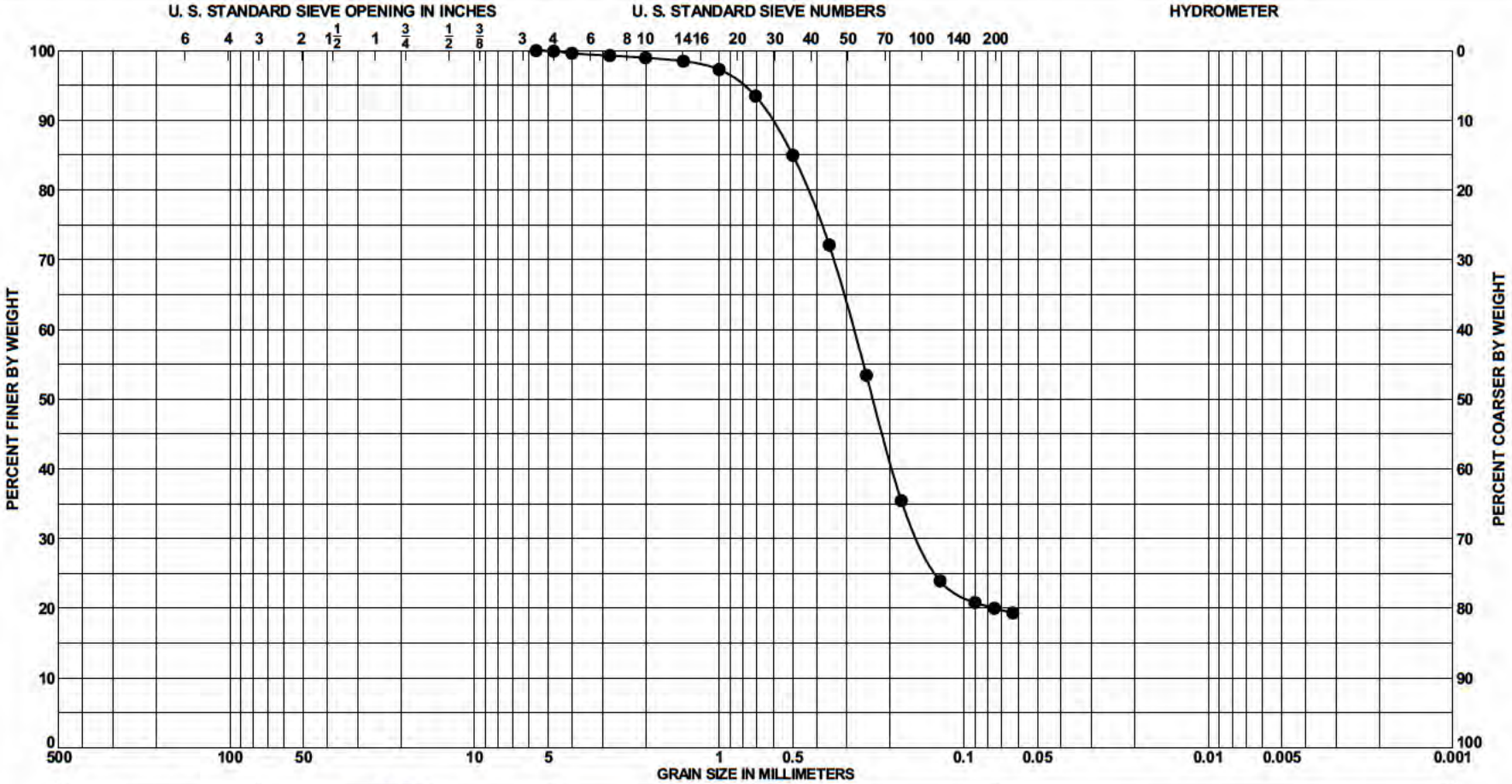


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 1	2.0 to 2.5 Ft.	SAND, poorly graded with silt, mostly fine to medium-grained sand-sized quartz, some fine to coarse-grained sand-sized limestone, few silt, trace shell, light olive brown	2.5Y 5/6	3	34						

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-18
BORING ELEV.	-18.1 Ft., MLLW
DATE	9/20/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02

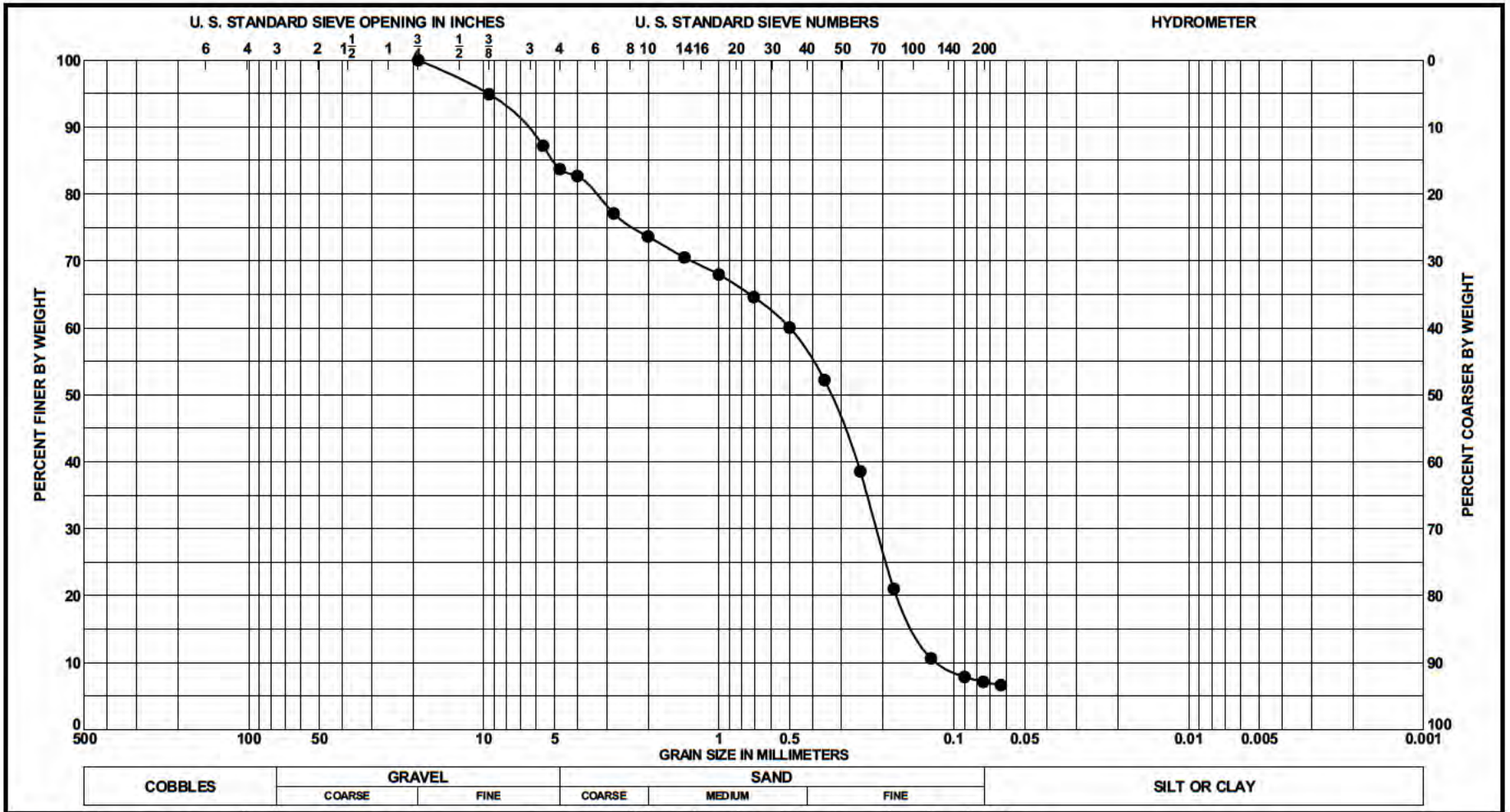


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 2	6.0 to 6.5 Ft.	SAND, silty, mostly fine to medium-grained sand-sized quartz, little silt, few fine to medium-grained sand-sized limestone, light olive brown (SM)	2.5Y 5/6	0	7						

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-18
BORING ELEV.	-18.1 Ft., MLLW
DATE	9/20/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02



Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	$\%CO_3$	G_s	Org %	w_n	LL	PL	PI
● 3	9.0 to 9.5 Ft.	SAND, poorly graded with silt,	2.5Y 6/4	1							
		mostly fine to medium-grained									
		sand-sized quartz, some fine									
		gravel-sized sandstone, few silt,									
		trace shell, light yellowish brown									

(SP)

GRADATION CURVES

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-18
BORING ELEV.	-18.1 Ft., MLLW
DATE	9/20/2012

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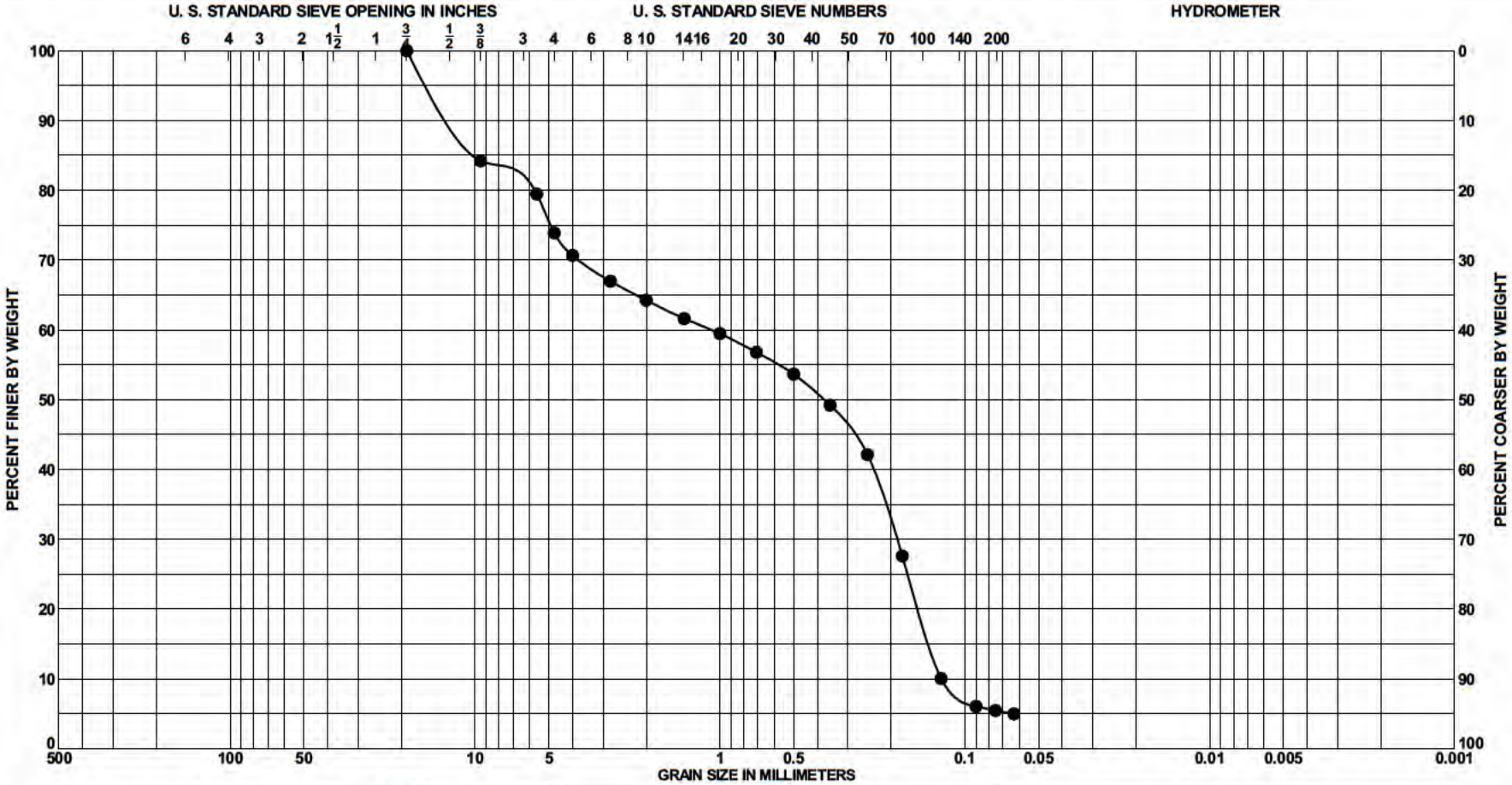
JUN 02

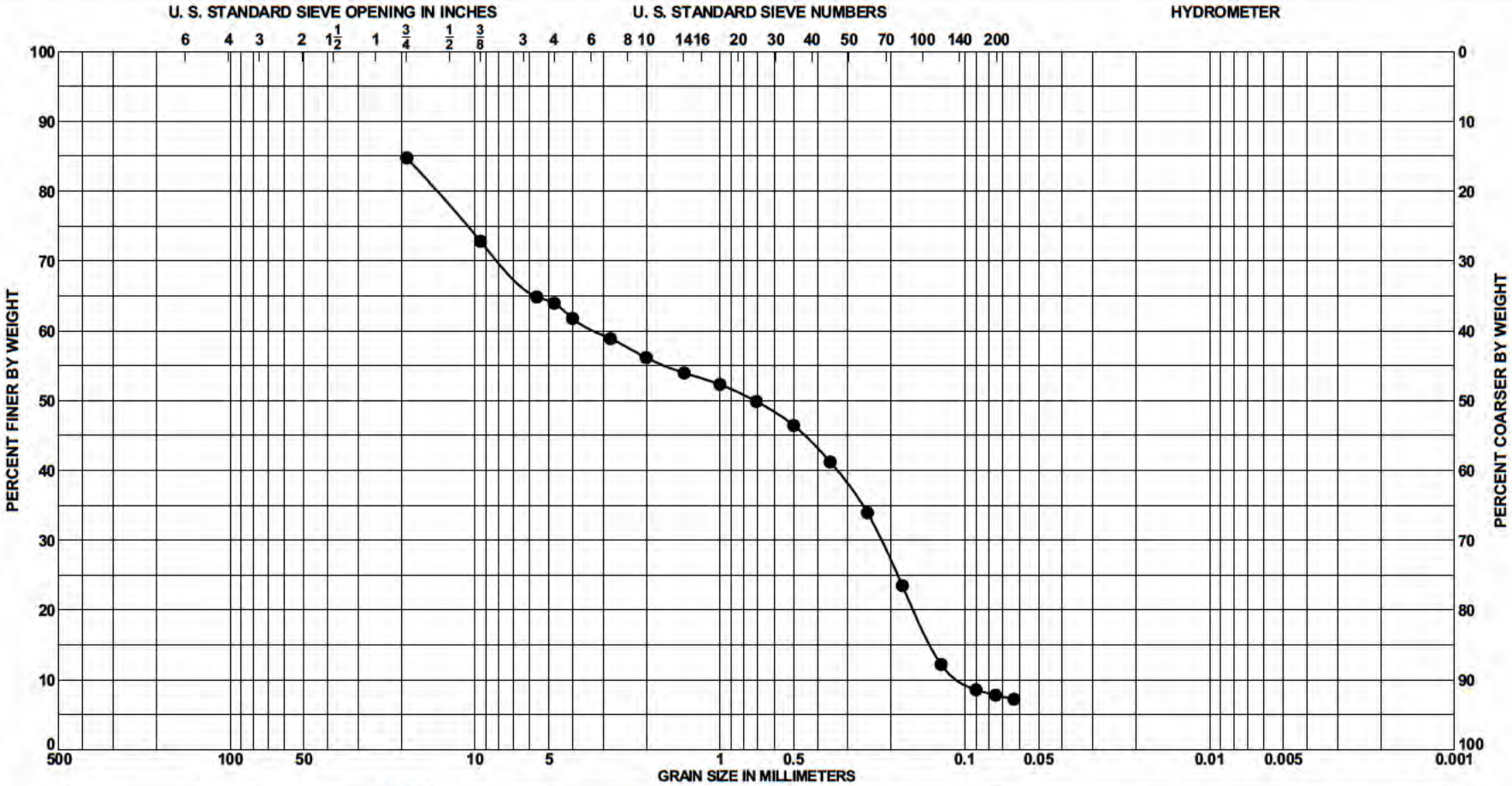


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 4	13.0 to 13.5 Ft.	SAND, poorly graded with silt,	5Y 8/2	3	36						
		mostly fine to medium-grained									
		sand-sized quartz, some fine									
		gravel-sized sandstone, few silt,									
		trace shell, pale yellow (SP-SM)									

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-18
BORING ELEV.	-18.1 Ft., MLLW
DATE	9/20/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02

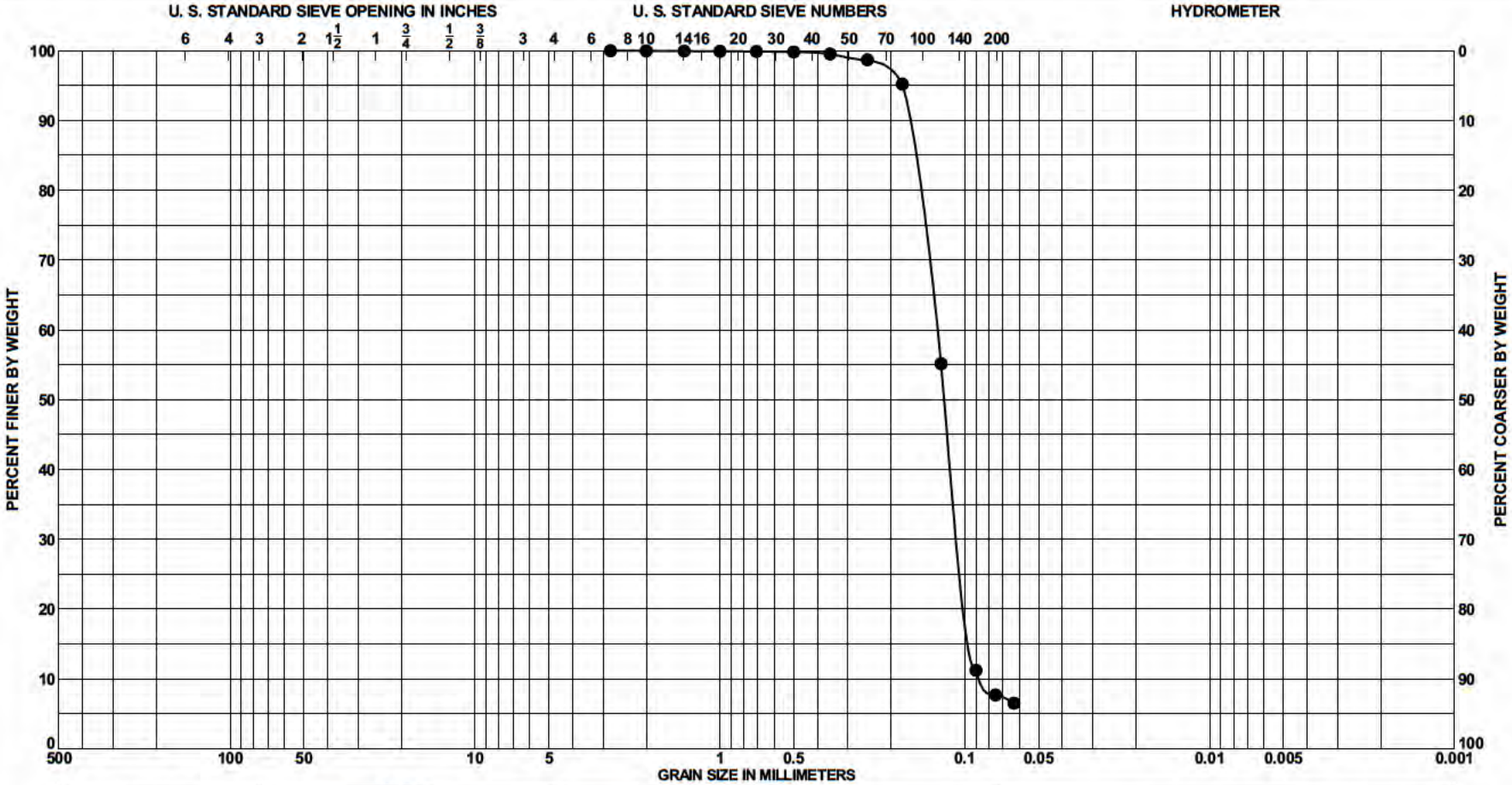


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 5	16.0 to 16.5 Ft.	SAND, poorly graded with silt, mostly fine to medium-grained sand-sized quartz, some fine to coarse gravel-sized sandstone, few silt, pale yellow (SP-SM)	5Y 8/2	1							

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-18
BORING ELEV.	-18.1 Ft., MLLW
DATE	9/20/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02

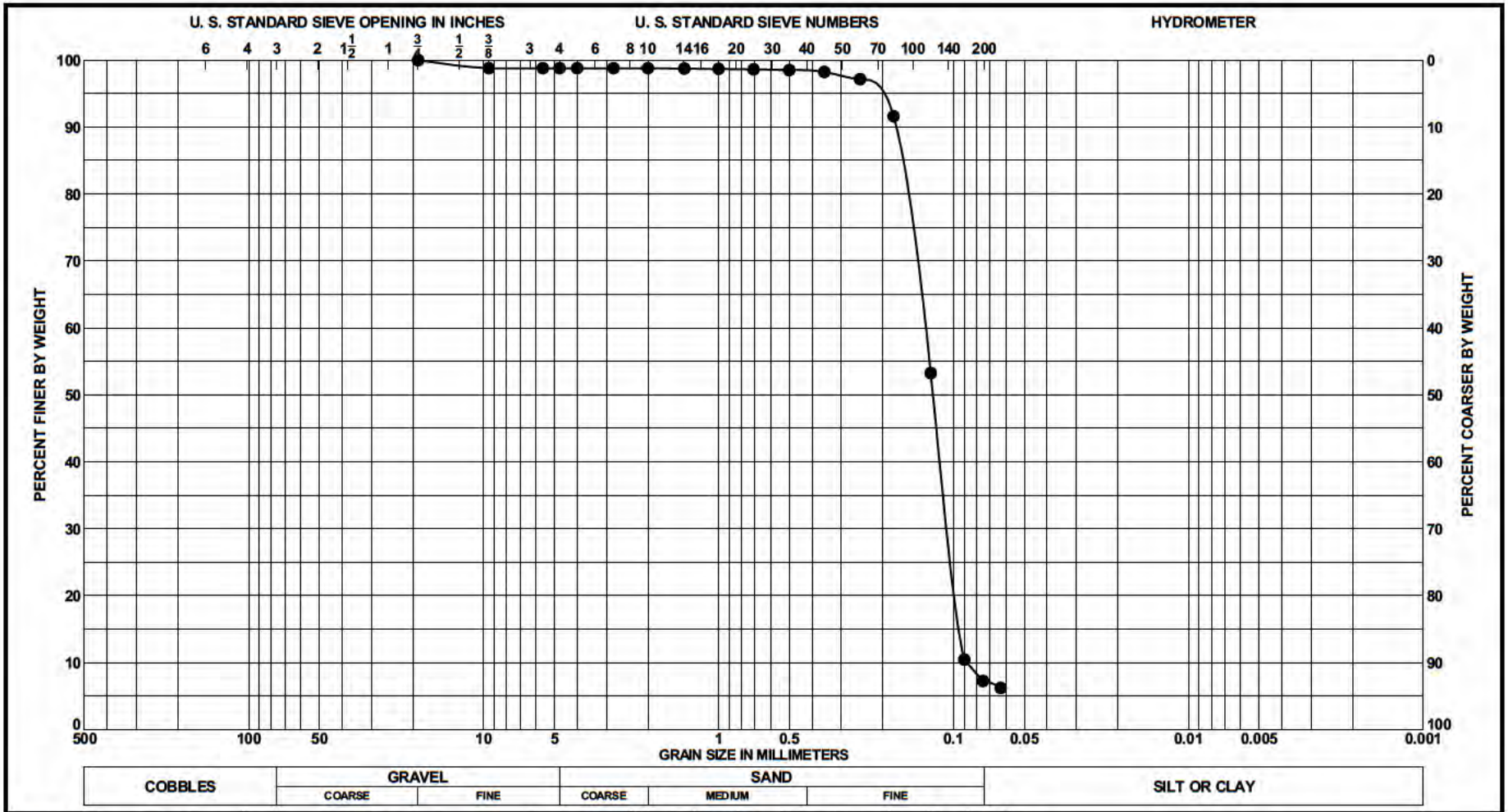


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 2	6.0 to 6.5 Ft.	SAND, poorly graded with silt, mostly fine-grained sand-sized quartz, little fine-grained sand-sized shell, few silt, gray (SP-SM)	5Y 5/1	24							

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-19
BORING ELEV.	-26.5 Ft., MLLW
DATE	9/20/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02

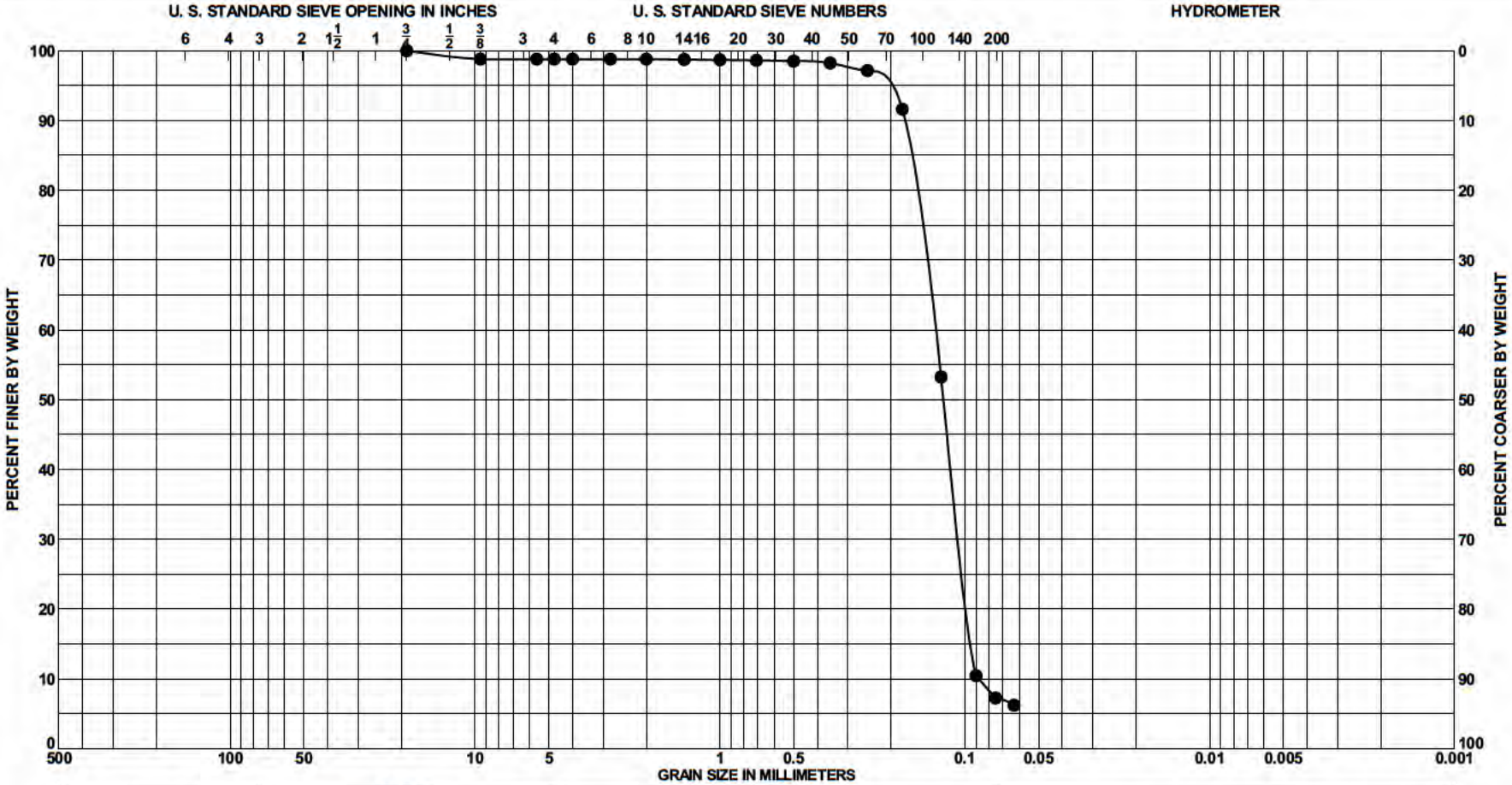


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 3	9.0 to 9.5 Ft.	SAND, poorly graded with silt,	5Y 5/1	27	19						
		mostly fine-grained sand-sized									
		quartz, little fine-grained sand-sized									
		shell, few silt, gray (SP-SM)									

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-19
BORING ELEV.	-26.5 Ft., MLLW
DATE	9/20/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02

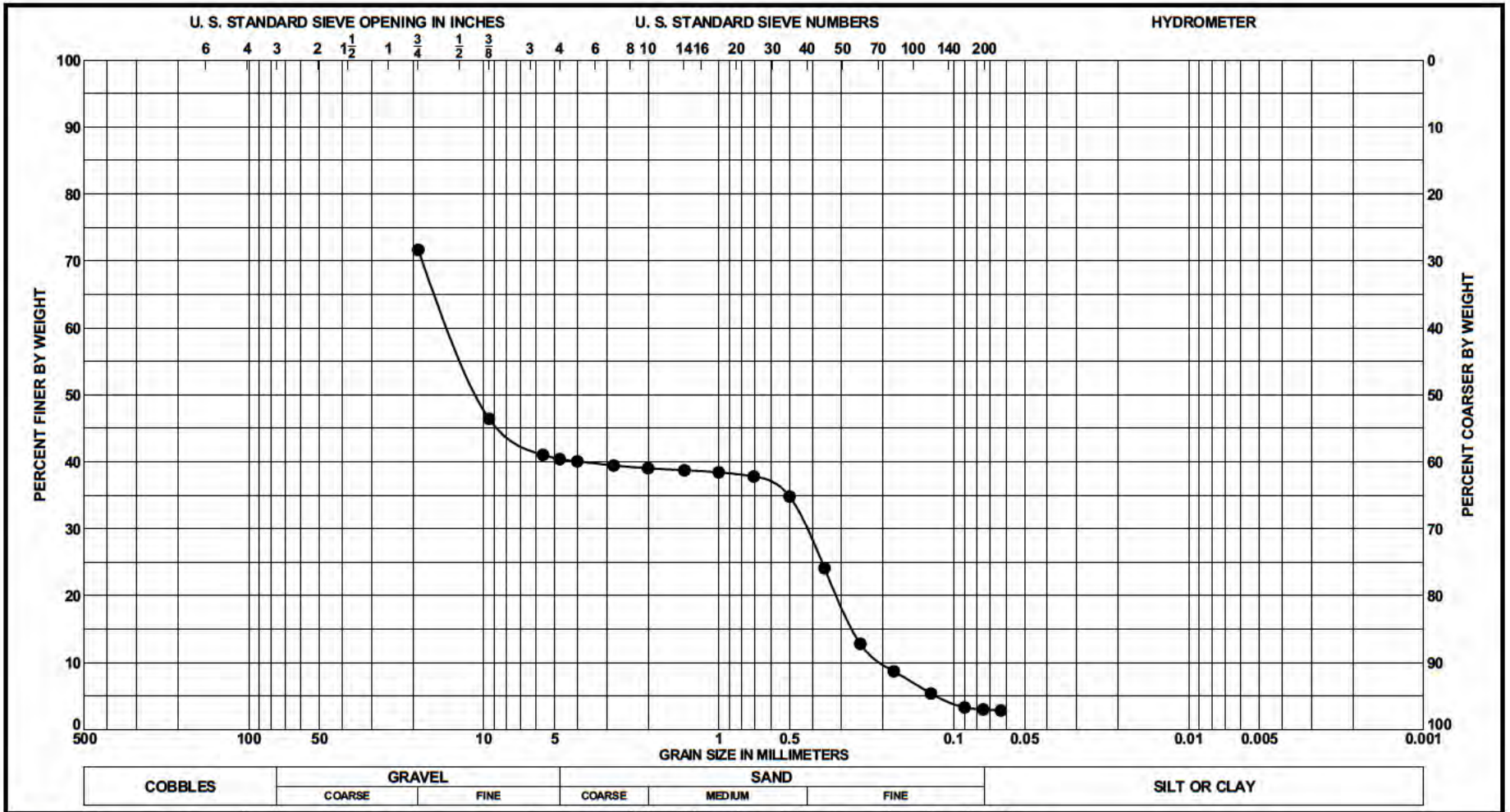


Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 3	9.0 to 9.5 Ft.	SAND, poorly graded with silt,	5Y 5/1	27	19						
		mostly fine-grained sand-sized									
		quartz, little fine-grained sand-sized									
		shell, few silt, gray (SP-SM)									

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-19
BORING ELEV.	-26.5 Ft., MLLW
DATE	9/20/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02



Sample No.	Depth	Classification	Munsell	Visual % Shell (est)	%CO_3	G_s	Org %	w_n	LL	PL	PI
● 4	12.0 to 12.5 Ft.	LIMESTONE, mostly fine to coarse gravel-sized limestone, some fine-grained sand-sized quartz, trace silt, white (LIMESTONE)	5Y 8/1	1							

PROJECT	Lake Worth Inlet Snell Vibracoring 2012
	Vibracore Borings
BORING NO.	VB-LWI2012-19
BORING ELEV.	-26.5 Ft., MLLW
DATE	9/20/2012

GRADATION CURVES

SAJ FORM 2087
JUN 02

Boring Logs and Laboratory Results:

Beach

x=814 524 y=886,652

Hole No.CB-LWI99-1

DRILLING LOG

DIVISION South Atlantic	INSTALLATION Jacksonville District
	SHEET 1 OF 2
1. PROJECT Lake Worth Inlet Sand Transfer Plant	10. SIZE AND TYPE OF BIT 2-3/8, 3-7/8 inch Tricone Bits
2. LOCATION (Coordinates or Station) X=970,761 Y=886,715	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD 29, Horizontal Datum: FLE, NAD 83
3. DRILLING AGENCY US Drilling	12. MANUFACTURER'S DESIGNATION OF DRILL Mobile B-30 Buggy
4. HOLE NO. (As shown on drawing title and file number) CB-LWI99-1	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 13 undisturbed: 0
5. NAME OF DRILLER J. C. Moffit	14. TOTAL NUMBER OF CORE BOXES 1
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED	15. ELEVATION GROUND WATER +2.5
	16. DATE HOLE STARTED 11/24/99 COMPLETED 11/24/99
7. THICKNESS OF BURDEN 18.5 Ft.	17. ELEVATION TOP OF HOLE +7.5 Ft.
8. DEPTH DRILLED INTO ROCK 10.0 Ft.	18. TOTAL CORE RECOVERY FOR BORING See Below %
9. TOTAL DEPTH OF HOLE 28.5 Ft.	19. SIGNATURE OF Civil Engineer Erik S. Urch

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/.5'
7.5	0.0					7.5	
			SAND, medium subrounded quartz, little medium sand-sized subangular shell fragments, tan to white (SP)	67	1	SPLIT SPOON	1, 1, 2
						6.0	
				89	2	SPLIT SPOON	4, 7, 9
4.5	3.0					4.5	
			SAND, medium quartz, little subangular to angular coarse sand-sized shell fragments, tan to white (SP)	78	3	SPLIT SPOON	8, 9, 9
						3.0	
				100	4	SPLIT SPOON	10, 14, 17
1.5	6.0					1.5	
			SAND, medium to fine quartz, some subangular medium sand-sized shell fragments, gray (SP)	100	5	SPLIT SPOON	14, 15, 15
						0.0	
				67	6	SPLIT SPOON	6, 7, 12
						-1.5	
				67	7	SPLIT SPOON	4, 5, 5
						-3.0	
				89	8	SPLIT SPOON	5, 5, 7
						-4.5	
				83	9	SPLIT SPOON	7, 10, 10
						-6.0	
				78	10	SPLIT SPOON	7, 10, 9
-7.5	15.0					-7.5	
			SAND, medium to fine quartz, little subangular medium to fine sand-sized shell fragments, gravel-sized cemented sand and shell fragments, tan to red (SW)	17	11	SPLIT SPOON	5, 3, 5
						-9.0	
				17	12	SPLIT SPOON	3, 5, 9
						-10.5	
-11.0	18.5			60	13	-11.0 SPLIT SPOON	55/5
			LIMESTONE, weakly cemented, shelly, sand-filled solution holes, gray to white	67		Timed Rock Coring 18.5 to 19.5 - 0 min. 20 sec. 19.5 to 20.5 - 0 min. 30 sec. 20.5 to 21.5 - 0 min. 32 sec. 21.5 to 22.5 - 0 min. 28 sec.	
						(continued)	

Depth scale: 0, 2.5, 5, 7.5, 10, 12.5, 15, 17.5, 20, 22.5

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT	HOLE NUMBER
Lake Worth Inlet Sand Transfer Plant	CB-LWI99-1

DRILLING LOG (Cont. Sheet)

ELEVATION TOP OF HOLE: +7.5 Ft.

SHEET 2 OF 2

PROJECT: Lake Worth Inlet Sand Transfer Plant

INSTALLATION: Jacksonville District

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/ .5'
-15.0	22.5						
			some coral, 22.5 to 28.5 feet	67		22.5 to 23.5 - 0 min. 25 sec. Recovery = 67%, RQD = 67 -16.0	
						Timed Rock Coring	
						23.5 to 24.5 - 0 min. 20 sec.	
						24.5 to 25.5 - 0 min. 22 sec.	
				93		25.5 to 26.5 - 0 min. 35 sec.	
						26.5 to 27.5 - 0 min. 25 sec.	
						27.5 to 28.5 - 0 min. 22 sec. Recovery =93%, RQD = 83 -21.0	
-21.0	28.5						
			Laboratory Classifications Depth From To 3.0 4.5 (SP) 7.5 9.0 (SP) 18.0 18.5 (GP)			140# Hammer with 30" drop used on a 2.0' split spoon (1 3/8" I.D. X 2" O.D.)	
			Notes: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.			NAD-27 Coordinates X = 814,524 Y = 886,552	

22.5 25 27.5 30 32.5 35 37.5 40 42.5 45 47.5 50

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT: Lake Worth Inlet Sand Transfer Plant

HOLE NUMBER: CB-LWI99-1

X = 814,266 Y = 885,750

Hole No.CB-LWI99-2

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 1

1. PROJECT Lake Worth Inlet Sand Transfer Plant	10. SIZE AND TYPE OF BIT 2-3/8, 3-7/8 inch Tricone Bits
2. LOCATION (Coordinates or Station) X=970,503 Y=885,913	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD 29, Horizontal Datum: FLE, NAD 83
3. DRILLING AGENCY US Drilling	12. MANUFACTURER'S DESIGNATION OF DRILL Mobile B-30 Buggy
4. HOLE NO. (As shown on drawing title and file number) CB-LWI99-2	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 7 undisturbed: 0
5. NAME OF DRILLER J. C. Moffit	14. TOTAL NUMBER OF CORE BOXES 1
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED	15. ELEVATION GROUND WATER +2.0
	16. DATE HOLE STARTED 11/24/99 COMPLETED 11/24/99
7. THICKNESS OF BURDEN 10.0 Ft.	17. ELEVATION TOP OF HOLE +7.5 Ft.
8. DEPTH DRILLED INTO ROCK 5.0 Ft.	18. TOTAL CORE RECOVERY FOR BORING See Below %
9. TOTAL DEPTH OF HOLE 15.0 Ft.	19. SIGNATURE OF Civil Engineer Erik S. Urch

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/ .5'
7.5	0.0					7.5	
			SAND, medium to coarse quartz, little angular to subangular medium to coarse sand-sized shell fragments, tan to white (SW)	50	1	SPLIT SPOON 6.0	1 1 2
				67	2	SPLIT SPOON 4.5	3 3 5
3.0	4.5			83	3	SPLIT SPOON 3.0	5 5 6
			SAND, medium to fine quartz, little subangular medium sand-sized shell fragments, tan-gray (SW)	100	4	SPLIT SPOON 1.5	6 13 13
				100	5	SPLIT SPOON 0.0	10 10 10
			- little silt, 7.5 ft to 9.0 ft	67	6	SPLIT SPOON -1.5	7 10 9
-2.0	9.5			100	7	SPLIT SPOON -2.5	15 50/3
-2.5	10.0		SAND, medium to fine quartz, gray (SP)				
			LIMESTONE, weakly cemented, shelly, light gray	92		Timed Rock Coring 10.0 to 11.0 - 0 min. 32 sec. 11.0 to 12.0 - 0 min. 40 sec. 12.0 to 13.0 - 0 min. 38 sec. 13.0 to 14.0 - 0 min. 40 sec. 14.0 to 15.0 - 0 min. 22 sec. Recovery = 92%, RQD = 88	
-7.5	15.0					-7.5	
			Laboratory Classifications Depth From To 1.5 3.0 (SP) 6.0 7.5 (SP) Notes: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.			140# Hammer with 30" drop used on a 2.0' split spoon (1 3/8" I.D. X 2" O.D.) NAD-27 Coordinates X = 814,266 Y = 885,750	

0, 2.5, 5, 7.5, 10, 12.5, 15, 17.5, 20, 22.5

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT	HOLE NUMBER
Lake Worth Inlet Sand Transfer Plant	CB-LWI99-2

X = 814,086 Y = 887,230

Hole No.CB-LWI99-3

DRILLING LOG	DIVISION South Atlantic	INSTALLATION Jacksonville District	SHEET 1 OF 2

1. PROJECT Lake Worth Inlet Sand Transfer Plant	10. SIZE AND TYPE OF BIT 2-3/8 inch Tricone Bit
2. LOCATION (Coordinates or Station) X=970,323 Y=884,393	11. DATUM FOR ELEVATION SHOWN (TBM or MSL) NGVD 29, Horizontal Datum: FLE, NAD 83
3. DRILLING AGENCY Black Diamond Drilling	12. MANUFACTURER'S DESIGNATION OF DRILL Mobile B-30
4. HOLE NO. (As shown on drawing title and file number) CB-LWI99-3	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN disturbed: 21 undisturbed: 0
6. NAME OF DRILLER Marty Hernandez	14. TOTAL NUMBER OF CORE BOXES 1
6. DIRECTION OF HOLE ☒ VERTICAL ☐ INCLINED	15. ELEVATION GROUND WATER +2.6
	16. DATE HOLE STARTED 9/22/99 COMPLETED 9/23/99
7. THICKNESS OF BURDEN 34.5 Ft.	17. ELEVATION TOP OF HOLE +10.1 Ft.
8. DEPTH DRILLED INTO ROCK 0.0 Ft.	18. TOTAL CORE RECOVERY FOR BORING See Below %
9. TOTAL DEPTH OF HOLE 34.5 Ft.	19. SIGNATURE OF Civil Engineer Erik S. Urch

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/.5'
10.1	0.0					10.1	
			SAND, fine to medium quartz, little angular to subangular medium sand-sized shell fragments, gray to tan (SP)	89	1	SPLIT SPOON 8.6	1, 3, 3
				100	2	SPLIT SPOON 7.1	4, 5, 7
				100	3	SPLIT SPOON 5.6	7, 8, 7
				89	4	SPLIT SPOON 4.1	5, 6, 7
			medium to coarse quartz sand, 6.0 ft to 13.5 ft	89	5	SPLIT SPOON 2.6	5, 7, 12
				89	6	SPLIT SPOON 1.1	4, 6, 9
			- Lost drilling fluid circulation at 9.0 ft, installed casing	100	7	SPLIT SPOON -.4	10, 12, 24
				100	8	SPLIT SPOON -1.9	7, 26, 34
-3.4	13.5			28	9	SPLIT SPOON -3.4	6, 7, 12
			SAND, medium to coarse quartz, some angular to subangular coarse sand- to fine gravel-sized shell and shell fragments, tan (SW)	100	10	SPLIT SPOON -4.9	23, 32, 46
				67	11	SPLIT SPOON -6.4	11, 18, 28
				100	12	SPLIT SPOON -7.9	12, 16, 16
			some peat, gray-black, 18.0 ft to 21.0 ft	89	13	SPLIT SPOON -9.4	2, 2, 2
-10.9	21.0			100	14	SPLIT SPOON -10.9	7, 14, 30
			SAND, sub-rounded medium to fine quartz, shelly, angular to subangular shell fragments, gray-black (SP)	100	15	SPLIT SPOON -12.4	14, 28, 24
						(continued)	

0 2.5 5 7.5 10 12.5 15 17.5 20 22.5

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT	HOLE NUMBER
Lake Worth Inlet Sand Transfer Plant	CB-LWI99-3

DRILLING LOG (Cont. Sheet)

ELEVATION TOP OF HOLE +10.1 Ft.

SHEET 2 OF 2

PROJECT: Lake Worth Inlet Sand Transfer Plant

INSTALLATION: Jacksonville District

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS (Description)	CORE REC %	SAMPLE NUMBER	REMARKS Bit or Barrel	BLOWS/ .5'
-12.4	22.5					-12.4	
				100	16	SPLIT SPOON	6, 12, 22
						-13.9	
				100	17	SPLIT SPOON	16, 40, 49
						-15.4	
				100	18	SPLIT SPOON	5, 8, 16
-16.9	27.0					-16.9	
			SAND, medium to fine quartz, trace of shell fragments, gray-black (SP)	100	19	SPLIT SPOON	19, 37, 54
						-18.4	
				0		SPLIT SPOON	34, 35, 68
-19.9	30.0					-19.9	
			SAND, medium to coarse quartz, some subangular to angular medium to coarse sand-sized shell and shell fragments, green-tan (SW)	100	20	SPLIT SPOON	45, 37, 105/5
						-21.4	
						See Note Below	NR, NR, NR
						-22.9	
				83	21	SPLIT SPOON	55, 94, 100/3
-24.4	34.5					-24.4	
			Laboratory Classifications Depth From To 3.0 4.5 (SP) 9.0 10.5 (SP) 21.0 22.5 (SP) 27.0 28.5 (SP-SM) Notes: 1. Soils are field visually classified in accordance with the Unified Soils Classification System.			140# Hammer with 30" drop used on a 2.0' split spoon (1 3/8" I.D. X 2" O.D.) Drilled from 31.5 ft to 33.0 ft, omitted split-spoon sample due to high blow-count of previous sample. Resumed sampling at 33.0 ft. NAD-27 Coordinates X = 814,086 Y = 884,230	

22.5 25 27.5 30 32.5 35 37.5 40 42.5 45 47.5 50

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE.

PROJECT: Lake Worth Inlet Sand Transfer Plant

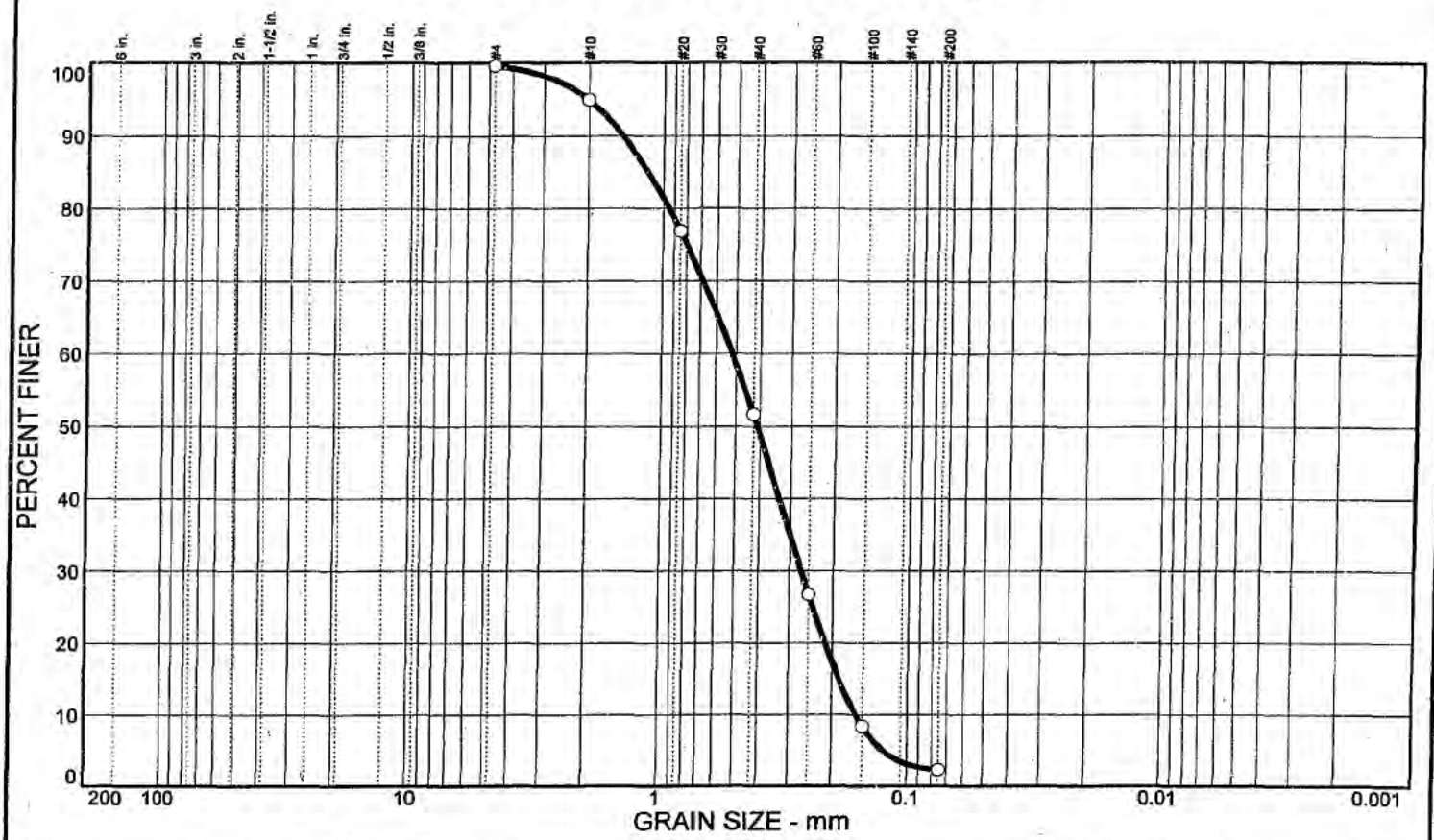
HOLE NUMBER: CB-LWI99-3

SUMMARY OF LABORATORY TEST RESULTS

LAKE WORTH INLET SAND TRANSFER PLANT
U. S. ARMY CORPS OF ENGINEERS
LAW PROJECT NO. 40521-8-8051-12

Boring No.	Sample No.	Sample Depth (feet)	Unified Soil Classification Symbol	Specific Gravity	Percent Passing Sieve No.						
					4	10	20	40	60	100	200
CB-LWI99-1	3	3.0 - 4.5	SP		99.6	94.9	76.9	51.6	26.7	8.4	2.3
	6	7.5 - 9.0	SP		99.3	97.5	95.5	83.5	56.4	25.3	2.5
	7	9.0 - 10.5		2.718							
	11	15.0 - 16.5		2.786							
	13	18.0 - 18.5	GP		12.1	8.9	7.1	4.6	3.2	2.3	1.6
CB-LWI99-2	2	1.5 - 3.0	SP		100.0	99.8	98.1	74.8	16.9	1.1	0.2
	3	3.0 - 4.5		2.742							
	5	6.0 - 7.5	SP		100.0	99.8	99.2	90.4	60.0	29.6	2.6
	6	7.5 - 9.0		2.714							
CB-LWI99-3	3	3.0 - 4.5	SP		100.0	99.5	92.4	58.3	14.0	1.9	0.8
	7	9.0 - 10.5	SP		100.0	99.2	91.5	52.7	10.5	2.8	1.7
	8	10.5 - 12.0		2.753							
	15	21.0 - 22.5	SP		100.0	98.9	85.3	40.8	14.3	4.9	2.9
	16	22.5 - 24.0		2.813							
	19	27.0 - 28.5	SP-SM		100.0	99.8	95.5	78.2	38.5	12.3	7.4

Grain Size Distribution Report



	% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○			97.3	2.3		SP	A-3		

SIEVE inches size	PERCENT FINER ○		
	GRAIN SIZE		
D_{60}	0.519		
D_{30}	0.269		
D_{10}	0.160		
	COEFFICIENTS		
C_C	0.87		
C_U	3.25		

SIEVE number size	PERCENT FINER ○		
#4	99.6		
#10	94.9		
#20	76.9		
#40	51.6		
#60	26.7		
#100	8.4		
#200	2.3		

SOIL DESCRIPTION

○ SAND, fine to medium quartz, little medium to coarse sand-sized shell fragments, trace of silt, tan to white

REMARKS:

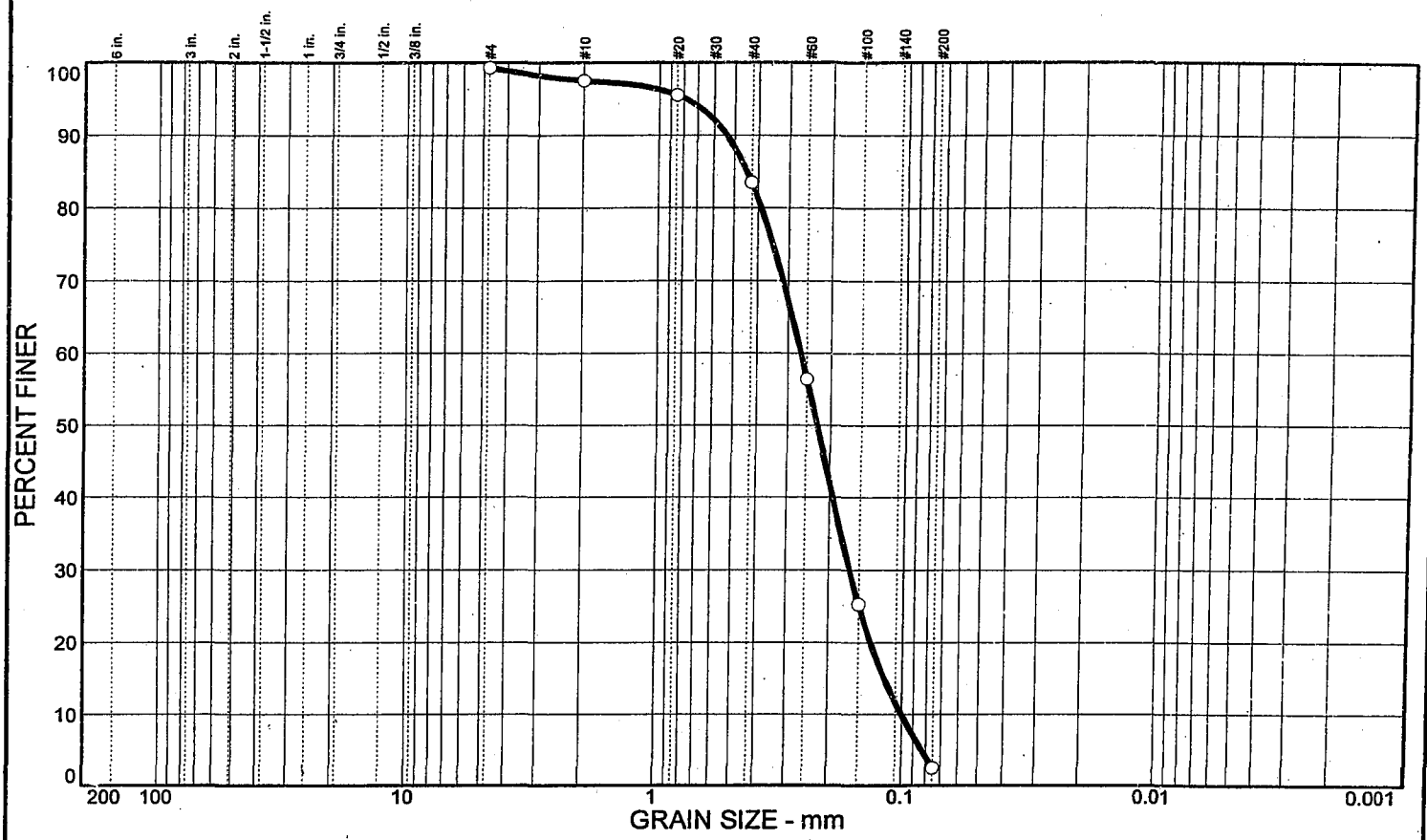
○

○ Source: Boring No. CB-LWI99-1 Sample No.: 3 Elev./Depth: 3.0'- 4.5'

Law Engineering and Environmental Services, Inc.

Client: US Army Corp of Engineers
Project: Lake Worth Inlet Project
Project No.: 40521-8-8051-12

Grain Size Distribution Report



	% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○			96.8	2.5		SP	A-3		

SIEVE inches size	PERCENT FINER ○		
	GRAIN SIZE		
D_{60}	0.265		
D_{30}	0.164		
D_{10}	0.100		
	COEFFICIENTS		
C_c	1.01		
C_u	2.64		

SIEVE number size	PERCENT FINER ○		
#4	99.3		
#10	97.5		
#20	95.5		
#40	83.5		
#60	56.4		
#100	25.3		
#200	2.5		

SOIL DESCRIPTION

○ SAND, fine to medium quartz, trace of medium to coarse sand-sized shell fragments, gray

REMARKS:

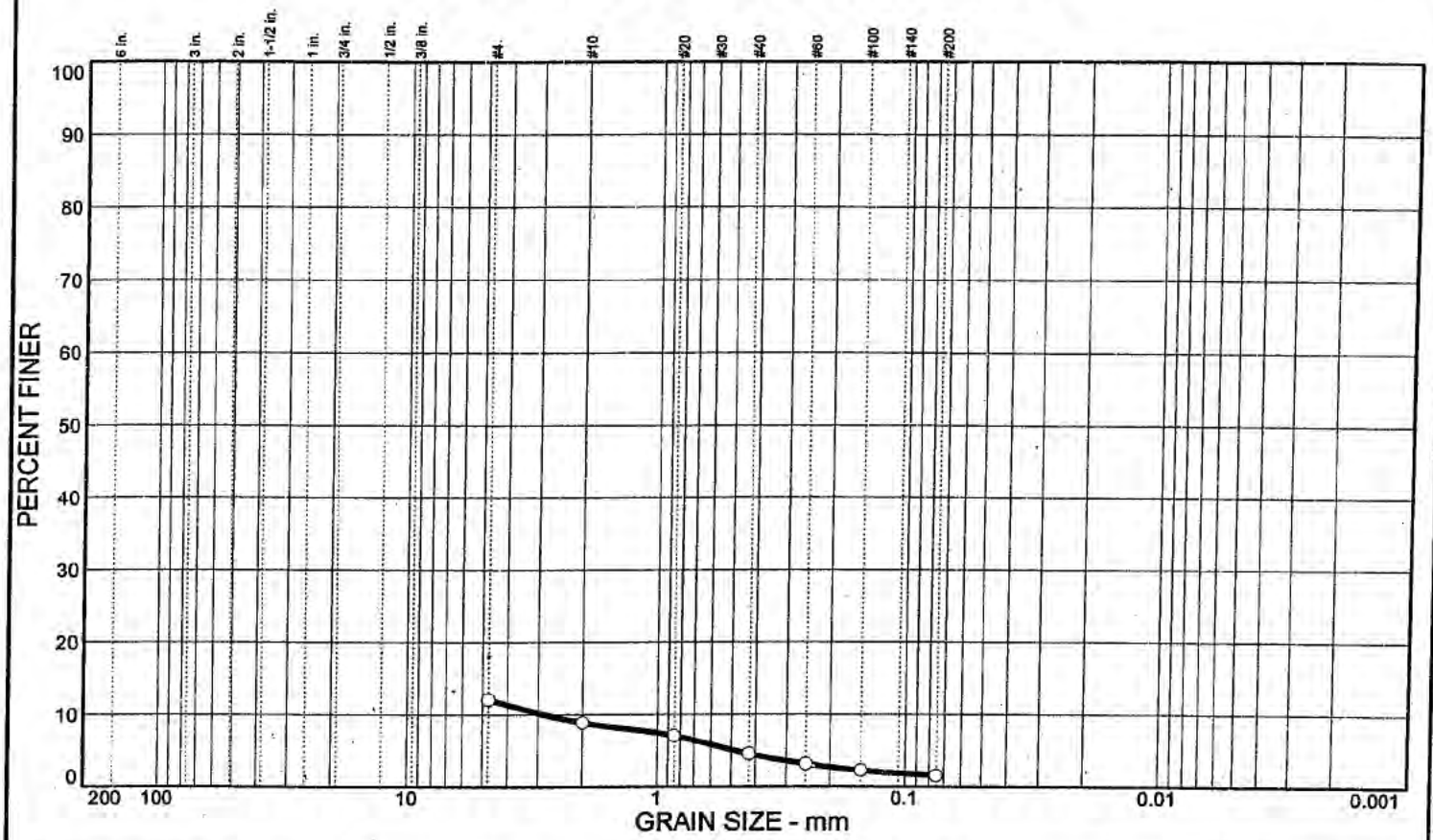
○

○ Source: Boring No. CB-LWI99-1 Sample No.: 6 Elev./Depth: 7.5'- 9.0'

Law Engineering and Environmental Services, Inc.

Client: US Army Corp of Engineers
Project: Lake Worth Inlet Project
Project No.: 40521-8-8051-12

Grain Size Distribution Report



	% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○			10.5	1.6		GP	A-1-a		

SIEVE inches size	PERCENT FINER ○		
	GRAIN SIZE		
D_{60}			
D_{30}			
D_{10}	2.83		
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○		
#4	12.1		
#10	8.9		
#20	7.1		
#40	4.6		
#60	3.2		
#100	2.3		
#200	1.6		

SOIL DESCRIPTION

○ GRAVEL, fine to coarse shelly limestone gravel, trace of fine quartz sand, trace of fine to coarse sand-sized shell fragments, trace of silt, tan to red

REMARKS:

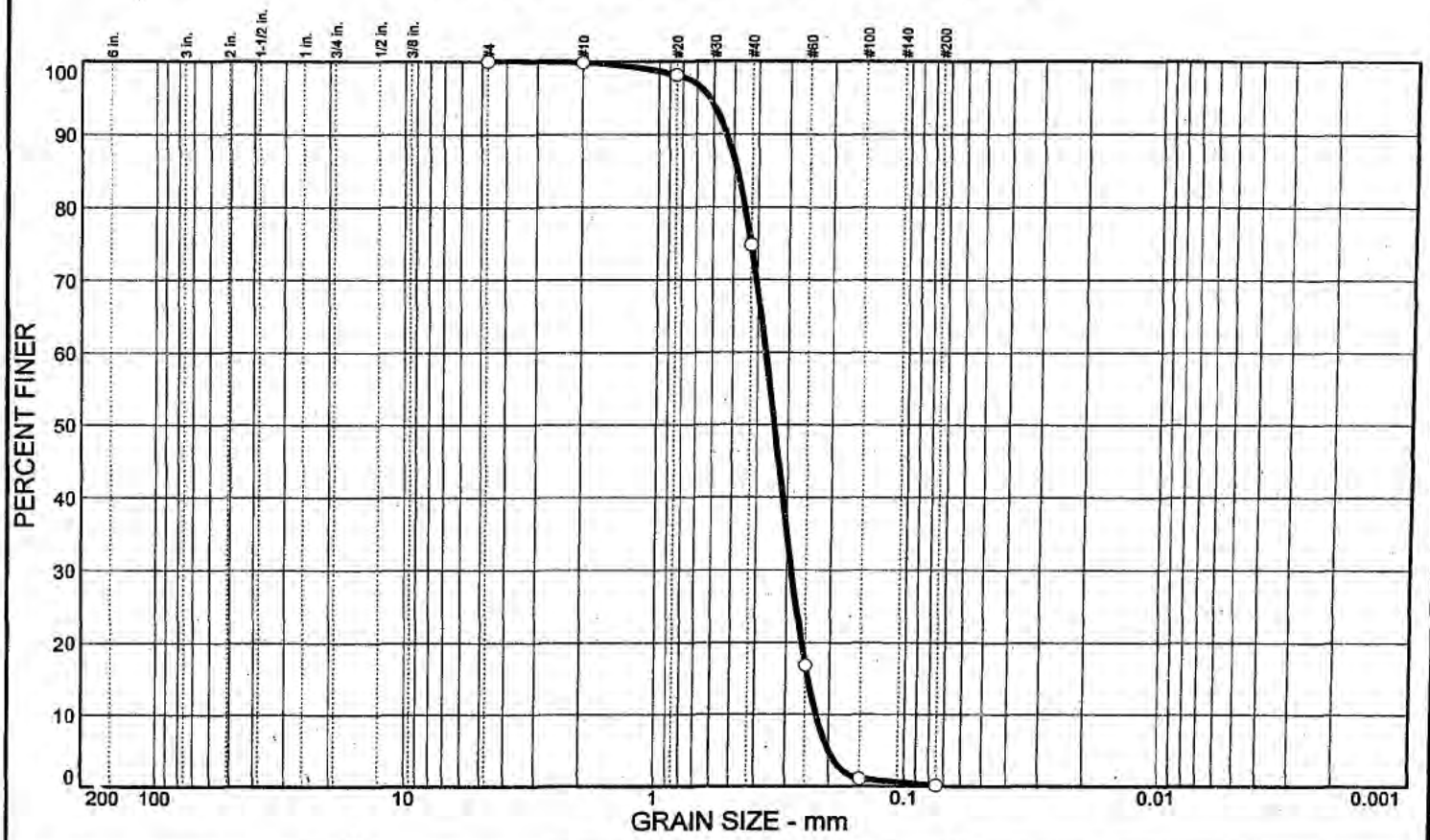
○

○ Source: Boring No. CB-LWI99-1 Sample No.: 13 Elev./Depth: 18.0' - 18.5'

Law Engineering and Environmental Services, Inc.

Client: US Army Corp of Engineers
Project: Lake Worth Inlet Project
Project No.: 40521-8-8051-12

Grain Size Distribution Report



	% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○			99.8	0.2		SP	A-3		

SIEVE inches size	PERCENT FINER ○		

	GRAIN SIZE		
D_{60}	0.369		
D_{30}	0.286		
D_{10}	0.225		
	COEFFICIENTS		
C_c	0.98		
C_u	1.64		

SIEVE number size	PERCENT FINER ○		
#4	100.0		
#10	99.8		
#20	98.1		
#40	74.8		
#60	16.9		
#100	1.1		
#200	0.2		

SOIL DESCRIPTION

○ SAND, fine to medium quartz, trace of medium to coarse sand-sized shell fragments, tan to brown

REMARKS:

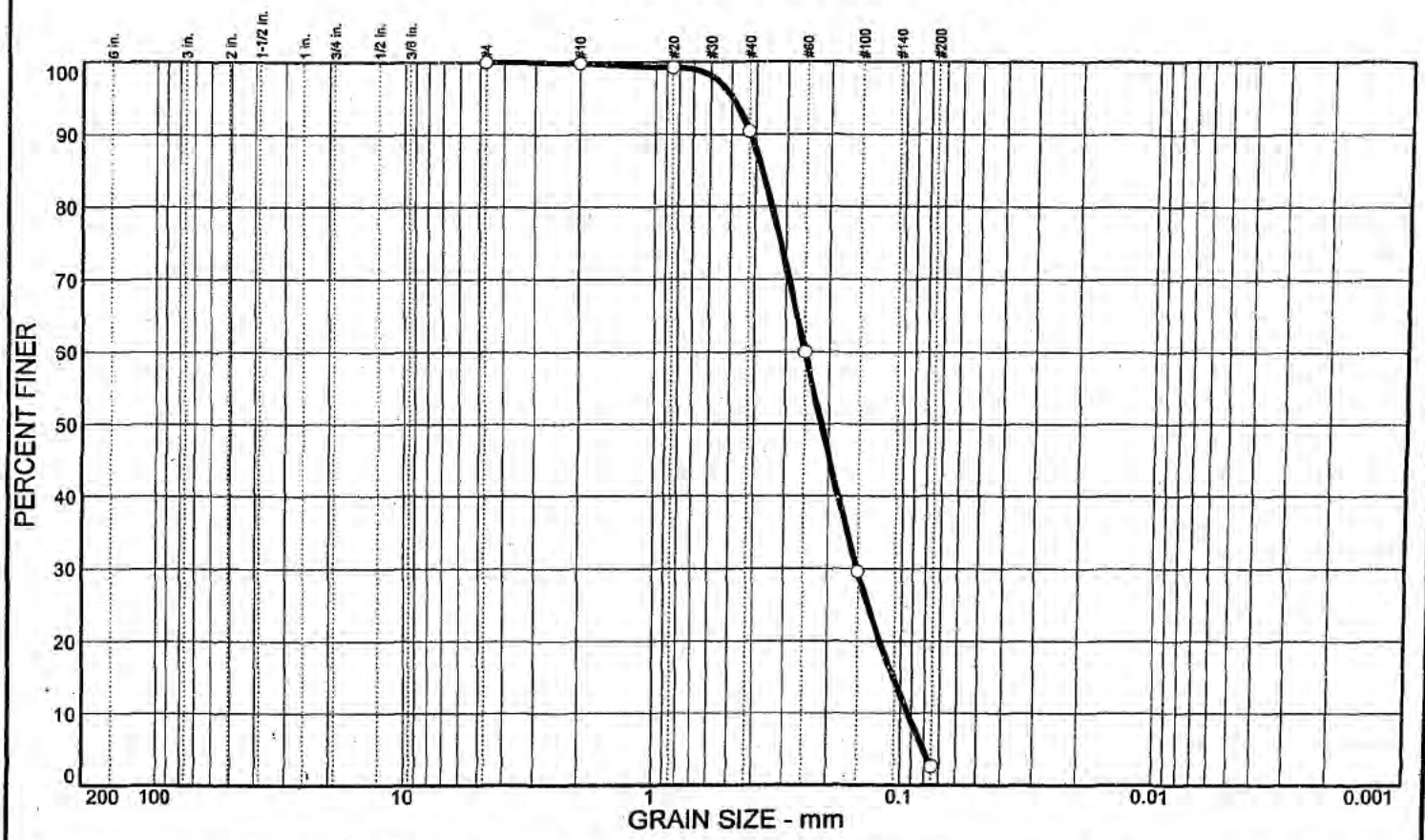
○

○ Source: Boring No. CB-LWI99-2 Sample No.: 2 Elev./Depth: 1.5'- 3.0'

Law Engineering and Environmental Services, Inc.

Client: US Army Corp of Engineers
Project: Lake Worth Inlet Project
Project No.: 40521-8-8051-12

Grain Size Distribution Report



	% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○			97.4	2.6		SP	A-3		

SIEVE inches size	PERCENT FINER ○		
	GRAIN SIZE		
D_{60}	0.250		
D_{30}	0.151		
D_{10}	0.0933		
	COEFFICIENTS		
C_c	0.98		
C_u	2.68		

SIEVE number size	PERCENT FINER ○		
#4	100.0		
#10	99.8		
#20	99.2		
#40	90.4		
#60	60.0		
#100	29.6		
#200	2.6		

SOIL DESCRIPTION

○ SAND, fine to medium quartz, trace of medium sand-sized shell fragments, trace of silt, tan-gray

REMARKS:

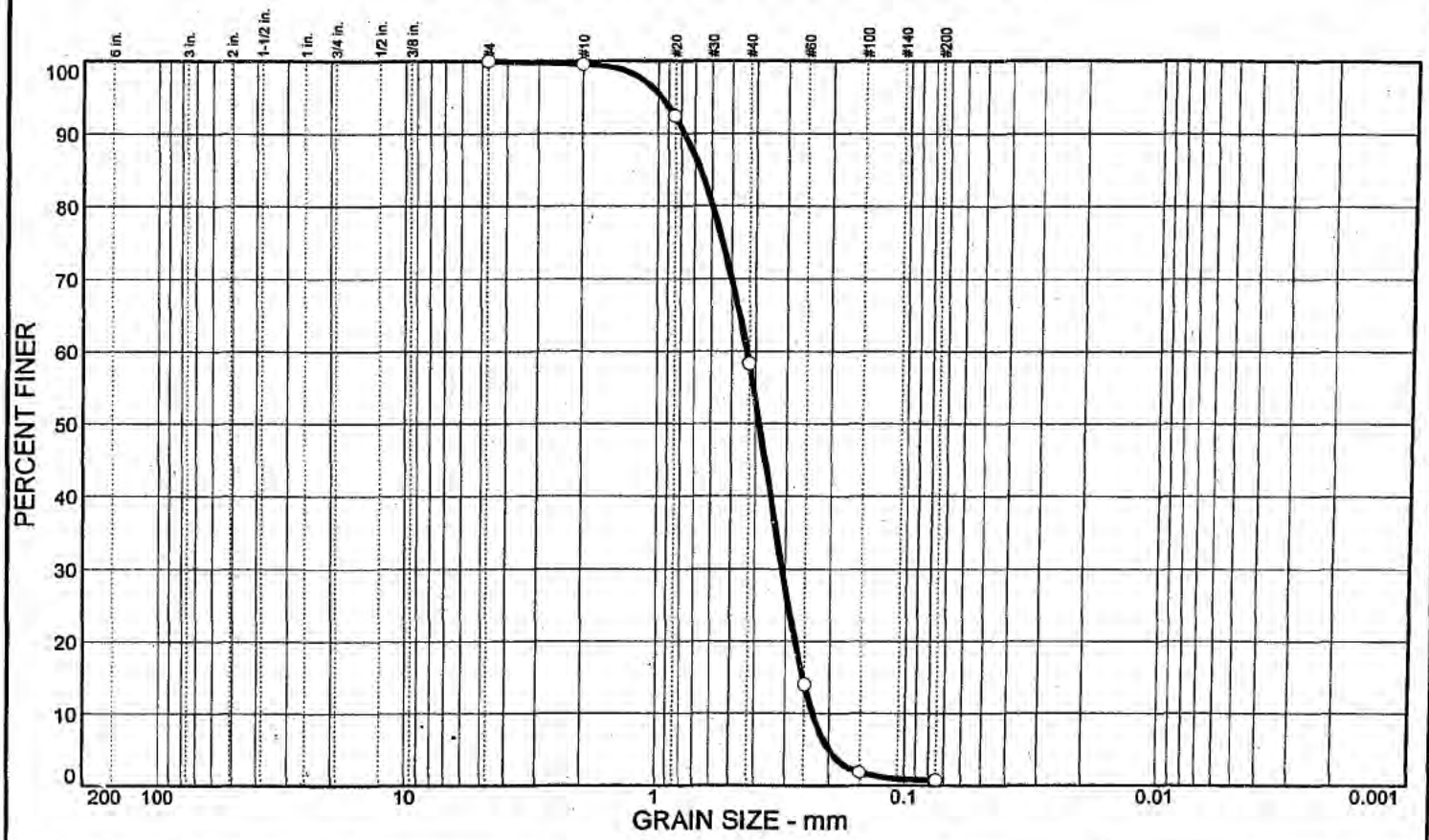
○

○ Source: Boring No. CB-LWI99-2 Sample No.: 5 Elev./Depth: 6.0'- 7.5'

Law Engineering and Environmental Services, Inc.

Client: US Army Corp of Engineers
Project: Lake Worth Inlet Project
Project No.: 40521-8-8051-12

Grain Size Distribution Report



	% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○			99.2	0.8		SP	A-3		

SIEVE inches size	PERCENT FINER ○		
	GRAIN SIZE		
D_{60}	0.434		
D_{30}	0.309		
D_{10}	0.231		
	COEFFICIENTS		
C_c	0.95		
C_u	1.88		

SIEVE number size	PERCENT FINER ○		
#4	100.0		
#10	99.5		
#20	92.4		
#40	58.3		
#60	14.0		
#100	1.9		
#200	0.8		

SOIL DESCRIPTION

○ SAND, fine to medium quartz, little medium sand-sized shell fragments, tan

REMARKS:

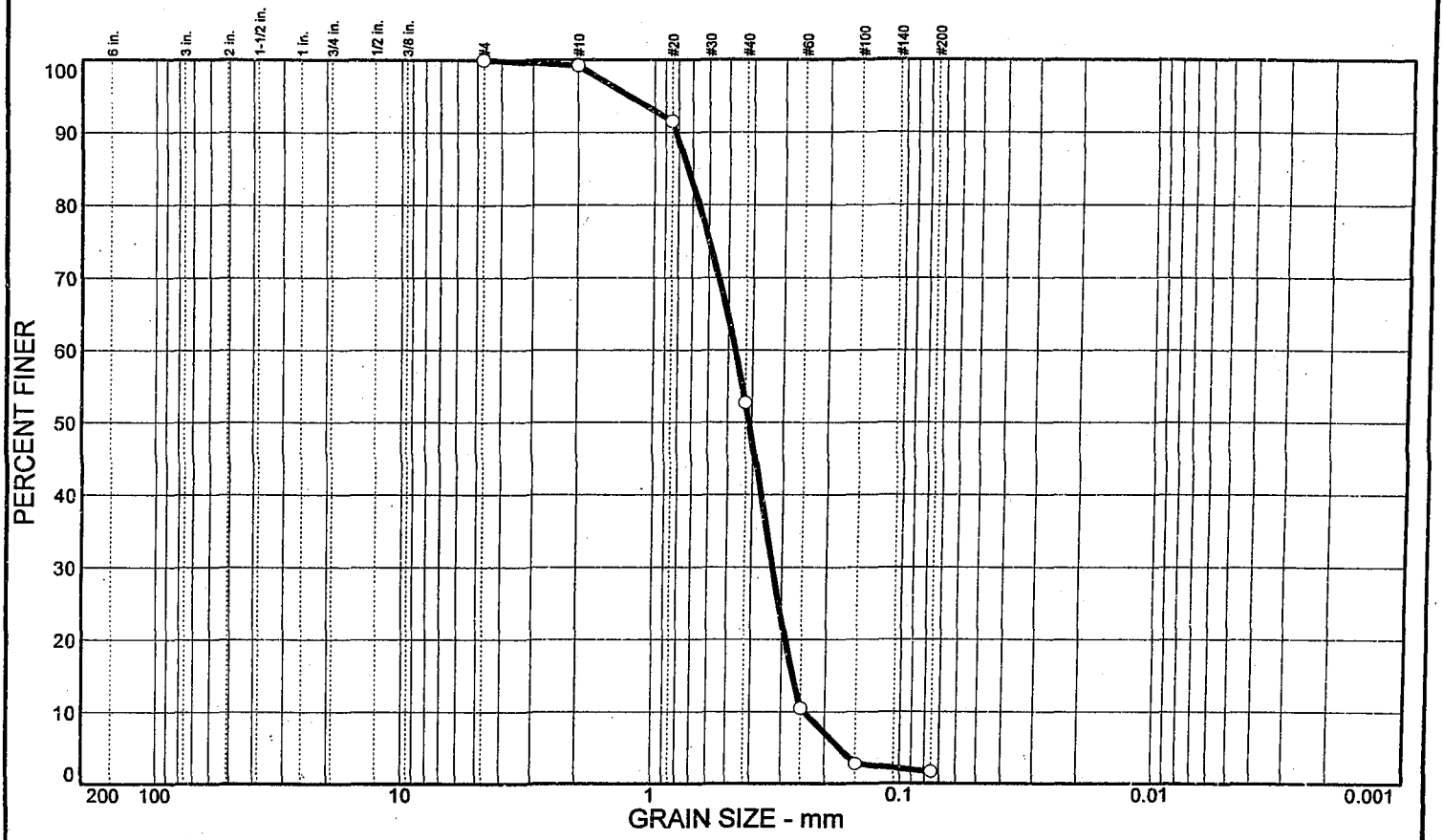
○

○ Source: Boring No. CB-LWI99-3 Sample No.: 3 Elev./Depth: 3.0'- 4.5'

Law Engineering and Environmental Services, Inc.

Client: US Army Corp of Engineers
Project: Lake Worth Inlet Project
Project No.: 40521-8-8051-12

Grain Size Distribution Report



	% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○			98.3	1.7		SP	A-3		

SIEVE inches size	PERCENT FINER ○		
	GRAIN SIZE		
D_{60}	0.468		
D_{30}	0.327		
D_{10}	0.242		
	COEFFICIENTS		
C_c	0.95		
C_u	1.94		

SIEVE number size	PERCENT FINER ○		
#4	100.0		
#10	99.2		
#20	91.5		
#40	52.7		
#60	10.5		
#100	2.8		
#200	1.7		

SOIL DESCRIPTION

○ SAND, fine to medium quartz, little medium sand-sized shell fragments, tan

REMARKS:

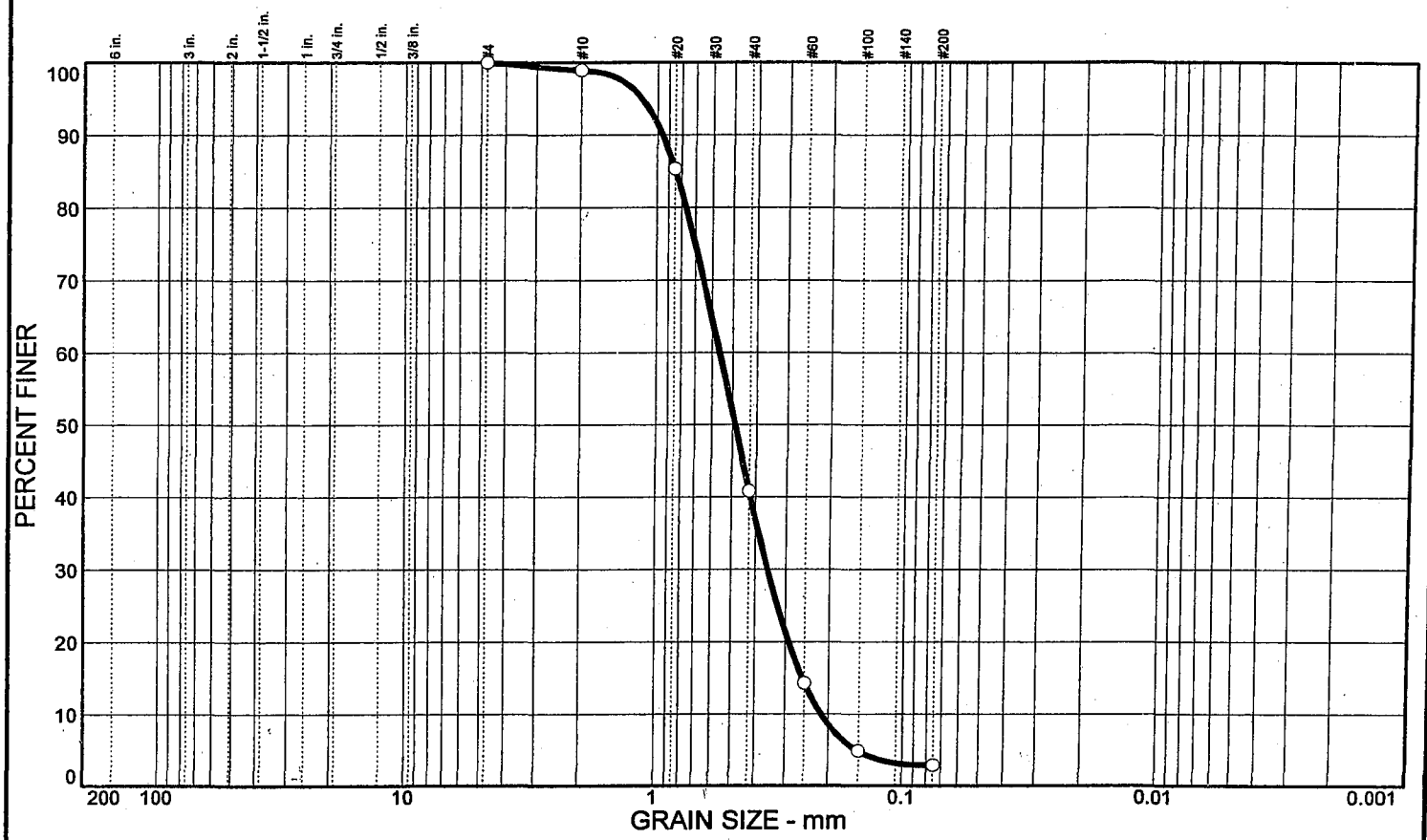
○

○ Source: Boring No. CB-LWI99-3 Sample No.: 7 Elev./Depth: 9.0'- 10.5'

Law Engineering and Environmental Services, Inc.

Client: US Army Corp of Engineers
Project: Lake Worth Inlet Project
Project No.: 40521-8-8051-12

Grain Size Distribution Report



	% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○			97.1	2.9		SP	A-1-b		

SIEVE inches size	PERCENT FINER ○		
	GRAIN SIZE		
D_{60}	0.561		
D_{30}	0.355		
D_{10}	0.214		
	COEFFICIENTS		
C_c	1.05		
C_u	2.63		

SIEVE number size	PERCENT FINER ○		
#4	100.0		
#10	98.9		
#20	85.3		
#40	40.8		
#60	14.3		
#100	4.9		
#200	2.9		

SOIL DESCRIPTION

○ SAND, fine to medium quartz, trace of medium sand-sized shell fragments, trace of silt, gray-black

REMARKS:

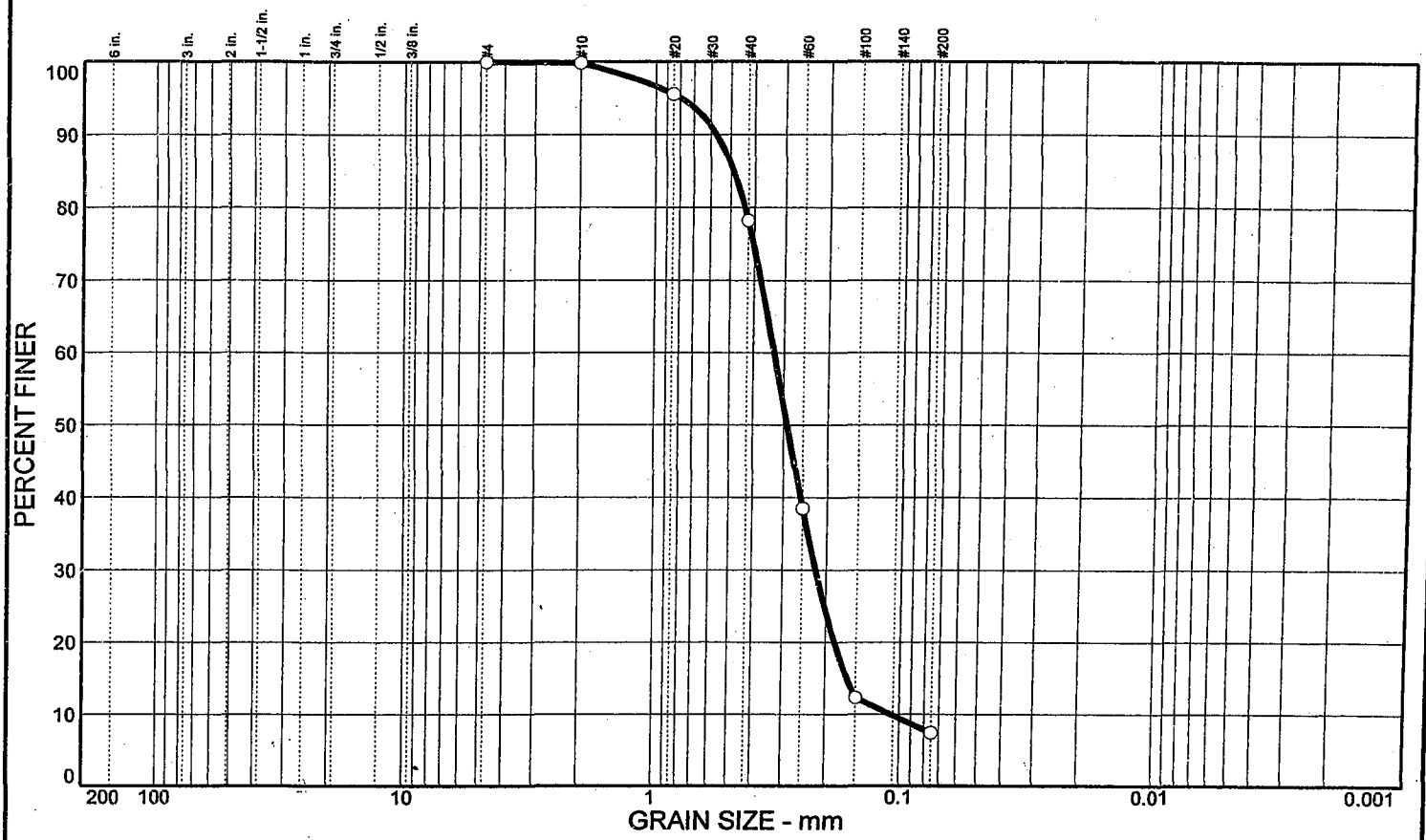
○

○ Source: Boring No. CB-LWI99-3 Sample No.: 15 Elev./Depth: 21.0'- 22.5'

Law Engineering and Environmental Services, Inc.

Client: US Army Corp of Engineers
Project: Lake Worth Inlet Project
Project No.: 40521-8-8051-12

Grain Size Distribution Report



	% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○			92.6	7.4		SP-SM	A-3		

SIEVE inches size	PERCENT FINER ○		

GRAIN SIZE			
D_{60}	0.329		
D_{30}	0.221		
D_{10}	0.108		

COEFFICIENTS			
C_c	1.37		
C_u	3.03		

SIEVE number size	PERCENT FINER ○		
#4	100.0		
#10	99.8		
#20	95.5		
#40	78.2		
#60	38.5		
#100	12.3		
#200	7.4		

SOIL DESCRIPTION

○ SAND, fine to medium quartz, trace of medium sand-sized shell fragments, trace of silt, gray-black

REMARKS:

○

○ Source: Boring No. CB-LWI99-3 Sample No.: 19 Elev./Depth: 27.0'- 28.5'

Law Engineering and Environmental Services, Inc.

Client: US Army Corp of Engineers
Project: Lake Worth Inlet Project
Project No.: 40521-8-8051-12

LAW
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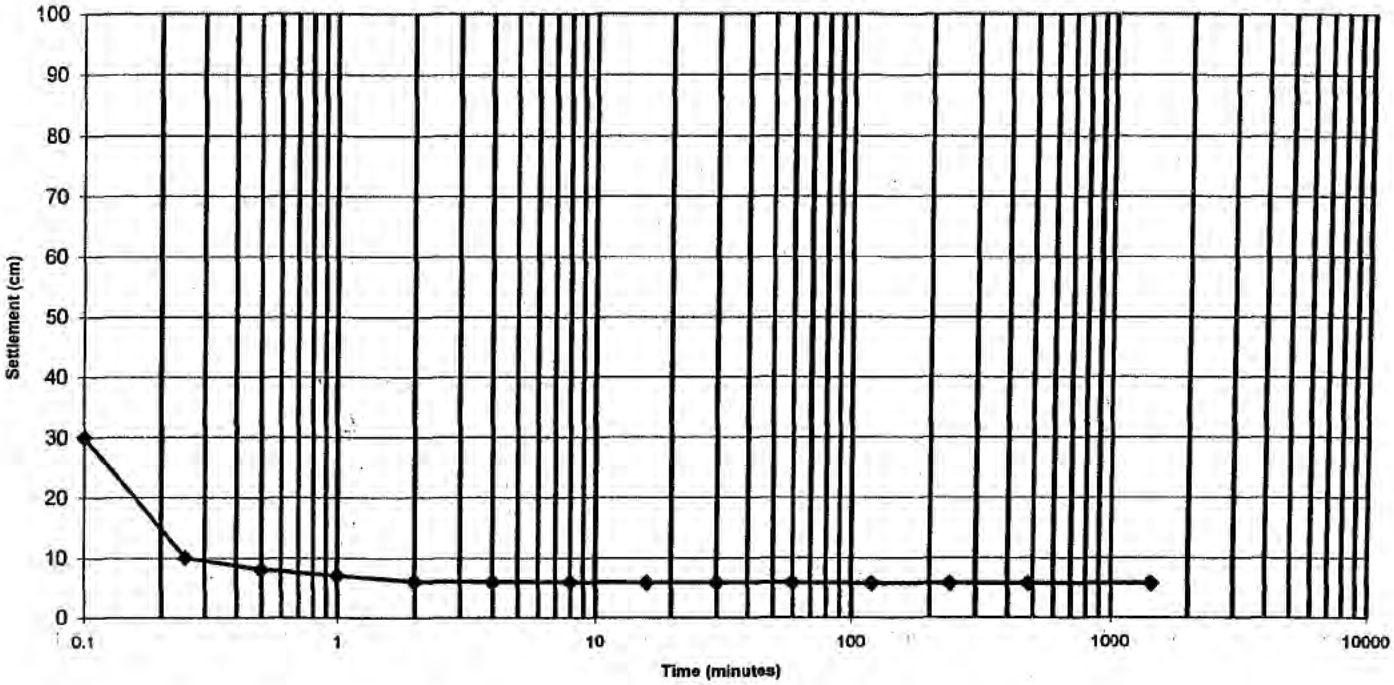
(904)396-5173

REPORT OF SETTLING RATE TESTING

LAW PROJECT NO: 40521-8-8051-12
PROJECT: COE Lake Worth
CLIENT: USACE, Jacksonville District

SAMPLE : 8
STATION : CB-LWI99-1
CONCENTRATION: 100g/L



TIME	INTERFACE (cm)	TIME	INTERFACE (cm)
0.1	30	16	5.8
0.25	10	30	5.8
0.5	8	60	5.8
1	7	120	5.7
2	6	240	5.7
4	5.9	480	5.7
8	5.9	1440	5.7

Final concentration: 1754 g/L

Reviewed By:

Andrew T. Gatti

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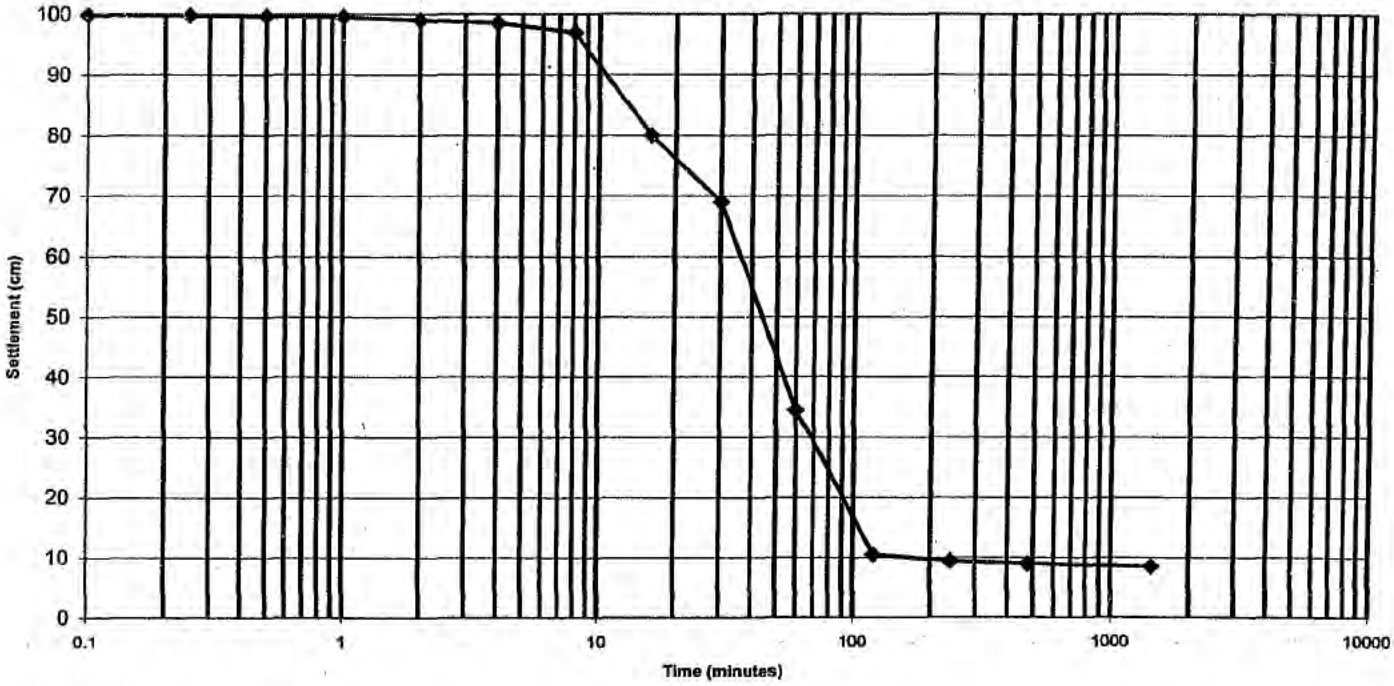
REPORT OF SETTLING RATE TESTING

LAW PROJECT NO: 40521-8-8051-12
PROJECT: COE Lake Worth
CLIENT: USACE, Jacksonville District

SAMPLE : 12
STATION : CB-LWI99-1
CONCENTRATION: 100g/L



TIME	INTERFACE (cm)	TIME	INTERFACE (cm)
0.1	99.9	16	80
0.25	99.8	30	69
0.5	99.7	60	34.5
1	99.5	120	10.5
2	99	240	9.4
4	98.5	480	9
8	97	1440	8.5

Final concentration: 1177 g/L

Reviewed By:

Andrew T. Batt

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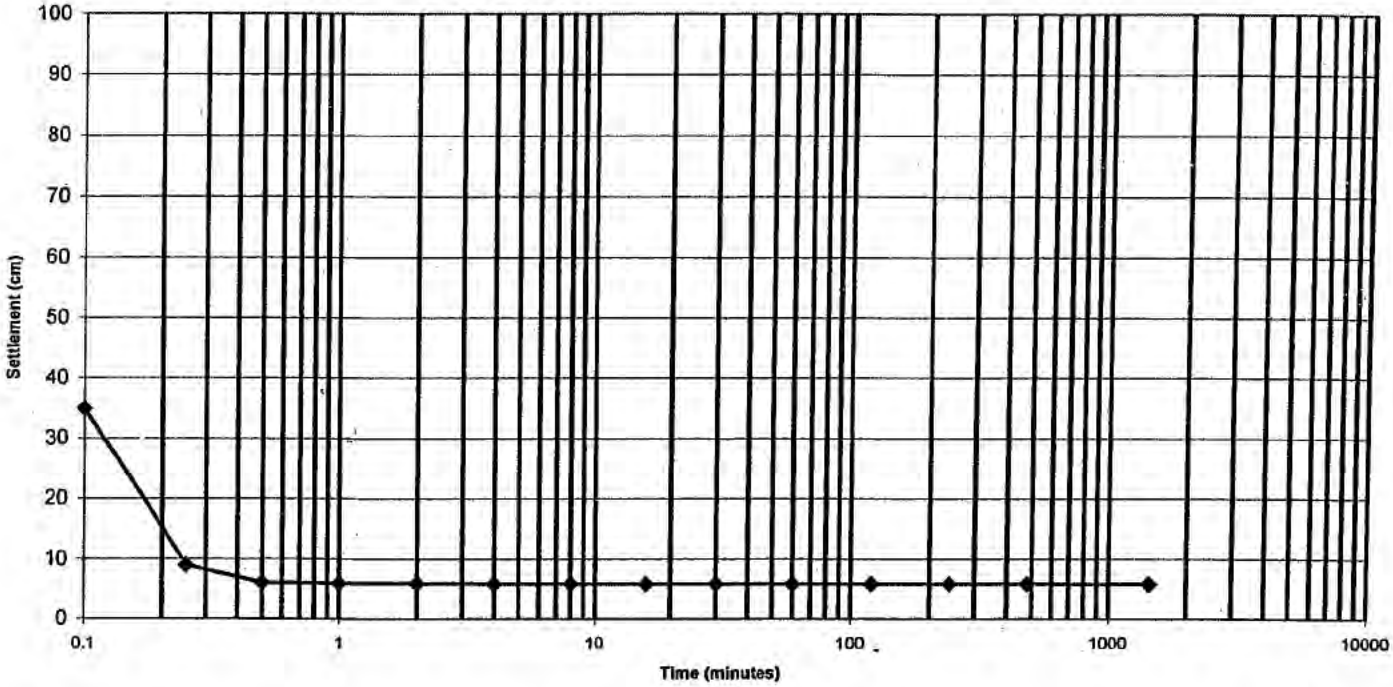
REPORT OF SETTLING RATE TESTING

LAW PROJECT NO: 40521-8-8051-12
PROJECT: COE Lake Worth
CLIENT: USACE, Jacksonville District

SAMPLE : 3
STATION : CB-LWI99-2
CONCENTRATION: 100g/L



TIME	INTERFACE (cm)	TIME	INTERFACE (cm)
0.1	35	16	5.8
0.25	9	30	5.8
0.5	6	60	5.8
1	5.9	120	5.8
2	5.9	240	5.8
4	5.8	480	5.8
8	5.8	1440	5.8

Final concentration: 1724 g/L

Reviewed By:

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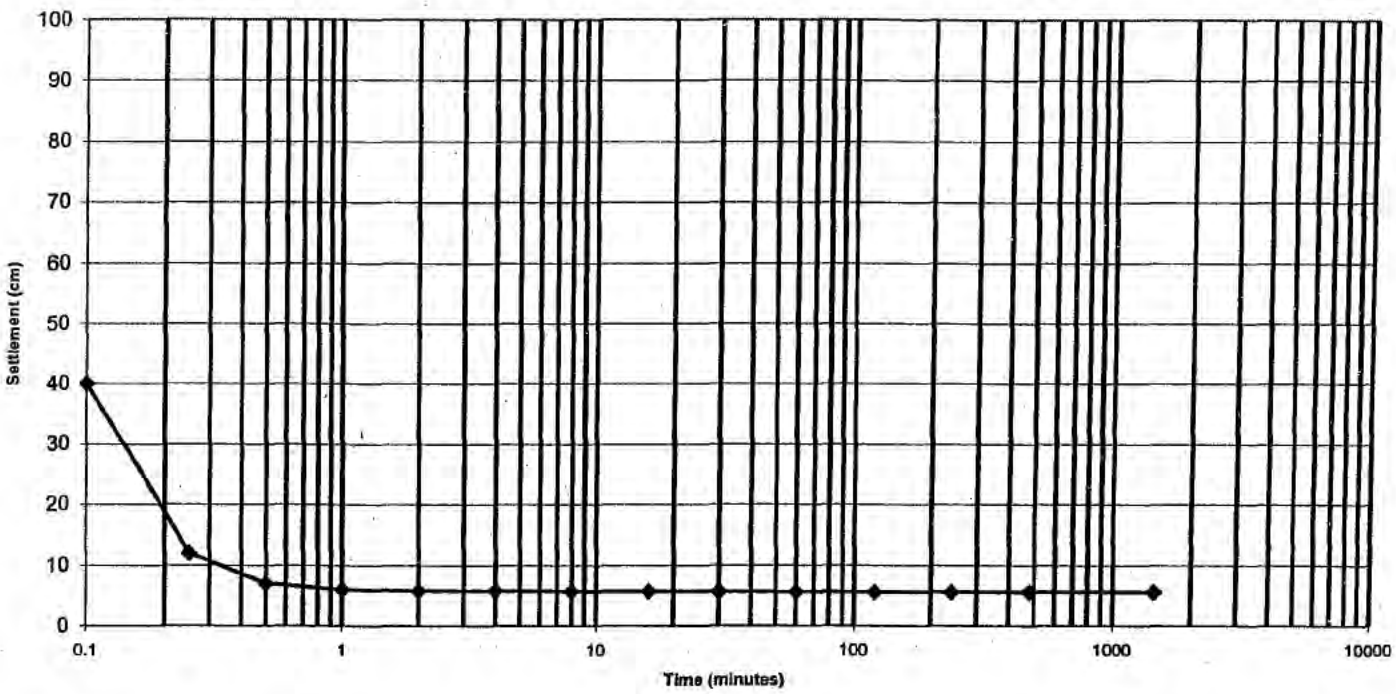
REPORT OF SETTLING RATE TESTING

LAW PROJECT NO: 40521-8-8051-12
PROJECT: COE Lake Worth
CLIENT: USACE, Jacksonville District

SAMPLE : 6
STATION : CB-LWI99-2
CONCENTRATION: 100g/L



TIME	INTERFACE (cm)	TIME	INTERFACE (cm)
0.1	40	16	5.7
0.25	12	30	5.7
0.5	7	60	5.6
1	6	120	5.6
2	5.8	240	5.6
4	5.8	480	5.6
8	5.7	1440	5.6

Final concentration: 1786 g/L

Reviewed By:

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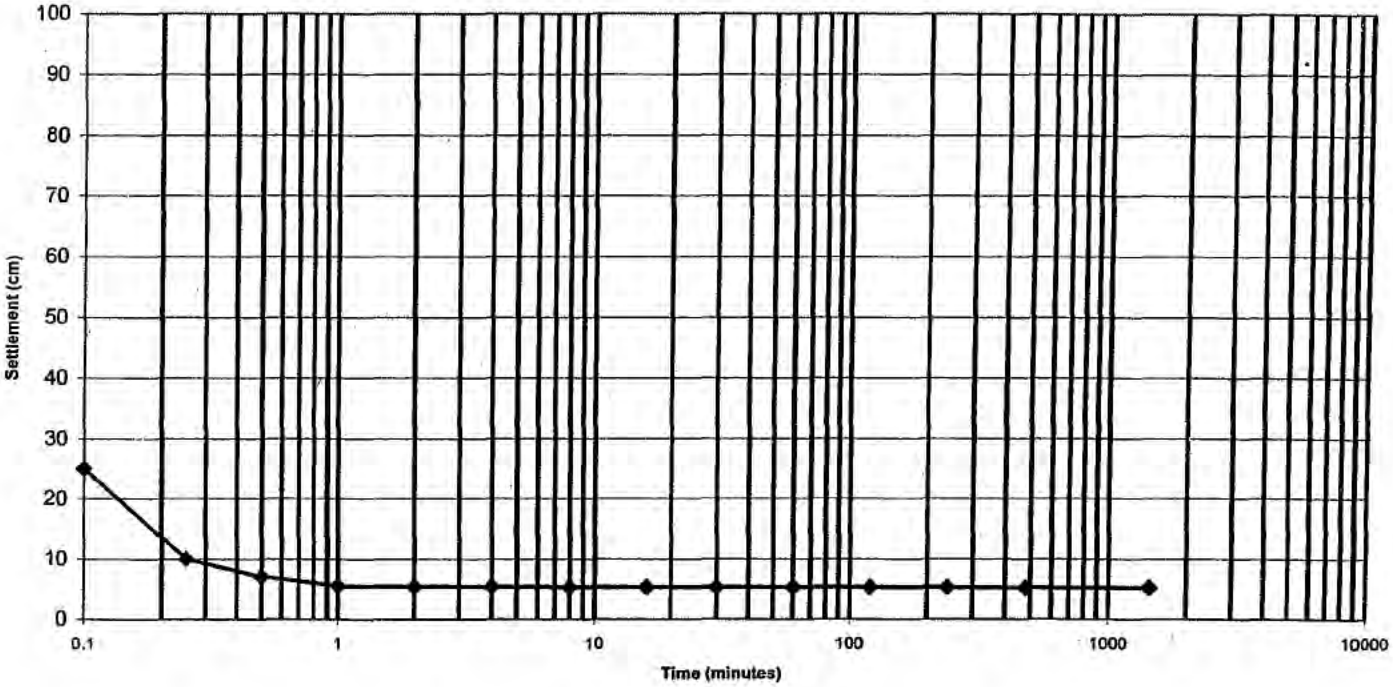
REPORT OF SETTLING RATE TESTING

LAW PROJECT NO: 40521-8-8051-12
PROJECT: COE Lake Worth
CLIENT: USACE, Jacksonville District

SAMPLE : 6
STATION : CB-LWI99-3
CONCENTRATION: 100g/L



TIME	INTERFACE (cm)	TIME	INTERFACE (cm)
0.1	25	16	5.3
0.25	10	30	5.3
0.5	7	60	5.3
1	5.5	120	5.3
2	5.4	240	5.3
4	5.4	480	5.2
8	5.3	1440	5.2

Final concentration: 1923 g/L

Reviewed By:

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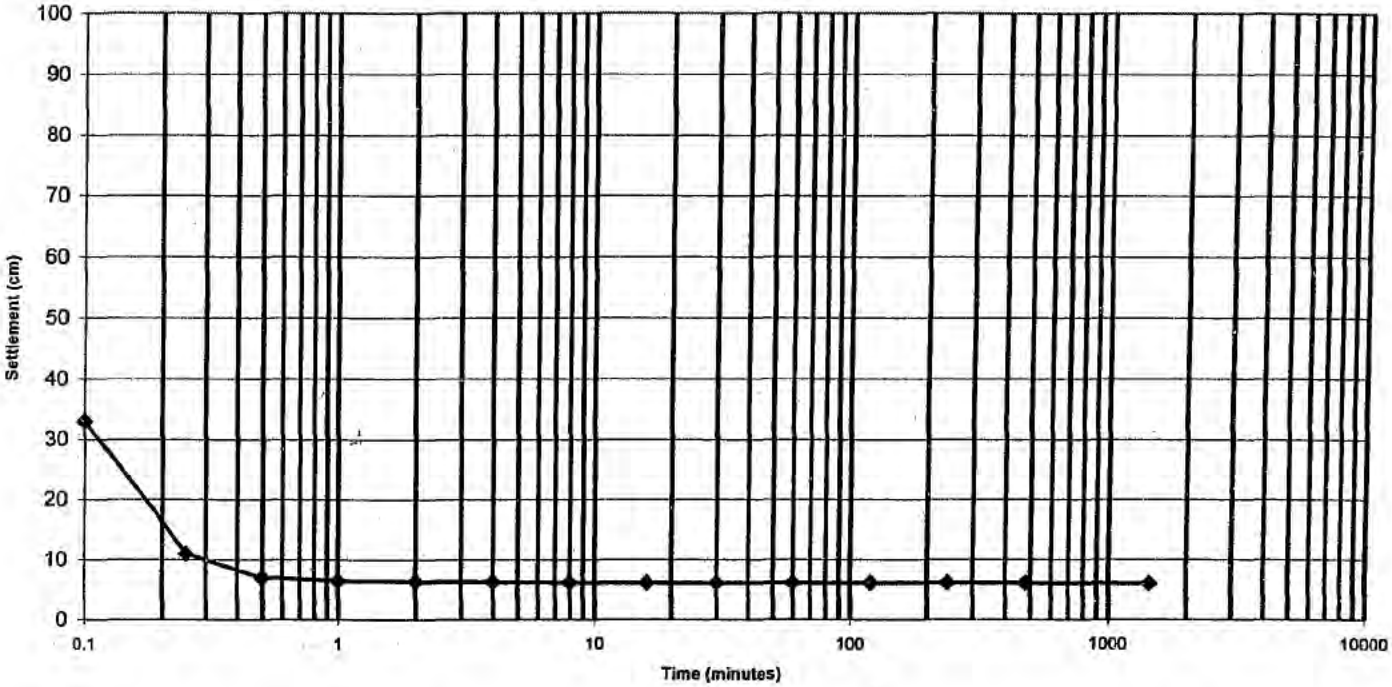
JACKSONVILLE, FLORIDA 32207
(904)396-5173

REPORT OF SETTLING RATE TESTING

LAW PROJECT NO: 40521-8-8051-12
PROJECT: COE Lake Worth
CLIENT: USACE, Jacksonville District

SAMPLE : 17
STATION : CB-LWI99-3
CONCENTRATION: 100g/L



TIME	INTERFACE (cm)	TIME	INTERFACE (cm)
0.1	33	16	6.1
0.25	11	30	6.1
0.5	7	60	6.1
1	6.5	120	6.1
2	6.4	240	6.1
4	6.3	480	6.1
8	6.2	1440	6

Final concentration: 1667 g/L

Reviewed By: