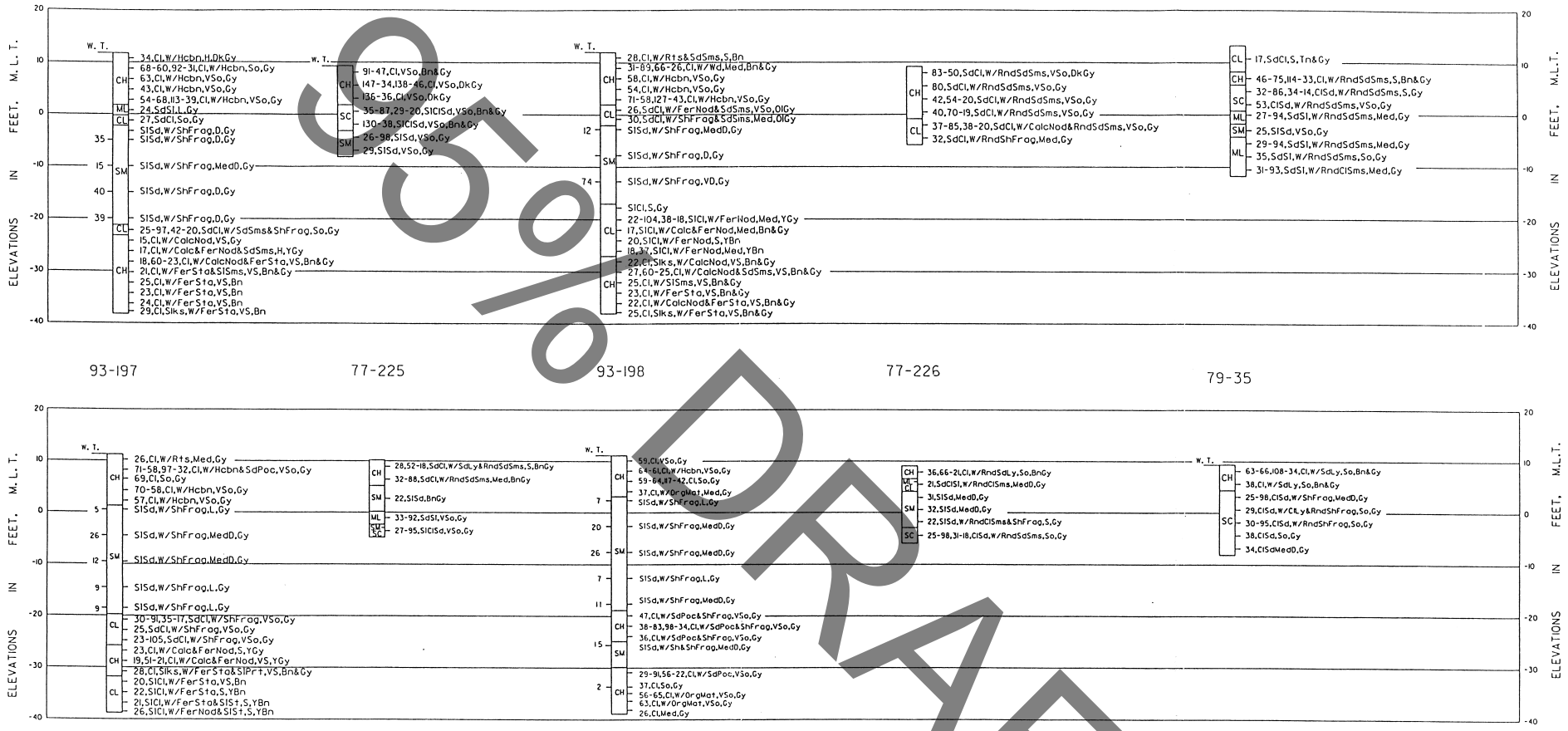


50% DRAFT

NOTES:

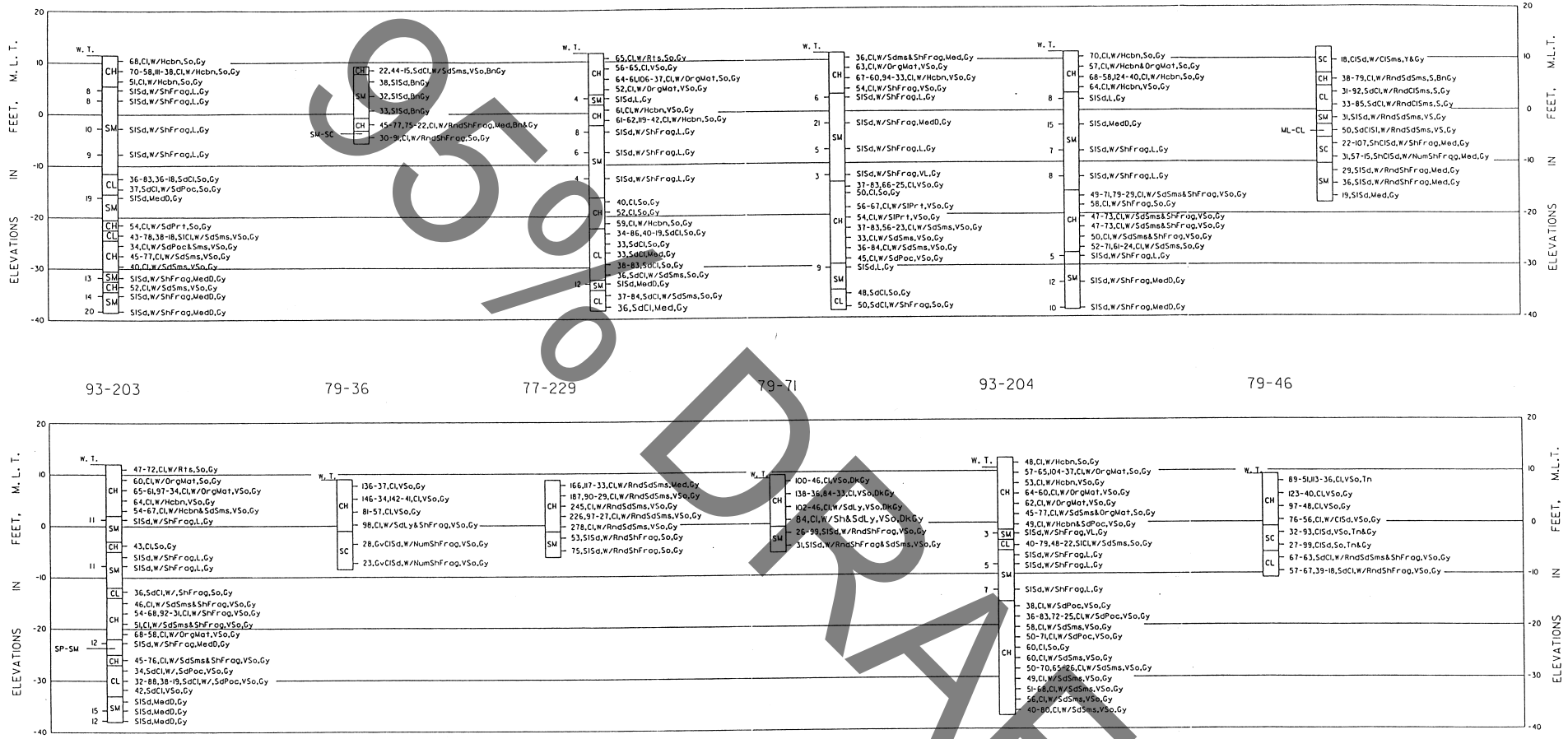
SEE PLATE FD-55 FOR BORING LOCATIONS.
SEE PLATE FD-63 FOR BORING NOTES AND LEGEND.

HOUSTON-GALVESTON NAVIGATION CHANNELS, TEXAS
PELICAN ISLAND

BORING LOGS

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

TO ACCOMPANY ENGINEERING SUPPLEMENT
TO LIMITED REEVALUATION REPORT
DATED: X



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NOTES:

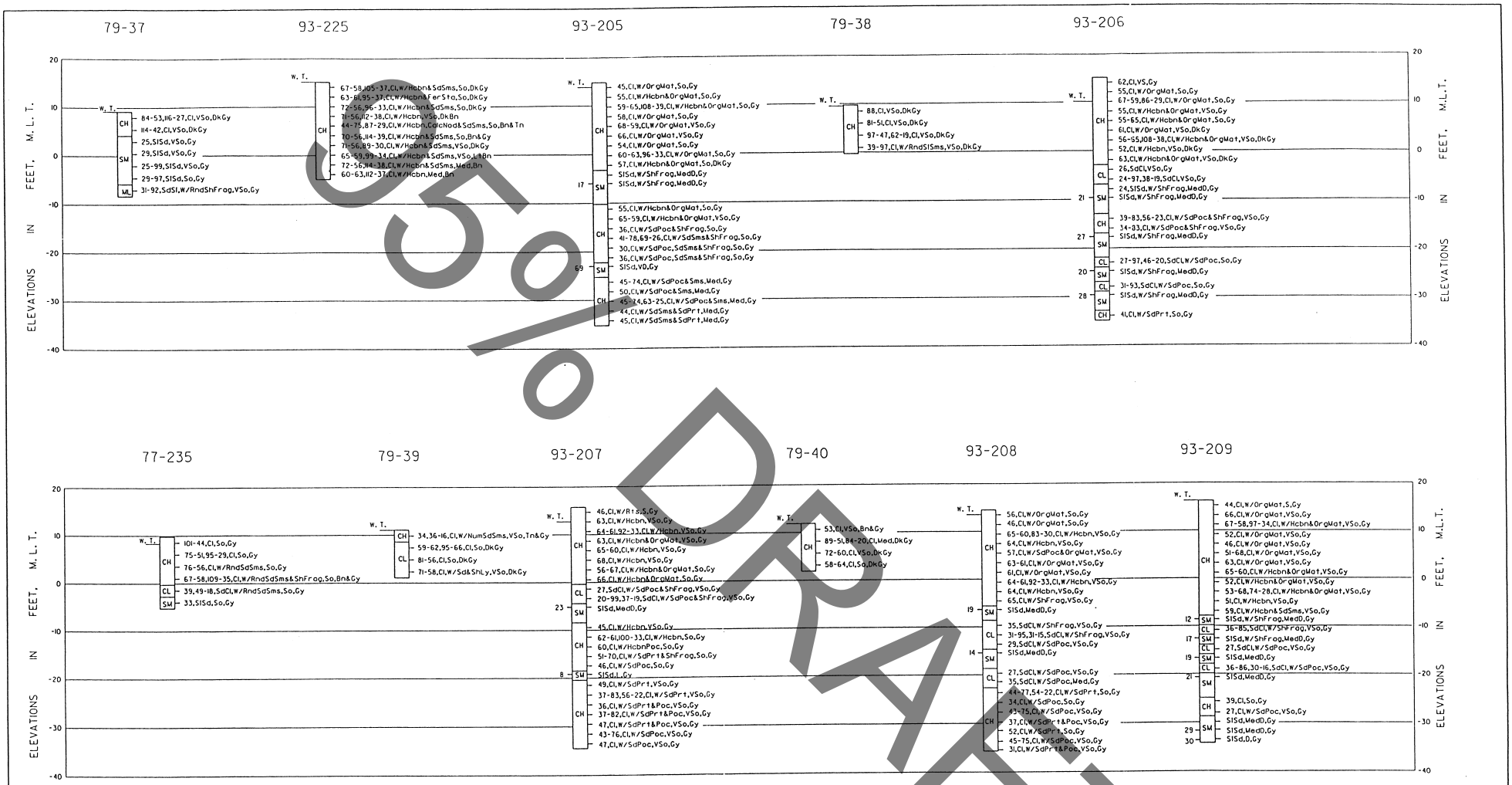
SEE PLATE FD-55 FOR BORING LOCATIONS.
SEE PLATE FD-63 FOR BORING NOTES AND LEGEND.

HOUSTON-GALVESTON NAVIGATION CHANNELS, TEXAS
PELICAN ISLAND

BORING LOGS

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

TO ACCOMPANY ENGINEERING SUPPLEMENT
TO LIMITED REEVALUATION REPORT
DATED: X



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NOTES:

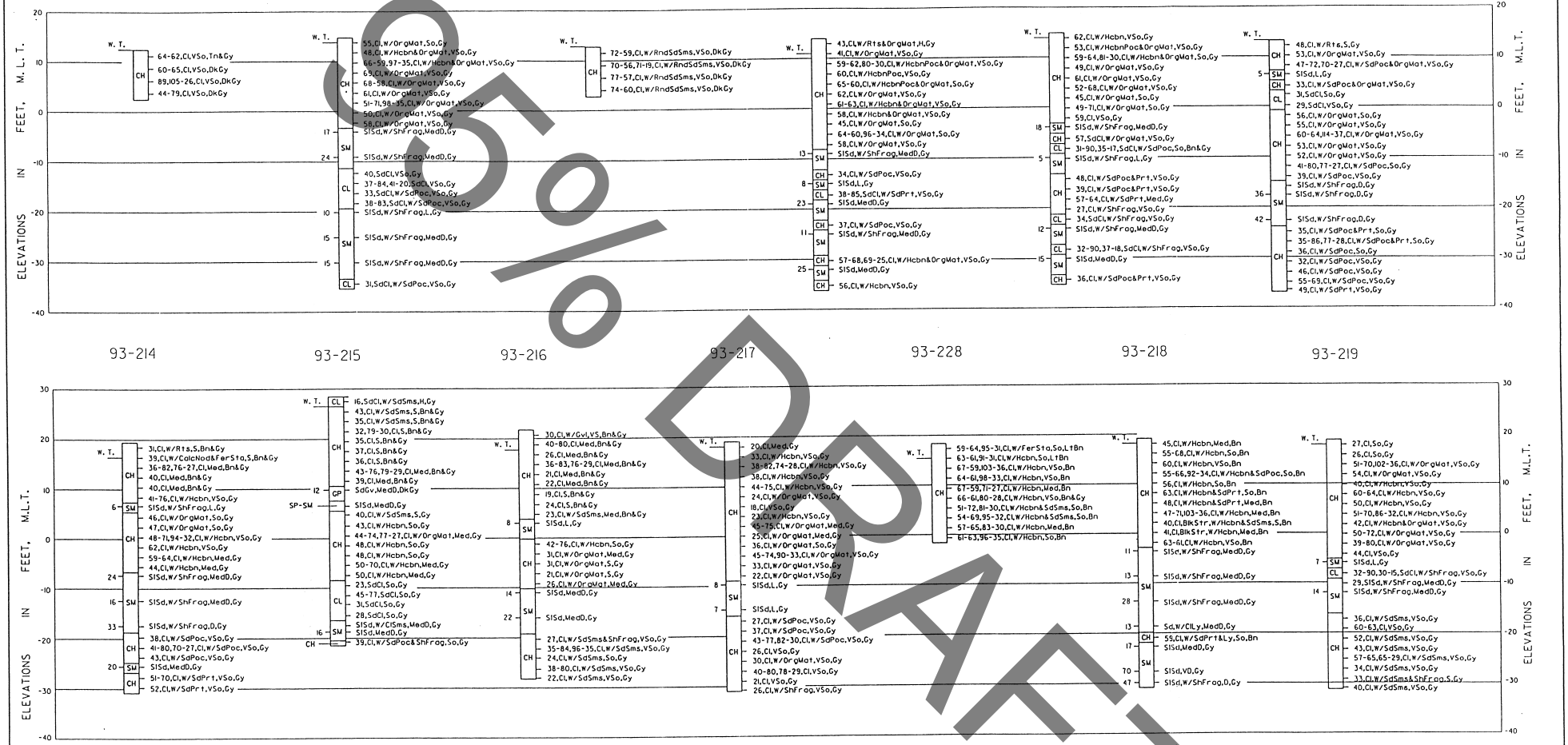
SEE PLATE FD-55 FOR BORING LOCATIONS.
SEE PLATE FD-63 FOR BORING NOTES AND LEGEND.

HOUSTON-GALVESTON NAVIGATION CHANNELS, TEXAS
PELICAN ISLAND

BORING LOGS

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

TO ACCOMPANY ENGINEERING SUPPLEMENT
TO LIMITED REEVALUATION REPORT
DATED: X



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NOTES:

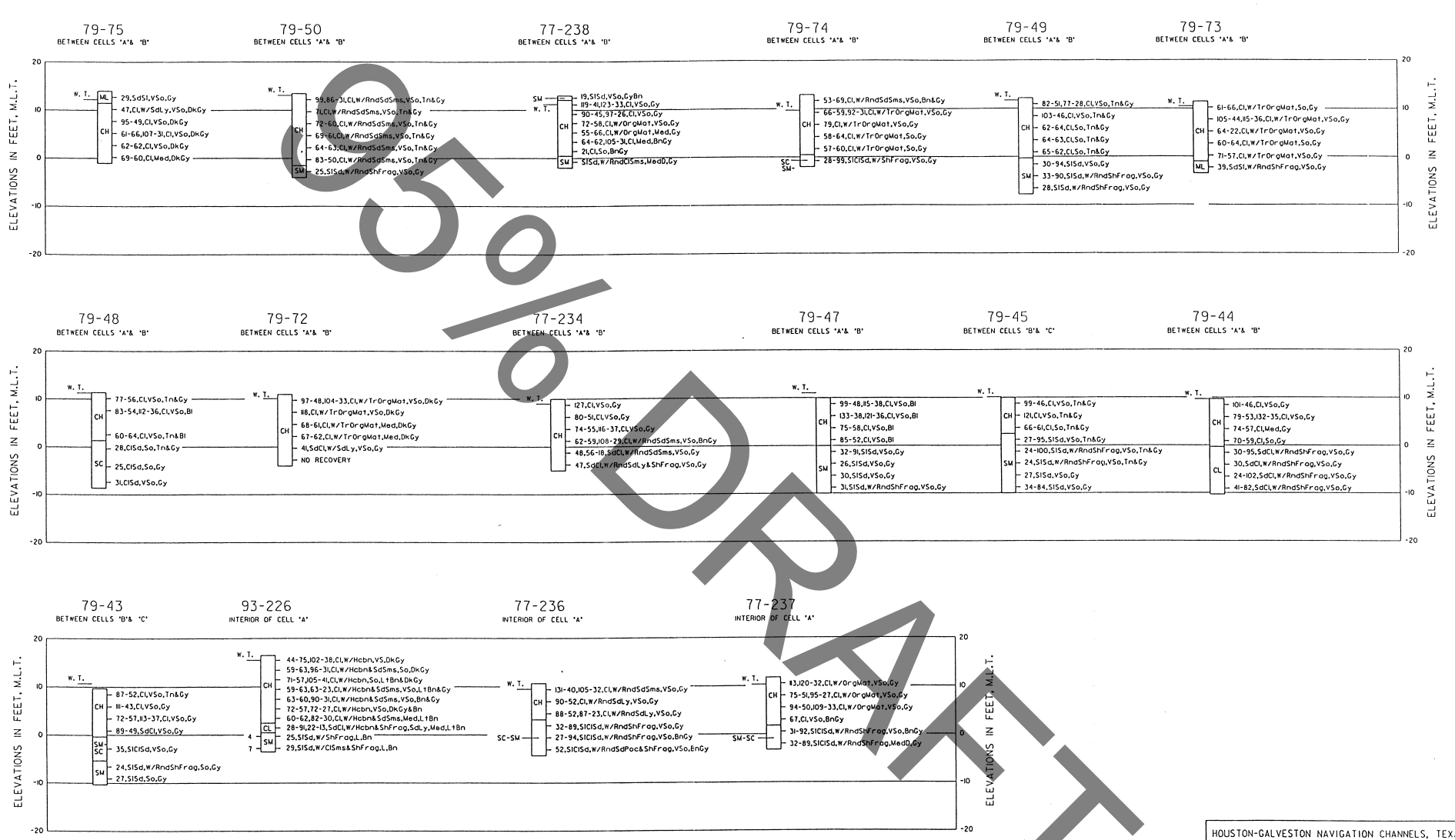
SEE PLATE FD-55 FOR BORING LOCATIONS.
SEE PLATE FD-63 FOR BORING NOTES AND LEGEND.

HOUSTON-GALVESTON NAVIGATION CHANNELS, TEXAS
PELICAN ISLAND

BORING LOGS

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

TO ACCOMPANY ENGINEERING SUPPLEMENT
TO LIMITED REEVALUATION REPORT
DATED: X



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NOTES:

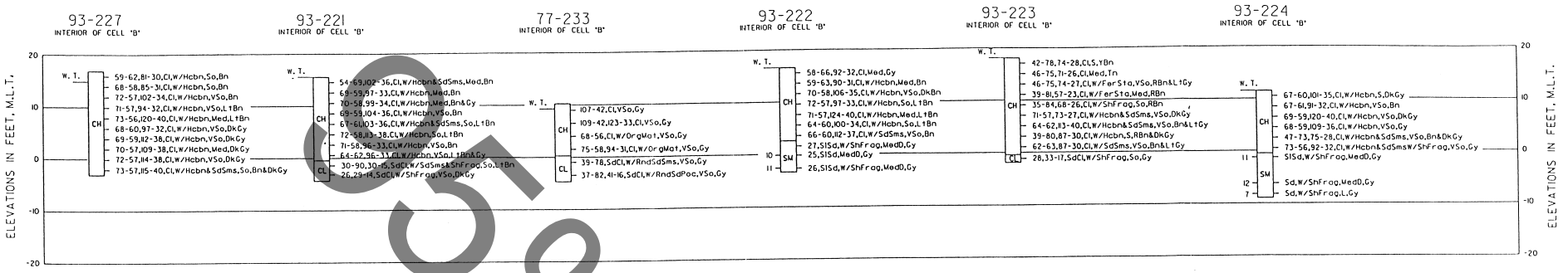
SEE PLATE FD-55 FOR BORING LOCATIONS.
SEE PLATE FD-63 FOR BORING NOTES AND LEGEND.

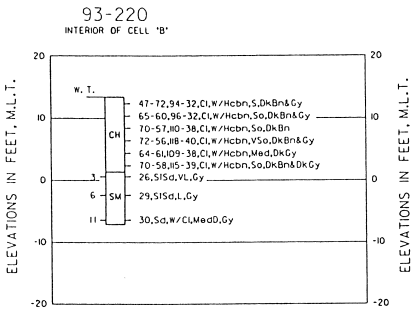
HOUSTON-GALVESTON NAVIGATION CHANNELS, TEXAS
PELICAN ISLAND

BORING LOGS

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

TO ACCOMPANY ENGINEERING SUPPLEMENT
TO LIMITED REEVALUATION REPORT
DATED: X





95% DRAFT

NOTES;

1. SOILS HAVE BEEN CLASSIFIED IN ACCORDANCE WITH MILITARY STANDARD 619B 'UNIFIED SOIL CLASSIFICATION SYSTEM FOR ROADS, AIRFIELDS, EMBANKMENTS, AND FOUNDATIONS.' CONSISTENCY OF SOILS SUCH AS SOFT, MEDIUM, HARD, LOOSE, DENSE, ETC., ARE RELATIVE TERMS BASED ON ESTIMATED UNDISTURBED SHEAR STRENGTH OF THE MATERIAL AS DETERMINED BY VISUAL CLASSIFICATION POCKET PENETROMETER TESTS AND PENETRATION RESISTANCE DURING SAMPLING.
2. FIGURES TO THE RIGHT OF BORING LOGS ARE WATER CONTENTS IN PERCENT OF THE DRY WEIGHT, DRY DENSITY, LIQUID LIMIT, PLASTIC LIMIT, AND BAR LINEAR SHRINKAGE. (MC-UDW),(LL-PL),(B.L.S.)• FIGURES TO THE LEFT OF BORING LOGS ARE BLOWS PER FOOT OF PENETRATION FROM STANDARD PENETRATION TESTING.
3. BORINGS WERE DRILLED USING WET ROTARY DRILLING TECHNIQUES AND UNDISTURBED SAMPLES WERE RECOVERED WITH A 3-INCH DIAMETER THIN WALL SAMPLER WHERE COHESIVE MATERIALS WERE ENCOUNTERED. WHERE COHESIONLESS MATERIALS WERE ENCOUNTERED, DISTURBED SAMPLES WERE TAKEN WITH A SPLIT SPOON SAMPLER DURING PERFORMANCE OF STANDARD PENETRATION TESTING.
4. ELEVATIONS OF THE TOP OF BORINGS ON 79 SERIES BORINGS ARE APPROXIMATE.

VISUAL CLASSIFICATIONS

Bl Black	Hcbn Hydrocarben	Rts Root(s)	Tn Tan(ish)
Blk Blocky(y)	L Loose	S Stiff	Tr Traces
Bn Brown(ish)	Lt Light	Sd Sand(y)	V Very
Calc Calcereous	Ly Layer(s)	Sh Shell(y)	Wd Wood
Cl Clay(ey)	Mat Material	Sl Silty	W/ With
D Dense	Med Medium	Slks Slicken Sides	W.O.P. Weight Of Pipe
Dk Dark	Nod Nodules	Sms Seams	W.T. Water Table
Fer Ferrous	Ol Olive	So Soft	Y Yellow(ish)
Frag Fragment(s)	Org Organic	S.N.S. Sample Not Submitted	
Gv Gravel(ly)	Poc Pocket(s)	Str Structure	
Gy Gray(ish)	Prt Parting	St Stone(s)	
H Hard	Rnd Random	Sta Stain(s)	

LABORATORY CLASSIFICATION

CH INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS.
CL INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, LEAN CLAYS.
GP POORLY-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LITTLE OR NO FINES.
SM SILTY SANDS, SAND-SILT MIXTURES.
SP-SM OR SM-SP SLIGHTLY SILTY SANDS, SANDS WITH SOME SILTS

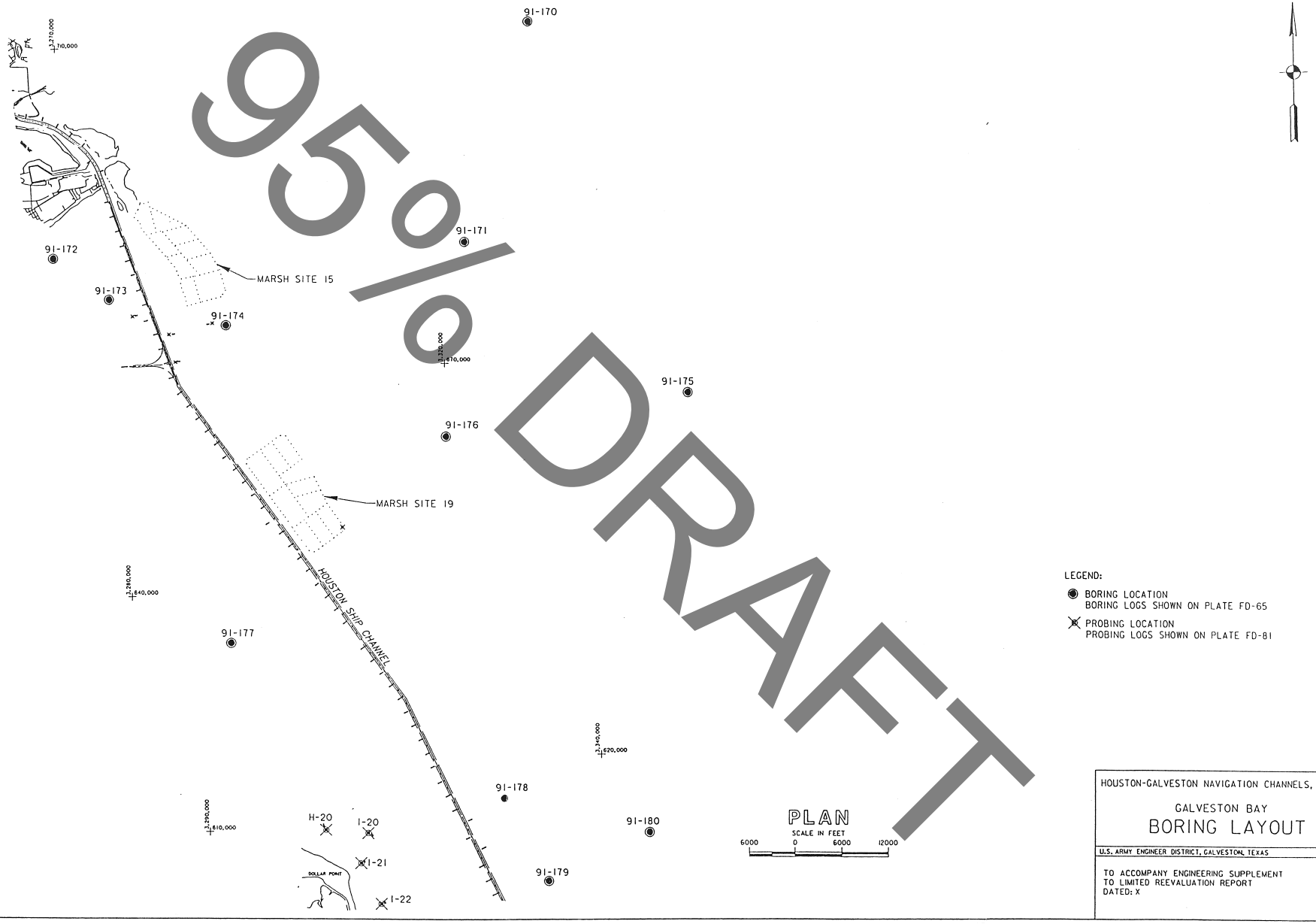
NOTES:
SEE PLATE FD-55 FOR BORING LOCATIONS.

HOUSTON-GALVESTON NAVIGATION CHANNELS, TEXAS
PELICAN ISLAND

BORING LOGS

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

TO ACCOMPANY ENGINEERING SUPPLEMENT
TO LIMITED REEVALUATION REPORT
DATED: X



95% DRAFT

HOUSTON-GALVESTON NAVIGATION CHANNELS, TEXAS

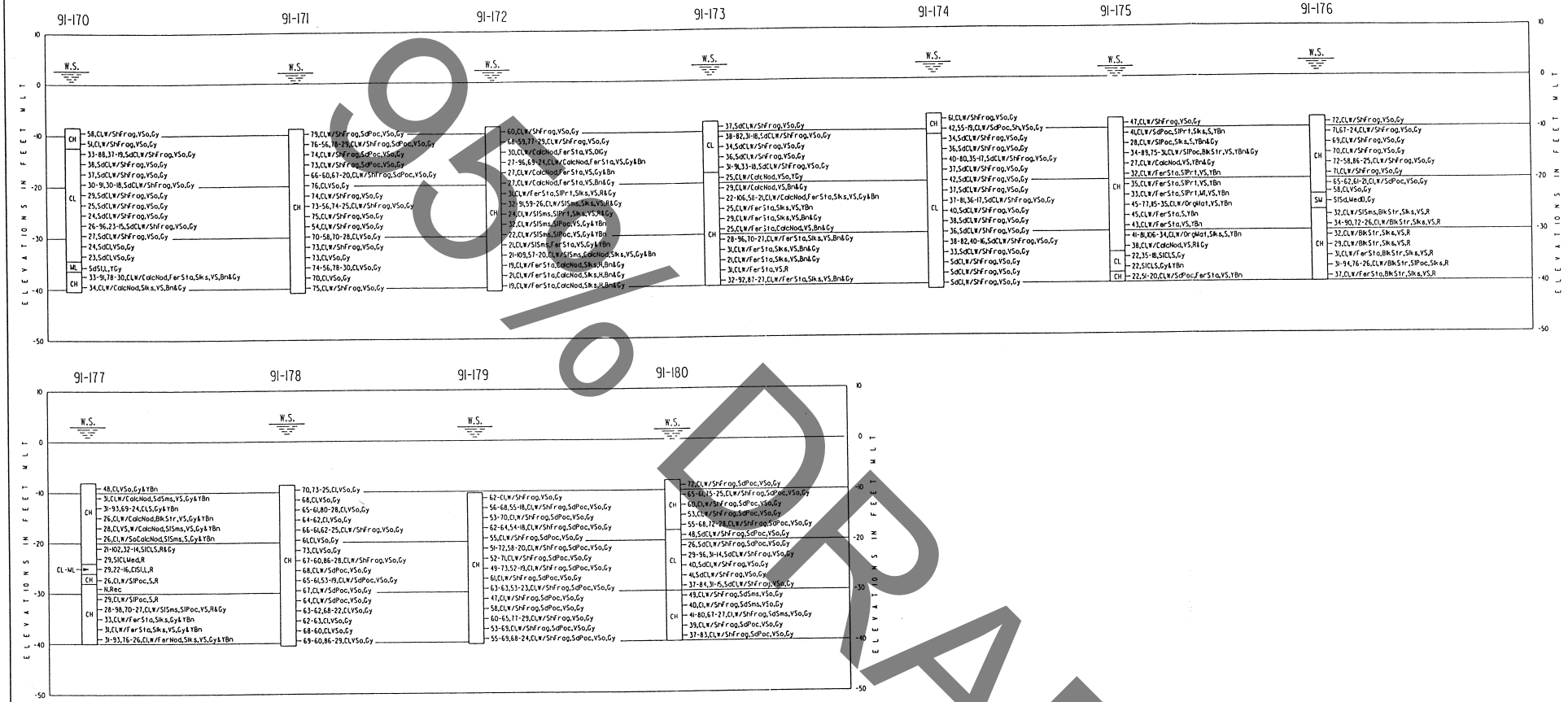
GALVESTON BAY

BORING LAYOUT

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

TO ACCOMPANY ENGINEERING SUPPLEMENT
TO LIMITED REEVALUATION REPORT
DATED: X

PLATE FD-64



90% DRAFT

NOTES;

1. SOILS HAVE BEEN CLASSIFIED IN ACCORDANCE WITH MILITARY STANDARD 619B 'UNIFIED SOIL CLASSIFICATION SYSTEM FOR ROADS, AIRFIELDS, EMBANKMENTS AND FOUNDATIONS.' CONSISTENCY OF SOILS SUCH AS SOFT, MEDIUM, HARD, LOOSE, DENSE, ETC., ARE RELATIVE TERMS BASED ON ESTIMATED UNDISTURBED SHEAR STRENGTH OF THE MATERIAL AS DETERMINED BY VISUAL CLASSIFICATION POCKET PENETROMETER TESTS AND PENETRATION RESISTANCE DURING SAMPLING.
2. FIGURES TO THE RIGHT OF BORING LOGS ARE WATER CONTENTS IN PERCENT OF THE DRY WEIGHT, DRY DENSITY, LIQUID LIMIT, PLASTIC LIMIT, AND BAR LINEAR SHRINKAGE. (MC-UDW),(LL-PL),(B.L.S.).
3. BORINGS WERE DRILLED USING WET ROTARY DRILLING TECHNIQUES AND UNDISTURBED SAMPLES WHERE RECOVERED WITH A 3-INCH DIAMETER THIN WALL SAMPLER WHERE COHESIVE MATERIALS WERE ENCOUNTERED. WHERE COHESIONLESS MATERIALS WERE ENCOUNTERED, DISTURBED SAMPLES WERE TAKEN WITH A SPLIT SPOON SAMPLER DURING PERFORMANCE OF STANDARD PENETRATION TESTING.
4. ALL BORES ARE TAKEN BELOW THE WATER SURFACE.

VISUAL CLASSIFICATIONS

Blk Blocky(ish)	Med Medium	Sh Shelly(ish)
Bn Brown(ish)	Ml Mica	Sl Silty
Calc Calcareous	Nod Nodules	Slks Slicken Sides
Cl Clay(ey)	N.Rec No Recovery	Sms Seams
D Dense	Ol Olive	So Soft
Fer Ferrous	Poc Pocket(s)	Sta Stain(s)
Frag Fragment(s)	Prt Parting	Str Structure
Gy Gray(ish)	R Red(dish)	V Very
H Hard	S Stiff	W With
L Loose	Sd Sand(y)	Y Yellow(ish)

LABORATORY CLASSIFICATION

CH INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS.
CL INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, LEAN CLAYS.
ML INORGANIC SILTS AND VERY FINE SANDS, WITH SLIGHT PLASTICITY.
SW SILTY SANDS, SAND-SILT MIXTURES.

SEE PLATE FD-64 FOR BORING LOCATIONS.

HOUSTON-GALVESTON NAVIGATION CHANNELS, TEXAS

GALVESTON BAY

BORING LOGS

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

TO ACCOMPANY ENGINEERING SUPPLEMENT
TO LIMITED REEVALUATION REPORT
DATED: X

PLATE FD-65

Project: ...on-Galveston navigation channel

SUM... OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-37

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
1	0 - 2	0.00		Gray,Clay,Very soft,Silty,w/shell fragments	C L	38.7											
2	2 - 4	1.50		Reddish brown,Clay,Stiff	C H	32.4											
3	4 - 6	1.75		Reddish brown,Clay,Stiff,w/silt partings	C H	33.1											
4	6 - 8	1.75		Reddish brown,Clay,Stiff,w/silt pockets	C H	37											
5	8 - 10	2.00		Reddish brown,Clay,Very stiff,w/silt pockets	C H	36.0	84.8	115.4	81.0	33.0	100.0	100.0	100.0	99.4	98.8		2.01
6	10 - 12	3.25		Reddish brown,Clay,Very stiff,w/silt pockets	C H	34											
7	12 - 14	3.25		Reddish brown,Clay,Very stiff,w/silt pockets	C H	34											
8	14 - 15	3.00		Yellowish brown,Clay,Very stiff,w/ferrous stains,Slickensided	C H	33.4											
9	15-16.5	2.25	16	Gray,Clay,Very stiff,w/silt partings	C H	36.6											
10	16.5-18.5	1.75		Gray,Clay,Stiff,w/organic materials	C H	42.0	76.9	109.1	93.0	33.0	100.0	100.0	100.0	100.0	100.0		?
11	18.5-20.5	2.25		Gray,Clay,Very stiff	C H	31											
12	20.5-22.5	2.25		Gray,Clay,Very stiff,w/organic material	C H	30											
13	22.5-24.5	1.75		Gray,Clay,Stiff,w/organic material	C H	30											
14	24.5-25	1.25		Gray&yellowish gray,Clay,Stiff,Sandy,w/sand layer	C L	22.6											
15	25-26.5		24	Gray,Sand,Medium dense,Silty	S M												
16	27-28.5		36	Gray,Sand,Dense,Silty	S M						100.0	10.0	100.0	43.8	31.5		
17	31.5-33		57	Gray,Sand,Very dense,Silty	S M												
18	33-34.5		57	Gray,Sand,Very dense,Silty	S M												
19	35-36.5		47	Gray,Sand,Dense,Silty	S M						100.0	100.0	99.9	46.0	18.6		
20	40-42	2.25		Gray,Clay,Very stiff,w/organic material	C H	45.1											

95% DRAFT

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classifcation, M c : Moisture Content
q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe
* : Material retained are shell fragments

Project: on-Galveston navigation channel

SUM. OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-37

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
21	42-44	2.00		Olive gray,Clay,Very stiff	C H	25.3	96.3	120.6	58.0	24.0	100.0	100.0	100.0	98.7	98.3		2.04
22	44-46	2.75		Olive gray,Clay,Very stiff,w/sand seams	C H	24.7											
23	46-48	2.50		Olice gray,Clay,Very stiff,w/sand seams	C H	25.8											
24	48-50	1.75		Yellowish gray,Clay,Stiff,w/sand seams & calcareous nodules	C H	19.7											
25	50-52	4.5+		Yellowish gray,Clay,Hard,w/calcareous nodules	C H	18.0											
26	52-54	4.5+		Yellowish gray,Clay,Hard,w/calcareous nodules	C H	17.2											
27	54-55	4.25		Red,Clay,Hard,Slickensided	C H	27.9											

95% DRAFT

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classifcation, M c : Moisture Content
q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe
* : Material retained are shell fragments

Project: .on-Galveston navigation channel

SUM..... OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-38

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
1	0 - 2	0.00		Gray,Clay,Very soft,Sandy,w/shell fragment	C L	25.9											
2	2 - 4	3.00		Olive gray,Clay,Very stiff,w/sand seams & blocky structure	C H	25.2											
3	4 - 6	2.25		Olive gray&brown,Clay,Very stiff,w/sand seams&calcareous nodules	C H	23.2											
4	6 - 8	4.50		Reddish brown,Clay,Hard,w/calcareous nodules	C H	20.5											
5	8 - 10	4.50		Reddish brown,Clay,Hard,w/silt seams	C H	21											
6	10 - 12	4.50		Yellowish brown,Clay,Hard,Silty,w/calcareous nodules	C L	21.0	106.8	129.2	39.0	19.0	100.0	100.0	99.6	98.6	98.5		4.41
7	12 - 14	3.00		Brown,Clay,Very stiff,w/silt seams,Slickensided	C H	24											
8	14 - 16	3.25		Brown,Clay,Very stiff,Slickensided SWD - See Report 16250	C H	28.6	95		75	19							
9	16-16.5	3.25		Brown,Clay,Very stiff,Slickensided	C H	32											
10	16.5-18	1.75	13	Brown,Clay,Stiff,w/calcareous nodules	C H	29.0											
11	18-20	3.00		Gray&yellowish brown,Clay,Very stiff,w/calc-areous nodules,Slickensided	C H	23.7	101.4	125.5	57.0	24.0	100.0	100.0	99.9	99.4	98.9		
12	20-21	2.50		Gray,Clay,Very stiff	C H	21											
12A	21-22	2.00		Gray,Clay,Very stiff,w/silt layer&silt seams SWD - report 16250	~~C H~~ C L												
13	22-24	3.00		Gray,Clay,Very stiff,w/sand seams SWD - report 16250	~~C H~~ C L	18.8	107		37	13							
14	24-26	3.25		Gray,Clay,Very stiff,w/silt seams	C H	16											
15	26-26.5	3.25		Gray,Clay,Very stiff,w/silt seams	C H	20											
16	26.5-28	2.00	15	Brown&gray,Clay,Very stiff,w/sand pockets	C H	21.4											
17	28-28.5	2.75		Gray,Clay,Very stiff	C H	18											
18	28.5-30.5	2.00		Light gray,Clay,Very stiff,Sandy	C L												
19	30.5-32.5	3.50		Yellowish brown,Clay,Very stiff,Sandy,w/ sand seams&ferrous stains	C L	21.7	105.4	128.3	44.0	17.0	100.0	99.5	97.9	93.7	80.1		2.02

95% DRAFT

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classifcation, M c : Moisture Content
q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe
* : Material retained are shell fragments

Project: ...ston-Galveston navigation channel

SUM... OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-38

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
20	32.5-34.5	3.75		Light gray,Clay,Very stiff	C H	19											
21	34.5-36	4.50	42	Gray & yellowish gray,Clay,Hard,Sandy,w/ sand seams	C L	18.7											
22	36-36.5	2.25		Gray & yellowish gray,Clay,Very stiff,Sandy,w/ sand seams	C L	16.1											
23	36.5-38		36	Brown,Sand,Dense,Silty	S M						100.0	100.0	89.3	36.9	28.4		
24	41-43	3.25		Gray,Clay,Very stiff	C H	31											
25	43-45	2.75		Gray & yellowish brown,Clay,Very stiff,w/ferr-ous stains& sand seams	C H	33.4											
26	45-47	3.25		Gray,Clay,Very stiff,w/sand seams	C H	32											
27	47-49	2.50		Gray,Clay,Very stiff,w/ferrous nodules	C H	47											
28	49-50	1.25		Gray,Clay,Stiff,w/ferrous stains	C H	31											
29	50-51	1.75		Gray,Clay,Stiff,Silty,w/sand seams	C L	23.7											
30	51-53	1.75		Gray,Clay,Stiff,Silty	C L	20											
31	53-55	4.25		Olive gray,Clay,Hard,Silty,w/sand seams & calcareous nodules	C L	17.8											
32	55-57	3.75		Red & gray,Clay,Very siff/calcareous nodules ,Slickensided	C H	25.8											

95% DRAFT

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classifcation, M c : Moisture Content
q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe
* : Material retained are shell fragments

Project: ...on-Galveston navigation channel

SU... OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-39

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
1	0 - 2	1.50		Gray&brown,Clay,Stiff,w/blocky structure	C H	26.8											
2	2 - 4	2.50		Gray&brown,Clay,Very stiff,w/ferrous stains &calcareous nodules	C H	23.7											
3	4 - 6	3.00		Yellowish gray,Clay,Very stiff,w/sand seams &blocky structure	C H	22.4											
4	6 - 8	4.25		Brown&gray,Clay,Hard,w/calcareous nodules&ferrous stains	C H	21.6											
5	8 - 10	3.50		Brown&gray,Clay,Very stiff,w/ferrous stains	C H	27.8	95.4	121.9	62.0	25.0	100.0	100.0	100.0	99.4	98.3		2.05
6	10 - 12	3.50		Yellowish brown,Clay,Very stiff,w/calcareous nodules,Slickensided	C H	23.0											
7	12 - 14	2.00		Gray,Clay,Very stiff	C H	32											
8	14-15.5	3.75	29	Yellowish brown,Clay,Very stiff,w/calcareous nodules,Slickensided	C H	25.5											
9	15.5-17.5	3.50		Gray,Clay,Very stiff,w/ferrous nodules&sand pockets	C H	20											
10	17.5-19.5	3.75		Yellowish brown&gray,Clay,Very stiff,w/sand seams calcareous&ferrous nodules,Slickensided	C H	20.1											
11	19.5-21.5	3.75		Gray,Clay,Very stiff,Sandy,w/calcareous nodules & sand seams	C L	22											
12	21.5-23.5	2.75		Yellowish gray,Clay,Very stiff,w/ferrous nodules	C H	18.0	111.0	130.9	53.0	22.0	99.8	99.4	96.1	94.8	93.0		2.13
13	23.5-24	3.50		Light gray,Clay,Very stiff	C H	19											
14	24-25.5	3.25	25	Yellowish gray,Clay,Very stiff,Sandy,w/sand seams	C L	22.4											
15	26-27.5		47	Yellowish gray,Sand,Dense,Silty	S M						100.0	100.0	99.7	85.0	47.0		
16	30.5-32		69	Yellowish gray,Sand,Very dense,Silty	S M												
17	32-33.5		45	Yellowish gray,Sand,Dense,Silty	S M												
18	34 - 36	3.50		Gray,Clay,Very stiff	C H	22											
19	36 - 38	3.25		Light gray,Clay,Very stiff,w/sand pockets	C H	24											
20	38 - 40	3.50		Light gray,Clay,Very stiff,w/sand pockets	C H	21											

95% DRAFT

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classifcation, M c : Moisture Content
q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe
* : Material retained are shell fragments

Project: ...ton-Galveston navigation channel

SUM... OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-39

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
21	40-42	3.50		Yellowish brown,Clay,Very stiff,w/sand seams&ferrous stains	C H	21.8	104.9	127.7	58.0	24.0	100.0	100.0	99.9	95.1	85.4		3.07
22	42-44	3.25		Reddish brown,Clay,Very stiff,Slickensided w/shell	C H	25											
23	44-46	3.75		Reddish brown,Clay,Very stiff,w/calcareous nodules,Slickensided	C H	26											
24	46-48	4.25		Reddish brown,Clay,Hard,w/calcareous nodules,Slickensided	C H	28											
25	48-50	4.25		Reddish brown,Clay,Hard,w/calcareous nodules,Slickensided	C H	27.6											
26	50-52	4.5		Reddish brown,Clay,Hard,w/calcareous nodules,Slickensided	C H	27.7											
27	52-54	4.25		Reddish brown,Clay,Hard,w/calcareous nodules,Slickensided	C H	28.0											

95% DRAFT

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classifcation, M c : Moisture Content
q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe
* : Material retained are shell fragments

Project: ...ion-Galveston navigation channel

SUM... OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-40

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
1	0 - 2			Yellowish gray,Sand,Very loose,Silty,w/shell fragments	S M												
2	2-3.5		W.O.H.	Gray,Sand,Very loose,Silty,w/shell fragments	S M												
3	7-8.5		W.O.H.	Gray,Sand,Very loose,Silty,w/shell fragments	S M						97.6*	93.7*	92.7*	51.5	30.3		
4	12-13.5		W.O.H.	Gray,Sand,Very loose,Silty,w/shell fragments	S M												
5	14-16	0.00		Gray,Clay,Very soft,Sandy,w/sand pockets and shell fragments	C L	21.1											
6	16-18	1.00		Gray,Clay,Stiff,Sandy w/ shell	C L	41											
7	18-19.5	4.50+		Brown&gray,Clay,Hard,w/calcareous noules	C H	25.6											
8	19.5-21.5	2.25		Gray,Clay,Very stiff,Slickensided	C H	28											
9	21.5-23.5	2.50		Gray&yellowish brown,Clay,Very stiff,w/calcareous nodules,slickensided	C H	27.2	96.3	122.5	70.0	27.0	100.0	100.0	99.9	99.4	98.8		2.17
10	23.5-25.5	3.00		Gray,Clay,Very stiff,w/ferrous nodules	C H	24											
11	25.5-27.5	3.00		Gray,Clay,Very stiff	C H	23											
12	27.5-28	4.50+		Yellowish gray,Clay,Hard,w/ferrous nodules and sand pockets	C H	22.2	105.7	129.2	57.0	23.0	99.9	99.3	98.6	95.1	85.3		
13	28-29.5	3.75	27	Yellowish gray,Clay,Very stiff,Sandy,w/ferrous nodules	C L	18.8											
14	29.5-30	2.75		Gray,Clay,Very stiff,Sandy	C L	16											
15	30-32	2.75		Yellowish brown&gray,Clay,Very stiff,Sandy, w/ferrous stains	C L	17.6	111.5	131.1	34.0	18.0	100.0	99.9	99.7	89.3	67.8		
16	32-34	2.00		Light gray,Clay,Very stiff,Sandy	C L	17											
17	34-36	2.00		Light gray,Clay,Very stiff,Sandy	C L	22											
17A	36-37.5		45	Yellowish gray,Sand,Dense,Silty	S M												
18	38-39.5		30	Yellowish gray,Sand,Dense,Silty	S M						100.0	100.0	94.9	51.0	29.8		
19	43-44.5		27	Yellowish gray,Sand,Medium dense,Silty	S M												

95% DRAFT

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q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe
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Project: ston-Galveston navigation channel

SUM . . OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-40

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
20	44.5-46.5	3.25		Light gray,Clay,Very stiff,w/sand pockets	C H	22											
21	46.5-48.5	3.75		Light gray,Clay,Very stiff,w/sand pockets	C H	21.8											
22	48.5-50.5	3.75		Light gray,Clay,Very stiff,w/sand pockets	C H	22											
23	50.5-52.5	3.75		Light gray,Clay,Very stiff	C H	23											
24	52.5-54.5	4.00		Yellowish gray,Clay,Very stiff,w/sand seams Slickensided	C H	21.1											
25	54.5-56.5	3.75		Brown&gray,Clay,Very stiff,w/calcareous nodules,Slickensided	C H	23.2											
26	56.5-58	3.50		Red&gray,Clay,Very stiff,w/calcareous nodules &ferrous stains,Slickensided	C H	23.2											

95% DRAFT

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q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe
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Project: ...uston-Galveston navigation channel

SUM... OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-41

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
1	0 - 2	0.00		Gray,Clay,Very soft,Sandy,w/shell & shell fragments	C L	27.4											
2	2 - 4	0.00		Gray,Clay,Very soft,Silty,w/sand pockets & shell fragments	C L	36.2											
3	4 - 6	0.00		Gray,Clay,Very soft,w/sand pockets & shell fragments	CH	45.7											
4	6 - 8	0.00		Gray,Clay,Very soft,w/sand seams&shell fragments	C H	50.8	70.7	106.6	57.0	24.0	100.0	99.9	99.4	99.3	98.2		
5	8 - 10	0.00		Gray,Clay,Very soft,w/sand seams & shell fragments	C H	58.3											
6	10 - 12	0.50		Yellowish brown,Clay,Medium stiff	C H	45.6	74.3	108.2	69.0	27.0	100.0	100.0	100.0	99.5	98.6		0.67
7	12 - 14	2.00		Brown,Clay,Very stiff	C H	30											
8	14-15	2.25		Brown,Clay,Very stiff	C H	39											
9	15-16.5	2.50	20	Yellowish gray,Clay,Very stiff,w/ferrous stains	C H	28.3											
10	16.5-18.5	2.25		Yellowish brown,Clay,Very stiff,w/ferrous nodules,Slickensided	C H	29.2	93.9	121.3	72.0	28.0	100.0	100.0	100.0	99.1	99.1		2.14
11	18.5-20.5	2.25		Light brown,Clay,Very stiff,w/ferrous nodules,Slickensided	C H	30											
12	20.5-22.5	2.25		Light brown,Clay,Very stiff,w/ferrous nodules,Slickensided	C H	29											
13	22.5-24.5	2.25		Yellowish brown,Clay,Very stiff,w/calcarous &ferrous nodules,Slickensided	C H	27.0	96.1	122.0	70.0	27.0	100.0	100.0	99.9	99.3	98.1		2.11
14	24.5-25	2.00		Light brown,Clay,Very stiff,w/calcareous & ferrous nodules,Slickensided	C H	30											
15	25-26.5	2.25	17	Yellowish brown,Clay,Very stiff,w/calcareous and ferrous nodules,Slickensided	C H	29.0											
16	26.5-27	2.00		Yellowish brown,Clay,Very stiff,Silty,w/ferrous nodules,Slickensided	C L	21.6											
17	27-29	2.25		Brown,Clay,Very stiff,w/sand pockets	C H												
18	29-31	1.25		Light gray,Clay,Stiff,Sandy	C L	18											
19	31-33	1.00		Yellowish brown,Clay,Stiff,Sandy,w/ferrous nodules & sand seams	C L	19.0	109.5	130.3	41.0	20.0	100.0	100.0	100.0	93.4	80.3		
20	33-34.5	3.75	27	Yellowish brown,Clay,Very stiff,Sandy,w/ferrous nodules&sand seams	C L												

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Project: ...ston-Galveston navigation channel

SU... ... OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-41

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
21	34.5-35	1.50		Light gray,Clay,Stiff,Sandy	C L	23											
22	35-37	4.00		Reddish brown,Clay,Very stiff	C H												
23	37-38.5		25	Yellowish gray,Sand,Medium dense,Silty	S M												
24	40-42	2.75		Yellowish gray,Clay,Very stiff,Silty,w/sand seams&ferrous stains	C L	28											
25	42-44	2.50		Yellowish gray,Clay,Very stiff,Silty,w/ferrous nodules&sand seams	C L	21.5											
26	44-46	2.50		Gray,Clay,Very stiff,Sandy	C L	20											
27	46-48	3.00		Gray,Clay,Very stiff,Sandy	C L	16											
28	48-50	3.50		Yellowish brown,Clay,Very stiff,Sandy,w/ calcareous nodules	C L	17.3											
29	50-51.5		61	Brown,Sand,Very dense,Silty	S M												
30	53.5-55		53	Brown,Sand,Very dense,Silty	S M												

95% DRAFT

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Project: ..ton-Galveston navigation channel

SU. OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-42

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
1	0 -1.5		W.O.H.	Dark gray,Sand,Very loose,Silty,w/shell fragments	S M												
2	5-6.5		W.O.H.	Dark gray,Sand,Very loose,Silty,w/shell fragments	S M												
3	10-11.5		2	Gray,Sand,Very loose,Silty,w/shell fragments	S M						94.8*	94.4*	93.1*	83.8	47.1		
4	12 - 14	0.00		Gray,Clay,Very soft,Sandy,w/shell fragment	C L	31.6											
5	14 - 16	0.00		Gray,Clay,Very soft,Sandy,w/shell fragment	C L	30.7	91.2	119.2	36.0	17.0	100.0	99.6*	95.1*	87.4	69.5		0.11
6	16-17	0.00		Gray,Clay,Very soft,Sandy,w/shell fragment	C L	28.0											
7	17-18.5	0.25	2	Gray,Clay,Soft,Sandy,w/sheli fragment	C L	38.4											
8	18.5-20.5	0.00		Gray,Clay,Very soft,Sandy,w/shell fragment	C L	33.9	85.6	114.6	41.0	20.0	100.0	99.9*	98.0*	88.8	74.1		0.15
9	20.5-22.5	0.00		Gray,Clay,Very soft,Sandy,w/shell fragment	C L	32.4											
10	22.5-24.5	0.00		Gray,Clay,Very soft,Sandy,w/shell fragment	C L	31.2											
11	24.5-26		5	Gray,Sand,Loose,Silty,w/shell fragments	S M												
12	27-28.5		7	Gray,Sand,Loose,Silty,w/shell fragments	S M												
13	29-30.5		11	Gray,Sand,Medium dense,Silty,w/shell fragments	SP-SM						99.2*	98.6*	94.8*	32.5	11.0		
14	33.5-35		30/20	Gray,Sand,Dense,Silty	S M												
15	35-36.5		16	Gray,Sand,Medium dense,Silty	S M												
16	37-38.5		21	Gray,Sand,Medium dense,Silty,w/sh frag	S M						99.5*	99.1*	92.3*	63.3	37.4		
17	40-42	3.50		Gray,Clay,Very stiff,Slickensided	C H	34											
18	42-44	3.25		Gray,Clay,Very stiff,Slickensided	C H	20											
19	44-46	3.00		Gray,Clay,Very stiff	C H	23											
20	46-48	3.50		Yellowish brown&gray,Clay,Very stiff,w/ferrous stains,Slickensided	C H	30.4	92.6	120.8	84.0	31.0	100.0	100.0	99.6	98.6	97.5		

95% DRAFT

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Project: ...ton-Galveston navigation channel

SUM... ... OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-42

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
21	48-50	3.50		Gray,Clay,Very stiff	C H	29											
22	50-51.5		42	Gray,Sand,Dense,Silty	S M												
23	51.5-53.5	3.75		Yellowish brown&gray,Clay,Very stiff,w/sand seams&ferrous stains,Slickensided	C H	22.7											
24	53.5-55	3.50		Yellowish brown&gray,Clay,Very stiff,w/sand seams&ferrous stains,Slickensided	C H	22.3											
25	55-57	3.50		Yellowish brown&gray,Clay,Very stiff,w/sand seams&ferrous stains,Slickensided	C H	22.6											

95% DRAFT

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Project: ...ston-Galveston navigation channel

SUM... OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-43

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
1	0-1.5		W.O.H.	Gray,Sand,Very loose,Silty,w/shell frag-ments	S M												
2	5-6.5		W.O.H.	Gray,Sand,Very loose,Silty,w/shell frag-ments	S M												
3	10 - 12	0.00		Gray,Clay,Very soft,Sandy,w/shell&shell fragments	C L	29.5											
4	12 - 14	0.00		Gray,Clay,Very soft,Sandy,w/sand pockets & shell fragments	C L	28.9	92.9	119.7	30.0	16.0	99.9*	99.8*	99.0*	78.8	57.4		0.12
5	14 - 15	0.00		Gray,Clay,Very soft,Sandy,w/sand pockets & shell fragments	C L	28.4											
6	15-16.5	0.00	W.O.H.	Gray,Clay,Very soft,Sandy,w/sand pockets & shell fragments	C L	30.3											
7	16.5-18	0.00		Gray,Clay,Very soft,Sandy,w/sand pockets & shell fragments	C L	25.1	96.6	120.8	35.0	18.0	100.0	99.9*	99.1*	71.9	52.6		0.16
8	18 - 20	0.00		Gray,Clay,Very soft,Sandy,w/sand pockets & shell fragments	C L	29.4											
9	20 - 22	0.00		Gray,Clay,Very soft,Sandy,w/sand pockets & shell fragments	C L	26.9											
10	22 - 24	0.00		Gray,Clay,Very soft,Sandy,w/sand pockets & shell fragments	C L	27.8	95.3	121.8	31.0	17.0	97.8*	97.1*	96.1*	62.2	58.6		0.17
11	24 - 25	0.00		Gray,Clay,Very soft,Sandy,w/sand pockets & shell fragments	C L	28.4											
12	25-26.5	0.00	3	Gray,Clay,Very soft,Sandy,w/sand pockets & shell fragments	C L	22.0											
13	26.5-27			Yellowish gray,Sand,Medium dense,Silty	S M												
14	27-28.5		19	Yellowish gray,Sand,Medium dense,Silty	S M						100.0	100.0	100.0	60.1	32.5		
15	31.5-33		24	Yellowish gray,Sand,Medium dense,Silty	S M												
16	33-34.5		29	Gray,Sand,Medium dense,Silty	S M												
17	35-36.5		31	Gray,Sand,Dense,Silty	S M						100.0	100.0	99.9	50.5	25.5		
18	40 - 42	2.50		Gray,Clay,Very stiff	C H	28											
19	42 - 44	2.00		Gray,Clay,Very stiff,w/calcareous&ferrous nodules	C H	37											
20	44 - 46	2.25		Gray,Clay,Very stiff,w/calcareous&ferrous nodules	C H	30											

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95% DRAFT

Project: ...on-Galveston navigation channel

SUI... OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-43

S #	Depth (ft)	P P	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
21	46-48	2.50		Yellowish brown,Clay,Very stiff,w/vertical silt seams	C H	33.7	88.9	118.9	72.0	27.0	100.0	100.0	100.0	99.6	98.9		
22	48-50	1.75		Gray,Clay,Stiff,w/ferrous stains	C H	31.4											
23	50-52	3.25		Gray,Clay,Very stiff,Sandy,w/sand seams	C L	19.4											
24	52-54	2.50		Yellowish brown,Clay,Very stiff,Sandy,w/ ferrous nodules	C L	19.7											
25	54-55	3.25		Yellowish brown,Clay,Very stiff,Sandy,w/ ferrous nodules	C L	19.6											

95% DRAFT

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q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe
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Project: ...on-Galveston navigation channel

Contract No. DACW64-94-C-0040

SU... OF LABORATORY TEST RESULTS *

Boring No. 93-44

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
1	0 - 2	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	24.2											
2	2 - 4	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	23.6											
3	4 -5.5		W.O.P.	Gray,Sand,Very loose,Silty,w/shell fragments	S M												
4	6 - 8	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	28.1											
5	8 - 10	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	30.0	91.1	118.4	33.0	17.0	97.3*	96.9*	96.7*	89.9	66.7		0.09
6	10 - 12	0.00		Gray,Clay,Very soft,Silty,w/shell fragments	C L	34.1											
7	12 - 14	0.00		Gray,Clay,Very soft,w/sand pockets&shell fragments	C H	37.3											
8	14 - 16	0.00		Gray,Clay,Very soft,w/sand pockets&shell fragments	C H	32.3	87.9	116.3	70.0	27.0	100.0	99.6	98.6	97.0	96.3		0.21
9	16 - 17	0.00		Gray,Clay,Very soft,w/sand pockets&shell fragments	C H	34.8											
10	17 -18.5	0.00	WOP	Gray,Clay,Very soft,w/sand pockets&shell fragments	C H	34.9											
11	18.5-20	0.00		Gray,Clay,Very soft,w/sand pockets&shell fragments	C H	32.8	87.7	116.5	70.0	27.0	100.0	100.0	99.5	97.9	97.0		
12	20 - 22	0.00		Gray,Clay,Very soft,w/sand pockets&shell fragments	C H	32.8											
13	22 - 23.5		11	Gray,Sand,Medium dense,Silty	S M												
14	25.5 -27		13	Gray,Sand,Medium dense,Silty	S M												
15	27 -28.5		19	Gray,Sand,Medium dense,Silty	S M						100.0	100.0	97.4	44.5	24.0		
16	29-30.5		17	Gray,Sand,Medium dense,Silty	S M												
17	33.5-35		22	Gray,Sand,Medium dense,Silty	S M												
18	35-36.5		22	Gray,Sand,Medium dense,Silty	S M												
19	37-38.5		21	Gray,Sand,Medium dense,Silty	SP-SM						100.0	100.0	85.0	20.1	9.9		
20	42-43.5		23	Gray,Sand,Medium dense,Silty	S M												

95% DRAFT

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classifcation, M c : Moisture Content
q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe
* : Material retained are shell fragments

Geotest Engineering, Inc.

Project: ston-Galveston navigation channel

SUM... OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-44

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
21	47-48.5		17	Gray,Sand,Medium dense,Silty	S M												
22	52-53.5		11	Gray,Sand,Medium dense,Silty	S M												
23	55.5-57		30	Gray,Sand,Dense,Silty	S M												

95% DRAFT

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classifcation, M c : Moisture Content
q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe
* : Material retained are shell fragments

Project: [illegible]ston-Galveston navigation channel

Contract No. DACW64-94-C-0040

SUMMARY OF LABORATORY TEST RESULTS

Boring No. 93-45

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing #4	#10	#40	#100	#200	Torvane Shear Strength (tsf)	q u (tsf)
1	0 - 1.5		W.O.P	Gray,Sand,Very loose,Silty,w/shell fragments	S M												
2	5 - 6.5		W.O.P	Gray,Sand,Very loose,Silty,w/shell fragments	S M												
3	10 - 11.5		W.O.P	Gray,Sand,Very loose,Silty,w/shell fragments	S M												
4	13 -14.5		5	Gray,Sand,Loose,Silty	S M												
5	18-19.5		6	Gray,Sand,Loose,Silty	S M						100.0	100.0	95.0	30.1	20.2		
6	23-24.5		8	Gray,Sand,Loose,Silty	S M												
7	24.5-25	3.50		Yellowish gray,Clay,Very stiff,Sandy,w/calcareous noduels & sand seams	C L	16.8											
8	25-27	3.75		Light gray,Clay,Very stiff,w/silt partings	C H												
9	27-29	4.00		Light gray,Clay,Very stiff,w/silt partings	C H	18											
10	29-31	4.00		Light gray,Clay,Very stiff,w/silt partings	C H	18											
11	31-32.5	3.75	25	Brown gray,Clay,Very stiff,w/calcareous nodules & ferrous stains	C H	17.1											
12	32.5-33	4.00		Yellowish brown,Clay,Very stiff,w/sand seams & Calcareous nodules,Slickensided	C H	16.4	115.8	134.8	50.0	19.0	100.0	100.0	99.9	99.3	97.4		
13	33-35	3.00		Light gray&brown,Clay,Very stiff	C H												
14	35-37	2.75		Light gray,Clay,Very stiff	C H	18											
15	37-39	4.50+		Light gray,Clay,Hard,w/silt pockets&calcareous nodules	C H	16											
16	39-41	4.25		Brown,Clay,Hard,w/silt pockets & calcareous nodule	C H	16											
17	41-43	4.50+		Brown&gray,Clay,Hard,w/silt seams & silt pockets & calcareous nodules	C H	16.1											
18	43-45	4.50+		Reddish brown,Clay,Hard,Slickensided	C H	24											
19	45-47	4.25		Reddish brown,Clay,Hard,w/calcareous nodules & ferrous stains,Slickensided	C H	25.0	104.0	130.0	72.0	28.0	100.0	100.0	99.9	99.2	98.1		
20	47-49	4.50		Red,Clay,Hard,w/silt parting & ferrous stains, Slickensided	C H	25.3											

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classifcation, M c : Moisture Content
q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe
* : Material retained are shell fragments

95% DRAFT

pc7,excel,original xls

Geotest Engineering Inc

Project: ...ton-Galveston navigation channel

SUM... OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-45

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
21	49-51	4.25		Red,Clay,Hard,w/silt partings calcareous nodules & ferrous stains,Slickensided	C H	26.0											
22	51-53	3.25		Yellowish brown,Clay,Very stiff,Silty,w/ ferrous nodules	C L	15.6											

95% DRAFT

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classifcation, M c : Moisture Content
q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe
* : Material retained are shell fragments

Project: Ho..on-Galveston navigation channel

SUMM... OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-46

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
1	0 - 2	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	38.5											
2	2 - 4	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	28.3											
3	4 - 6	0.00		Gray,Clay,Very soft,w/sand pockets & shell frragments	C H	50.5											
4	6 - 8	0.00		Gray,Clay,Very soft,w/sand pockets	C H	26.4	94.2	119.1	59.0	22.0	100.0	100.0	99.6	98.6	97.0		
5	8 - 10	0.00		Gray,Clay,Very soft,w/sand pockets	C H	24.6											
6	10 - 12	0.50		Yellowish gray,Clay,Medium stiff,w/ferrous stains	C H	30.2	90.3	117.6	56.0	22.0	100.0	100.0	99.9	99.4	97.9		0.55
7	12 - 13.5		7	Gray,Sand,Loose,Silty	S M												
8	16 - 17.5		9	Gray,Sand,Loose,Silty	S M												
9	17.5- -19		13	Gray,Sand,Medium dense,Silty	S M												
10	22 - 24	2.50		Yellowish gray,Clay,Very stiff,w/ferrous stains	C H	22.8											
11	24 - 26	2.50		Gray,Clay,Very stiff,w/calcareous nodules	C H	15											
12	26 -27.5	2.75		Yellowish gray&brown,Clay,Very stiff,Sandy,w/ ferrous stains & sand seams	C L	18.9	109.7	130.5	42.0	18.0	100.0	100.0	99.8	97.2	84.2		2.14
13	27.5-29	3.75	29	Yellowish gray,Clay,Very stiff,Sandy,w/sand seams	C L	20.0											
14	29-31	1.50		Gray,Clay,Stiff,Sandy	C L	17											
15	31 - 33	3.25		Yellowish brown,Clay,Very stiff,w/calcareous & ferrous nodules & sand seams	C H	20.1											
16	33 - 35	3.25		Gray,Clay,Very stiff	C H	16											
17	35-35.5	3.25		Yellowish brown,Clay,Very stiff,Sandy,w/ ferrous stains & sand seams	C L	20.4											
18	35.5-37	3.75	28	Yellowish brown,Clay,Very stiff,Sandy,w/ ferrous stains & sand seams	C L	19.0											
19	37 - 39	2.50		Yellowish brown,Clay,Very stiff,Sandy,w/ ferrous stains & sand seams	C L	18.7											
20	39 - 41	2.50		Reddish brown,Clay,Very stiff,Silty,w/cal-careous nodules	C L	19											

95% DRAFT

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q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe

* : Material retained are shell fragments

Project: [illegible]n-Galveston navigation channel

SUM[illegible] OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-46

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
21	41-43	3.00		Red,Clay,Very stiff,w/ferrous stains & sand pockets	C H	22.5	101.8	124.8	69.0	28.0	100.0	100.0	99.5	98.4	97.5		2.11
22	43-45	4.25		Red,Clay,Hard,w/ferrous stains & sand pockets	C H	24.5											
23	45-47	3.00		Red,Clay,Very stiff,w/sand pockets & calcareous nodules	C H	21.6											
24	47-49	4.50		Brown,Clay,Hard,w/calcareous nodules & silt parting,Slickensided	C H	26.2											
25	49-51	4.25		Brown,Clay,Hard,w/calcareous nodules & silt parting,Slickensided	C H	23.3											
26	51-53	4.50+		Gray&brown,Clay,Hard,Silty,w/sand seams & calcareous nodules	C L	16.1											
27	53-55	4.50+		Reddish brown,Clay,Hard,Silty,w/sand seams & calcareous nodules	C L	15.4											
28	55-57	4.50+		Reddish brown,Clay,Hard,Silty,w/sand seams & calcareous nodules	C L	19.0											
29	57-58	4.50+		Reddish brown,Clay,Very stiff,Silty,w/calcareous nodules	C L	21.2											

95% DRAFT

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q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe

* : Material retained are shell fragments

Project: ...on-Galveston navigation channel

SUMM... OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-47

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
1	0 - 2	0.00		Gray,Clay,Very soft,Sandy,w/shell fragment	C L	28.1											
2	2 - 4	0.00		Gray,Clay,Very soft,Sandy,w/shell fragment	C L	31.9	88.8	117.1	39.0	18.0	100.0	99.9	92.6	76.6	69.7		
3	4 - 6	0.00		Gray,Clay,Very soft,w/sand pockets	C H	34.9											
4	6 - 7	0.00		Gray,Clay,Very soft,w/sand pockets	C H	30.6											
5	7 - 8.5		13	Gray,Sand,Medium dense,Silty,w/pea gravel	S M												
6	12 - 14	3.50		Gray&brown,Clay,Very stiff	C H	34											
7	14 -16	2.50		Yellowish gray&brown,Clay,Very stiff,w/sand seams & ferrous stains	C H	23.1	101.9	125.4	62.0	25.0	100.0	100.0	99.6	98.7	97.6		2.18
8	16 - 17	4.5+		Yellowish brown,Clay,Hard,Sandy,w/calcareous nodules ferrous stains & seams	C L	15.8											
9	17 - 18.5	4.00		Yellowish brown,Clay,Very stiff,Sandy,w/ calcareous nodules & ferrous stains	C L	17.6											
10	18.5 -20	4.00		Light gray&brown,Clay,Very stiff,w/calcareous nodules & sand pockets	C H	17											
11	20 - 22	4.25		Yellowish brown,Clay,Hard,w/calcareous nodules ferrous stains & sand seams	C H	17.5											
12	22 - 24	4.5+		Light gray&brown,Clay,Hard,w/calcareous nodules & sand pockets	C H	18											
13	24 - 25	2.75		Yellowish brown,Clay,Very stiff,w/calcareous and ferrous nodules & sand pockets	C H	19.7											
14	25 -26.5	3.75	25	Brown&gray,Clay,Very stiff,w/calcareous nodules & sand seams	C H	15.7											
15	26.5-28	3.50		Light gray&reddish brown,Clay,Very stiff,w/ silt partings	C H	10											
16	28-30	2.75		Light gray&reddish brown,Clay,Very stiff,w/ silt partings	C H	16											
17	30-31.5		67	Brown&gray,Silt,Very dense,Sandy	M L												
18	31.5-33	3.50		Reddish brown,Clay,Very stiff,w/calcareous nodules & sand seams	C H	18.0											
19	33-35	3.50		Reddish brown,Clay,Very stiff,w/calcareous nodules & sand seams	C H	20.2											
20	35-37	3.50		Gray&yellowish brown,Clay,Very stiff,w/calcareous nodule & sand seams,Slickensided	C H	22.2											

95% DRAFT

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q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe
* : Material retained are shell fragments

Project: [illegible]-Galveston navigation channel

SUMM[illegible] OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-47

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
21	37-39	4.5+		Gray&yellowish brown,Clay,Hard,w/calcareous nodules & sand seam,Slickensided	C H	21.3											
22	39-41	4.00		Reddish brown,Clay,Very stiff,Silty,w/calcareous nodules	C L	17.7											
23	41-43	1.00		Gray,Caly,Stiff,Silty,w/carcaleous nodules	C L	19.2											
24	43-44.5		50/2"	Red,Sand,Very dense,Silty	S M												
25	45.5-47		50/2.5"	Red,Sand,Very dense,Silty	S M												

95% DRAFT

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classifcation, M c : Moisture Content
q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe
* : Material retained are shell fragments

M_c, LL, PL Performed by WES for clay ball experiment.

00 4 4 H3

Project : Houston - Galveston Navigation Channel
Contract No. DACW64-94-C-0040
Reference: Soil Samples Delivered to Waterways Experiment Station

Boring No.	Sample No.
93-01	6,8,9,11,12
93-02	6,8,10,12
93-04	
93-05	
93-06	
93-07	
93-08	9,11,[illegible],18,[illegible],18,20,22,24,25
93-09	3,5,[illegible],8,[illegible],12,14,16,18,20
93-10	5,7,9,[illegible],14,16,18,18,20,22,24,26
93-11	[illegible]
93-12	[illegible]
93-13	[illegible]
93-14	[illegible]
93-15	[illegible]
93-21	[illegible]
93-29	5,9,10,13,14
93-30	4,11,[illegible],14,16A,[illegible],18
93-31	5,8,9,12,[illegible],17,[illegible],22,28
93-34	[illegible]
93-35	4,7,8,11
93-37	4,6,7,11,12,13
93-38	5,7,9,12,14,15,17,[illegible],20,24,26,27,28,30
93-39	7,9,11,13,18,19,20,22,23,24
93-40	6,8,10,11,14,16,17,20,22,23
93-41	7,8,11,12,14,17,[illegible],21,22,24,26,27
93-42	17,18,19,21
93-43	16,19,20
93-45	8,9,10,13,14,15,16,18
93-46	11,14,16,20
93-47	6,10,12,15,16
93-48	10,13,14,18,20

Note : also 41 quart jar water samples from S-1 through S-41 were deliverd

Paul Gilbert
Received by.

Jay Montemarano
Delivered by.

95% DRAFT

LIQUID AND PLASTIC LIMIT TESTS

For use of this form, see EM 1110-2-1906.

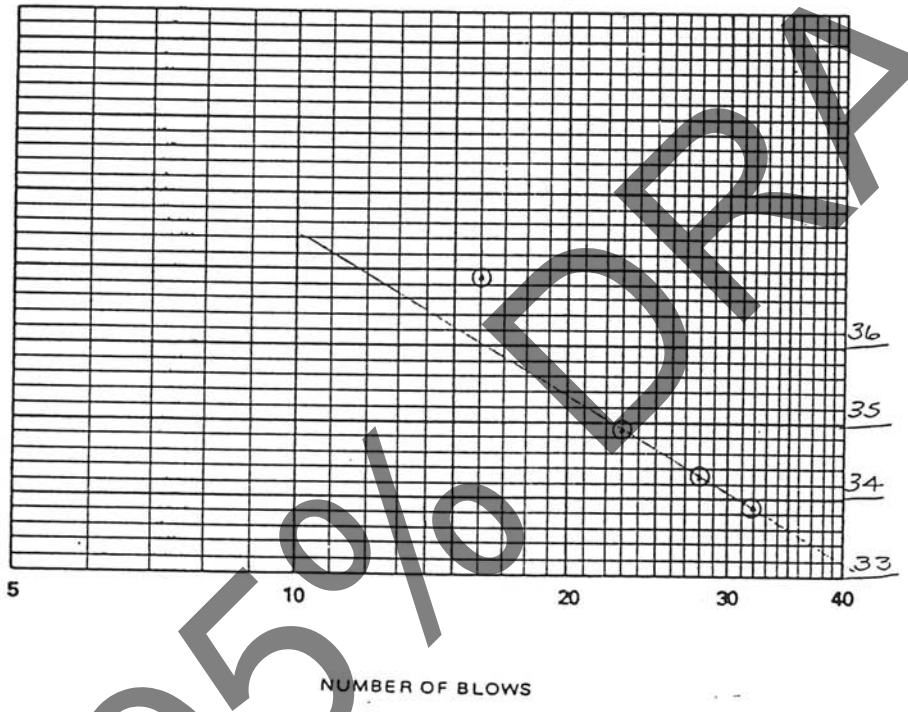
PROJECT HOUSTON - GALVESTON NAVIGATION CHANNEL DATE

BORING NO. 93-01 SAMPLE NO. 8

LIQUID LIMIT

	RUN NO.	1	2	3	4	5	6
	TARE NO.	24	40	51	15		
WEIGHT IN GRAMS	TARE PLUS WET SOIL	44.02	47.25	46.02	46.22		
	TARE PLUS DRY SOIL	41.57	44.61	43.60	43.62		
	WATER W_w	2.45	2.64	2.42	2.60		
	TARE	34.83	37.05	36.55	35.95		
	DRY SOIL W_s	6.64	7.56	7.05	7.67		
	WATER CONTENT, % w	36.9	34.9	34.3	32.9		
	NUMBER OF BLOWS	16	23	27	32		

N-41



LL 35.0

PL 20.0

PI 15.0

Symbol from plasticity chart CL

PLASTIC LIMIT

	RUN NO.	1	2	3	4	5	NATURAL WATER CONTENT
	TARE NO.	illegible	illegible				
WEIGHT IN GRAMS	TARE PLUS WET SOIL	illegible	illegible				
	TARE PLUS DRY SOIL	illegible	illegible				
	WATER W_w	illegible	1.31				
	TARE	illegible	15.33				
	DRY SOIL W_s	6.3	6.38				
	WATER CONTENT, % w	illegible	illegible				
	PLASTIC LIMIT		illegible				

REMARKS CLAY (CL) illegible

TECHNICIAN CEC COMPUTED BY illegible CHECKED BY

ENG FORM 1 JUN 65 3838

☆ U.S.GPO:1984-0-452-954/18650

PLATE III-1

95% DRAFT

LIQUID AND PLASTIC LIMIT TESTS

For use of this form, see EM 1110-2-1906.

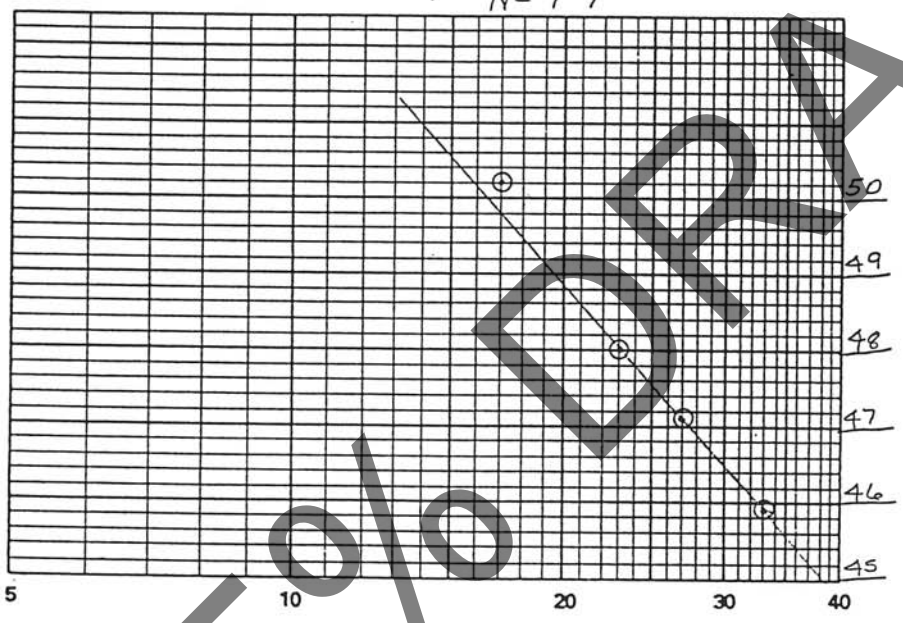
PROJECT HOUSTON GALVESTON NAVIGATION CHANNEL DATE

BORING NO. 93-01 SAMPLE NO. 11

LIQUID LIMIT

	RUN NO.	1	2	3	4	5	6
	TARE NO.	89	50A	284	459		
WEIGHT IN GRAMS	TARE PLUS WET SOIL	27.54	18.92	23.39	25.48		
	TARE PLUS DRY SOIL	24.53	16.32	20.75	22.49		
	WATER W_w	3.01	2.60	2.64	2.99		
	TARE	18.54	10.90	15.14	15.98		
	DRY SOIL W_s	5.99	5.42	5.61	6.51		
	WATER CONTENT, % w	50.2	48.0	47.1	45.9		
	NUMBER OF BLOWS	17	23	27	33		

N-77



LL 48.0

PL 20.0

PI 28.0

Symbol from plasticity chart CL

95% DRAFT

PLASTIC LIMIT

	RUN NO.	1	2	3	4	5	NATURAL WATER CONTENT
	TARE NO.	475	483				
WEIGHT IN GRAMS	TARE PLUS WET SOIL	22.40	22.88				
	TARE PLUS DRY SOIL	21.32	21.73				
	WATER W_w	1.08	1.15				
	TARE	15.92	15.85				
	DRY SOIL W_s	5.40	5.88				
	WATER CONTENT, % w	20.0	19.6				
	PLASTIC LIMIT		19.8				

REMARKS CLAY (CL) BROWN

TECHNICIAN COMPUTED BY CHECKED BY

LIQUID AND PLASTIC LIMIT TESTS

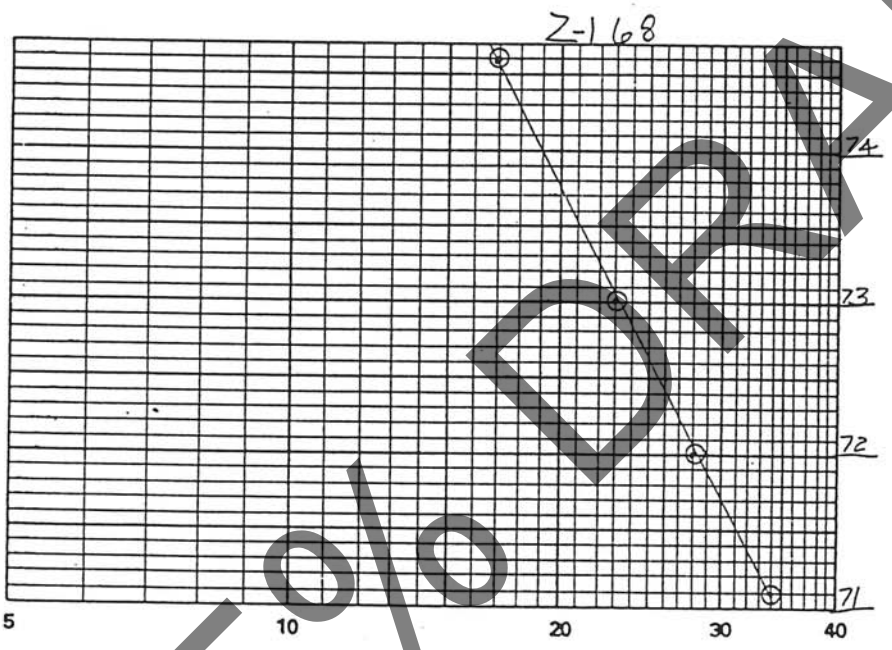
For use of this form, see EM 1110-2-1906.

PROJECT HOUSTON-GALVESTON NAVIGATION CHANNEL DATE

BORING NO. 93-02 SAMPLE NO. 12

LIQUID LIMIT

	RUN NO.	1	2	3	4	5	6
	TARE NO.	462	490	455	441		
WEIGHT IN GRAMS	TARE PLUS WET SOIL	23.49	23.21	24.83	24.01		
	TARE PLUS DRY SOIL	20.23	19.88	21.25	20.59		
	WATER W_w	3.36	3.33	3.58	3.42		
	TARE	15.86	15.32	16.28	15.78		
	DRY SOIL W_s	4.37	4.56	4.97	4.81		
	WATER CONTENT, % w	74.6	73.0	72.0	71.1		
	NUMBER OF BLOWS	17	23	28	34		



LL 73.0

PL 21.0

PI 52.0

Symbol from plasticity chart CH

95% DRAFT

PLASTIC LIMIT

	RUN NO.	1	2	3	4	5	NATURAL WATER CONTENT
	TARE NO.	391	405				
WEIGHT IN GRAMS	TARE PLUS WET SOIL	22.26	20.82				
	TARE PLUS DRY SOIL	21.16	19.95				
	WATER W_w	1.10	0.87				
	TARE	15.91	15.71				
	DRY SOIL W_s	5.25	4.25				
	WATER CONTENT, % w	21.0	20.5				
	PLASTIC LIMIT		20.8				

REMARKS CLAY (CH) GR. 4

TECHNICIAN CEC COMPUTED BY CEC CHECKED BY

☆ U.S.GPO:1984-0-452-954/18650

LIQUID AND PLASTIC LIMIT TESTS

For use of this form, see EM 1110-2-1906.

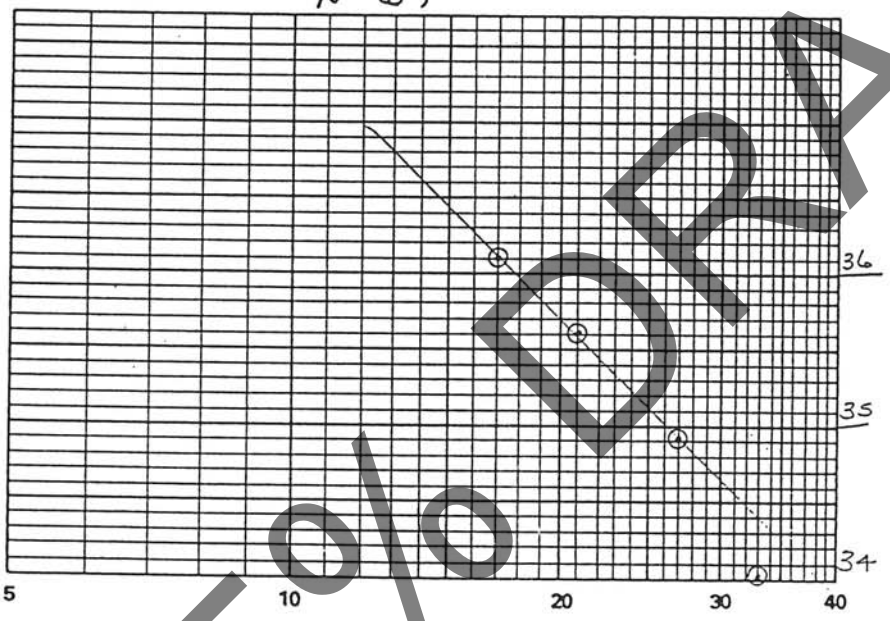
PROJECT HOUSTON-GALVESTON NAVIGATION CHANNEL DATE

BORING NO. 93-08 SAMPLE NO. 13

LIQUID LIMIT

	RUN NO.	1	2	3	4	5	6
	TARE NO.	329	432	430	500		
WEIGHT IN GRAMS	TARE PLUS WET SOIL	24.87	25.45	26.57	23.94		
	TARE PLUS DRY SOIL	22.46	22.90	23.81	21.78		
	WATER W_w	2.41	2.55	2.76	2.16		
	TARE	15.80	15.73	15.89	15.42		
	DRY SOIL W_s	6.66	7.17	7.92	6.36		
	WATER CONTENT, % w	36.1	35.6	34.8	34.0		
	NUMBER OF BLOWS	17	21	27	33		

N-69



LL 35.0

PL 22.0

PI 13.0

Symbol from plasticity chart

95% DRAFT

PLASTIC LIMIT

	RUN NO.	1	2	3	4	5	NATURAL WATER CONTENT
	TARE NO.	325	330				
WEIGHT IN GRAMS	TARE PLUS WET SOIL	24.07	24.26				
	TARE PLUS DRY SOIL	22.57	23.30				
	WATER W_w		1.46				
	TARE	15.78	15.19				
	DRY SOIL W_s	6.79	6.61				
	WATER CONTENT, % w	22.2	22.1				
	PLASTIC LIMIT		22.2				

REMARKS CLAY (CL) BROWN

TECHNICIAN CEC COMPUTED BY [illegible] CHECKED BY

LIQUID AND PLASTIC LIMIT TESTS

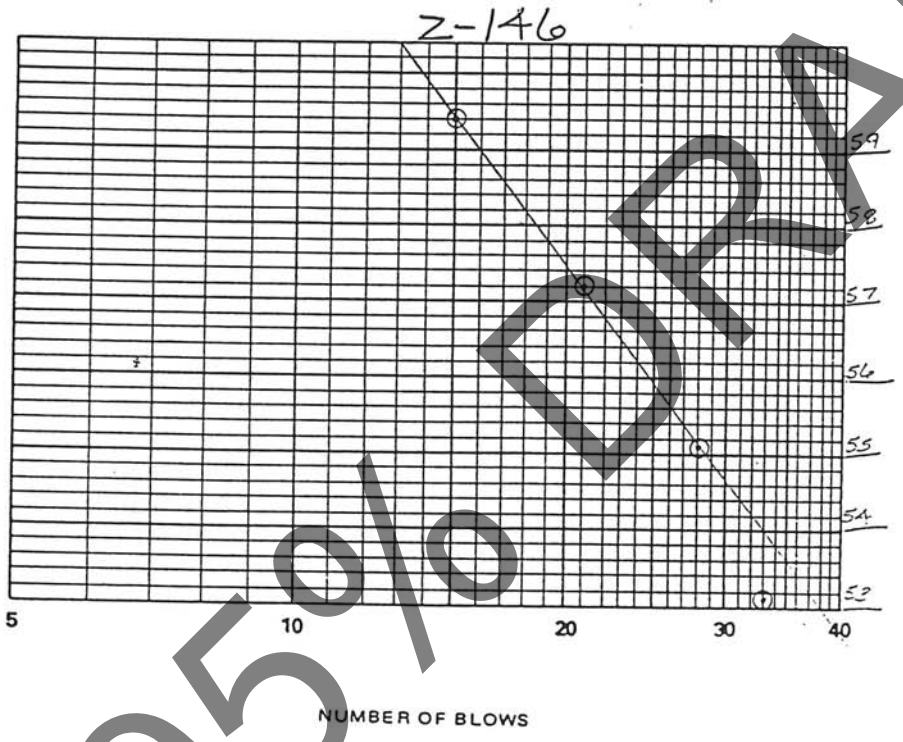
For use of this form, see EM 1110-2-1906.

PROJECT HOUSTON-GALVESTON NAVIGATION CHANNEL DATE

BORING NO. 93-08 SAMPLE NO. 18

LIQUID LIMIT

	RUN NO.	1	2	3	4	5	6
	TARE NO.	54A	314	469	322		
WEIGHT IN GRAMS	TARE PLUS WET SOIL	18.88	24.93	24.32	22.73		
	TARE PLUS DRY SOIL	15.93	21.66	21.33	20.28		
	WATER W_w	2.95	3.27	2.99	2.45		
	TARE	10.96	15.94	15.90	15.67		
	DRY SOIL W_s	4.97	5.72	5.43	4.61		
	WATER CONTENT, % w	59.4	57.2	55.1	53.1		
	NUMBER OF BLOWS	15	21	28	33		



LL 56.0

PL 22.0

PI 34.0

Symbol from plasticity chart CH

PLASTIC LIMIT

	RUN NO.	1	2	3	4	5	NATURAL WATER CONTENT
	TARE NO.	336	452				
WEIGHT IN GRAMS	TARE PLUS WET SOIL	22.59	23.00				
	TARE PLUS DRY SOIL	21.39	21.67				
	WATER W_w	1.20	1.33				
	TARE	16.01	15.69				
	DRY SOIL W_s	5.38	5.98				
	WATER CONTENT, % w	22.3	22.2				
	PLASTIC LIMIT	—	22.2				

REMARKS CLAY (CH) GRAY

TECHNICIAN CSC COMPUTED BY CSC CHECKED BY

95% DRAFT

LIQUID AND PLASTIC LIMIT TESTS

For use of this form, see EM 1110-2-1906.

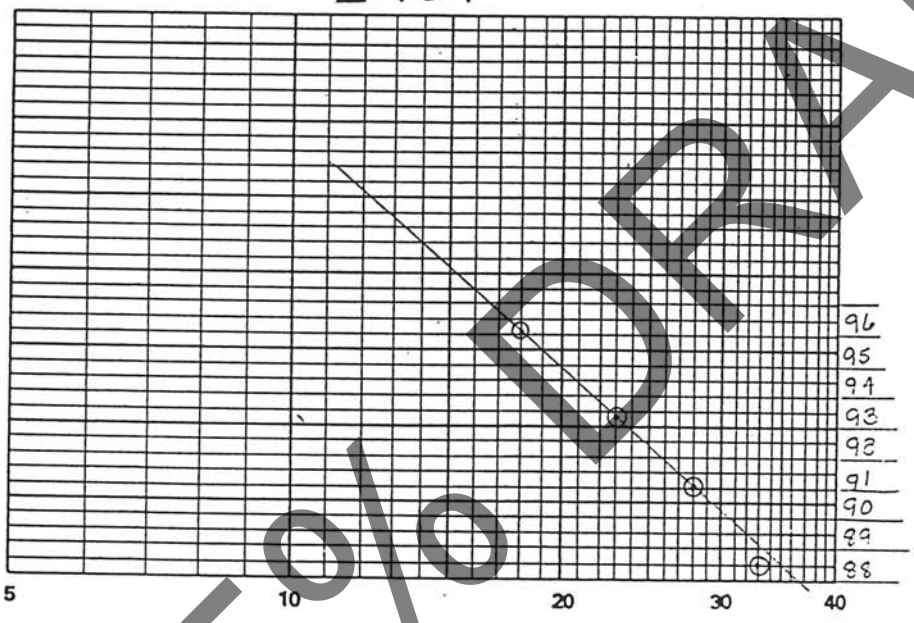
PROJECT HOUSTON-GALVESTON NAVIGATION CHANNEL DATE

BORING NO. 93-09 SAMPLE NO. 20

LIQUID LIMIT

	RUN NO.	1	2	3	4	5	6
	TARE NO.	456	497	475	483		
WEIGHT IN GRAMS	TARE PLUS WET SOIL	24.03	23.11	23.60	24.39		
	TARE PLUS DRY SOIL	20.05	19.36	19.94	20.38		
	WATER W_w	3.98	3.75	3.66	4.01		
	TARE	15.91	15.32	15.92	15.85		
	DRY SOIL W_s	4.14	4.04	4.02	4.53		
	WATER CONTENT, % w	96.1	92.8	91.0	88.5		
	NUMBER OF BLOWS	18	23	28	33		

Z-139



LL 92.0

PL 27.0

PI 65.0

Symbol from plasticity chart CH

95% DRAFT

PLASTIC LIMIT

	RUN NO.	1	2	3	4	5	NATURAL WATER CONTENT
	TARE NO.	367	411				
WEIGHT IN GRAMS	TARE PLUS WET SOIL	21.66	22.83				
	TARE PLUS DRY SOIL	20.40	21.30				
	WATER W_w	1.26	1.53				
	TARE	15.69	15.74				
	DRY SOIL W_s	4.71	5.56				
	WATER CONTENT, % w	26.8	27.5				
	PLASTIC LIMIT		27.2				

REMARKS OLIVE (5Y 4/3) GRAY

TECHNICIAN COMPUTED BY CHECKED BY

LIQUID AND PLASTIC LIMIT TESTS

For Use of this form, see EM 1110-2-1906.

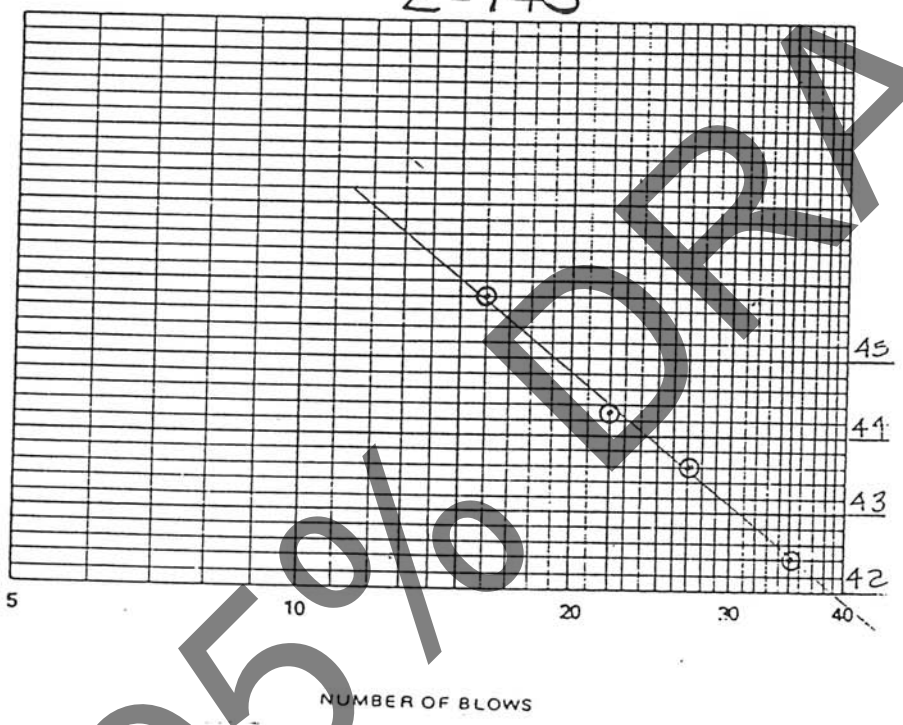
PROJECT HOUSTON-GALVESTON NAVIGATION CHANNEL DATE

BORING NO. 9331 SAMPLE NO. 23

LIQUID LIMIT

	RUN NO.	1	2	3	4	5	6
	TARE NO.	325	330	391	405		
WEIGHT IN GRAMS	TARE PLUS WET SOIL	24.28	24.59	24.70	25.38		
	TARE PLUS DRY SOIL	21.61	21.70	22.03	22.50		
	WATER W_w	2.67	2.89	2.67	2.88		
	TARE	15.78	15.19	15.91	15.71		
	DRY SOIL W_s	5.83	6.51	6.12	6.79		
	WATER CONTENT, % w	45.8	44.3	43.6	42.4		
	NUMBER OF BLOWS	16	22	27	35		

Z-143



LL 44.0

PL 15.0

PI 29.0

Symbol from plasticity chart CL

95% DRAFT

PLASTIC LIMIT

	RUN NO.	1	2	3	4	5	NATURAL WATER CONTENT
	TARE NO.	207	287				
WEIGHT IN GRAMS	TARE PLUS WET SOIL	23.45	22.52				
	TARE PLUS DRY SOIL	22.35	21.53				
	WATER W_w	1.10	0.99				
	TARE	15.27	14.99				
	DRY SOIL W_s	7.08	6.54				
	WATER CONTENT, % w	15.5	15.1				
	PLASTIC LIMIT		15.3				

REMARKS CLAY (CL) GRAY

TECHNICIAN COMPUTED BY CHECKED BY

ENG FORM 1 JUN 65 3838

☆U.S GPO:1984-0-452-954/18550

PLATE III-1

LIQUID AND PLASTIC LIMIT TESTS

For use of this form, see EM 1110-2-1906.

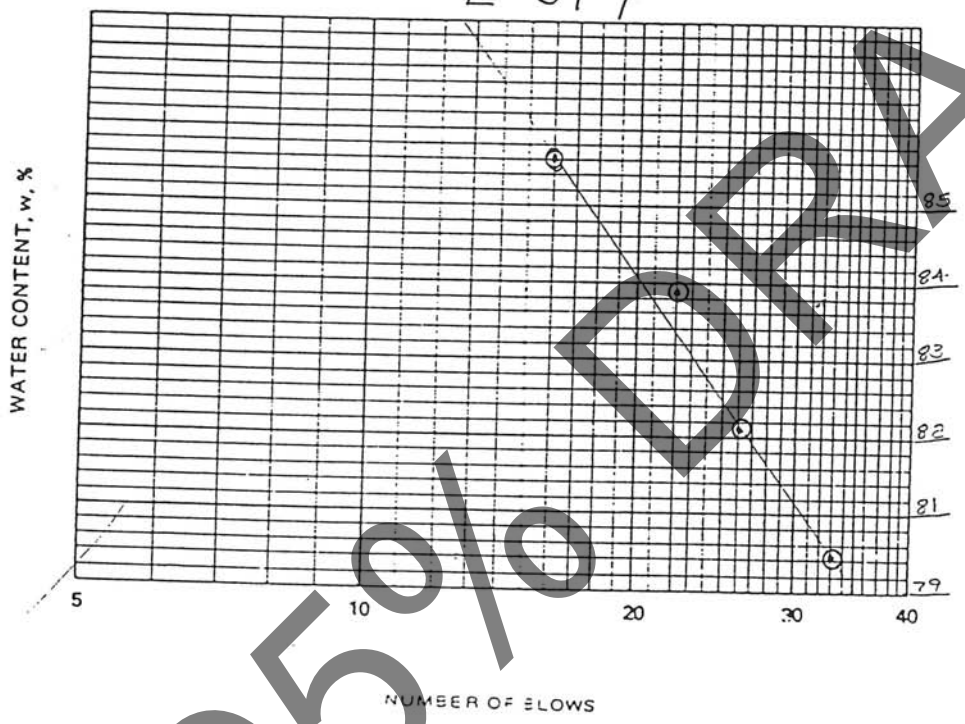
PROJECT HOUSTON-GALVESTON NAVIGATION CHANNEL DATE

BORING NO. 9335 SAMPLE NO. 7

LIQUID LIMIT

	RUN NO.	1	2	3	4	5	6
	TARE NO.	207	336	367	416		
WEIGHT IN GRAMS	TARE PLUS WET SOIL	22.60	24.03	22.72	23.49		
	TARE PLUS DRY SOIL	19.22	20.37	19.55	20.06		
	WATER W_w	3.38	3.66	3.17	3.43		
	TARE	15.27	16.01	15.69	15.74		
	DRY SOIL W_s	3.95	4.36	3.86	4.32		
	WATER CONTENT, % w	85.6	83.9	82.1	79.4		
	NUMBER OF BLOWS	16	22	27	33		

L-519



LL 82.0

PL 27.0

PI 55.0

Symbol from plasticity chart

95% DRAFT

PLASTIC LIMIT

	RUN NO.	1	2	3	4	5	NATURAL WATER CONTENT
	TARE NO.		414				
WEIGHT IN GRAMS	TARE PLUS WET SOIL	[illegible]	21.17				
	TARE PLUS DRY SOIL	[illegible]	20.10				
	WATER W_w	[illegible]	1.07				
	TARE	[illegible]	16.12				
	DRY SOIL W_s	[illegible]	3.98				
	WATER CONTENT, % w	26.8	26.9				
	PLASTIC LIMIT		26.6				

REMARKS CLAY (CH)

TECHNICIAN [illegible] COMPUTED BY [illegible] CHECKED BY

ENG FORM 1 JUN 65 3838

☆U.S.GPO:1984-0-452-954/18650

PLATE III-1

WATER CONTENT - GENERAL

DATE _____

PROJECT HOUSTON - GALVESTON NAVIGATION CHANNEL

BORING NO. _____

Sample or Specimen No.			9301 (8)	9301 (9)	9301 (11)	9301 (12)	9302 (9)	9302 7
Tare No.			29	33	61	21	89	34
Weight in grams	Tare plus wet soil		146.93	163.08	126.48	136.87	146.77	158.80
	Tare plus dry soil		122.53	132.90	105.43	115.23	113.73	127.24
	Water	W_w	24.40	30.18	21.05	21.64	33.04	31.56
	Tare		39.26	38.62	38.82	38.88	38.99	38.53
	Dry soil	W_s	83.27	94.28	66.61	76.34	74.74	88.71
Water content		w	29.30%	32.01%	31.60%	28.35%	44.21%	35.58%

Sample or Specimen No.			9302 (12)	93-08 (9)	9308 (11)	9308 (13)	9308 (18)	9308 (20)
Tare No.			65	42	70	12	43	51
Weight in grams	Tare plus wet soil		129.99	119.28	144.05	124.39	96.73	111.14
	Tare plus dry soil		106.54	98.17	117.08	106.57	81.07	89.68
	Water	W_w	23.45	21.11	26.97	17.82	15.66	21.46
	Tare		38.79	38.67	38.50	38.85	38.91	38.59
	Dry soil	W_s	67.75	59.50	78.58	67.72	42.16	51.09
Water content		w	34.61%	35.48%	34.32%	26.35%	37.14%	42.00%

Sample or Specimen No.			9308 (22)	9309 (24)	9309 (30)	9309 (3)	9309 (5)	9309 (8)
Tare No.			53	62	41	3	17	6
Weight in grams	Tare plus wet soil		114.82	138.24	181.71	151.35	133.60	185.71
	Tare plus dry soil		90.41	107.32	138.79	121.78	113.44	153.41
	Water	W_w	24.41	31.42	42.92	29.57	19.16	32.30
	Tare		38.56	38.52	38.41	32.46	32.76	38.53
	Dry soil	W_s	51.85	68.80	100.38	89.32	74.68	114.86
Water content		w	47.10%	45.75%	42.76%	33.15%	25.66%	28.12%

$$w\% = \frac{\text{(tare plus wet soil)} - \text{(tare plus dry soil)}}{\text{(tare plus dry soil)} - \text{(tare)}} \times 100 = \frac{W_w}{W_s} \times 100$$

Remarks _____

_____

Technician _____ Computed by _____ Checked by _____

ENG FORM 3835
1 JUN 65

95% DRAFT

WATER CONTENT - GENERAL

DATE _____

PROJECT HOUSTON-GALVESTON NAVIGATION CHANNEL

BORING NO. _____

Sample or Specimen No.			9309 (12)	9309 (14)	9309 (16)	9309 (18)	9309 (20)	9310 (5)
Tare No.			26	8	50	29	33	37
Weight in grams	Tare plus wet soil		185.61	180.95	153.62	182.55	120.22	151.58
	Tare plus dry soil		150.72	143.11	118.26	138.45	92.05	126.67
	Water	W_w	34.89	37.84	35.36	44.10	28.17	25.31
	Tare		38.59	38.94	38.41	39.25	38.61	39.08
	Dry soil	W_s	112.13	104.17	79.85	99.20	53.44	87.12
Water content		w	31.12 %	36.32 %	44.28 %	44.46%	52.71%	29.05 %

Sample or Specimen No.			9310 (7)	9310 (9)	9310 (14)	9310 (16)	9310 (18)	9310 (19)
Tare No.			64	19	65	34	89	59
Weight in grams	Tare plus wet soil		135.92	177.45	180.28	162.25	199.24	168.12
	Tare plus dry soil		117.19	145.83	147.04	132.15	160.44	130.84
	Water	W_w	18.73	31.62	33.24	30.10	38.80	37.28
	Tare		39.07	38.49	38.78	38.53	39.00	39.08
	Dry soil	W_s	78.12	107.34	108.26	93.62	121.44	91.76
Water content		w	23.98 %	29.46%	30.70 %	32.15%	31.95 %	40.63 %

Sample or Specimen No.			9310 (20)	9310 (22)	9310 (24)	9310 (26)	9329 (5)	9329 (9)
Tare No.			31	53	61	57	38	46
Weight in grams	Tare plus wet soil		131.12	186.57	183.56	169.13	153.54	177.79
	Tare plus dry soil		101.31	142.63	135.27	126.97	124.76	150.46
	Water	W_w	29.81	43.94	47.47	42.16	28.78	27.33
	Tare		39.31	38.52	39.11	39.12	38.89	38.82
	Dry soil	W_s	62.43	104.10	97.07	87.85	85.97	111.64
Water content		w	47.75 %	42.21 %	49.11 %	48.00%	33.48 %	24.48 %

$$w\% = \frac{\text{(tare plus wet soil)} - \text{(tare plus dry soil)}}{\text{(tare plus dry soil)} - \text{(tare)}} \times 100 = \frac{W_w}{W_s} \times 100$$

Remarks _____

Technician _____ Computed by _____ Checked by _____

ENG FORM 1 JUN 65 3835

95% DRAFT

WATER CONTENT - GENERAL

DATE _____

PROJECT HOUSTON-GALVESTON NAVIGATION CHANNEL

BORING NO. _____

Sample or Specimen No.			9329 (10)	9329 (14)	9330 (4)	9330 (11)	9330 (14)	9330 (16A)
Tare No.			20	17	62	41	53	26
Weight in grams	Tare plus wet soil		123.67	120.50	111.40	178.98	175.52	191.64
	Tare plus dry soil		106.69	103.00	93.68	149.70	147.30	149.96
	Water	W_w	16.98	17.50	17.72	29.28	28.22	41.68
	Tare		38.85	38.76	38.52	38.41	38.56	38.58
	Dry soil	W_s	67.84	64.24	55.16	111.29	108.74	111.38
Water content		w	25.03%	27.24%	32.12%	26.31%	25.95%	37.42%

Sample or Specimen No.			9330 (18)	9331 (5)	9331 (6)	9331 (9)	9331 (12)	9331 (17)
Tare No.			8	51	43	9	50	12
Weight in grams	Tare plus wet soil		140.76	124.12	135.17	125.14	134.65	120.47
	Tare plus dry soil		117.33	105.47	115.15	109.05	112.21	100.53
	Water	W_w	23.43	18.65	20.02	16.09	22.44	19.94
	Tare		39.94	38.58	38.91	38.55	38.40	38.85
	Dry soil	W_s	77.39	66.89	76.24	70.50	73.81	61.68
Water content		w	30.28%	27.88%	26.26%	22.82%	30.40%	32.33%

Sample or Specimen No.			9331 (22)	9331 (23)	9335 (4)	9335 (7)	9335 (9)	9335 (11)
Tare No.			70	3	42	17	33	29
Weight in grams	Tare plus wet soil		146.37	106.00	136.68	115.56	178.38	127.50
	Tare plus dry soil		119.06	92.67	115.03	97.12	145.20	107.78
	Water	W_w	27.31	13.33	21.65	18.44	33.18	19.72
	Tare		38.50	38.46	38.66	38.74	38.60	39.36
	Dry soil	W_s	80.56	54.21	76.37	58.38	106.60	68.52
Water content		w	33.90%	24.59%	28.35%	31.57%	31.12%	28.78%

$$w\% = \frac{\text{(tare plus wet soil)} - \text{(tare plus dry soil)}}{\text{(tare plus dry soil)} - \text{(tare)}} \times 100 = \frac{W_w}{W_s} \times 100$$

Remarks _____

Technician _____ Computed by _____ Checked by _____

ENG FORM 1 JUN 65 3835

95% DRAFT

WATER CONTENT - GENERAL

DATE _____

PROJECT HOUSTON-GALVESTON NAVIGATION CHANNEL

BORING NO. _____

Sample or Specimen No.			9337 (4)	9337 (6)	9337 (7)	9337 (11) *	9337 (12)	9337 (13)
Tare No.			37	20	65	19	64	34
Weight in grams	Tare plus wet soil		159.50	133.88	165.77	132.17	129.43	165.30
	Tare plus dry soil		127.12	109.66	133.37	109.74	108.57	136.16
	Water	W_w	32.38	24.22	32.40	22.43	20.86	29.14
	Tare		39.09	38.85	38.78	38.49	39.08	38.53
	Dry soil	W_s	88.03	70.81	94.59	71.25	69.49	97.63
Water content		w	36.78 %	34.20 %	34.25 %	31.48 %	30.02 %	29.85 %

Sample or Specimen No.			9338 (5)	9338 (7)	9338 (9)	9338 (12)	9338 (14)	9338 (15)
Tare No.			68	59	52	21	61	48
Weight in grams	Tare plus wet soil		124.28	167.34	152.28	131.56	132.58	182.04
	Tare plus dry soil		109.19	142.75	124.83	115.60	119.66	158.44
	Water	W_w	15.09	24.59	27.45	15.96	12.92	23.60
	Tare		39.00	39.08	38.53	38.88	38.82	38.82
	Dry soil	W_s	70.19	103.67	86.30	76.72	80.84	119.62
Water content		w	21.50 %	23.72 %	31.81 %	20.80 %	15.98 %	19.73 %

Sample or Specimen No.			9338 (17)	9338 (20)	9338 (24)	9338 (26)	9338 (27)	9338 (28)
Tare No.			32	57	62	26	3	12
Weight in grams	Tare plus wet soil		135.26	165.18	143.04	163.19	148.75	152.66
	Tare plus dry soil		120.66	145.24	118.46	132.95	116.26	125.45
	Water	W_w	14.60	19.94	24.58	30.24	32.49	27.21
	Tare		38.89	39.12	38.52	38.57	38.46	38.85
	Dry soil	W_s	81.77	106.12	79.94	94.36	77.80	86.60
Water content		w	17.85 %	18.79 %	30.75 %	32.05 %	41.76 %	31.42 %

$$w\% = \frac{(\text{tare plus wet soil}) - (\text{tare plus dry soil})}{(\text{tare plus dry soil}) - (\text{tare})} \times 100 = \frac{W_w}{W_s} \times 100$$

Remarks * 9337 - S-11 HAS A 1 1/2 OF SHELL 18.5 - 20.5

Technician [illegible] Computed by [illegible] Checked by _____

ENG FORM 1 JUN 65 3835

95% DRAFT

WATER CONTENT - GENERAL

DATE _____

PROJECT HOUSTON-GALVESTON NAVIGATION CHANNEL

BORING NO. _____

Sample or Specimen No.		9338 (30)	9339 (7)	9339 (9)	9339 (11)	9339 (13)	9339 (18)
Tare No.		43	41	53	51	50	6
Weight in grams: Tare plus wet soil		165.25	120.88	167.33	196.58	148.85	181.11
Tare plus dry soil		143.90	100.61	146.73	168.39	131.42	155.06
Water	W_w	21.25	20.27	21.60	28.19	17.43	26.05
Tare		38.91	38.41	38.56	38.58	38.40	38.55
Dry soil	W_s	104.99	62.20	107.17	129.81	93.02	116.51
Water content	w	20.43 %	32.49 %	20.15 %	21.72 %	18.74 %	22.36 %

Sample or Specimen No.		9339 (19)	9339 (20)	9339 (22) *	9339 (23)	9339 (24)	9340 (6) **
Tare No.		8	70	48	38	37	3
Weight in grams: Tare plus wet soil		190.18	180.63	120.18	179.63	138.64	163.78
Tare plus dry soil		161.31	155.53	104.12	150.23	116.72	127.61
Water	W_w	28.87	25.10	16.06	29.40	21.92	36.17
Tare		38.94	38.50	38.83	38.29	39.09	38.47
Dry soil	W_s	122.37	117.03	65.29	111.34	77.63	89.14
Water content	w	23.59 %	21.45 %	24.60 %	26.40%	28.24 %	40.58 %

Sample or Specimen No.		9340 (8)	9340 (10)	9340 (11)	9340 (14)	9340 (16)	9340 (17)
Tare No.		12	26	62	5[illegible]	[illegible]	17
Weight in grams: Tare plus wet soil		141.56	176.36	158.75	[illegible]	[illegible]	154.65
Tare plus dry soil		118.96	149.90	135.88	150.82	[illegible]	133.90
Water	W_w	22.60	26.46	22.87	17.76	15.51	20.75
Tare		38.85	38.60	[illegible]	[illegible]	[illegible]	38.[illegible]
Dry soil	W_s	80.38	111.30	100.36	111.70	89.78	95.14
Water content	w	28.12 %	23.77 %	22.79 %	15.90 %	17.[illegible] %	21.81 %

$$w\% = \frac{(\text{tare plus wet soil}) - (\text{tare plus dry soil})}{(\text{tare plus dry soil}) - (\text{tare})} \times 100 = \frac{W_w}{W_s} \times 100$$

Remarks * 9339 S-22 (42-44) [illegible]

** 9340 S-6 (16-18)

Technician _____ Computed by _____ Checked by _____

ENG FORM 1 JUN 65 3835

95% DRAFT

WATER CONTENT - GENERAL

DATE _____

PROJECT HOUSTON-GALVESTON NAVIGATION CHANNEL

BORING NO. _____

Sample or Specimen No.		9340 (20)	9340 (22)	9340 (23)	9341 (7)	9341 (8)	9341 (11)
Tare No.		42	33	29	42	17	29
Weight in grams: Tare plus wet soil		151.40	118.29	139.42	127.43	144.46	138.38
Tare plus dry soil		131.16	103.68	121.10	106.83	120.60	115.78
Water	W_w	20.24	14.61	18.62	20.60	23.86	22.60
Tare		38.66	38.62	39.26	38.67	38.76	39.27
Dry soil	W_s	92.50	65.06	81.84	68.16	61.84	76.51
Water content	w	21.88 %	22.46 %	22.75 %	30.22 %	38.58 %	29.54 %

Sample or Specimen No.		9341 (12)	9341 (14)	9341 (18)	9341 (21)	9341 (24)	9341 (26)
Tare No.		20	65	19	64	34	68
Weight in grams: Tare plus wet soil		174.00	126.59	137.30	132.53	138.41	185.88
Tare plus dry soil		143.91	106.40	122.04	115.34	120.80	161.33
Water	W_w	30.09	20.19	15.26	17.19	17.61	24.55
Tare		38.86	38.79	38.50	39.08	38.53	39.00
Dry soil	W_s	105.05	67.61	83.54	76.26	62.27	122.33
Water content	w	28.64 %	29.86 %	18.27 %	22.54 %	28.28 %	20.07 %

Sample or Specimen No.		9341 (27)	9342 (17)	9342 (18)	9342 (19)	9342 (21)	9342 (18)
Tare No.		59	52	21	61	37	33
Weight in grams: Tare plus wet soil		201.6[illegible]	167.10	169.34	182.51	144.83	184.9[illegible]
Tare plus dry soil		178.68	134.[illegible]	147.37	155.22	121.05	152.8[illegible]
Water	W_w	23.01	[illegible]	21.97	27.29	23.78	32.[illegible]
Tare		39.0[illegible]	38.54	38.8[illegible]	38.8[illegible]	39.0[illegible]	38.63
Dry soil	W_s	139.60	[illegible]	108.48	116.39	81.96	[illegible]
Water content	w	16.4[illegible] %	33.[illegible] %	20.[illegible] %	23.45 %	29.0[illegible] %	28.1[illegible] %

$$w\% = \frac{(\text{tare plus wet soil}) - (\text{tare plus dry soil})}{(\text{tare plus dry soil}) - (\text{tare})} \times 100 = \frac{W_w}{W_s} \times 100$$

Remarks _____

Technician _____ Computed by _____ Checked by _____

ENG FORM 1 JUN 65 3835

95% DRAFT

WATER CONTENT - GENERAL

DATE _____

PROJECT HOUSTON-GALVESTON NAVIGATION CHANNEL

BORING NO. _____

Sample or Specimen No.			9343 (19)	9343 (20)	9345 (9)	9345 (10)	9345 (14)	9345 (15)
Tare No.			42	17	29	20	65	19
Weight in grams	Tare plus wet soil		162.51	198.28	183.08	189.96	181.52	137.99
	Tare plus dry soil		128.81	161.17	161.52	166.55	159.92	124.40
	Water	W_w	33.70	37.11	21.56	23.41	21.60	13.49
	Tare		38.67	38.77	39.26	38.87	38.79	38.50
	Dry soil	W_s	90.14	122.40	122.26	127.68	121.13	85.90
Water content		w	37.39 %	30.32 %	17.63 %	18.33%	17.83 %	15.82 %

Sample or Specimen No.			9345 (16)	9345 (18)	9346 (11)	9346 (14)	9346 (16)	9346 (20)
Tare No.			64	34	68	59	43	57
Weight in grams	Tare plus wet soil		167.20	158.11	196.38	194.32	185.42	189.24
	Tare plus dry soil		149.61	135.20	176.27	171.65	164.95	165.71
	Water	W_w	17.59	22.91	20.11	22.67	20.47	23.53
	Tare		39.08	38.54	39.01	39.08	38.92	39.12
	Dry soil	W_s	110.53	96.66	137.26	132.57	126.03	126.58
Water content		w	15.91 %	23.70%	14.65 %	17.10 %	16.24 %	18.59 %

Sample or Specimen No.			9347 (6)	9347 (10)	9347 (12)	9347 (15)	[illegible] 16	[illegible] 19
Tare No.			63	26	13	3	28	41
Weight in grams	Tare plus wet soil		160.50	179.11	185.34	198.33	153.20	131.45
	Tare plus dry soil		131.34	159.10	163.07	184.13	137.84	117.48
	Water	W_w	31.26	20.01	22.27	14.10	15.36	13.97
	Tare		38.74	38.60	38.86	39.17	39.70	39.53
	Dry soil	W_s	93.80	120.50	124.21	145.66	98.34	74.53
Water content		w	33.33 %	16.60 %	17.93 %	9.68 %	15.62 %	18.71 %

$$w\% = \frac{\text{(tare plus wet soil)} - \text{(tare plus dry soil)}}{\text{(tare plus dry soil)} - \text{(tare)}} \times 100 = \frac{W_w}{W_s} \times 100$$

Remarks 9347 - S 10, 13, 15, 16 + 10 HAD SAND STONE

Technician _____ Computed by _____ Checked by _____

ENG FORM 1 JUN 65 3835

95% DRAFT

WATER CONTENT - GENERAL

DATE _____

PROJECT HOUSTON-GALVESTON NAVIGATION CHANNEL

BORING NO. _____

Sample or Specimen No.			9348 (13)	9348 (14)	9348 (18)	9348 (20)		
Tare No.			70	8	9	50	51	53
Weight in grams	Tare plus wet soil		131.32	148.69	197.26	173.12		
	Tare plus dry soil		112.45	127.59	170.38	142.85		
	Water	W_w	18.87	21.10	26.88	30.27		
	Tare		38.51	38.95	38.56	38.41	38.60	38.58
	Dry soil	W_s	73.94	88.64	131.82	104.44		
Water content		w	25.52 %	23.80 %	20.39 %	28.98 %	%	%

Sample or Specimen No.								
Tare No.			41					
Weight in grams	Tare plus wet soil							
	Tare plus dry soil							
	Water	W_w						
	Tare		38.43					
	Dry soil	W_s						
Water content		w	%	%	%	%	%	%

Sample or Specimen No.								
Tare No.								
Weight in grams	Tare plus wet soil							
	Tare plus dry soil							
	Water	W_w						
	Tare							
	Dry soil	W_s						
Water content		w	%	%	%	%	%	%

$$w\% = \frac{\text{(tare plus wet soil)} - \text{(tare plus dry soil)}}{\text{(tare plus dry soil)} - \text{(tare)}} \times 100 = \frac{W_w}{W_s} \times 100$$

Remarks _____

Technician _____ Computed by _____ Checked by _____

ENG FORM 1 JUN 65 3835

95% DRAFT

U.S. ARMY CORPS OF ENGINEERS
GEOTECHNICAL BORING DATA

PROJECT NAME HOUSTON GALVESTON NAVIGATION channel

LOG OF BORING NO. 93-37

LOCATION/STATION Stg. 217600, 500R

DATE/TIME STARTED 8-10-94 9:15
DATE/TIME COMPLETED 8-10-94 1:20

TIDE ELEVATION 3 MLT DATUM, TIME 9:05 LOCATION LT. BKN.# PIER @ MORGANS POINT

WATER DEPTH 20 -7(DECK) = 13.

DEPTH FROM WATER SURFACE
BOTTOM OF BORING 68

WEATHER CLOUDY & WINDY

DRILL RIG MANUFACTURE
MODEL NO. MAYHEW 200

DRILLER JACKIE SMITH
LOGGER JOHN A. GENTRY

DRILLER'S/LOGGER'S COMMENTS

95% DRAFT

U.S. ARMY CORPS OF ENGINEERS

BORING NO. 93-37 DATE: BEGIN 8-10-94 PAGE 2 / 2
JOB NO. 94C783.3 COMPLETE 8-10-94 Thin Walled Tube
PROJECT HOUSTON GALVESTON NAVIGATION CHANNELS ■ 3" ✱ □ 6"
LOCATION Stg 217+00, 500R
ELEVATION OF HOLE -10 MLT (Mud line
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 200
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling
WEATHER CLOUDY & WINDY
DRILLER JIM TURNER LOGGER JOHN A. GENTRY

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
0		1	0	GRAY	CLAY	VERY SOFT		-w/shell Fragments, 0-4' Set 28 ft of casing
		2	1.5	REDISH BROWN	CLAY	STIFF		
5		3	1.75	REDISH BROWN	CLAY	STIFF		-w/SILT POCKETS 4'-15'
	WES	4	1.75	REDISH BROWN	CLAY	STIFF		
	U	5	2.0	REDISH BROWN	CLAY	VERY STIFF		+GRAY 8'-15'
10	WES	6	3.25	REDISH BROWN	CLAY	VERY STIFF		
	WES	7	3.25	REDISH BROWN	CLAY	VERY STIFF		
		8	3.0	REDISH BROWN	CLAY	VERY STIFF		
15	X	9	4 7 9	REDISH BROWN	CLAY	VERY STIFF		(Pocket Pen. 2.25)
	U	10	1.75	GRAY	CLAY	STIFF		+BROWN ~ 16.5-21.5
	WES	11	2.25	GRAY	CLAY	VERY STIFF		
20	WES	12	2.25	GRAY	CLAY	VERY STIFF		-w/ORGANICS 21.5-24
	WES	13	1.75	GRAY	CLAY	STIFF		
		14	1.25	GRAY	CLAY	STIFF	SANDY	+BROWN -w/SAND @ 25
25	X	15	5 9 18	GRAY	SAND	MEDIUM DENSE	SILTY	+YELLOWISH BROWN 25'-30' FINE 25'-40'
	X	16	6 16 20	GRAY	SAND	DENSE	SILTY	*Pushed 6" Tube NO Recovery Due to sand, split spoon @ 27'
30								
	X	17	8 23 34	GRAY	SAND	VERY DENSE	SILTY	+BROWN ~ 30'-36.5
	X	18	9 21 36	GRAY	SAND	VERY DENSE	SILTY	
35	X	19	6 18 29	GRAY	SAND	DENSE	SILTY	*Pushed 6" Tube NO Recovery Due to sand, split spoon @ 35'

90% DRAFT

BORING NO. 93-37 DATE: BEGIN 8-10-94 PAGE 2 / 3
JOB NO. 9467833 COMPLETE 8-10-94 Thin Walled Tube
PROJECT HOUSTON GALVESTON NAVIGATION CHANNEL ☒ 3" ☐ 6"
LOCATION STA 2176065.00R
ELEVATION OF HOLE -10 MLT (MUD line)
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 200
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling
WEATHER PARTLY CLOUDY SUNNY & HOT
DRILLER JIM TURNER LOGGER JOHN A. GENTRY

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
35				GRAY	SAND	DENSE		36.5-40
40								clay @ 40'
		20	2.25	GRAY	CLAY	VERY STIFF		
		21	2.0	GRAY	CLAY	VERY STIFF		
45		22	2.75	GRAY	CLAY	VERY STIFF		+ BROWN 46'-
		23	2.5	GRAY	CLAY	VERY STIFF		
		24	1.75	GRAY	CLAY	STIFF	SANDY	+ YELLOWISH BROWN 48'-54'
50		25	4.5+	GRAY	CLAY	HARD	SANDY	w/ CALCAREOUS NODULES 48'-54'
		26	4.5+	GRAY	CLAY	HARD	SANDY	
		27	4.5+	GRAY	CLAY	HARD		
55								
60								
65								
70								

95% DRAFT

U.S. ARMY CORPS OF ENGINEERS
GEOTECHNICAL BORING DATA

PROJECT NAME HOUSTON GALVESTON NAVIGATION CHANNEL

LOG OF BORING NO. 93-38

LOCATION/STATION Sta 20+000, 500L

DATE/TIME STARTED 8-10-94 1:50
DATE/TIME COMPLETED 8-11-94 5:00

TIDE ELEVATION 2.5 MLT DATUM, TIME 1:30 LOCATION LT. BKN.# PIER @ MORGAN POT

WATER DEPTH 18 - 7(DECK) = 11

DEPTH FROM WATER SURFACE TO BOTTOM OF BORING 68

WEATHER PARTLY CLOUDY SUNNY + HOT

DRILL RIG MANUFACTURE
MODEL NO. MAYEW 200

DRILLER JACKIE SMITH
LOGGER JOHN A. GENTRY

DRILLER'S/LOGGER'S COMMENTS Cable Broke on (PULL down) stop Drilling @ 28.5'

95% DRAFT

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U.S. ARMY CORPS OF ENGINEERS
GEOTECHNICAL BORING DATA

PROJECT NAME HOUSTON GALVESTON NAVIGATION

LOG OF BORING NO. 93-38

LOCATION/STATION Stg. 20.+000.500L

DATE/TIME STARTED 8-11-94 8:00
DATE/TIME COMPLETED 8-11-94 11'20

TIDE ELEVATION 2.5 MLT DATUM, TIME 6:00 LOCATION LT. BKN.# PIER @ MORGAN POINT

WATER DEPTH 18.7 (DECK) - 11

DEPTH FROM WATER SURFACE TO BOTTOM OF BORING 68'

WEATHER PARTLY CLOUDY SUNNY & HOT

DRILL RIG MANUFACTURE
MODEL NO. MAYHEW 900

DRILLER JACKIE SMITH
LOGGER JOHN A. GENTRY

DRILLER'S/LOGGER'S COMMENTS Set 23' of casing Resum Drilling

95% DRAFT

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U.S. ARMY CORPS OF ENGINEERS

BORING NO. 93-38 DATE: BEGIN 8-10-94 PAGE 3 14
JOB NO. 946783.3 COMPLETE 8-11-94 Thin Walled Tube
PROJECT HOUSTON GALV. NAVIGATION CHANNEL ■ 3" ★ □ 6"
LOCATION STA 20 + 000 SOUTH
ELEVATION OF HOLE- 8.5' MLT (Mudline)
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 200
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling
WEATHER PARTLY CLOUDY SUNNY & HOT
DRILLER JACKIE SMITH LOGGER JOHN A. GENTRY / ROBERT ARNOLD

Torvane Reads 0.2

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
0		1	0/0.04	Gray	Clay	very soft	Silty	with shell 0'-2'
		2	3.0	Light Gray	clay	very stiff		Set 23' of casing
5		3	2.25	Light Gray	clay	very stiff		Reddish brown with calcarious nodules 4'-6'
		4	4.5	Reddish Brown	clay	Hard		
WES 7		5	4.5	Reddish Brown	clay	Hard		with silt seams 8'-14'
10		6	4.5	BROWN	clay	Hard		with calcarious nodules 10'-20'
		7	3.0	BROWN	clay	very stiff		Light Gray 12'-18' -w/SLICKEN SIDE @ 12'-20'
DS		8	3.25	BROWN	clay	very stiff		
WES		9	3.25	BROWN	CLAY	VERY STIFF		
	X	10	3.67	BROWN	CLAY	STIFF		(Pocket Pen. 1.75)
		11	3.0	GRAY	CLAY	VERY STIFF		+ BROWN 18'-26.5'
WES 20		12	2.5	Gray	clay	very stiff		
		12	2.00	Gray	clay	very stiff		- w/silt layers silt seams @ 21'-21.5'
DS		13	2.0	GRAY	CLAY	VERY STIFF		- w/SAND seams 22'-24'
WES		14	3.25	GRAY	CLAY	VERY STIFF		Set 28' of casing - w/SILT SEAMS 24'
WES		15	3.25	GRAY	CLAY	VERY STIFF		
	X	16	5.78	GRAY	CLAY	VERY STIFF		Pocket Pen R-pg
WES		17	2.75	GRAY	CLAY	VERY STIFF		
WES 30		18	2.0	LIGHT GRAY	CLAY	VERY STIFF	SILTY	★ 6" Diameter Sample @ 28.5'-30.5'
		19	3.5	LIGHT GRAY	CLAY	VERY STIFF		+ BROWN 30.5-36'
WES		20	3.75	LIGHT GRAY	CLAY	VERY STIFF		
35	X	21	12, 18, 24	LIGHT GRAY	CLAY	HARD		Pocket Pen. 4.5+

95% DRAFT

BORING NO. 93-38 DATE: BEGIN 8-10-94 PAGE 4 1.4
JOB NO. 946 783.3 COMPLETE 8-11-94 Thin Walled Tube
PROJECT HOUSTON GALVESTON NAVIGATION CHANNELS ☒ 3" ☐ 6"
LOCATION S/O 207000 5001
ELEVATION OF HOLE -8.5 MLT (Mud line)
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 200
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling
WEATHER PARTLY CLOUD SUNNY & HOT
DRILLER JACKIE SMITH LOGGER JOHN A. GENTRY

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
35		22	2.25	LIGHT GRAY	CLAY	VERY STIFF	SANDY	w/Sand @ Bottom of Sample
	X	23	6 12 34	LIGHT GRAY	SAND	DENSE	SILTY	* Pushed 6" Tube NO Recovery Due to Sand, Split spoon @ 36.5'
40								clay @ 41'
		24	3.25	GRAY	CLAY	VERY STIFF		+ BROWN 41'-49'
		25	2.75	GRAY	CLAY	VERY STIFF		** PAUL GILBERT FROM C.O.E. TOOK EXTRA PART OF SAMPLE 43'-45'
45		26	3.25	GRAY	CLAY	VERY STIFF		- W/SAND SEAMS 45'-47'
		27	2.5	GRAY	CLAY	VERY STIFF		- W/Ferrous Nodules 47'-49'
	WF?	28	1.25	Gray	CLAY	STIFF		- W/Ferrous stains 49'-50'
50		29	1.75	Yellowish Gray	Clay	STIFF		- W/Sand Seam & Sand Pkt @ 50'-51'
		30	1.75	GRAY	CLAY	STIFF	SILTY	+ BROWN
		31	4.25	GRAY	CLAY	HARD		+ REDISH BROWN - W/SAND POCKETS
55		32	3.75	GRAY	CLAY	VERY STIFF		
								Torvane Multiplier 0.2
60								
65								
70								

95% DRAFT

U.S. ARMY CORPS OF ENGINEERS
GEOTECHNICAL BORING DATA

PROJECT NAME HOUSTON GALVESTON NAVIGATION CHANNEL

LOG OF BORING NO. 93-39

LOCATION/STATION Sta 18+400 500R

DATE/TIME STARTED 8-11-94 11:50
DATE/TIME COMPLETED 8-11-94 4:44

TIDE ELEVATION 2 MLT DATUM, TIME 11:30 LOCATION LT. BKN.# PIER 00 MORGAN POIN

WATER DEPTH 20 -7(DECK) = 13

DEPTH FROM WATER SURFACE
TO BOTTOM OF BORING 67

WEATHER PARTLY CLOUDY SUNNY & HOT

DRILL RIG MANUFACTURE
MODEL NO. MAYHEW 200

DRILLER JIM TURNER
LOGGER JOHN A. GENTRY / Robert Arnold

DRILLER'S/LOGGER'S COMMENTS

95% DRAFT

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U.S. ARMY CORPS OF ENGINEERS

BORING NO. 93-39 DATE: BEGIN 8-1-94 PAGE 2 13
JOB NO. 946783.3 COMPLETE 8-1-94 Thin Walled Tube
PROJECT HOUSTON GALVESTON NAVIGATION CHANNEL ☒ 3" ☐ 6"
LOCATION STA 18+400.500R
ELEVATION OF HOLE -11 MLT (Mud line)
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW-200
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling
WEATHER PARTLY SUNNY & HOT
DRILLER Jim Turner LOGGER JOHN A. GENTRY/Robert Arnold

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
0		1	1.5	Light Gray	Clay	Stiff		With Brown 0'-4' Set 23' of casing
		2	2.5	Light Gray	Clay	very stiff		
5		3	3.0	Brown	clay	very St. ff.		with gray 4'-12
		4	4.25	Reddish Brown	Clay	Hard		
		5	3.5	Reddish Brown	clay	very Stiff		
10		6	3.5	REDDISH BROWN	CLAY	VERY STIFF		- w/Calcareous Nodules 10'-15.5
	WSS	7	2.0	GRAY	CLAY	VERY STIFF		+ BROWN 12'-17.5
15		8	1.0 3.9	GRAY	CLAY	VERY STIFF		(Pocket Pen 3.75)
	WSS	9	3.5	GRAY	CLAY	VERY STIFF		- w/FERROUS Nodules 15.5-1 - w/SAND POCKETS 15.5-17.5
		10	3.75	GRAY	CLAY	VERY STIFF	SANDY	+ BROWN 17.5- - w/FERROUS Nodules 17.5-19
20	WSS	11	3.75	GRAY	CLAY	VERY STIFF	SANDY	- w/sand seams 19.5-23.5 - w/cale & ferrous nodules 19.5-23.5'
		12	2.75	LIGHT GRAY	CLAY	VERY STIFF	SANDY	
	WSS	13	2.5	LIGHT GRAY	CLAY	VERY STIFF	SANDY	
25		14	1.0 1.5	LIGHT GRAY	CLAY	VERY STIFF	SANDY	w/sand layer @ 25-25.5'
		15	11 19 28	Yellowish BROWN	Sand	Dense	silty	* Pushed 6" Tube No Recovery Due to Sand, split spoon @ 26' + GRAY 26'-34'
30		16	12 21 42	Yellowish BROWN	SAND	VERY DENSE	SILTY	- w/SAND STONE 30.5-32'
		17	9 19 26	Yellowish Brown	Sand	Dense	silty	- clay @ 34'
	WSS	18	3.5	GRAY	CLAY	VERY STIFF		* 6" Diameter Sample 34'-36' + BROWN

95% DRAFT

BORING NO. 93-39 DATE: BEGIN 8-11-94 PAGE 3 13
JOB NO. 94C783.3 COMPLETE 8-11-94 Thin Walled Tube
PROJECT HOUSTON GALVESTON NAVIGATION CHANNEL 3" 6"
LOCATION STA 187 400, 560R
ELEVATION OF HOLE -11' MLT (MUDline)
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 200
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling
WEATHER PARTLY CLOUDY SUNNY & HOT
DRILLER JIM TURNER LOGGER JOHN AGENTRY / Robert Arnold

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
35	WSS	19	3.25	LIGHT GRAY	CLAY	VERY STIFF		+ YELLOWISH BROWN 36'-42'
	VSS	20	3.5	LIGHT GRAY	CLAY	VERY STIFF		-W/SAND POCKETS 36'-42'
40	U	21	3.5	LIGHT GRAY	CLAY	VERY STIFF		
	VSS	22	3.25	REDISH BROWN	CLAY	VERY STIFF		-W/SLICKENSIDED 42'-54'
	VSS	23	3.75	Reddish Brown	clay	very stiff		+ LIGHT GRAY 42'-54'
	WSS	24	4.25	REDISH BROWN	CLAY	HARD		-W/Calcareous Nodules 44'-54'
		25	4.25	REDISH BROWN	CLAY	HARD		
50		26	4.5	REDISH BROWN	CLAY	HARD		
		27	4.25	REDISH BROWN	CLAY	HARD		
55								
60								
65								
70								

95% DRAFT

U.S. ARMY CORPS OF ENGINEERS
GEOTECHNICAL BORING DATA

PROJECT NAME HOUSTON GALVESTON NAVIGATION CHANNEL

LOG OF BORING NO. 9340

LOCATION/STATION Sta 16+600 95 00L

DATE/TIME STARTED 8-12-94 6:55
DATE/TIME COMPLETED 8-12-94 11:10

TIDE ELEVATION 3 MLT DATUM, TIME 6:00 LOCATION LT. BKN.# PIER A MORGANS POINT

WATER DEPTH 17 -7(DECK) = 10

DEPTH FROM WATER SURFACE
TO BOTTOM OF BORING 68

WEATHER PARTLY CLOUDY SUNNY & HOT

DRILL RIG MANUFACTURE
MODEL NO. MAYHEW 200

DRILLER JIM TURNER
LOGGER JOHN A. GENTRY

DRILLER'S/LOGGER'S COMMENTS

95% DRAFT

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U.S. ARMY CORPS OF ENGINEERS

BORING NO. 9340 DATE: BEGIN 8-12-94 PAGE 213
JOB NO. 94G783.3 COMPLETE 8-12-94 Thin Walled Tube
PROJECT HOUSTON GALVESTON NAVIGATION CHANNEL ☒ 3" ☐ 6"
LOCATION STA 16+600 / 500 L
ELEVATION OF HOLE -7' MLT Mud Line
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 200
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling
WEATHER PARTLY CLOUDY SUNNY/HOT
DRILLER JIM TURNER LOGGER JOHN A GENTRY

TORVANE READING

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
0	J	1			SAND	VERY LOOSE		- W/SHELL 0'-14' SET 23FT. of CASING
	X	2	W.O.H	GRAY	SAND	VERY LOOSE		Jar sample 0-2'
5								
	X	3	WOH	GRAY	SAND	VERY LOOSE		- Set 12 more of casing 35'
10								
	X	4	WOH	GRAY	SAND	VERY LOOSE		
0.4 15		5	0/0.08	GRAY	CLAY	VERY SOFT	SANDY	
WES		6	1.0	GRAY	CLAY	STIFF	SANDY	CLAY a LAYER 17.5-18'
	X	7	12 18 18	GRAY	CLAY	HARD		- W/CLAY STONE 18'-23.5' + BROWN 18'-28' (Pocket Pen 4.5+)
20 WES		8	2.25	GRAY	CLAY	VERY STIFF		- W/SLICKENSIDES 19.5-23.5
U		9	2.5	GRAY	CLAY	VERY STIFF		
WES 25		10	3.0	GRAY	CLAY	VERY STIFF		- W/FERROUS Nodules 23.5-25.5'
WES		11	3.0	GRAY	CLAY	VERY STIFF		
		12	4.5+	GRAY	CLAY	HARD		- W/SAND POCKETS 27.5-28
	X	13	8 12 15	GRAY	CLAY	VERY STIFF	SANDY	BROWN 28'-32' (Pocket Pen 3.75+)
WES 30		14	3.75	GRAY	CLAY	VERY STIFF	SANDY	* Pushed 6" down the time recorded 5 Inches full + yellowish brown 32'-36'
		15	2.75	Light Gray	clay	very stiff	SANDY	Push Line Sample at 30'
WES		16	2.0	Light Gray	clay	very stiff	Sandy	
WES		17	2.0	Light Gray	clay	very stiff	Sandy	

95% DRAFT

BORING NO. 93-40 DATE: BEGIN 8-12-94 PAGE 3 of 3
JOB NO. 94C783.3 COMPLETE 8-12-94 Thin Walled Tube
PROJECT HOUSTON GALVESTON NAVIGATION CHANNEL ■ 3" ☐ 6"
LOCATION Sta 164+600 500'L
ELEVATION OF HOLE -7' MLT MUD line
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 200
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling
WEATHER PARTLY CLOUDY SUNNY HOT
DRILLER JIM TURNER LOGGER JOHN A. CENTRY

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
35	X	17	12 20 25	LIGHT GRAY	SAND	DENSE	SILTY	↓BROWN 36'-43'
	X	18	50 13 17	LIGHT GRAY	SAND	DENSE	SILTY	* PUSH 6" DIAMETER TUBE NO RECOVERY, Split spoon @ 38'
40								
	X	19	10 12 15	LIGHT GRAY	SAND	MEDIUM DENSE	SILTY	↓BROWN 43'-44.5 clay @ 44.5'
45		20	3.25	LIGHT GRAY	CLAY	VERY STIFF		↓BROWN 44.5-46.5 w/SAND POCKETS 44.5-50.5
		21	3.75	LIGHT GRAY	CLAY	VERY STIFF		↓LIGHT BROWN 46.5-52.5
		22	3.75	LIGHT GRAY	CLAY	VERY STIFF		
		23	3.75	LIGHT GRAY	CLAY	VERY STIFF		
		24	40	LIGHT GRAY	CLAY	VERY STIFF		↓BROWN 52.5-54.5
55		25	3.75	REDISH BROWN	CLAY	VERY STIFF		- w/SLICKEN SIDED 54.5-58'
		26	3.5	REDISH BROWN	CLAY	VERY STIFF		↓LIGHT GRAY 54.5-58'
60								Torvane Multiplier 0.2
								W.O.H: weight of Hammer
65								
70								

95% DRAFT

U.S. ARMY CORPS OF ENGINEERS
GEOTECHNICAL BORING DATA

PROJECT NAME HOUSTON GALVESTON NAVIGATION CHANNEL

LOG OF BORING NO. 93-41

LOCATION/STATION Sta 13+400, 500R

DATE/TIME STARTED 8-15-94 8:20
DATE/TIME COMPLETED 8-15-94 10:05

TIDE ELEVATION 3 MLT DATUM, TIME 6.0 LOCATION LT. BKN.# PIER 30 MORGAN

WATER DEPTH 20 - 7 (Deck) = 13

DEPTH FROM WATER SURFACE TO BOTTOM OF BORING 68

WEATHER SUNNY, HOT

DRILL RIG MANUFACTURE
MODEL NO. MAYHEW 200

DRILLER JIM TURNER
LOGGER JOHN A. GENTRY

DRILLER'S/LOGGER'S COMMENTS

95% DRAFT

U.S. ARMY CORPS OF ENGINEERS

BORING NO. 93-41 DATE: BEGIN 8-12-94 PAGE 2 of 3
JOB NO. 94G783.3 COMPLETE 8-15-94 Thin Walled Tube
PROJECT HOUSTON GALVESTON NAVIGATION CHANNEL ☒ 3" ☐ 6"
LOCATION STA 13+400 500R
ELEVATION OF HOLE -10 MLT (Mud line)
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHW 200
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling
WEATHER SUNNY & HOT
DRILLER JIM TURNER LOGGER JOHN A. GENTRY

TORVANE RDG.

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
0	J	1	1.0	GRAY	CLAY	VERY SOFT	SANDY	0'-2' JAR SAMPLE -W/SHELL 0-2 SAMPLER BLIC WHILE EXTRUDING
0.45		2	0/0.09	GRAY	CLAY	VERY SOFT		-W/SAND SEAMS 2'-11'
0.5	5	3	0/0.10	GRAY	CLAY	VERY SOFT		-W/SHELL 2'-10' SET 23' OF CASING
0.4		4	0/0.08	GRAY	CLAY	VERY SOFT		
0.4		5	0/0.08	GRAY	CLAY	VERY SOFT		
	10	6	0.5	BROWN	CLAY	MEDIUM STIFF		+GRAY 10'-29'
WSC WE		7	2.0	BROWN	CLAY	VERY STIFF		
WES 15		8	2.25	BROWN	CLAY	VERY STIFF		
	X	9	5.0	BROWN	CLAY	VERY STIFF		(Pocket Pen 2.50)
		10	2.25	LIGHT BROWN	CLAY	VERY STIFF		-W/FERROUS Nodules 16.5-29
WES 20		11	2.25	LIGHT BROWN	CLAY	VERY STIFF		-W/SLICKEN SIDED 18.5-25
WES		12	2.25	LIGHT BROWN	CLAY	VERY STIFF		
		13	2.25	LIGHT BROWN	CLAY	VERY STIFF		
WES 25		14	2.0	LT BROWN	CLAY	VERY STIFF		-W/CALCAREOUS NODULES 24.5-29
	X	15	6.8	LIGHT BROWN	CLAY	VERY STIFF		
WES		16	2.0	BROWN	CLAY	VERY STIFF		-W/SAND POKETS 26.5-29
WE		17	2.25	BROWN	CLAY	VERY STIFF		*6" Diameter Sample 27'-29'
WES		18	1.25	LIGHT GRAY	CLAY	STIFF	SANDY	+YELLOWISH BROWN 29'-37'
		19	1.0	LIGHT GRAY	CLAY	STIFF	SANDY	
	X	20	1.25	LIGHT GRAY	CLAY	VERY STIFF	SANDY	(pocket Pen 3.75)
WES 35		21	1.5	LIGHT GRAY	CLAY	STIFF	SANDY	
WE		22	1.0	REDISH BROWN	CLAY	VERY STIFF		+LIGHT GRAY 35'-37' *6" Diameter Sample 35-37'

SAND @ 37'

95% DRAFT

BORING NO. 93-41 DATE: BEGIN 8-15-94 PAGE 3 13
JOB NO. 946 753.3 COMPLETE 8-15-94 Thin Walled Tube 3" 6"
PROJECT HOUSTON GALVESTON
LOCATION Sta 137+00 500R
ELEVATION OF HOLE -10 MLT (Mud line)
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 200
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling
WEATHER SUNNY & HOT
DRILLER JIM TURNER LOGGER JOHN A. GENTRY/IRAJ Mo...

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
35								Sand @ 37'
	X	23	9 11 14	LIGHT GRAY	SAND	MEDIUM DENSE	SILTY	▼YELLOWISH BROWN 37-40
40								
	WBS	24	2.75	YELLOWISH GRAY	CLAY	VERY STIFF	SILTY	-W/FERROUS STAINS 40-42' -W/SAND SEAM 40-44
		25	2.5	GRAY	CLAY	VERY STIFF	SILTY	▼BROWN 42' -W/CALCAREOUS NODULES 42'-44'
45	WBS	26	2.5	GRAY	CLAY	VERY STIFF	SANDY	▼BROWN 44 -W/CALCAREOUS NODULES 44'
	WBS	27	3.0	GRAY	CLAY	VERY STIFF	SANDY	
		28	3.5	GRAY	CLAY	VERY STIFF	SANDY	-W/SAND @ BOTTOM OF SAMPLE
50	X	29	18 26 35	GRAY	SAND	VERY DENSE	SILTY	FINE 50'-55'
	X	30	11 21 32	GRAY	SAND	VERY DENSE	SILTY	▼BROWN 53-55'
55								Torvane Multiplier 0.2
60								
65								
70								

95% DRAFT

U.S. ARMY CORPS OF ENGINEERS
GEOTECHNICAL BORING DATA

PROJECT NAME HOUSTON GALVESTON NAVIGATION CHANNEL

LOG OF BORING NO. 9342

LOCATION/STATION STA 11+600, 5006

DATE/TIME STARTED 8-16-94 8:30
DATE/TIME COMPLETED 8-16-94 10:05

TIDE ELEVATION 3 MLT DATUM, TIME 6:00 LOCATION LT. BKN.# PIER 10 MORGAN POINT

WATER DEPTH 18-7-11

DEPTH FROM WATER SURFACE
TO BOTTOM OF BORING 68

WEATHER

DRILL RIG MANUFACTURE
MODEL NO. MAYHEW 200

DRILLER JIM TURNER
LOGGER JOHN A. GENTRY

DRILLER'S/LOGGER'S COMMENTS

95% DRAFT

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U.S. ARMY CORPS OF ENGINEERS

BORING NO. 93-42 DATE: BEGIN 8-15-94 PAGE 213
JOB NO. 9467833 COMPLETE 8-16-94 Thin Walled Tube
PROJECT HOUSTON GALVESTON NAVIGATION CHANNEL ☒ 3" ☐ 6"
LOCATION Sta 1176+00 500L
ELEVATION OF HOLE -8 MLT (MUD LINE)
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 200
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling
WEATHER SUNNY & HOT
DRILLER JIM TURNER LOGGER JOHN A. GENTRY/IRAC MOSTAMUM

TORVANE RDG

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
0	X	1	WOH	GRAY	SAND	VERY LOOSE	SILTY	FINE -W/SHELL FRAGMENTS 0'-12'
								SET 37 FT OF CASING
5	X	2	WOH	GRAY	SAND	VERY LOOSE	SILTY	
10	X	3	1, 1	GRAY	SAND	VERY LOOSE	SILTY	
0.5		4	0/0.10	GRAY	CLAY	VERY SOFT		-W/SAND SEAMS 12'-14'
0.6		5	0/0.12	GRAY	CLAY	VERY SOFT		-W/SHELL FRAGMENTS 12'-17'
0.5		6	0/0.10	GRAY	CLAY	VERY SOFT		
	X	7	1, 1	GRAY	CLAY	SOFT		
0.5		8	0/0.10	GRAY	CLAY	VERY SOFT	SANDY	-W/SHELL FRAGMENTS, 18.5-24.5'
0.5		9	0/0.10	GRAY	CLAY	VERY SOFT	SANDY	
0.5		10	0/0.10	GRAY	CLAY	VERY SOFT	SANDY	W/sand at bottom of Sample
25	X	11	2, 3	GRAY	SAND	LOOSE	SILTY	COARSE 24.5-33 -W/SHELL 24.5-3
	X	12	2, 3, 4	GRAY	SAND	LOOSE	SILTY	
30	X	13	3, 4, 7	GRAY	SAND	MEDIUM DENSE		*PUSH 6" DIAMETER SAMPLE NO RECOVERY, Split spoon D29
	X	14	6, 8, 12	GRAY	SAND	MEDIUM DENSE	SILTY	FINE 33'-36.5'
35	X	15	9, 7, 9	GRAY	SAND	MEDIUM DENSE	SILTY	

95% DRAFT

BORING NO. 9342 DATE: BEGIN 8-15-94 PAGE 3 13
JOB NO. 946783.3 COMPLETE 8-16-94 Thin Walled Tube
PROJECT HOUSTON GALVESTON NAVIGATION CHANNEL ☒ 3" ✱☐ 6"
LOCATION Sta 117600 500L
ELEVATION OF HOLE -8 MLT (MUD LINE)
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling
WEATHER SUNNY & HOT
DRILLER JIM TURNER LOGGER JOHN A GENTRY/IRAJ MOSTAMMI

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
35	X	16	4,7,14	GRAY	SAND	MEDIUM DENSE	SILTY	*PUSH 6" DIAMETER NO RECOVERY Due to Sand split spoon @ 37' +BROWN 37'-40' FINE 37'-40'
40		17	3.5	GRAY	CLAY	VERY STIFF		+BROWN 40'-50' -W/SLICKENSIDED 40'- -W/FERROUS STAINS 40'- -W/SAND POCKETS 42'-48' SET 45' OF CASING
		18	3.25	GRAY	CLAY	VERY STIFF		
		19	3.0	GRAY	CLAY	VERY STIFF		
		20	3.5	GRAY	CLAY	VERY STIFF		
		21	3.5	Gray	clay	very St.Fi		Sand @ bottom of sample
50	X	22	10,17,35	GRAY	SAND	DENSE		-w/clay @ 51.5'
		23	3.75	Gray & Brown	clay	Very stiff		
		24	3.5	GRAY & BROWN	CLAY	VERY STIFF		
55		25	3.5	GRAY & BROWN	CLAY	VERY STIFF		
60								Torvane Multiplier 0.2 W.O.H: Weight of Hammer
65								
70								

95% DRAFT

U.S. ARMY CORPS OF ENGINEERS
GEOTECHNICAL BORING DATA

PROJECT NAME HOUSTON GALVESTON NAVIGATION CHANNEL

LOG OF BORING NO. 93-43

LOCATION/STATION STA. 87+400 560R

DATE/TIME STARTED 8-16-94 10:15
DATE/TIME COMPLETED 8-16-94 2:50

TIDE ELEVATION 3 MLT DATUM, TIME 10:20 LOCATION LT. BKN.# PIER @ MORGANS POINT

WATER DEPTH 20 - 7 (DECK) = 13

DEPTH FROM WATER SURFACE
TO BOTTOM OF BORING 68

WEATHER PARTLY CLOUD SUNNY & HOT

DRILL RIG MANUFACTURE
MODEL NO. MAYHEW 200

DRILLER
LOGGER JOHN A. GENTRY

DRILLER'S/LOGGER'S COMMENTS

95% DRAFT

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U.S. ARMY CORPS OF ENGINEERS

BORING NO. 9343 DATE: BEGIN 8-16-94 PAGE 1 / 3
JOB NO. 94G783.3 COMPLETE 8-16-94 Thin Walled Tube
PROJECT HOUSTON GALVESTON NAVIGATION CHANNEL ☒ 3" ☐ 6"
LOCATION Sta 8 +400 500R
ELEVATION OF HOLE -10 MLT (MUD LINE)
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 200
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling;
WEATHER PARTLY CLOUDY SUNNY & HOT
DRILLER J.M. TURNER LOGGER JOHN A. GENTRY

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
0	X	1	WOH	GRAY	SAND	VERY LOOSE	SILTY	FINE 0'-10' -W/SHELL 0'-10'
5	X	2	WOH	GRAY	SAND	VERY LOOSE	SILTY	
10		3	0/0.04	GRAY	CLAY	VERY SOFT	SANDY	-W/SHELL 10'-26'
		4	0/0.10	GRAY	CLAY	VERY SOFT	SANDY	
		5	0/0.12	GRAY	CLAY	VERY SOFT	SANDY	
15	X	6	WOH	GRAY	CLAY	VERY SOFT	SANDY	
		7	0/0.12	GRAY	CLAY	VERY SOFT	SANDY	
		8	0/0.06	GRAY	CLAY	VERY SOFT	SANDY	
20		9	0/0.12	GRAY	CLAY	VERY SOFT	SANDY	SET 23FT OF CASING
		10	0/0.08	GRAY	CLAY	VERY SOFT	SANDY	
		11	0/0.06	GRAY	CLAY	VERY SOFT	SANDY	
25	X	12	2/5/7	GRAY	CLAY	SOFT	VERY SANDY	-W/CLAY SAND @ 26' +BROWN 26-26.5
		13		GRAY	SAND	MEDIUM DENSE	SILTY	-W/SAND LAYER 26.5-27 +BROWN 26.5-27 Jar Sample
	X	14	6/8/11	GRAY	SAND	MEDIUM DENSE	SILTY	+PUSH 6" NO RECOVERY DUE TO SAND
30	X	15	8/11/13	GRAY	SAND	MEDIUM DENSE	SILTY	
	X	16	8/12	GRAY	SAND	MEDIUM DENSE	SILTY	
35								

0.2
0.5
0.6
0.6
0.3
0.6
0.4
0.3

95% DRAFT

GEOTEST ENGINEERING, INC.

BORING NO. 93-43 DATE: BEGIN 8-16-94 PAGE 2 / 3
JOB NO. 94G783.3 COMPLETE 8-16-94 Thin Walled Tube
PROJECT HOUSTON GALVESTON NAVIGATION CHANNEL ☒ 3" ☐ 6"
LOCATION STA 8+400 500R
ELEVATION OF HOLE -10 MLT (MUD LINE
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 20
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling
WEATHER PARTLY CLOUDY SUNNY & HOT
DRILLER JIM TURNER LOGGER JOHN A. GENTRY

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
35	X	17	10/14/7	GRAY	SAND	DENSE	SILTY	35-40 * Pushed 6" Tube No Recovery Due to Sand Split Spoon @ 35' clay @ 40'
40		18	2.5	GRAY	CLAY	VERY STIFF		+BROWN 40-42'
		19	2.0	GRAY	CLAY	VERY STIFF		-W/CALCAREOUS NODULES 42-46' -W/FERROUS NODULES 42-46'
45		20	2.25	GRAY	CLAY	VERY STIFF		
		21	2.5	GRAY	CLAY	VERY STIFF		
		22	1.75	GRAY	CLAY	STIFF		-W/SAND SEAMS 50-54'
50		23	3.25	GRAY	CLAY	VERY STIFF		
		24	2.5	GRAY	CLAY	VERY STIFF		
		25	3.25	GRAY	CLAY	VERY STIFF		BLACK & BROWN 54-55
55								Torvane Multiplier 0.2 J: Jar Sample W.O.H: Weight of Hammer
60								
65								
70								

95% DRAFT

U.S. ARMY CORPS OF ENGINEERS
GEOTECHNICAL BORING DATA

PROJECT NAME HOUSTON GALVESTON NAVIGATION CHANNEL

LOG OF BORING NO. 9344

LOCATION/STATION STA 647+00 500L

DATE/TIME STARTED 8-17-94 7:00
DATE/TIME COMPLETED 8-17-94 12:50

TIDE ELEVATION 3 MLT DATUM, TIME 6:00 LOCATION LT. BKN.# PIER 9 MORGAN POINT

WATER DEPTH 18 - 7 (DECK) = 11

DEPTH FROM WATER SURFACE
TO BOTTOM OF BORING 68

WEATHER PARTLY CLOUDY

DRILL RIG MANUFACTURE
MODEL NO. MAYHEW 200

DRILLER JACKIE SMITH
LOGGER JOHN ACKROYD

DRILLER'S/LOGGER'S COMMENTS

95% DRAFT

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BORING NO. 9344 DATE: BEGIN 8-17-94 PAGE 213
JOB NO. 94G7833 COMPLETE 94 Thin Walled Tube
PROJECT HOUSTON GALVESTON NAVIGATION CHANNEL ☒ 3" ✱☐ 6"
LOCATION STA 6+600 500L
ELEVATION OF HOLE - 8 MLT (MUD LINE)
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 200
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling
WEATHER PARTLY CLOUDY
DRILLER JACKIE SMITH LOGGER JOHN A. GENTRY

TORVANE Reading	DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
	0								
0.3			1	0/0.06	GRAY	CLAY	VERY SOFT	SANDY	- W/SHELL FRAGMENTS 0'-SET 30' OF CASING
0.3			2	0/0.06	GRAY	CLAY	VERY SOFT	SANDY	
	5	X	3	WOP	GRAY	SAND	VERY LOOSE	SILTY	
			4	0	GRAY	CLAY	VERY SOFT	SANDY	SAMPLE BULG WHILE EXTRUDING - W/SHELL FRAGMENTS 6'-10'
0.5			5	0/0.10	GRAY	CLAY	VERY SOFT	SANDY	
	10								ADD 2.5 FT OF CASING TOTAL 32.5
0.45			6	0/0.09	GRAY	CLAY	VERY SOFT		-W/SAND SEAMS 10'-
0.6			7	0/0.12	GRAY	CLAY	VERY SOFT		-W/SHELL FRAGMENTS 12'-17'
0.6			8	0/0.12	GRAY	CLAY	VERY SOFT		
0.6			9	0/0.12	GRAY	CLAY	VERY SOFT		
		X	10	W.O.P	GRAY	CLAY	VERY SOFT		
1.2			11	0/0.08	GRAY	CLAY	VERY SOFT	SANDY	- W/ SAND SEAMS 20'-
	20		12	0.0/0.04	GRAY	CLAY	VERY SOFT	SANDY	-Sample Bulge on extrusion W/Sand at Bottom of Sample
		X	13	3,4,7	GRAY	SAND	MEDIUM DENSE	SILTY	
	25	X	14	4,5,8	GRAY	SAND	MEDIUM DENSE	SILTY	
		X	15	6,8,11	GRAY	SAND	MEDIUM DENSE	SILTY	
	30	X	16	4,7,10	GRAY	SAND	MEDIUM DENSE	SILTY	*PUSH 6" DIAMETER NO RECOVERY DUE TO SAND @ 29'
		X	17	5,10,12	GRAY	SAND	MEDIUM DENSE	SILTY	-W/ SANDY CLAY LAYER 34-34½' W/ORGANICS 34-36.5
	35	X	18	4,8,14	GRAY	SAND	MEDIUM DENSE	SILTY	

95% DRAFT

BORING NO. 93-44 DATE: BEGIN 8-17-94 PAGE 2 / 3

JOB NO. 946783.3 COMPLETE _____ Thin Walled Tube

PROJECT HOUSTON GALVESTON NAVIGATION CHANNEL ☒ 3" ☐ 6"

LOCATION STA 676 00 500L

ELEVATION OF HOLE - 8 MLT (MUD LINE)

MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 200

GROUNDWATER: DEPTH _____ ft., ELEV. _____ ft., at end of Drilling

WEATHER PARTLY

DRILLER JACKIE SMITH LOGGER JOHN A. CENTRY

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
35	X	19	4/9/12	GRAY	SAND	MEDIUM DENSE	SILTY	PUSH 6" DIAMETER NO RECOVERY PUSH TO SAND @ 37'
40	X	20	7/9/14	GRAY	SAND	MEDIUM DENSE	SILTY	
45	X	21	5 7/10	GRAY	SAND	MEDIUM DENSE	SILTY	
50	X	22	4/5/6	Gray	SAND	Medium dense	SILTY	
55	X	23	10/13/17	Gray	SAND	Dense	SILTY	
60								Torvane Multiplier 0.2 W.O.P : Weight of Pipe
65								
70								

95% DRAFT

U.S. ARMY CORPS OF ENGINEERS
GEOTECHNICAL BORING DATA

PROJECT NAME Houston - Galveston Navigation Channel

LOG OF BORING NO. 93-45

LOCATION/STATION 1+500, 500' L

DATE/TIME STARTED 8/19/94
DATE/TIME COMPLETED 8/19/94

TIDE ELEVATION 3' MLT DATUM, TIME 0640 LOCATION LT. BKN.# Pier at Morgans Point

WATER DEPTH 22-7' (deck) = 15'

DEPTH FROM WATER SURFACE TO BOTTOM OF BORING 68'

WEATHER Hazy / Hot

DRILL RIG MANUFACTURE
MODEL NO. Mayhew 200

DRILLER Jackie Smith
LOGGER Robert Arnold / Thon Gentry

DRILLER'S/LOGGER'S COMMENTS

95% DRAFT

U.S. ARMY CORPS OF ENGINEERS

BORING NO. 93-45 DATE: BEGIN 8/18/94 PAGE 213
JOB NO. 946783.3 COMPLETE _____ Thin Walled Tube
PROJECT Houston-Galveston Navigation Channel ■ 3" ★ □ 6"
LOCATION Sta 1+500, 500'L
ELEVATION OF HOLE -12 MLT (Mudline)
MANUFACTURER'S DESIGNATION OF DRILL RIG Mayhem 200
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling
WEATHER Partly Cloudy / Hazy / HOT
DRILLER Jackie Smith LOGGER Robert Arnold / Jhon Gentry

Torvane Reading

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
0	X	1	WOP	Gray	Sand	very loose	Silty	- set 30' of casing w/shell & shell fragments 0'-6.5'
5	X	2	WOP	Gray	Sand	very loose	Silty	
10	X	3	WOP	Gray	Sand	very loose	Silty	
	X	4	1 3 2	Gray	Sand	loose		- add 10' of casing Total 40'
15								
	X	5	1 2 4	Gray	Sand	loose		
20								- add 5' of casing total 45'
	X	6	2 3 5	Gray	Sand	loose		w/ clay at 24"
25		7	3.5	Light Gray	clay	very stiff	sandy	with calcarious nodules and sand seams 24.5-31' Light brown 24.5 - 31'
6"		8	3.75	Light Gray	clay	very stiff		with silt pockets 25 - 31
		9	4.0	Light Gray	clay	very stiff		* 6" diameter sample 25'-27'
30		10	4.0	Light Gray	clay	very stiff		add 5' of Casing Total 50'
	X	11	10 10 15	Light Gray	clay	very stiff		with Brown 31' - 39'
		12	4.0	Light Gray	clay	very stiff		with calcarious nodules 31' - 33'
6"		13	3.0	Light Gray	clay	very stiff		* 6 diameter 33-35 with ferrous nodules 33-35'
35								

95% DRAFT

BORING NO. 93-45 DATE: BEGIN 8/19/94 PAGE 3 13
JOB NO. 946783.3 COMPLETE 8/19/94 Thin Walled Tube
PROJECT Houston-Galveston Navigation Channel ☒ 3" ☐ 6"
LOCATION Sta 1+500, 500' L
ELEVATION OF HOLE B-MLT (Mudline)
MANUFACTURER'S DESIGNATION OF DRILL RIG Mayhem 200
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling
WEATHER Partly cloudy / Hazy / Hot
DRILLER Jackie Smith LOGGER Robert Arnold / Thon Gentry

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
35		14	2.75	Light Gray	clay	very stiff		
		15	4.5+	Light Gray	clay	Hard		with [illegible] 37' - 43'
40		16	4.25	Brown	clay	Hard		
		17	4.5+	Brown	clay	Hard		39' - 43'
		18	4.5+	Reddish Brown	clay	Hard		slicken sides 43' - 53'
45		19	4.25	Reddish Brown	clay	Hard		
		20	4.5	Reddish Brown	clay	Hard		
50		21	4.25	Reddish Brown	clay	Hard		
		22	3.25	Brown	clay	very stiff		with silt partings 51'-53'
55								W.O.P : weight of pipe
60								
65								
70								

95% DRAFT

U.S. ARMY CORPS OF ENGINEERS
GEOTECHNICAL BORING DATA

PROJECT NAME HOUSTON GALVESTON NAVIGATION CHANNEL

LOG OF BORING NO. 93-46

LOCATION/STATION Stg. 15+00, 400 R

DATE/TIME STARTED 8-18-94 7:00
DATE/TIME COMPLETED 8-18-94 3:05

TIDE ELEVATION 2.5 MLT DATUM, TIME 600 LOCATION LT. BKN.# PIER at MORGAN

WATER DEPTH 17 -7(DECK) = 10

DEPTH FROM WATER SURFACE TO BOTTOM OF BORING 68.

WEATHER PARTLY CLOUDY: SUNNY

DRILL RIG MANUFACTURE
MODEL NO. MAYHEW 200

DRILLER JACKIE SMITH
LOGGER JOHN AGENTRY

DRILLER'S/LOGGER'S COMMENTS

95% DRAFT

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U.S. ARMY CORPS OF ENGINEERS

BORING NO. 9346 DATE: BEGIN 8-18-94 PAGE 2 / 3
JOB NO. 946783.3 COMPLETE 8-18-94 Thin Walled Tube
PROJECT HOUSTON GALVESTON NAVIGATION CHANNEL ■ 3" □ 6"
LOCATION STA 15+00 400R
ELEVATION OF HOLE -7.5 MLT mudline
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 200
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling
WEATHER PARTLY CLOUDY
DRILLER JACKIE SMITH LOGGER JOHN A. GENTRY

Torvane Reading	DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE / SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
0.2	0		1	0/0.04	GRAY	CLAY	VERY SOFT	SANDY	- W/ SHELL FRAGMENTS 0'-10'
0.3		J	2	0/0.06	GRAY	CLAY	VERY SOFT	SANDY	SAMPLE PULG WHILE ESTRUDING FOR SAMPLE 2-4
0.6	5		3	0/0.12	GRAY	CLAY	VERY SOFT	SANDY	- W/ SAND SEAM 4'. SAMPLE BULG WHILE EXTRUDING
0.4			4	0/0.07	GRAY	CLAY	VERY SOFT	SANDY	- W/ SAND LAYER 6'-7'
0.5			5	0/0.10	GRAY	CLAY	VERY SOFT	SANDY	
	10	U	6	0.5	GRAY	CLAY	MEDIUM STIFF	SANDY	+ BROWN 10'-12' SET 29 FT OF 4" STEEL CASING
		X	7	2 3 4	GRAY	SAND	LOOSE	SILTY	
	15								
		X	8	3 4 5	GRAY	SAND	LOOSE	SILTY	
		X	9	4 5 8	GRAY	SAND	MEDIUM DENSE	SILTY	
	20								ADD 10 FT of casing 39' Total
			10	2.5	GRAY	CLAY	VERY STIFF		+ BROWN 22'-29
			11	2.5	GRAY	CLAY	VERY STIFF		- W/ CALCAREOUS NODULES 24'-26'
		U	12	2.75	GRAY	CLAY	VERY STIFF		LOST CIRCULATION @ 26' SET 44 FT OF CASING
		X	13	7 12 17	GRAY	CLAY	VERY STIFF		- W/ SAND POCKETS 26'-29' (Pocket Pen 3.75)
			14	1.5	GRAY	CLAY	STIFF	SANDY	+ BROWN 29-33
			15	3.25	GRAY	CLAY	VERY STIFF	SANDY	- W/ CALCAREOUS NODULES 31'-33 - W/ FERROUS NODULES 31'-33 - W/ CLAY LAYER @ 32.5-33
			16	3.25	GRAY	CLAY	VERY STIFF		+ BROWN 33'-35
	35								

95% DRAFT

GEOTEST ENGINEERING, INC.

BORING NO. 93-46 DATE: BEGIN 8-18-94 PAGE 3 13
JOB NO. 94G783.3 COMPLETE 8-18-94 Thin Walled Tube
PROJECT HOUSTON GALVESTON NAVIGATION CHANNEL ☒ 3" ☐ 6"
LOCATION STA. 15+00 400R
ELEVATION OF HOLE -7.5 MLT Mud line
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 200
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling
WEATHER PARTLY CLOUDY
DRILLER JACKIE SMITH LOGGER JOHN A. GENTRY

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
35		17	3-25	GRAY	CLAY	VERY STIFF		↓BROWN - SAND STARTS 35.3S
	X	18	11 13 15	GRAY	CLAY	VERY STIFF	SANDY	(Pocket Pen 3.75) ↓BROWN 35.5-39'
		19	2.5	GRAY	CLAY	VERY STIFF	SANDY	- W/CALCAREOUS NODULES 37-39
40		20	2.5	REDISH BROWN	CLAY	VERY STIFF	SILTY	- W/CALCAREOUS NODULES 39'-43' ↓GRAY 39-43
		21	3.0	REDISH BROWN	CLAY	VERY STIFF	SILTY	
		22	4.25	REDISH BROWN	CLAY	HARD		↓GRAY 43'- - W/ SILT SEAMS 43'-47 - W/CALCAREOUS 43'-45
45		23	3.0	REDISH BROWN	CLAY	VERY STIFF		- W/SILT STONE 45'-47' - W/SLICKEN SIDES 45'-47
		24	4.5	REDISH BROWN	CLAY	HARD		- W/SAND SEAMS 47-49 - W/SILT PARTING 47-51'
50		25	4.25	BROWN	CLAY	HARD		- W/CALCAREOUS NODULES 49-58'
		26	4.5+	BROWN	CLAY	HARD		- W/SILT POCKETS - 51'-55'
		27	4.5+	BROWN	CLAY	HARD		
55		28	4.5+	REDISH BROWN	CLAY	HARD		
		29	4.5+	REDISH BROWN	CLAY	HARD		- W/SILT & SAND SEAMS 57-58
60								Torvane Multiplier 0.2 J: Jar Sample
65								
70								

95% DRAFT

U.S. ARMY CORPS OF ENGINEERS
GEOTECHNICAL BORING DATA

PROJECT NAME HOUSTON GALVESTON NAVIGATION CHANNEL

LOG OF BORING NO. 93-47

LOCATION/STATION HOUSTON SHIP CHANNEL, Sta. 30+00 300 L

DATE/TIME STARTED 8-18-94 3:35
DATE/TIME COMPLETED 8-18-94 8:00

TIDE ELEVATION 3. MLT DATUM, TIME 3:15 LOCATION LT. BKN.# PIER AT MORGANS POINT

WATER DEPTH 28-7(DECK)=21

DEPTH FROM WATER SURFACE TO BOTTOM OF BORING 68

WEATHER sunny, partly cloudy

DRILL RIG MANUFACTURE
MODEL NO. MAYHEW 200

DRILLER JACKIE SMITH
LOGGER MOHAN/Thon Gentry

DRILLER'S/LOGGER'S COMMENTS

95% DRAFT

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U.S. ARMY CORPS OF ENGINEERS

BORING NO. 93-47 DATE: BEGIN 8-18-94 PAGE 2 / 3
JOB NO. 946783.3 COMPLETE _____ Thin Walled Tube
PROJECT HOUSTON GALVESTON NAVIGATION CHANNEL ■ 3" □ 6"
LOCATION Sta. 30+00 300L
ELEVATION OF HOLE -18 MLT
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 200
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling
WEATHER Partly Cloudy, Sunny
DRILLER Jackie Smith LOGGER Mohan/Thom Gentry

Torvane Reading	DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
	0								
2.4			1	0/0.08	GRAY	CLAY	Very soft	SANDY	w/ shell fragments 0'-4'
0.6			2	0/0.12	GRAY	CLAY	Very soft	SANDY	
0.4	5		3	0/0.08	GRAY	CLAY	Very soft	SANDY	w/ sand seams 4'-6'
0.2			4	0/0.04	GRAY	CLAY	Very Soft	SANDY	w/ sand layer 6.5-7'
		X	5	3/5/8	GRAY	SAND	Medium Dense	SILTY	W/ Shell Fragments
	10								clay @ 12'
			6	3.5	Gray & Brown	CLAY	Very Stiff		set 44ft of casing
	15		7	2.5	Light gray brown	CLAY	Very Stiff		w/ calcareous nodules 14'-17'
			8	4.5+	Light gray brown	CLAY	Hard		w/ sand pockets 14'-26.5'
		X	9	10/14/17	light gray brown	CLAY	HARD		Pocket Pen 4.25+
WOH			10	4.0	light gray & brown	CLAY	VERY STIFF		w/ calcareous nodules 18½'-30½'
	20		11	4.25	Light gray & brown	CLAY	Hard		
WOH			12	4.5+	Light gray brown	CLAY	Hard		
			13	2.75	Light gray brown	CLAY	Very Stiff		
	25	X	14	10/11/14	Light gray & Rd. Br.	CLAY	Very Stiff		Pocket Pen 3.00
WOH			15	3.5	light gray & Rd. Br	CLAY	Very Stiff		w/ sand partings 26.5'-30'
WOH			16	2.75	light gray & Rd Br	CLAY	Very Stiff		
	30	X	17	8/19/ref	Rd Brn & gray	SILT	Very dense		silt at Bottom of Sample
			18	3.5	Lt. gray REDDISH Brown	CLAY	Very STIFF		w/ silt stone 30' - 31.5'
			19	3.5	light gray REDDISH BROWN	CLAY	Very STIFF		w/ silt pockets 31.5'-33' w/ calc nodules 31.5'-35' w/ sand pockets 33'-35'
	35								

95% DRAFT

BORING NO. 93-47 DATE: BEGIN 8-18-94 PAGE 3 13

JOB NO. 94G783.3 COMPLETE _____ Thin Walled Tube

PROJECT HOUSTON GALVESTON NAVIGATION CHANNEL ☒ 3" ☐ 6"

LOCATION Sta 30+00 300L

ELEVATION OF HOLE -18 MLT

MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 200

GROUNDWATER: DEPTH _____ ft., ELEV. _____ ft., at end of Drilling

WEATHER PARTLY CLOUDY / SUNNY

DRILLER JACKIE SMITH LOGGER Mohan / John Gentry

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
35		20	3.5	Light gray Reddish Brown	CLAY	Very Stiff		w/ sand pockets 33' – 39'
		21	4.5	Light gray Reddish Brown	CLAY	Hard		w/ calc Nodules 33' – 39'
40		22	4.0	Reddish Brown	CLAY	Very Stiff	SANDY	w/ sand pockets 39' – 41'
		23	1.0	Reddish Brown	CLAY	Medium Stiff	SANDY	w/ calc Nodules 39' – 41' w/ sand partings and sand layer @ bottom of sample
	X	24	47/50/2"	Reddish brown	SAND	Very dense	SILTY FINE	
45	X	25	41/50/2 1/2"	Reddish brown	SAND	Very dense	SILTY FINE	w/ calcareous nodules
								Torvane Multiplier 0.2
50								
55								
60								
65								
70								

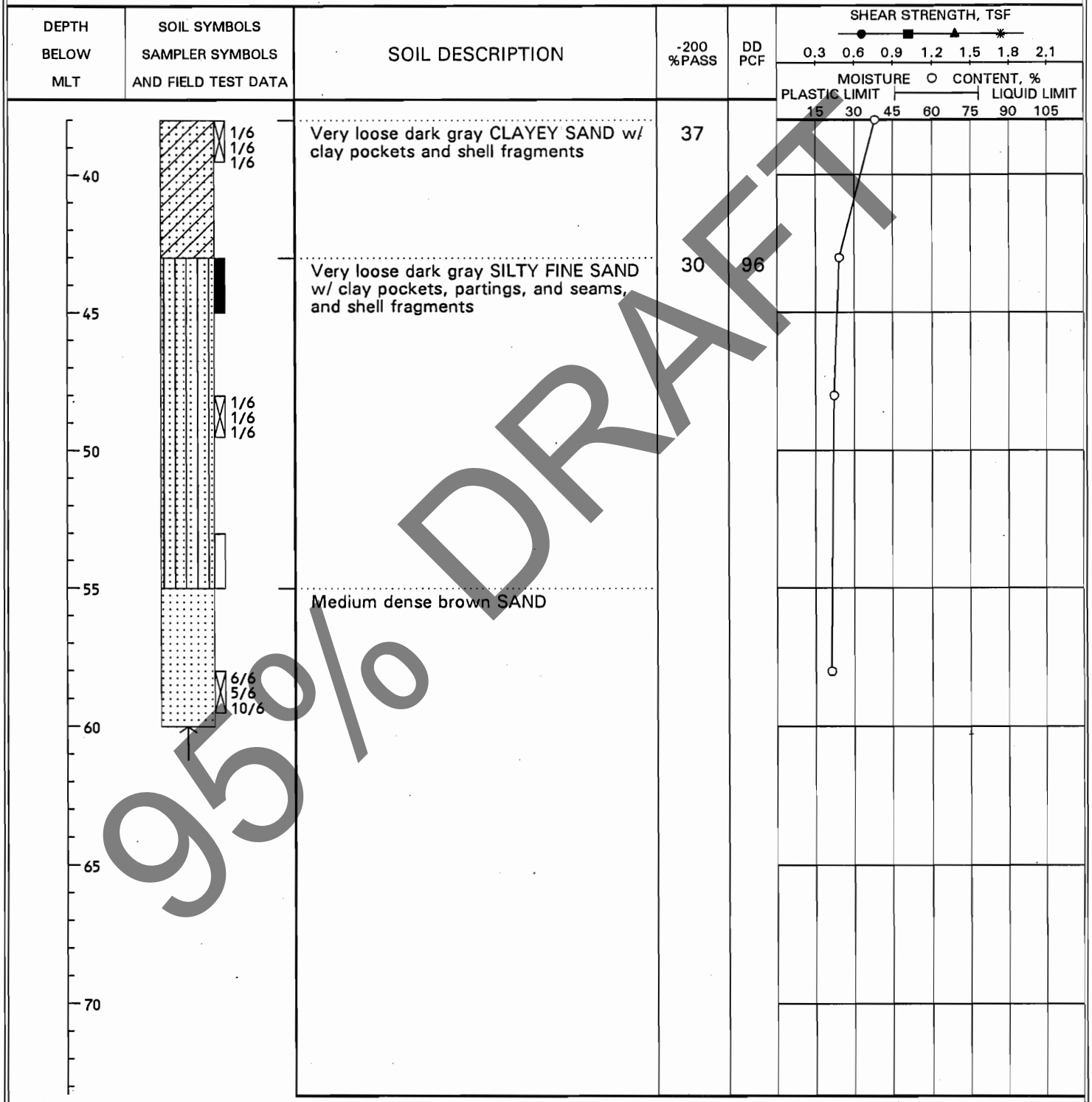
95% DRAFT

LOG OF SOIL BORING

Boring No. SC1

Project Name: Marsh Demonstration Project
Date: November 4, 1992
Water Depth: 17 feet
Northing: 689,495 feet

Project No. 92-217G3
Sea Floor Elevation: -16 feet
Time of Measurement: 1:44 PM
Easting: 3,277,074 feet



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✱ = UU Triaxial

See Plate 2 for boring location.

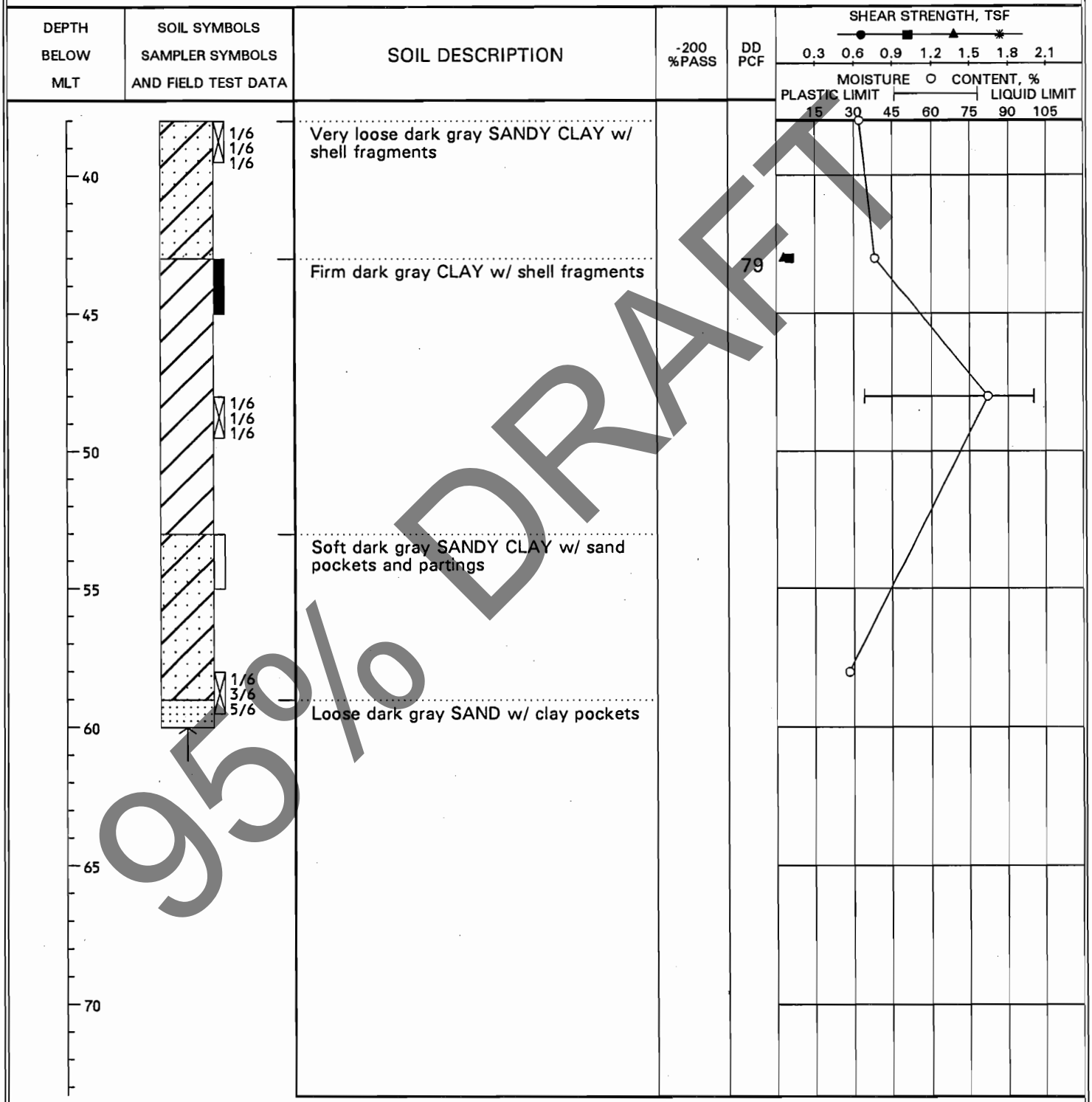
Plate 3

LOG OF SOIL BORING

Boring No. SC2

Project Name: Marsh Demonstration Project
Date: November 9, 1992
Water Depth: 16 feet
Northing: 687,670 feet

Project No. 92-217G3
Sea Floor Elevation: -13 feet
Time of Measurement: 7:53 AM
Easting: 3,277,797 feet



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✱ = UU Triaxial

See Plate 2 for boring location.

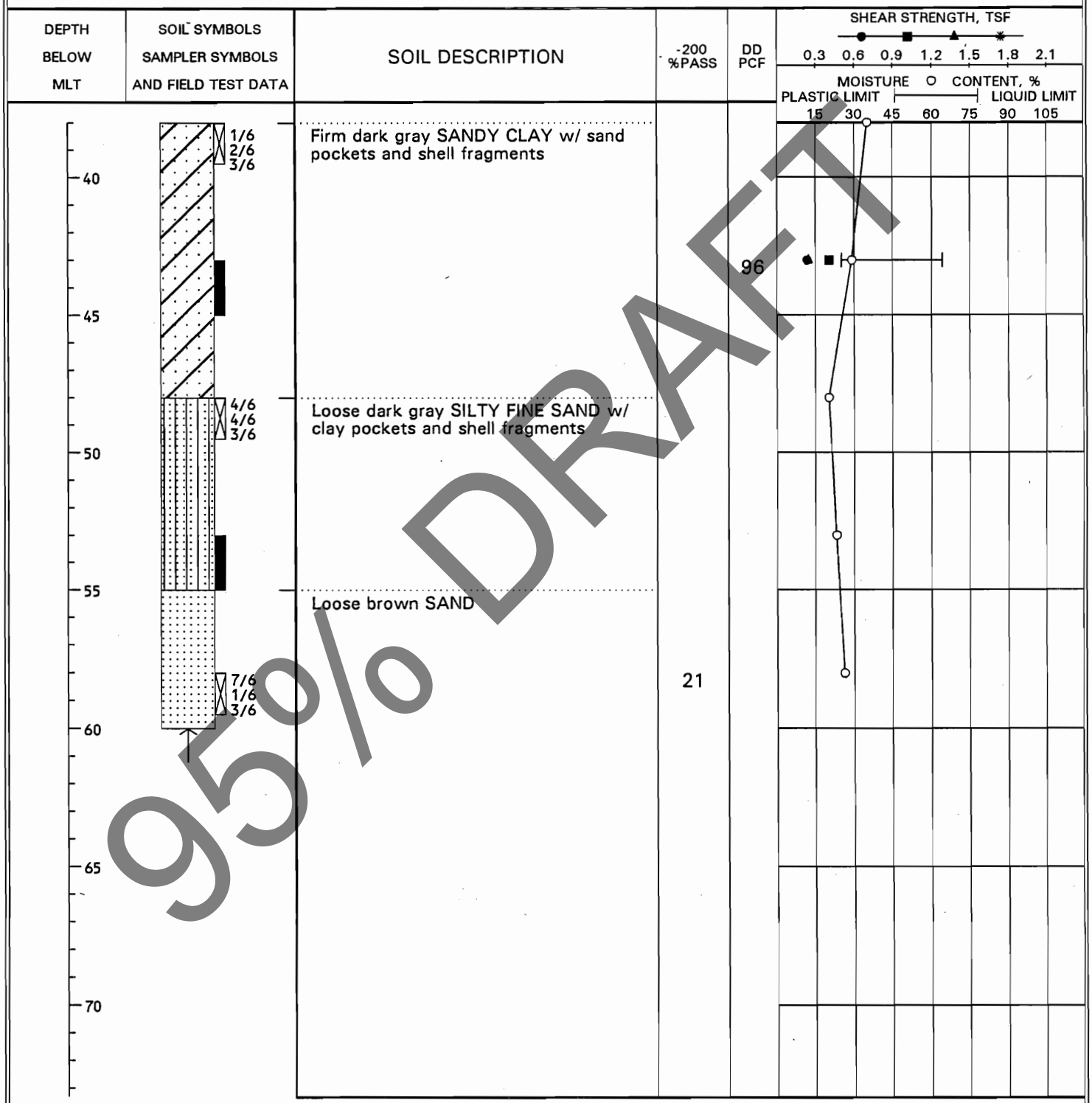
Plate 4

LOG OF SOIL BORING

Boring No. SC3

Project Name: Marsh Demonstration Project
Date: November 4, 1992
Water Depth: 15 feet
Northing: 688,827 feet

Project No. 92-217G3
Sea Floor Elevation: -14 feet
Time of Measurement: 10:43 AM
Easting: 3,278,095 feet



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✱ = UU Triaxial

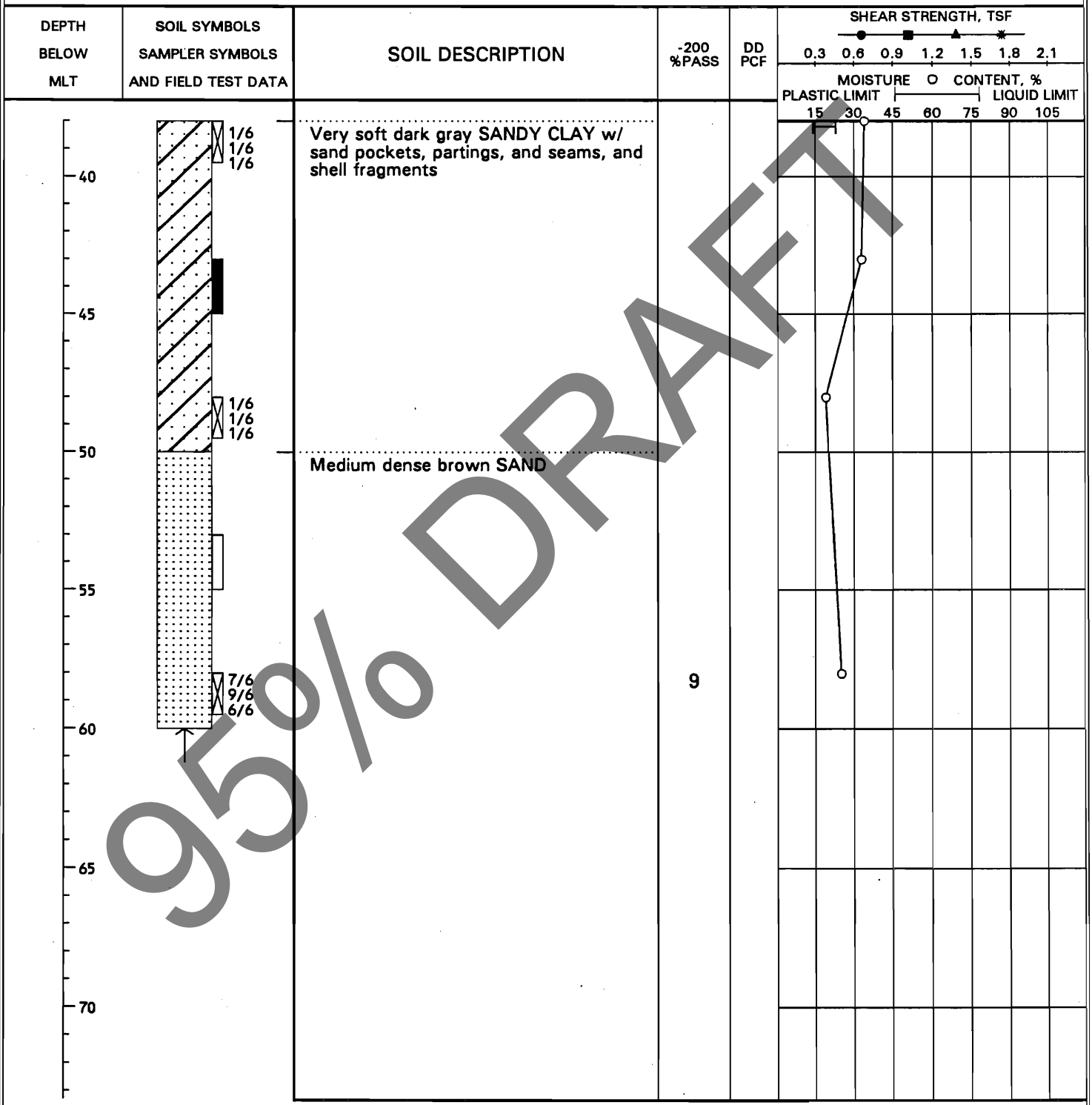
See Plate 2 for boring location.

Plate 5

LOG OF SOIL BORING
Boring No. SC4

Project Name: Marsh Demonstration Project
Date: November 9, 1992
Water Depth: 17 feet
Northing: 685,784 feet

Project No. 92-217G3
Sea Floor Elevation: -14 feet
Time of Measurement: 10:10 AM
Easting: 3,278,483 feet



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✱ = UU Triaxial

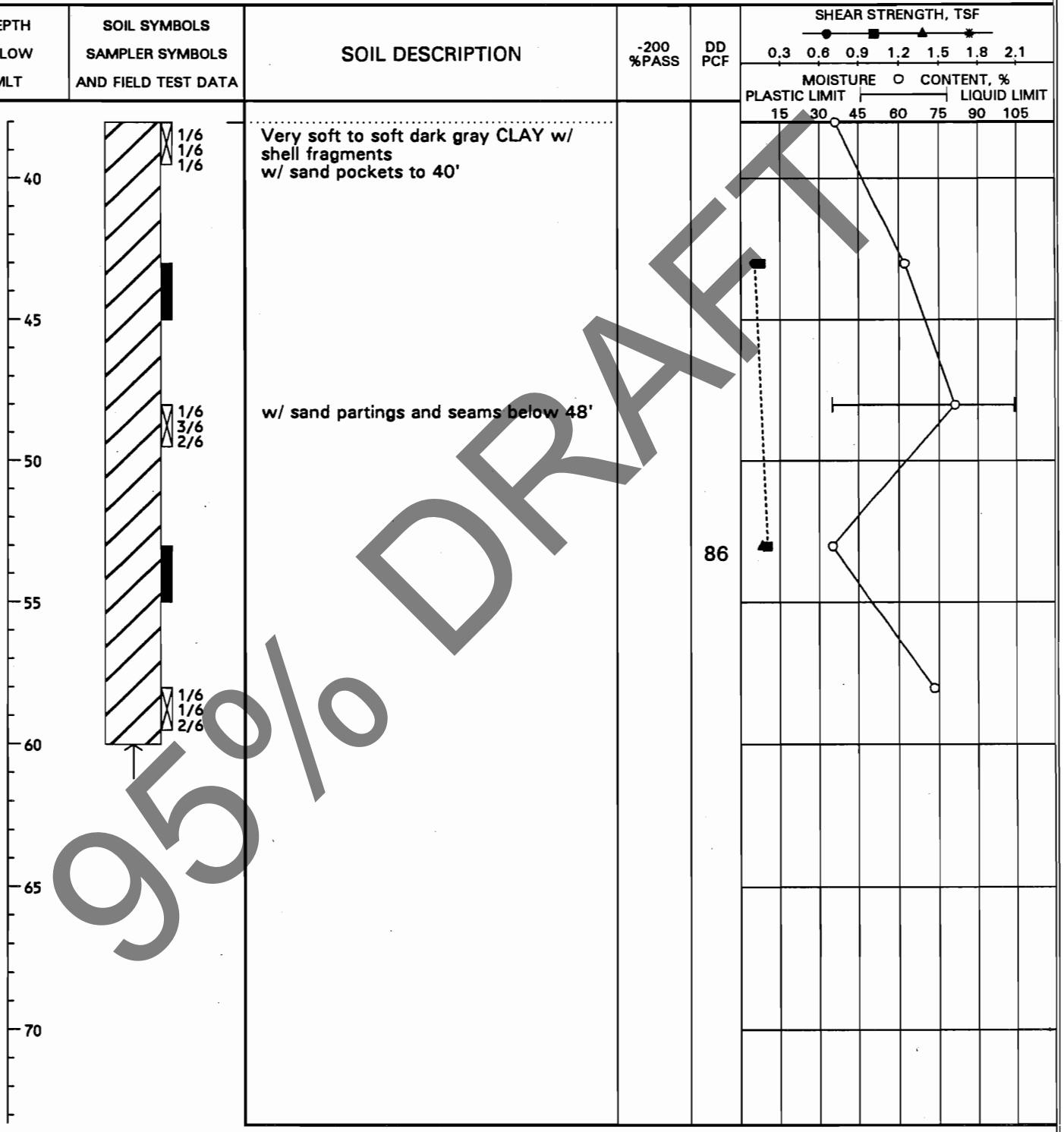
See Plate 2 for boring location.

Plate 6

LOG OF SOIL BORING
Boring No. SC5

Project Name: Marsh Demonstration Project
Date: November 9, 1992
Water Depth: 17 feet
Northing: 686,905 feet

Project No. 92-217G3
Sea Floor Elevation: -15 feet
Time of Measurement: 1:20 PM
Easting: 3,278,828 feet



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✸ = UU Triaxial

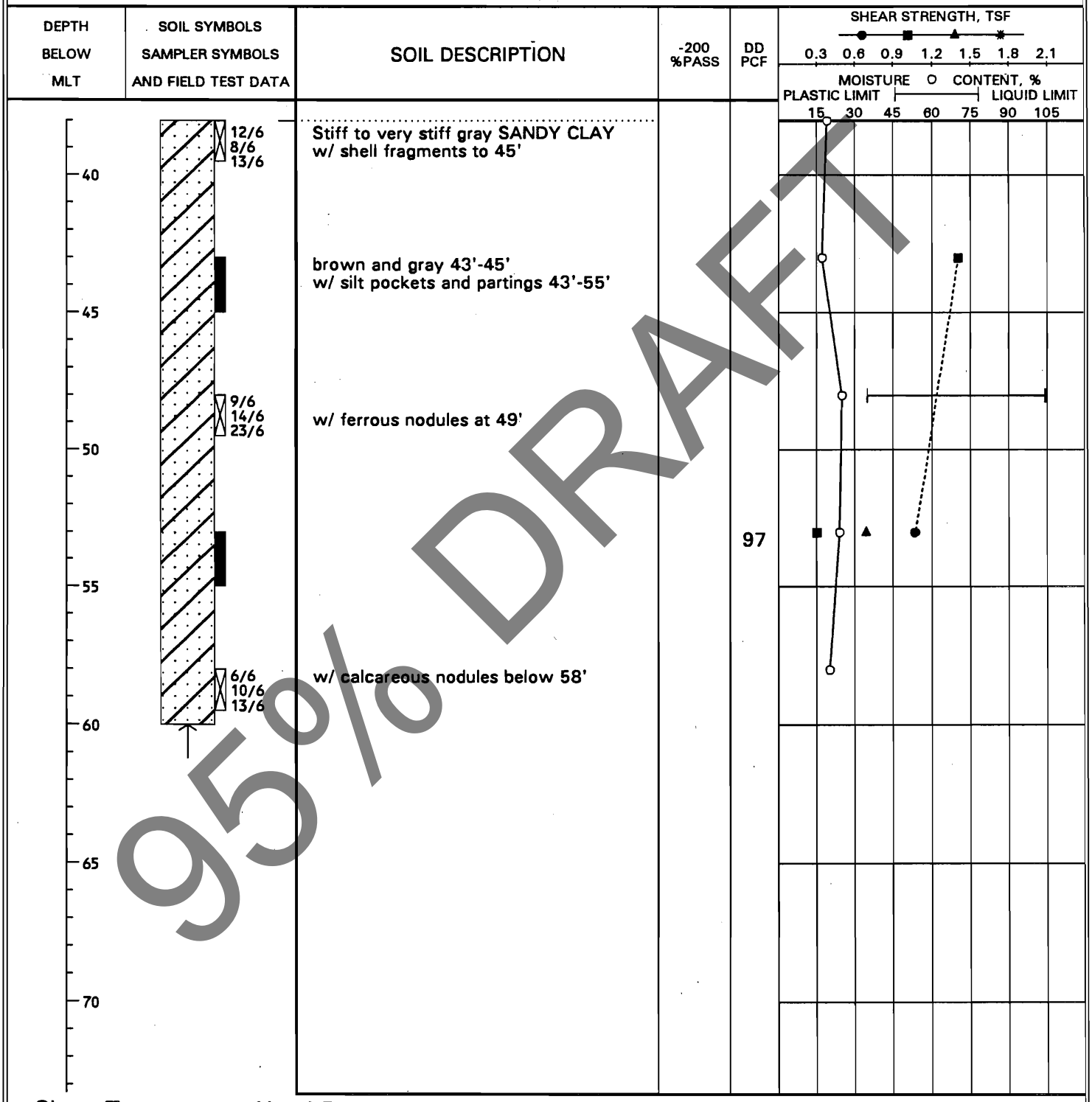
See Plate 2 for boring location.

Plate 7

LOG OF SOIL BORING
Boring No. SC6

Project Name: Marsh Demonstration Project
Date: November 5, 1992
Water Depth: 21 feet
Northing: 683,902 feet

Project No. 92-217G3
Sea Floor Elevation: -19 feet
Time of Measurement: 9:29 AM
Easting: 3,279,212 feet



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✸ = UU Triaxial

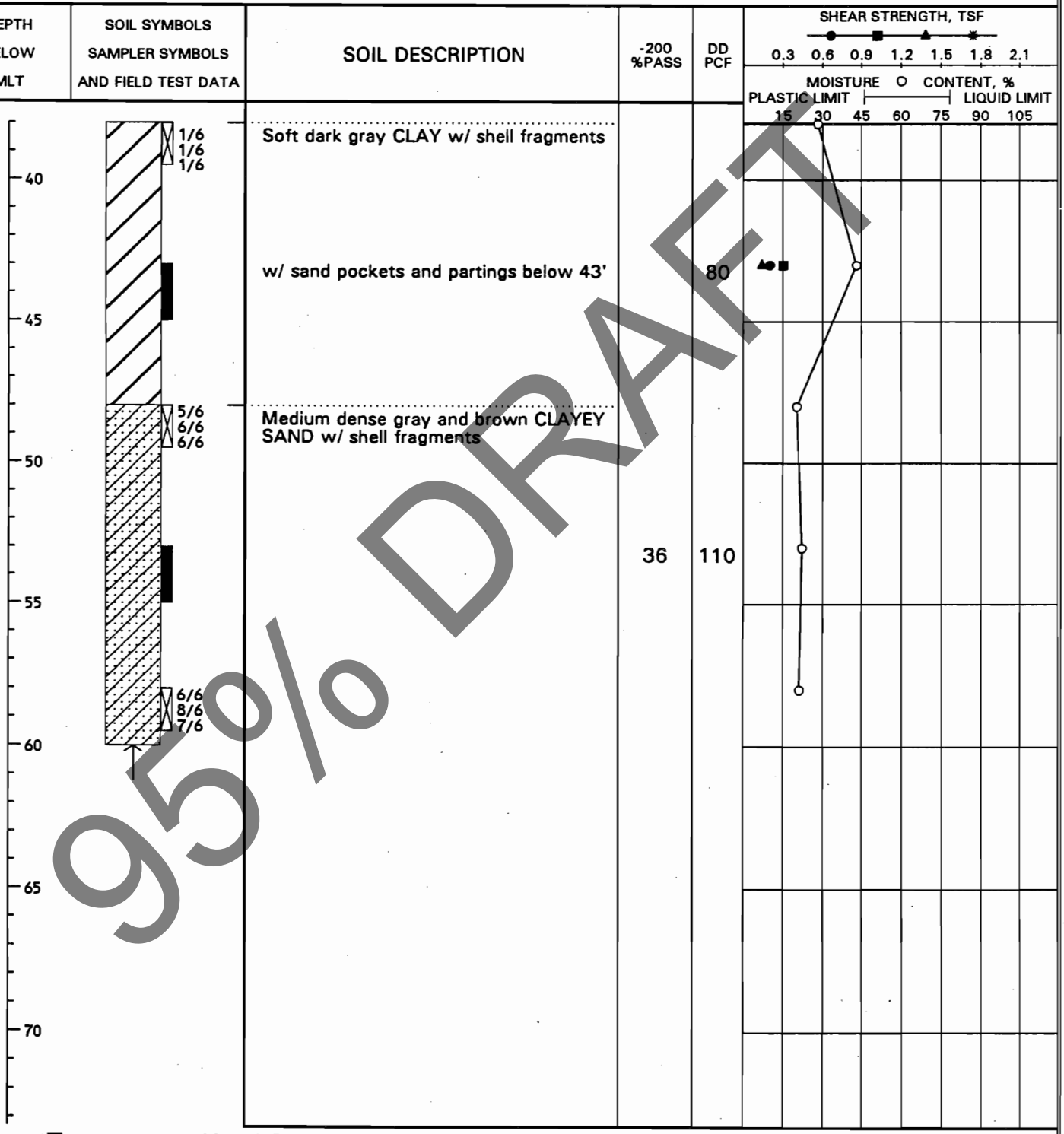
See Plate 2 for boring location.

Plate 8

LOG OF SOIL BORING
Boring No. SC7

Project Name: Marsh Demonstration Project
Date: November 9, 1992
Water Depth: 17 feet
Northing: 685,096 feet

Project No. 92-217G3
Sea Floor Elevation: -15 feet
Time of Measurement: 1:52 AM
Easting: 3,279,528 feet



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✸ = UU Triaxial

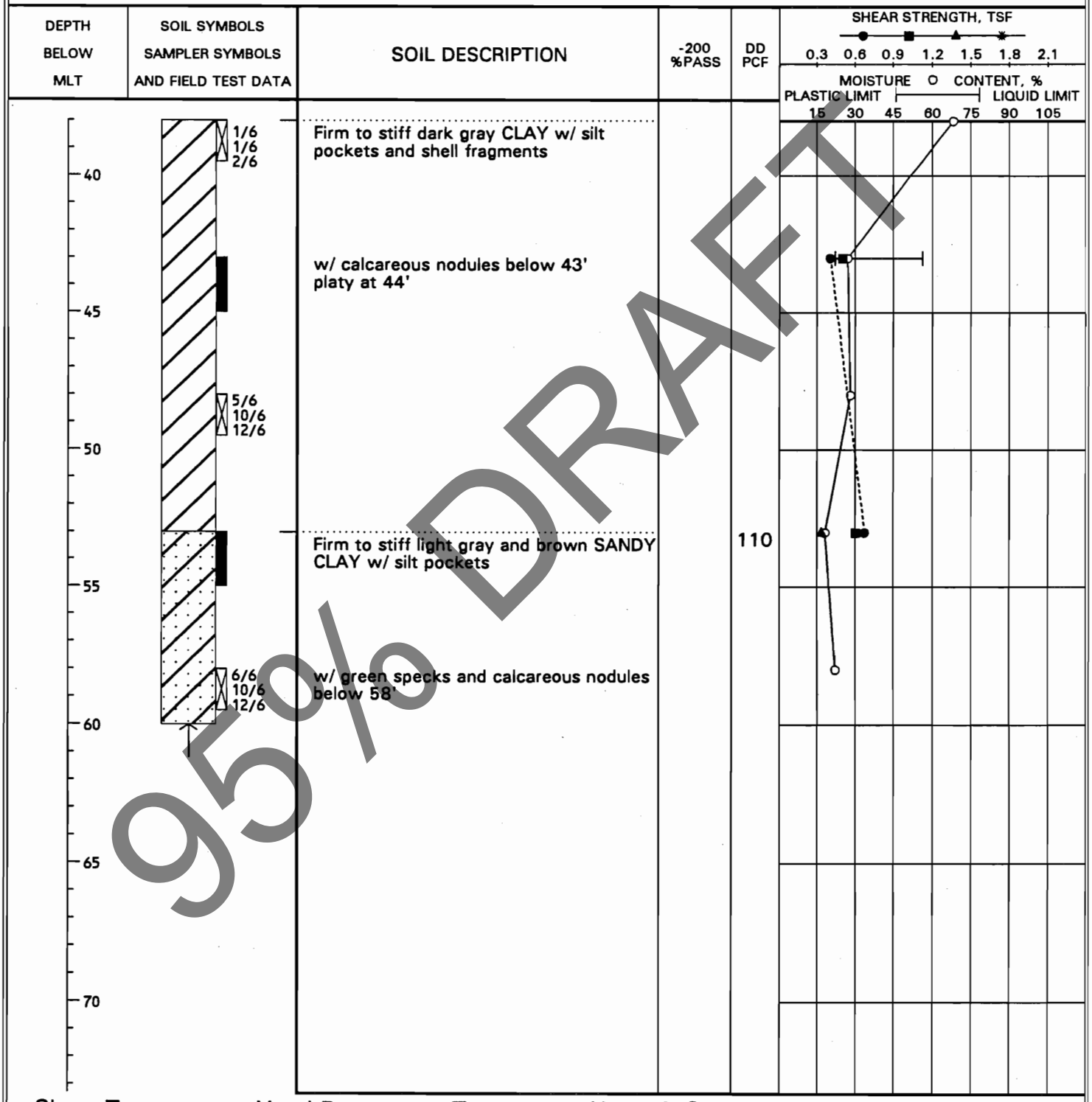
See Plate 2 for boring location.

Plate 9

LOG OF SOIL BORING
Boring No. SC8

Project Name: Marsh Demonstration Project
Date: November 5, 1992
Water Depth: 19 feet
Northing: 682,041 feet

Project No. 92-217G3
Sea Floor Elevation: -18 feet
Time of Measurement: 1:46 PM
Easting: 3,279,907 feet



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✸ = UU Triaxial

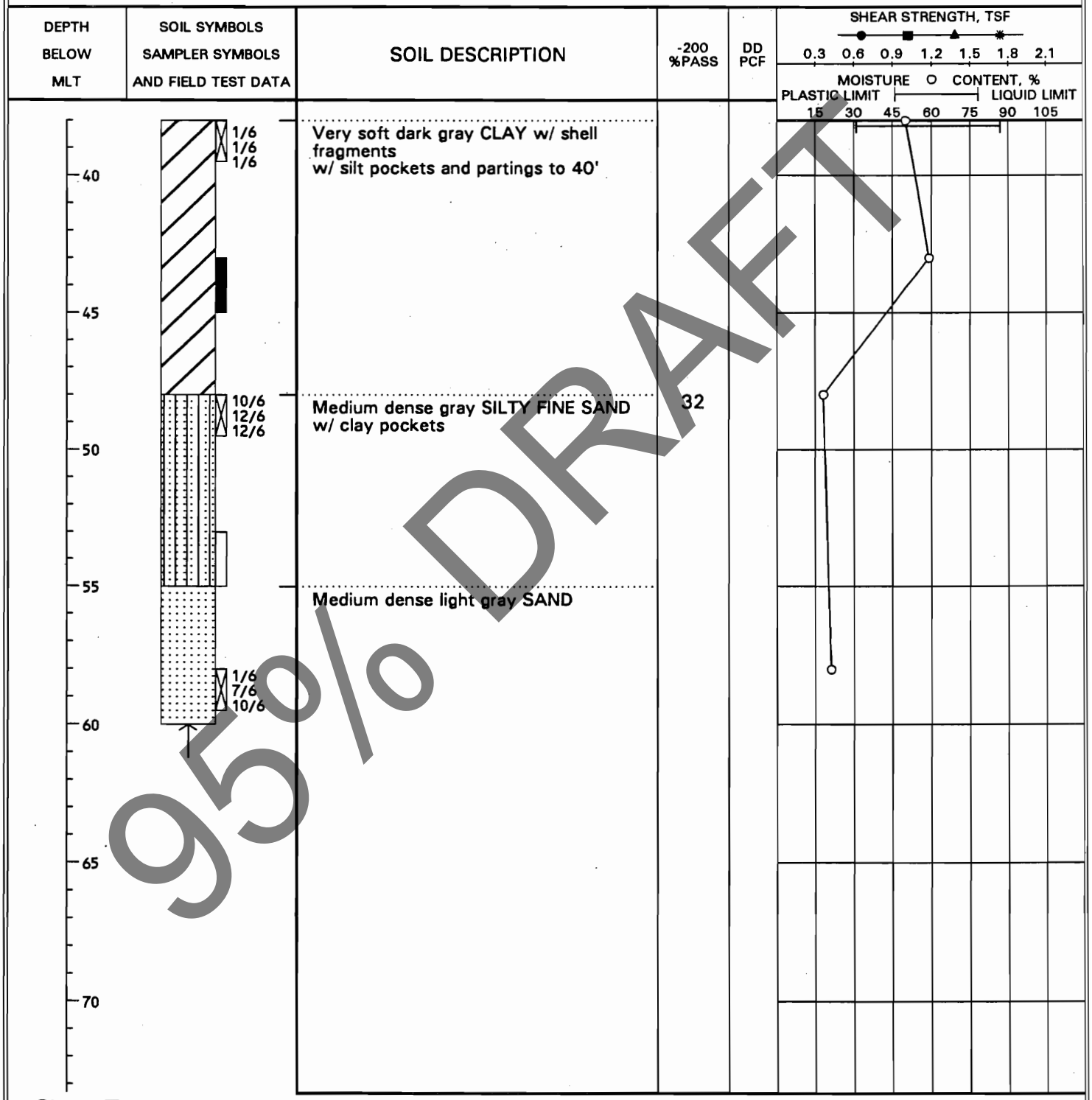
See Plate 2 for boring location.

Plate 10

LOG OF SOIL BORING
Boring No. SC9

Project Name: Marsh Demonstration Project
Date: November 6, 1992
Water Depth: 20 feet
Northing: 683,219 feet

Project No. 92-217G3
Sea Floor Elevation: -18 feet
Time of Measurement: 11:05 AM
Easting: 3,280,202 feet



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✸ = UU Triaxial

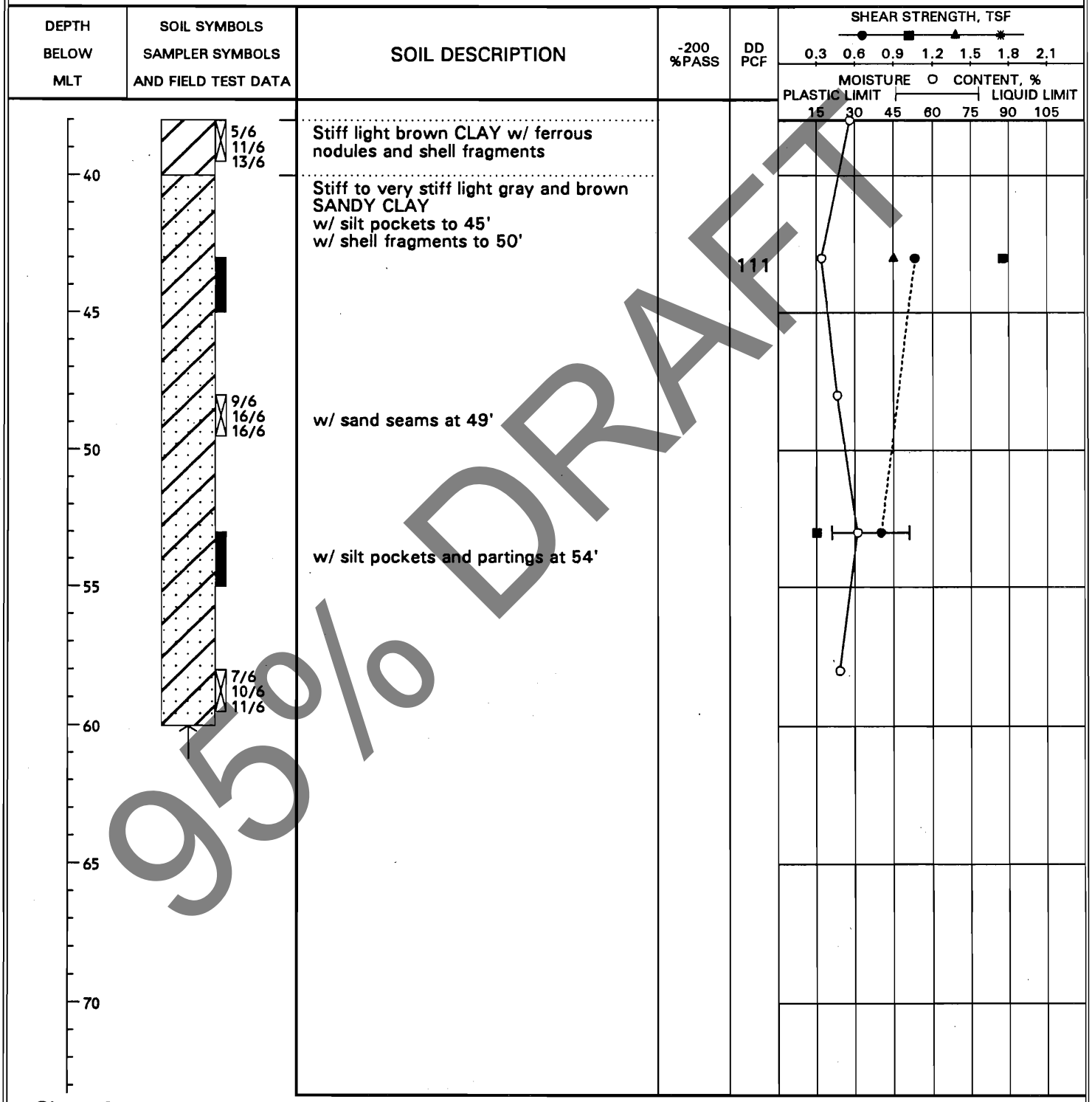
See Plate 2 for boring location.

Plate 11

LOG OF SOIL BORING
Boring No. SC10

Project Name: Marsh Demonstration Project
Date: November 5, 1992
Water Depth: 19 feet
Northing: 680,162 feet

Project No. 92-217G3
Sea Floor Elevation: -18 feet
Time of Measurement: 1:25 PM
Easting: 3,280,630 feet



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✱ = UU Triaxial

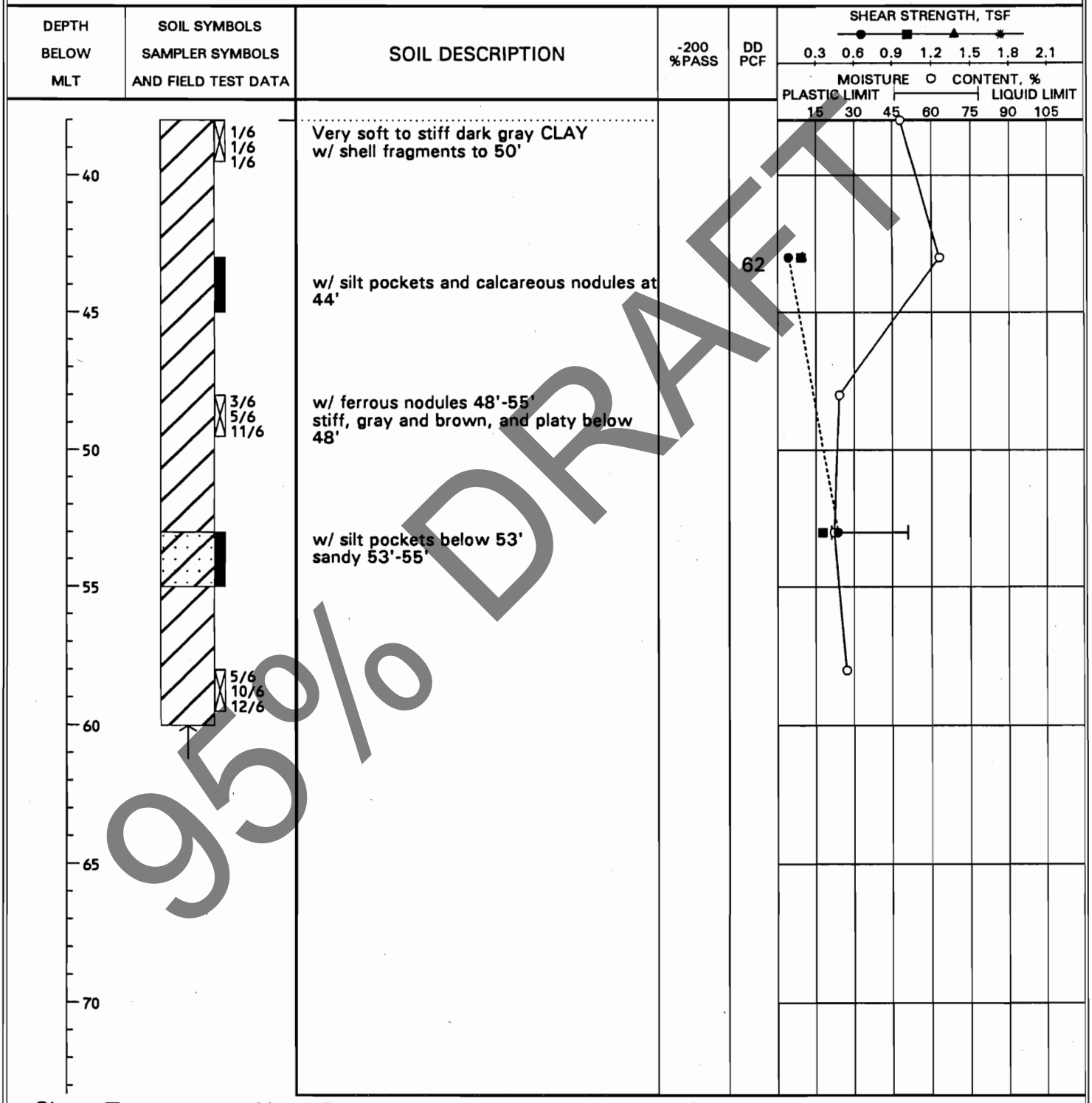
See Plate 2 for boring location.

Plate 12

LOG OF SOIL BORING
Boring No. SC11

Project Name: Marsh Demonstration Project
Date: November 6, 1992
Water Depth: 20 feet
Northing: 681,349 feet

Project No. 92-217G3
Sea Floor Elevation: -17 feet
Time of Measurement: 1:33 PM
Easting: 3,280,920 feet



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✸ = UU Triaxial

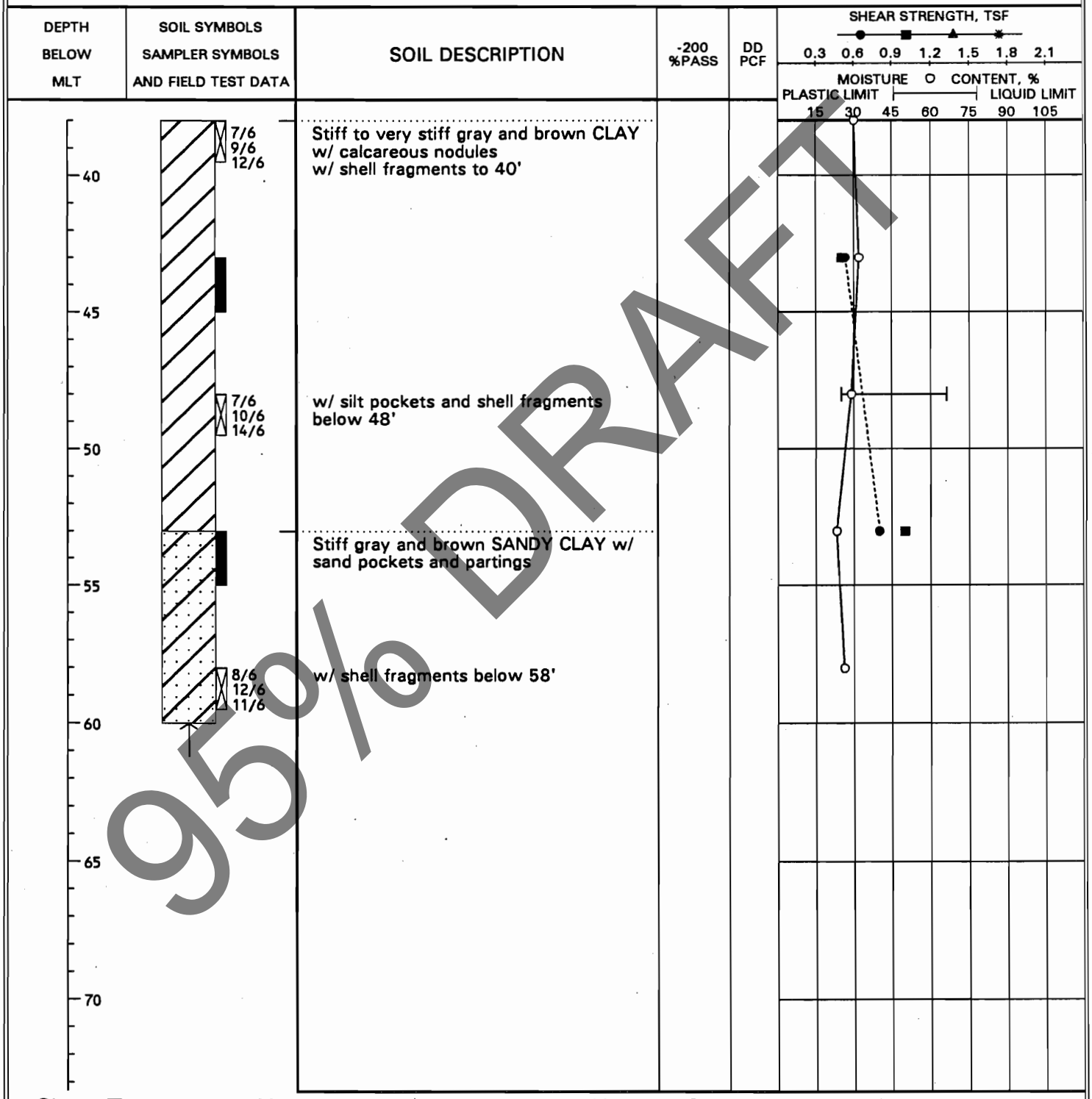
See Plate 2 for boring location.

Plate 13

LOG OF SOIL BORING
Boring No. SC12

Project Name: Marsh Demonstration Project
Date: November 9, 1992
Water Depth: 20 feet
Northing: 679,462 feet

Project No. 92-217G3
Sea Floor Elevation: -17 feet
Time of Measurement: 3:02 PM
Easting: 3,281,607 feet



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✱ = UU Triaxial

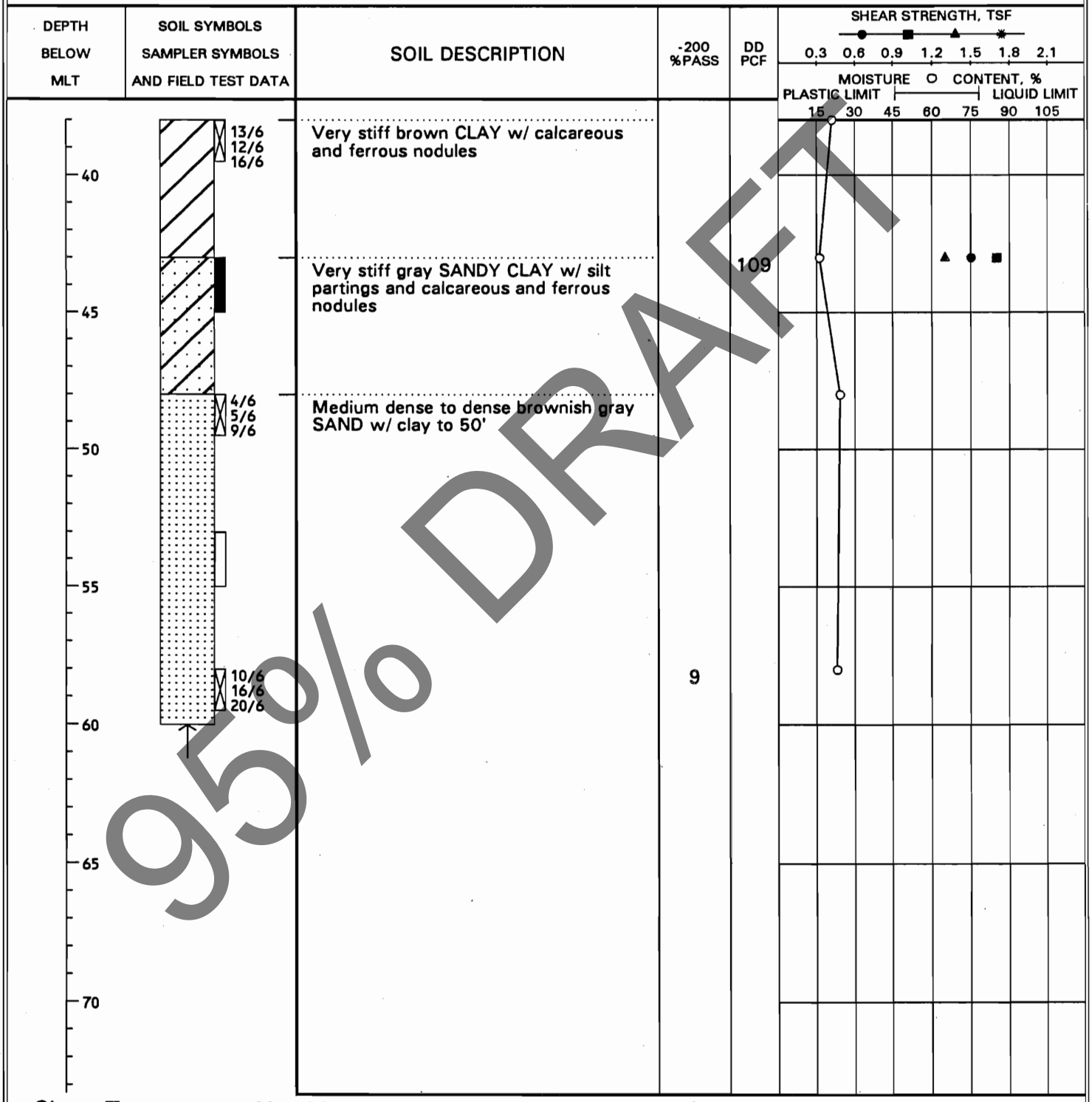
See Plate 2 for boring location.

Plate 14

LOG OF SOIL BORING
Boring No. SC13

Project Name: Marsh Demonstration Project
Date: November 12, 1992
Water Depth: 18 feet
Northing: 675,467 feet

Project No. 92-217G3
Sea Floor Elevation: -15 feet
Time of Measurement: 2:07 PM
Easting: 3,282,406 feet



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✸ = UU Triaxial

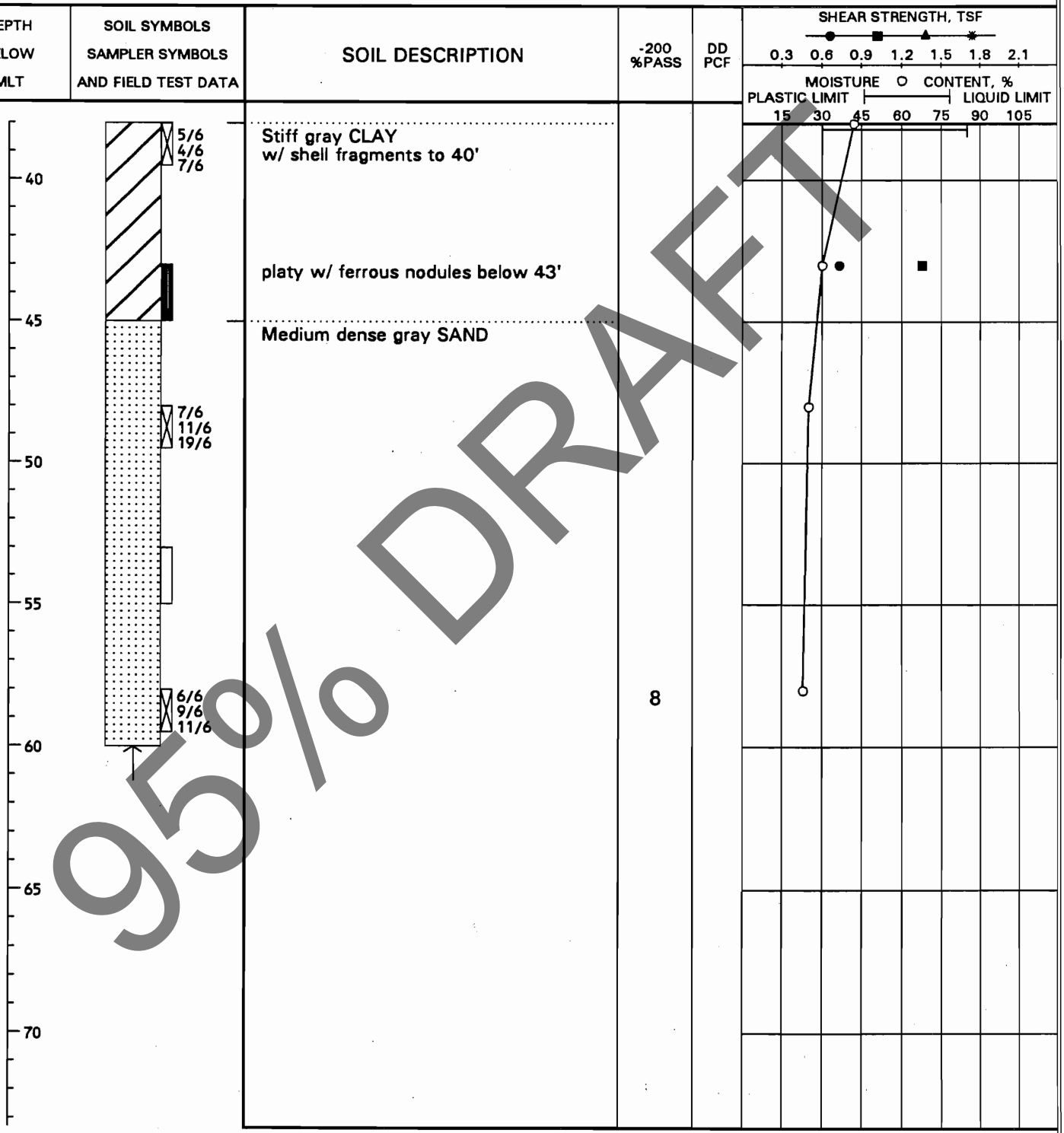
See Plate 2 for boring location.

Plate 15

LOG OF SOIL BORING
Boring No. SC14

Project Name: Marsh Demonstration Project
Date: November 7, 1992
Water Depth: 22 feet
Northing: 673,622 feet

Project No. 92-217G3
Sea Floor Elevation: -20 feet
Time of Measurement: 2:23 PM
Easting: 3,283,108 feet



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✱ = UU Triaxial

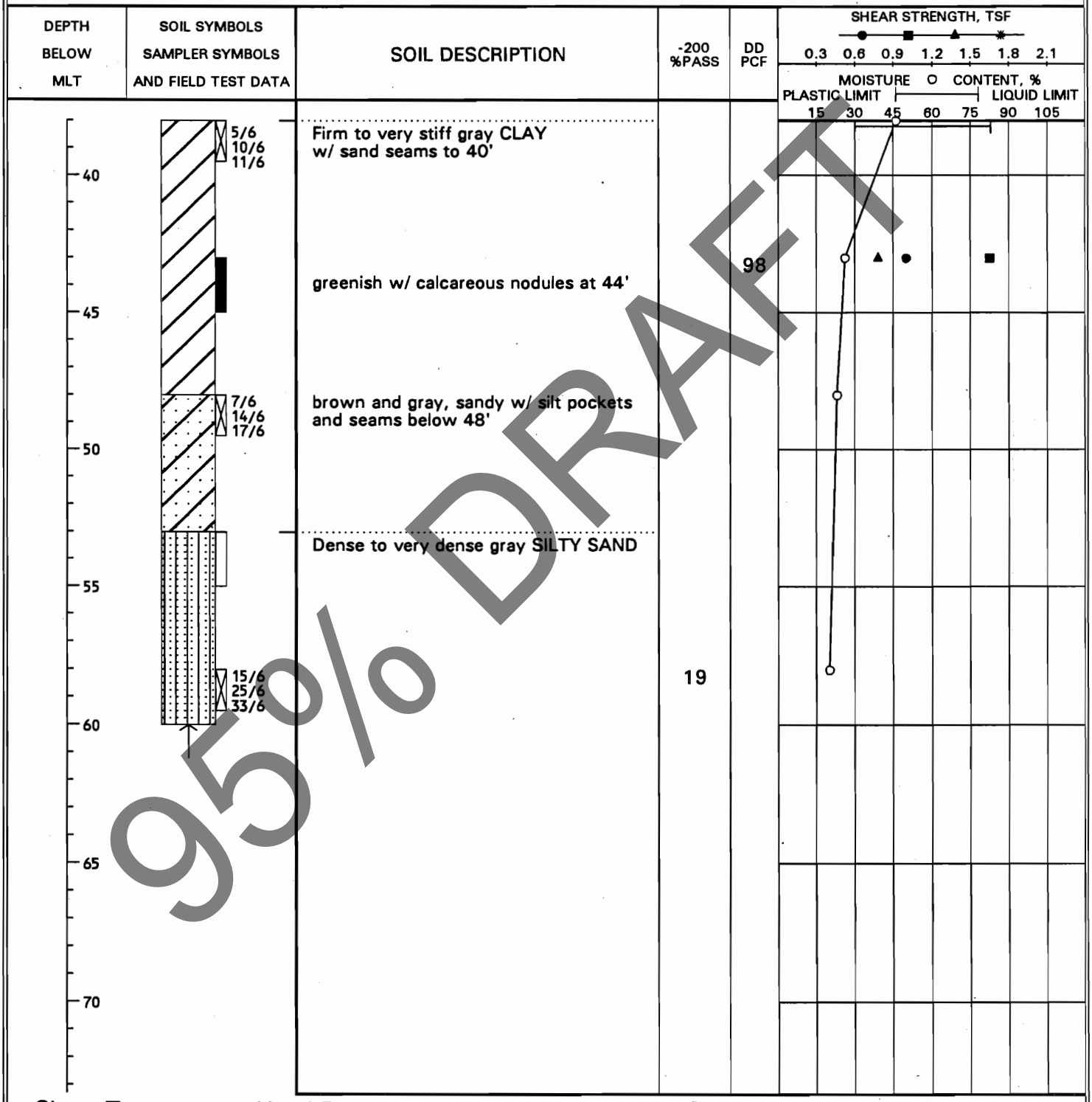
See Plate 2 for boring location.

Plate 16

LOG OF SOIL BORING
Boring No. SC15

Project Name: Marsh Demonstration Project
Date: November 12, 1992
Water Depth: 20 feet
Northing: 674,751 feet

Project No. 92-217G3
Sea Floor Elevation: -17 feet
Time of Measurement: 12:00 PM
Easting: 3,283,466 feet



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✱ = UU Triaxial

See Plate 2 for boring location.

Plate 17

95 % DRAFT

BORING LOG
FIELD DATA

Project HOUSTON SHIP CHANNEL — Location STA. 20+000 400' RIGHT ℄ — Date 5-30-72
Drill Rig ARCO 550 HD — Inspector MINOR — Operator SMITH — Surface elev TIDE +2.5
Levee District GALVESTON — Job No. — Boring No. 72-53

SAMPLE NUMBER	DATE TAKEN 1972	STRATUM FROM	STRATUM TO	DRIVE FROM	DRIVE TO	SAMPLE FROM	SAMPLE TO	TYPE OF SAMPLER	CONTAINER	POCKET PENETROMETER VALUE	CLASSIFICATION AND REMARKS
		0.0	8.4								WATER
1	30 MAY	8.4	9.5	8.2	9.5	8.4	10.0	3" SHELBY TUBE	JAR		DARK GRAY CLAY WITH SHELL VERY SOFT
											KELLY, 1 ROD, TUBE PENETRATED
											TO 9.5
		9.5									BROWN GRAY CLAYEY SILT. PROBABLY
											SPOIL FROM CLOSE BY SPOIL MOUND
			11.0	10.0	15.0						WASHED
		11.0									GRAY CLAY WITH SHELL VERY SOFT
2	30 MAY		17.0	15.0	17.5	16.3	17.5	3" SHELBY TUBE	CONT	2.50	GRAY-TAN MOTTLED CLAY WITH
											CALCAREOUS NODULES VERY
											STIFF
				17.5	20.0						WASHED
3	"			20.0	22.5	21.3	22.5	3" SHELBY TUBE	CONT	4.50	ALSO WITH FERRUGINOUS NODULES
				22.5	25.0						WASHED
4	"			25.0	27.5	26.3	27.5	3" SHELBY TUBE	CONT	3.50	
				27.5	30.0						WASHED
5	"			30.0	32.5	31.3	32.5	3" SHELBY TUBE	CONT	2.75	FEWER FERRUGINOUS AND CALCAREOUS NODULES

WES FORM NO. 819 REV NOV 1971 PREVIOUS EDITION IS OBSOLETE

BORING LOG
FIELD DATA

Project HOUSTON SHIP CHANNEL — Location STA 20+000 400 RIGHT ℄ — Date 5-30-72
Drill Rig ARCO 550 HD — Inspector MINOR — Operator SMITH — Surface elev TIDE +2.5
Levee District GALVESTON — Job No. — Boring No. 72-53

SAMPLE NUMBER	DATE TAKEN 1972	STRATUM FROM	STRATUM TO	DRIVE FROM	DRIVE TO	SAMPLE FROM	SAMPLE TO	TYPE OF SAMPLER	CONTAINER	POCKET PENETROMETER VALUE	CLASSIFICATION AND REMARKS
				32.5	35.0						WASHED
6	30 MAY			35.0	37.5	36.3	37.5	3" SHELBY TUBE	CONT	3.75	
				37.5	40.0						WASHED
7				40.0	42.5	41.3	42.5	3" SHELBY TUBE	CONT	4.00	SANDY
				42.5	45.0						WASHED
8			45.0	45.0	47.5	~~41.3~~	47.5	3" SHELBY TUBE	CONT	4.50+	TAN-BROWN VERY SANDY CLAY HARD
9		45.0		47.5	48.0	47.5		SPLIT SPOON	JAR		SEAT SPOON
				48.0	48.5	"					14.0 BLOWS
			49.0	48.5	49.0						8.0 BLOWS
		49.0		49.0	49.5		99.5				RETAIN SAMPLE BROWN-WHITE SAND
				47.5	52.0						WASHED
10				52.0	52.5	52.0		SPLIT SPOON	JAR		SEAT SPOON - TAN-WHITE MOTTLED SAND
				52.5	53.0						21 BLOWS
				53.0	53.5						25 BLOWS
				53.5	54.0		54.0				RETAIN SAMPLE
				54.0	59.0						WASHED

95 to DRAFT

95% DRAFT

BORING LOG
FIELD DATA

Project HOUSTON SHIP CHANNEL — Location STA 20+000 400' RIGHT ℄ — Date 5-30-72
Drill Rig ARCO 550 HD — Inspector MINOR — Operator SMITH — Surface elev TIDE +2.0
Levee District GALVESTON — Job No. — Boring No. 72-53

SAMPLE NUMBER	DATE TAKEN 1972	STRATUM FROM	STRATUM TO	DRIVE FROM	DRIVE TO	SAMPLE FROM	SAMPLE TO	TYPE OF SAMPLER	CONTAINER	POCKET PENETROMETER VALUE	CLASSIFICATION AND REMARKS
11	30 MAY		52.5 55.0	54.0	56.0						WASHED
		55.0		56.0	58.0	56.0	58.0	SPLIT SPOON	JAR		GRAY THIN MOTTLED CLAY, VERY STIFF
											WASHING PROGRESS INDICATED BOTTOM
											SAND STRATUM. PUSHED WITH
											SPLIT SPOON
				58.0	60.0						WASHED
12				60.0	62.5	61.3	62.5	3" SHELBY TUBE	CONT	2.25	BECOMING SANDY
											BOTTOMED AT 62.5'
											COMPLETED AT 1455
											NO/WATER TABLE/AT —
											WEIGHT OF HAMMER 140#
											DROP DISTANCE 30"
DRIVE SAMPLER			2"	X 1 3/8"		X 24"					

WES FORM NO. 819 REV NOV 1971 PREVIOUS EDITION IS OBSOLETE

BORING LOG
FIELD DATA

Project HOUSTON SHIP CHANNEL Location STATION 154000 200' LEFT Date 30 MAY 1972
Drill Rig ARCO 550 HD Inspector LANGFORD Operator ECK Surface elev TIDE +2.3 1300
Levee District GALVESTON Job No. Boring No. 72-54

SAMPLE NUMBER	DATE TAKEN 1972	STRATUM FROM	STRATUM TO	DRIVE FROM	DRIVE TO	SAMPLE FROM	SAMPLE TO	TYPE OF SAMPLER	CONTAINER	POCKET PENETROMETER VALUE	CLASSIFICATION AND REMARKS
	30 MAY	0.0	9.5								WATER DEPTH 1520 HOURS
1		9.5		9.5	13.0	9.5	13.0	3" SHELBY TUBE	JAR		GRAY CLAY W/ SAND WITH SHELL
2				13.0	15.0	13.0	15.0		JAR		
			18.0	15.0	18.0			FISHTAIL			WASHED
3	18.3	18.0	21.0	18.0	20.0	18.8	20.0	3" SHELBY TUBE	TUBE	0.0	GRAY SANDY CLAY, VERY SOFT,
4		21.0		20.0	22.0	20.8	22.0		TUBE	3.00	BROWN, GRAY CLAY WITH SHELLS,
			25.0	22.0	25.0			FISHTAIL	-	-	VERY STIFF.
5		25.0		25.0	27.0	25.8	27.0	3" SHELBY TUBE	TUBE	2.25	BROWN, GRAY CLAY, VERY STIFF,
				27.0	30.0			FISHTAIL			WASHED
6				30.0	32.0	30.8	32.0	3" SHELBY TUBE	TUBE	1.5+	HARD
				32.0	35.0			FISHTAIL			WASHED
7				35.0	37.0	35.8	37.0	3" SHELBY TUBE	TUBE	3.50	WITH SAND POCKETS AND ORGANIC
											MATERIAL, VERY STIFF
				37.0	40.0			FISHTAIL			WASHED
8				40.0	42.0	40.8	42.0	3" SHELBY TUBE	TUBE	1.25	STIFF
				42.0	45.0			FISHTAIL			WASHED
9				45.0	47.0	45.8	47.0	3" SHELBY TUBE	TUBE	2.25	WITH SILT AND SAND SEAMS VERY STIFF

9516 DRAFT

BORING LOG
FIELD DATA

Project HOUSTON SHIP CHANNEL Location STATION 157+000 200' LEFT Date 30 MAY 1972
Drill Rig ARCO 550 HD Inspector LANGFORD Operator ECK Surface elev
Levee District Job No. Boring No. 72-54

SAMPLE NUMBER	DATE TAKEN	STRATUM FROM	STRATUM TO	DRIVE FROM	DRIVE TO	SAMPLE FROM	SAMPLE TO	TYPE OF SAMPLER	CONTAINER	POCKET PENETROMETER VALUE	CLASSIFICATION AND REMARKS
				47.0	50.0			FISHTAIL			WASHED
10				50.0	52.0	50.8	52.0	3" SHELBY TUBE	TUBE	3.25	
				52.0	55.0			FISHTAIL			WASHED
11				55.0	57.0	55.8	57.0	3" SHELBY TUBE	TUBE	4.00	WITH CALCAREOUS MATERIAL
				57.0	60.0			FISHTAIL			WASHED
12			62.0	60.0	62.0	60.8	62.0	3" SHELBY TUBE	TUBE	1.75	WITH SILT AND SAND POCKETS, STIFF
											TOTAL DEPTH 62.0'
											NO WATER TABLE/AT
											WEIGHT OF HAMMER 140#
											DROP DISTANCE 30"

95/96 DRAFT

BORING LOG
FIELD DATA

Project HOUSTON SHIP CHANNEL Location STATION 10+000 200' RIGHT Date 30 MAY 1972
Drill Rig ARCO 550 HD Inspector LANGFORD Operator ECK Surface elev TIDE +2.3 1300
Levee District GALVESTON Job No. Boring No. 72-55

SAMPLE NUMBER	DATE TAKEN 1972	STRATUM FROM	STRATUM TO	DRIVE FROM	DRIVE TO	SAMPLE FROM	SAMPLE TO	TYPE OF SAMPLER	CONTAINER	POCKET PENETROMETER VALUE	CLASSIFICATION AND REMARKS
	30 MAY	0.0	10.3	(-8)							WATER DEPTH 1930 HOURS
1		10.3		10.3	11.8	10.3	11.8	3" SHELBY TUBE	JAR	0.0	GRAY ORGANIC SANDY CLAY,
			12.0								VERY SOFT.
2		12.0	(27)	11.8	13.0	11.8	13.0		TUBE		GRAY CLAYEY SAND,
				13.0	15.0			FISHTAIL			WASHED
3				15.0	17.0	15.8	17.0	3" SHELBY TUBE	TUBE		WITH SHELL,
				17.0	20.0			FISHTAIL			WASHED
4				20.0	22.0	20.8	22.0	3" SHELBY TUBE	TUBE		
			26.0	22.0	25.0			FISHTAIL			WASHED
5		26.0 (29)		25.0	27.0	25.8	27.0	3" SHELBY TUBE	TUBE	0.0	GRAY SANDY CLAY WITH FEW
											SHELL, VERY SOFT.
				27.0	30.0		(29)	FISHTAIL			WASHED
6		↓		30.0	32.0	30.8	32.0	3" SHELBY TUBE	TUBE	0.0	
		31.8		32.0	35.0			FISHTAIL			WASHED
7				35.0	37.0	35.8	37.0	3" SHELBY TUBE	TUBE	.25	SOFT
			40.0 (39)	37.0	40.0			FISHTAIL			
8		40.0		40.0	42.0	40.8	42.0	3" SHELBY TUBE	TUBE	.25	GRAY CLAYEY SAND, SOFT

95% DRAFT

BORING LOG
FIELD DATA

Project HOUSTON SHIP CHANNEL Location STATION 107000 200' RIGHT Date 30 MAY 1972
Drill Rig ____ Inspector ____ Operator ____ Surface elev ____
Levee District ____ Job No. ____ Boring No. 72-55

SAMPLE NUMBER	DATE TAKEN	STRATUM FROM	STRATUM TO	DRIVE FROM	DRIVE TO	SAMPLE FROM	SAMPLE TO	TYPE OF SAMPLER	CONTAINER	POCKET PENETROMETER VALUE	CLASSIFICATION AND REMARKS
			45.0	42.0	45.0			FISHTAIL			WASHED
9		45.0 (-42.7)		45.0	47.0	45.8	47.0	3" SHELBY TUBE	TUBE	1.50	GRAY SILTY CLAYEY SAND, STIFF
			50.0 (-45.5)	47.0	50.0			FISHTAIL			WASHED
10		50.0	51.0 (-46)	50.0	52.0	50.8	52.0	3" SHELBY TUBE	JAR	1.00	GRAY, BROWN SANDY CLAY, STIFF
		51.0		52.0 (-49.7)	55.0			FISHTAIL			BROWN, GRAY MEDIUM SAND
				55.0	57.0	—	—	3" SHELBY TUBE			NO RECOVERY, WASHED
11			(60)	57.0	57.5	57.0	59.0	DRIVE SAMPLER	JAR		
				57.5	58.0						27 BLOWS
			—	58.0	58.5						38 BLOWS
				58.5	59.0						
				59.0	60.0			FISHTAIL			WASHED
			62.0	60.0	62.0	—	—	3" SHELBY TUBE	—	—	NO RECOVERY
DRIVE SAMPLER 2" X 1 3/4 X 24"											TOTAL DEPTH 62.0'
				NO/WATER TABLE/AT							
				WEIGHT OF HAMMER				140#			
				DROP DISTANCE				30"			

95% DRAFT

BORING LOG
FIELD DATA

Project HOUSTON SHIP CHANNEL — Location STA 3+000, 200 LEFT Q — Date 5-31-72
Drill Rig ARCO 550 HD — Inspector MINOR — Operator SMITH — Surface elev TIDE +2.5
Levee District GALVESTON — Job No. — Boring No. 72-56

SAMPLE NUMBER	DATE TAKEN 1972	STRATUM FROM	STRATUM TO	DRIVE FROM	DRIVE TO	SAMPLE FROM	SAMPLE TO	TYPE OF SAMPLER	CONTA...	POCKET PENETROMETER VALUE	CLASSIFICATION AND REMARKS
		0.0	17.0								WATER
1	31 MAY			17.0	24.0	17.0	19.5	3" SHELBY TUBE	JAR	—	BLACK CLAY WITH SAND AND
											SHELL POCKETS VERY SOFT
											KELLY, 2 RODS, TUBE PENETRATED
											TO 24.0 PENETRATION REQUIRED
											BRACING
2	31 MAY		27.0	24.0	27.5	26.3	27.5	3" SHELBY TUBE	CONT	—	ABOVE ASSEMBLY PENETRATED
											TO 25.0, PRESSURE THEN REQUIRED
		27.0									GRAY-TAN CLAY SOFT
				27.5	30.0						WASHED
3	31 MAY		-27.5	30.0	32.5	31.3	32.5	3" SHELBY TUBE	CONT	1.75	WITH CALCAREOUS, FERRUGINOUS NODULES, STIFF
				32.5	35.0						WASHED
4	31 MAY			-32.5 35.0	37.5	36.3	37.5	3" SHELBY TUBE	CONT	2.00	
			-36.5 39.0	37.5	40.0						
5	31 MAY	39.0		40.0	42.5	41.3	42.5	3" SHELBY TUBE	CONT	1.31	GRAY SLIGHTLY CLAYEY SAND WITH
											ORGANIC PARTICLES, STIFF

95% DRAFT

BORING LOG
FIELD DATA

Project HOUSTON SHIP CHANNEL — Location STA 3+000, 300' LEFT ℄ — Date 5-31-72
Drill Rig ARCO 550 HD — Inspector MINOR — Operator SMITH — Surface elev TIDE +2.5
Levee District GALVESTON -14.5' — Job No. — Boring No. 72-56

SAMPLE NUMBER	DATE TAKEN 1972	STRATUM FROM	STRATUM TO	DRIVE FROM	DRIVE TO	SAMPLE FROM	SAMPLE TO	TYPE OF SAMPLER	CONTAINER	POCKET PENETROMETER VALUE	CLASSIFICATION AND REMARKS
6	31 May			42.5 (40)	43.0	42.5	44.5	SPLIT SPOON	JAR		SEAT SPOON; LESS CLAY, MORE SILT
				43.0	43.5						5 BLOWS
				43.5	44.0						3 BLOWS
				44.0	44.5		44.5				RETAIN SAMPLE
				44.5	50.0						WASHED
7	31 May			50.0	50.5	50.0		SPLIT SPOON	JAR		SEAT SPOON, FEW THIN CLAY LAYERS
				50.5	51.0						7 BLOWS
				51.0	51.5						7 BLOWS
				51.5	52.0		52.0				RETAIN SAMPLE
				52.0	55.0						WASHED
8	31 May			55.0	55.5	55.0		SPLIT SPOON	JAR		SEAT SPOON - CLAY LAYERS ABSENT
				55.5	56.0						6 BLOWS
				56.0	56.5						7 BLOWS
				56.5	57.0		57.0				RETAIN SAMPLE
				57.0	60.0 (579)						WASHED

95 DRAFT

BORING LOG
FIELD DATA

Project HOUSTON SHIP CHANNEL Location STA 3+000, 300' LEFT ℄ Date 5-31-72
Drill Rig ARCO 550 HD Inspector MINOR Operator SMITH Surface elev TIDE +2.5
Levee District GALVESTON Job No. Boring No. 72-56

SAMPLE NUMBER	DATE TAKEN 1972	STRATUM FROM	STRATUM TO	DRIVE FROM	DRIVE TO	SAMPLE FROM	SAMPLE TO	TYPE OF SAMPLER	CONTAINE	POCKET PENETROMETER VALUE	CLASSIFICATION AND REMARKS
9	31 MAY			60.5	61.0	60.5		SPLIT SPOON	JAR		SEAT SPOON
				61.0	61.5						2 BLOWS
				61.5	62.0						4 BLOWS
			62.5	62.0	62.5		62.5				RETAIN SAMPLE
								BOTTOMED AT		625	
								COMPLETED AT		09 25	
DRIVE	SAMPLER	2"	x 1 3/4"	x 2.0'							
											NO WATER TABLE/AT
											WEIGHT OF HAMMER 140#
											DROP DISTANCE 30"

95% DRAFT

375'

BORING LOG
FIELD DATA

Project HOUSTON SHIP CHANNEL — Location STA 01000 400' RIGHT ℄ — Date 5-31-72
Drill Rig ARCO 550 HD — Inspector MINOR — Operator SMITH — Surface elev TIDE +2.5
Levee District GALVESTON — 9.5 MLT — Job No. — Boring No. 72-94

SAMPLE NUMBER	DATE TAKEN 1972	STRATUM FROM	STRATUM TO	DRIVE FROM	DRIVE TO	SAMPLE FROM	SAMPLE TO	TYPE OF SAMPLER	CONTAINER	POCKET PENETROMETER VALUE	CLASSIFICATION AND REMARKS
	31 MAY	0.0	12.0								
1	"	12.0	13.5	12.0	15.7	12.0	13.5	3" SHELBY TUBE	JAR		DARK GRAY CLAY VERY SOFT
2	"	13.5				13.5	14.5	3" SHELBY TUBE	CAN	0.00	GRAY TAN MOTTLED CLAY, VERY
											SOFT KELLY, ROD, TUBE
											PENETRATED TO 15.7
3	"		16.0	15.7	18.0	16.8	18.0	3" SHELBY TUBE	CAN	0.00	
		-13.5 16.0									GRAY BROWN SILTY SAND, VERY SOFT
			19.0	18.0	20.0						WASHED
4		19.0		20.0	22.5	21.3	22.5	3" SHELBY TUBE	CAN	0.00	GRAY CLAYEY SILTY SAND VERY SOFT
				22.5	25.0						- WASHED
				25.0	27.5						NO RECOVERY
5			-26.5 29.0	-25 27.5	30.0	28.8	30.0	3" SHELBY TUBE	CAN	1.00	GRAY GREEN MOTTLED CLAY, CALCAREOUS
											NODULES, STIFF
				30.0	-30.5 33.0	—					WASHED
6				33.0	35.5	34.3	35.5	3" SHELBY TUBE	CAN	3.50	VERY STIFF
				35.5	38.0						WASHED
7				38.0	40.5	39.3	40.5	3" SHELBY TUBE	CAN	3.75	

95% DRAFT

95% DRAFT

BORING LOG
FIELD DATA

04+44 Bay = 04+00 Bayou

Project HOUSTON SHIP CHANNEL — Location STA 04+000, 400' RIGHT ℄ — Date 5-31-72
Drill Rig ARCO 550 HD — Inspector MINOR — Operator SMITH — Surface elev TIDE + 2.5
Levee District GALVESTON -10 — Job No. — Boring No. 72-94

SAMPLE NUMBER	DATE TAKEN 1972	STRATUM FROM	STRATUM TO	DRIVE FROM	DRIVE TO	SAMPLE FROM	SAMPLE TO	TYPE OF SAMPLER	CONTAINER	POCKET PENETROMETER VALUE	CLASSIFICATION AND REMARKS
				40.5	43.0						WASHED
8	31 MAY			43.0	45.5	43.0	44.1	3" SHELBY TUBE	CONT	4.00	SANDY, INCREASED CALCAREOUS
											NODULES, WITH SILT POCKETS
				45.5	48.0						WASHED
9				48.0	50.5	49.3	50.5	3" SHELBY TUBE	CONT	4.25	BECOMING PREDOMINATELY BROWN
				50.5	53.0						WASHED
10				53.0	55.5	54.3	55.5	3" SHELBY TUBE	CONT	4.50+	WITH INDURATED PARTS (SILT STONE)
				55.5	60.0						WASHED
11				60.0	62.5	61.3	62.5	3" SHELBY TUBE	CONT	3.50	TAN WITH FERRUGINOUS NODULES
								BOTTOMED AT 62.5			
								COMPLETED AT 1245			
											NO WATER TABLE AT
											WEIGHT OF HAMMER 140#
											DROP DISTANCE 30"

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BORING LOG
FIELD DATA

Project HOUSTON SHIP CHANNEL Location STA 5+400 400' LEFT ℄ Date 5-31-72
Drill Rig ARCO 550 Inspector MINOR Operator SMITH Surface elev TIDE +2.5
Levee District GALVESTON Job No. Boring No. 72-95

SAMPLE NUMBER	DATE TAKEN	STRATUM FROM	STRATUM TO	DRIVE FROM	DRIVE TO	SAMPLE FROM	SAMPLE TO	TYPE OF SAMPLER	CONTAINER	POCKET PENETROMETER VALUE	CLASSIFICATION AND REMARKS
		0.0	11.8								WATER
1		11.8		11.8	16.6	11.8	14.3	3" SHELBY TUBE	JAR		DARK GRAY CLAYEY, SILTY SAND, VERY SOFT
											WEIGHT 1 ROD, KELLY AND TUBE
											PENETRATED TO 11.8
				16.6	18.0						WASHED
2				18.0	20.5	19.3	20.5	3" SHELBY TUBE	CONT	0.00	WITH SHELL AND SAND LAYERS
			19.6								PENETRATION PRESSURE REQUIRED AT 19.5
			22.0	20.5	23.5						WASHED
3		22.0		23.5	26.0	24.8	26.0	3" SHELBY TUBE	CONT	0.50	GRAY VERY SANDY, SILTY CLAY WITH
											SHELL, SOFT
				26.0	28.0						WASHED
4				28.0	30.5	29.3	30.5	3" SHELBY TUBE	CONT	0.00	VERY SOFT
				30.5	33.0			FISHTAIL			WASHED
5				33.0	35.0	33.8	35.0	3" SHELBY TUBE	TUBE	0.0	
				35.0	39.0			FISHTAIL			WASHED
6				39.0	41.0	39.8	41.0	3" SHELBY TUBE	TUBE	.75	WITH ORGANIC MATERIAL, MEDIUM
			46.0	41.0	45.0			FISHTAIL			WASHED

95 to DRAFT

95 DRAFT

BORING LOG
FIELD DATA

Project HOUSTON SHIP CHANNEL Location STATION 54+00 400' LEFT ℄ Date 31 MAY 1972
Drill Rig ____ Inspector ____ Operator ____ Surface elev ____
Levee District ____ Job No. ____ Boring No. 72-95

SAMPLE NUMBER	DATE TAKEN	STRATUM FROM	STRATUM TO	DRIVE FROM	DRIVE TO	SAMPLE FROM	SAMPLE TO	TYPE OF SAMPLER	CONTAINER	POCKET PENETROMETER VALUE	CLASSIFICATION AND REMARKS
7		46.0		45.0	47.0	45.8	47.0	3" SHELBY TUBE	TUBE	0.0	GRAY CLAYEY SAND.
				47.0	50.0			FISHTAIL			WASHED
8				50.0	52.0	50.8	52.0	3" SHELBY TUBE	TUBE	0.0	
				52.0	55.0			FISHTAIL			WASHED
				55.0	57.0	–	–	3" SHELBY TUBE	–	–	NO RECOVERY
9				57.0	57.5	57.0	59.0	DRIVE SAMPLER	JAR		
				57.5	58.0						6 BLOWS
				58.0	58.5						11 BLOWS
				58.5	59.0						
				59.0	60.0			FISHTAIL			WASHED
			62.0	60.0	62.0	–	–	3" SHELBY TUBE	–		NO RECOVERY
											TOTAL DEPTH 62.0'
											NO WATER TABLE AT ____
											WEIGHT OF HAMMER 140#
											DROP DISTANCE 30"
DRIVE SAMPLER		2"		x 1 3/8"		x 24"					

WES FORM NO. 819 REV NOV 1971 PREVIOUS EDITION IS OBSOLETE

Sheet 2 of 2 Sheets

CELL 11 BORING LOGS

95% DRAFT

CELL 11 BORING LOGS

95% DRAFT

LOG OF BORING ECP-1030

PROJECT: Houston Ship Channel Expansion - Cell M11
PROJECT NO.: HG1910092.1.1
LOCATION: N: 13795541.07; E: 3261318.59
DEPTH OF WATER:7.25 FT
COMPLETION DEPTH: 50 FT
OFFSET: N/A
SURFACE ELEVATION: -7.05 FT
DATE: 12/27/2019

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: N/A TO N/A FT
WET ROTARY: 0 TO 50 FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
▽	0								
		Very soft, gray, FAT CLAY WITH SAND (CH)				106			
-10	5	-w/ shells at 2'-4'		77.7		89	74	31	43
		-w/ shells at 6'-8'			80	41			
-15	10	Very soft, gray, SANDY LEAN CLAY (CL) -w/ shells at 10'-12'		62.1		37	36	20	16
-20	15	Stiff, reddish brown, LEAN CLAY (CL)		99.0	99	27	40	26	14
-25	20	Very stiff, reddish brown, FAT CLAY (CH)		97.5		33	88	34	54
-30	25				89	35			
-35	30	Very soft, light gray, SILTY CLAY (CL-ML) -w/ shells at 28'-30'		95.0		29	27	20	7
-40	35	Stiff, light gray, FAT CLAY (CH)		99.5	87	35	53	27	26
-45	40	-w/ sand seams at 38'-40'		94.7		38	82	33	49
-50	45	-w/ roots at 43'-45'			83	40			
-55	50					21			

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.2 0.4 0.6 0.8 1.0

95% DRAFT

Remarks: Mudline was encountered at 7.25' below the water level during drilling operations.

Drilled By: Gary Logged By: PD

HVJ Associates, Inc.

PLATE A-112

LOG OF BORING ECP-1031

PROJECT: Houston Ship Channel Expansion - Cell M11
PROJECT NO.: HG1910092.1.1
LOCATION: N: 13795829.6; E: 3261767.88
DEPTH OF WATER:7.33 FT
COMPLETION DEPTH: 50 FT
OFFSET: N/A
SURFACE ELEVATION: -7.3 FT
DATE: 12/30/2019

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: N/A TO N/A FT
WET ROTARY: 0 TO 50 FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Very soft to soft, gray, FAT CLAY (CH)		90.5		108	90	30	60
-10	5	-w/ shells at 2'-4'				48			
-15	10	Very soft, gray, SANDY LEAN CLAY (CL)	WOP	63.5	83	42 75	43	26	17
		-w/ shells at 10'-12'		63.3		25	35	21	14
-20	15	Soft, gray, FAT CLAY (CH)		99.4		45	83	33	50
-25	20	Medium dense,gray and brown, CLAYEY SAND (SC) -w/ shells at 16'-18'	16		100	25 25	48	31	17
-30	25	Stiff, reddish brown, FAT CLAY (CH)		97.4		35	72	31	41
-35	30	Stiff to very stiff, brown, SANDY LEAN CLAY (CL)			101	24	43	28	15
-40	35	Medium dense, brown, CLAYEY SAND (SC)	26	23.8		24	33	23	10
-45	40	Firm to stiff, brown and gray, FAT CLAY (CH)			79	45			
-50	45			98.1		43	94	33	61
-55	50				90	29			

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.2 0.4 0.6 0.8 1.0

95% DRAFT

Remarks: Mudline was encountered at 7.33' below the water level during drilling operations.

Drilled By: Gary Logged By: PD

HVJ Associates, Inc.

PLATE A-113

LOG OF BORING ECP-1032

PROJECT: Houston Ship Channel Expansion - Cell M11
PROJECT NO.: HG1910092.1.1
LOCATION: N: 13796737.53; E: 3261427.26
DEPTH OF WATER:6.83 FT
COMPLETION DEPTH: 50 FT
OFFSET: N/A
SURFACE ELEVATION: -6.99 FT
DATE: 12/30/2019

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: N/A TO N/A FT
WET ROTARY: 0 TO 50 FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
0	0								
-10	5	Very soft, gray, SANDY FAT CLAY (CH) -w/ shells at 2'-4'		62.9	69	105 57	50	23	27
-15	10	Very soft, gray, LEAN CLAY WITH SAND (CL)			92	42 41 42			
-20	15		WOP	76.0	73	44 46	44	23	21
-25	20	Stiff, reddish brown, FAT CLAY (CH) Stiff to very stiff, reddish brown, LEAN CLAY (CL)		97.1 97.5		31 29	56 40	28 18	28 22
-30	25				87	35			
-35	30	Stiff to very stiff, reddish brown, FAT CLAY (CH)				34	73	29	44
-40	35	-w/ sand layer at 33'-35'	21	90.0		36			
-45	40	-w/ shells at 38'-40'		97.2	73	52	69	28	41
-50	45			98.4		41	84	25	59
-55	50					41			

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.2 0.4 0.6 0.8 1.0

95% DRAFT

Remarks: Mudline was encountered at 6.83' below the water level during drilling operations.

Drilled By: Gary Logged By: PD

HVJ Associates, Inc.

LOG OF BORING ECP-1033

PROJECT: Houston Ship Channel Expansion - Cell M11
PROJECT NO.: HG1910092.1.1
LOCATION: N: 13798420.14; E: 3260785.04
DEPTH OF WATER:7 FT
COMPLETION DEPTH: 50 FT
OFFSET: N/A
SURFACE ELEVATION: -7.2 FT
DATE: 12/21/2019

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: N/A TO N/A FT
WET ROTARY: 0 TO 50 FT

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
▽	0										
-10	5			Very soft, gray and brown, FAT CLAY (CH)	WOH	94.7		120	92	34	58
-15	10			Very loose, gray, CLAYEY SAND (SC) -w/ shells at 4'-12'	WOH	47.4		41	34	19	15
-20	15			Very soft, gray, SANDY LEAN CLAY (CL) -w/ shells at 12'-18'	WOH	59.6		41	39	16	23
-25	20				WOH	58.3		42	40	18	22
-30	25						65	39			
-35	30				1			59			
-40	35			Soft to firm, gray, FAT CLAT (CH) -w/ ferrous stains at 33'-35'	5	92.2		108	130	34	96
-45	40			Medium dense to dense, gray, SILTY SAND (SM) -w/ ferrous stains at 38'-40'	23						
-50	45				16	14.8		21			
-55	50				31			18			

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.2 0.4 0.6 0.8 1.0

95% DRAFT

Remarks: Mudline was encountered at 7.0' below the water level during drilling operations.

Drilled By: Gary Logged By: Matthew

HVJ Associates, Inc.

PLATE A-115

LOG OF BORING ECP-1034

PROJECT: Houston Ship Channel Expansion - Cell M11
PROJECT NO.: HG1910092.1.1
LOCATION: N: 13799316.12; E: 3260393.39
DEPTH OF WATER:7 FT
COMPLETION DEPTH: 50 FT
OFFSET: N/A
SURFACE ELEVATION: -6.57 FT
DATE: 12/19/2019

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: N/A TO N/A FT
WET ROTARY: 0 TO 50 FT

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
▽	0										
				Very soft, gray, FAT CLAY WITH SAND (CH)				120			
-10	5				WOH	79.8		86	87	26	61
				Very loose, gray, CLAYEY SAND (SC) -w/ shells at 6'-12'		42.0		33	29	20	9
-15	10				WOH						
				Very soft to firm, gray, SANDY LEAN CLAY (CL)	WOH	50.3		39	42	15	27
-20	15					51.2	79	32	34	17	17
					WOH			35			
-25	20					59.1		36	38	16	22
-30	25				WOH	59.5		41	43	17	26
-35	30						98	37	32	23	9
				Medium dense to dense, brown, CLAYEY SAND (SC)		43.6		33	30	16	14
-40	35										
-45	40				16	27.6		28			
				Dense, brown, SILTY CLAYEY SAND (SC-SM) -w/ ferrous stains at 43'-45'	32	25.4		19	24	20	4
-50	45										
-55	50				34			18			

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.2 0.4 0.6 0.8 1.0

95% DRAFT

Remarks: Mudline was encountered at 7.0' below the water level during drilling operations.

Drilled By: Gary Logged By: Matthew

HVJ Associates, Inc.

PLATE A-116

LOG OF BORING ECP-1035

PROJECT: Houston Ship Channel Expansion - Cell M11
PROJECT NO.: HG1910092.1.1
LOCATION: N: 13800281.83; E: 3260081.66
DEPTH OF WATER:7 FT
COMPLETION DEPTH: 55 FT
OFFSET: N/A
SURFACE ELEVATION: -7.4 FT
DATE: 12/18/2019

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: N/A TO N/A FT
WET ROTARY: 0 TO 55 FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Very soft, gray and brown, FAT CLAY (CH)		85.6		92	87	30	57
-10	5	Very soft, gray and brown, SANDY LEAN CLAY(CL)	WOH			49	43	23	20
-15	10	Very loose, gray and brown, CLAYEY SAND (SC) -w/ shells at 8'-10' -w/ shells at 12'-18'	WOH	38.8		29	30	20	10
-20	15		WOH	46.7		37	33	18	15
-25	20	Very soft to soft, gray, SANDY LEAN CLAY (CL)	WOH	56.9		36			
-30	25				98	41	38	18	20
-35	30	Very loose, gray, CLAYEY SAND (SC)	3	40.9		28			
-40	35	Stiff, light gray to brown, SANDY LEAN CLAY (CL)	10			30	32	17	15
-45	40		14	50.3		34			
-50	45			50.5		22	33	17	16
-55	50	Medium dense, tan, CLAYEY SAND (SC)		45.4		20	32	16	16
-60	55		12			20			
						22			

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.2 0.4 0.6 0.8 1.0

95% DRAFT

Remarks: Mudline was encountered at 7.0' below the water level during drilling operations.

Drilled By: Gary Logged By: Matthew

HVJ Associates, Inc.

PLATE A-117

LOG OF BORING ECP-1036

PROJECT: Houston Ship Channel Expansion - Cell M11
PROJECT NO.: HG1910092.1.1
LOCATION: N: 13801095.48; E: 3259738.99
DEPTH OF WATER:7 FT
COMPLETION DEPTH: 55 FT
OFFSET: N/A
SURFACE ELEVATION: -5.97 FT
DATE: 12/13/2019

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: N/A TO N/A FT
WET ROTARY: 0 TO 55 FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
▽	0								
		Very soft, gray and brown, SANDY LEAN CLAY (CL)	WOH	55.5		60	39	25	14
-10	5		WOH			47			
		Very loose to loose, gray, CLAYEY SAND (SC)	6						
-15	10	-w/ shells at 8'-12'	3	26.5		25			
			2						
-20	15		3			49			
			4	38.6		32	28	17	11
-25	20		2			23			
			2						
-30	25	Medium dense, gray, SAND (SP)	18			22			
-35	30	Firm to stiff, gray and reddish brown, FAT CLAY (CH)	13	91.8		34	70	33	37
-40	35				94	29	68	28	40
-45	40					28			
-50	45				101	26			
-55	50	Gray Fat Clay from 48'-55'		100		40	79	31	48
-60	55								

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.2 0.4 0.6 0.8 1.0

95% DRAFT

Remarks: Mudline was encountered at 7.0' below the water level during drilling operations.

Drilled By: Gary Logged By: Matthew

HVJ Associates, Inc.

LOG OF BORING ECP-1037

PROJECT: Houston Ship Channel Expansion - Cell M11
PROJECT NO.: HG1910092.1.1
LOCATION: N: 13801903.35; E: 3259439.77
DEPTH OF WATER:6.2 FT
COMPLETION DEPTH: 50 FT
OFFSET: N/A
SURFACE ELEVATION: -5.85 FT
DATE: 12/9/2019

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: N/A TO N/A FT
WET ROTARY: 0 TO 50 FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
0	0								
-10	5	Very loose to loose, gray, SILTY CLAYEY SAND (SC-SM) -w/ shells at 2'-8'	5	13.6		35			
			2			27	26	22	4
			WOH						
-15	10	Very loose to loose, gray, CLAYEY SAND (SC)	WOH	35.3		29	26	16	10
			1						
-20	15	Very loose to loose, gray, SILTY CLAY SAND (SC-SM) -w/ shells and silty clayey sand at 14'-16'	4						
			2			24	23	19	4
			5						
-25	20	Medium dense, gray, SILTY SAND (SM)	14	14.2		25			
-30	25	-w/ shells at 23'-25'	15			19			
-35	30	-w/ shells at 28'-30'	24			20			
-40	35	Firm to stiff, gray, FAT CLAY (CH) -w/ ferrous stains at 33'-35'		99.4		41	79	33	46
-45	40	-w/ shells and calcareous nodules at 38'-40'			102	20	55	25	30
-50	45								
-55	50	-w/ ferrous stains at 48'-50'			89	33			

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.2 0.4 0.6 0.8 1.0

95% DRAFT

Remarks: Mudline was encountered at 6.2' below the water level during drilling operations.

Drilled By: Gary Logged By: Majid

HVJ Associates, Inc.

PLATE A-119

LOG OF BORING ECP-1038

PROJECT: Houston Ship Channel Expansion - Cell M11
PROJECT NO.: HG1910092.1.1
LOCATION: N: 13798646.03; E: 3259632.81
DEPTH OF WATER:6 FT
COMPLETION DEPTH: 50 FT
OFFSET: N/A
SURFACE ELEVATION: -5.87 FT
DATE: 12/21/2019

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: N/A TO N/A FT
WET ROTARY: 0 TO 50 FT

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
0	0										
				Very soft, gray and reddish brown, FAT CLAY (CH)	WOH	92.1		114	78	30	48
-10	5				WOH						
				Very loose, gray, SILTY CLAYEY SAND (SC-SM)	WOH	37.6		36	27	23	4
-15	10							40			
					WOH						
				Very loose, gray, CLAYEY SAND (SC) -w/ shells at 12'-14'	WOH	39.8		30	33	19	14
-20	15			Very soft, gray, SANDY LEAN CLAY (CL)			98	33			
					WOH			44			
-25	20			-w/ shells at 18'-20'	WOH	51.2		36	36	19	17
-30	25				WOH			38			
-35	30			Very loose, gray, CLAYEY SAND (SC) -w/ shells at 28'-30'	1	42.9		32	34	19	15
-40	35			Dense, gray, SILTY SAND (SM)	41			21			
-45	40			-w/ shells at 38'-40'	43	19.6		24			
-50	45				32						
-55	50				37			25			

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.2 0.4 0.6 0.8 1.0

95% DRAFT

Remarks: Mudline was encountered at 6.0' below the water level during drilling operations.

Drilled By: Gary Logged By: Matthew

HVJ Associates, Inc.

PLATE A-120

LOG OF BORING ECP-1039

PROJECT: Houston Ship Channel Expansion - Cell M11
PROJECT NO.: HG1910092.1.1
LOCATION: N: 13800754.04; E: 3258991.5
DEPTH OF WATER:7 FT
COMPLETION DEPTH: 50 FT
OFFSET: N/A
SURFACE ELEVATION: -6.32 FT
DATE: 12/14/2019

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: N/A TO N/A FT
WET ROTARY: 0 TO 50 FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
0	0	Very soft, gray and brown, FAT CLAY (CH)		93.6		98	70	27	43
-10	5		WOH						
		Very loose, gray, SILTY CLAYEY SAND (SC-SM) -w/ shells at 6'-8'	1						
			WOH	32.9		27	26	22	4
-15	10	Very loose to loose, gray, CLAYEY SAND (SC) -w/ shells at 10'-14'							
			WOH			35			
-20	15								
			WOH	44.0		32	34	16	18
-25	20					28			
-30	25		6			29			
-35	30	-w/ shells at 28'-30'	4	12.6		19			
-40	35		4						
-45	40	Stiff to very stiff, gray and reddish brown, FAT CLAY (CH) -w/ shells at 38'-40'		98.9		29	60	28	32
-50	45					34			
-55	50			98.6	94	29	51	27	24

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.2 0.4 0.6 0.8 1.0

95% DRAFT

Remarks: Mudline was encountered at 7.0' below the water level during drilling operations.

Drilled By: Gary Logged By: Matthew

HVJ Associates, Inc.

PLATE A-121

LOG OF BORING ECP-1040

PROJECT: Houston Ship Channel Expansion - Cell M11
PROJECT NO.: HG1910092.1.1
LOCATION: N: 13800138.77; E: 3257011.28
DEPTH OF WATER:4 FT
COMPLETION DEPTH: 60 FT
OFFSET: N/A
SURFACE ELEVATION: -3.49 FT
DATE: 12/19/2019

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: N/A TO N/A FT
WET ROTARY: 0 TO 60 FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0								
-5		Very soft, gray and reddish brown, FAT CLAY (CH)				113			
	5		WOH	99.5		114	98	30	68
-10			WOH			101			
	10								
-15		Very soft to stiff, gray, SANDY LEAN CLAY (CL) -w/ shells at 10'-12'	WOH	52.4		40	46	17	29
	15		WOH						
-20		-w/ shells at 16'-18'	WOH	50.9		32	36	15	21
	20		9						
-25			11			30			
	25		5	56.0		34	32	17	15
-30			9						
	30								
-35		Soft, gray, FAT CLAY WITH SAND (CH)	3	79.7		51	77	24	53
	35								
-40		Firm to very stiff, gray, FAT CLAY (CH)	11						
	40								
-45			6			72			
	45								
-50			10			56			
	50								
-55		-w/ sand seams at 53'-55'	17	92.4		79	104	32	72
	55								
-60									
	60	Dense, gray, CLAYEY SAND (SC)	37			64			

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.2 0.4 0.6 0.8 1.0

95% DRAFT

Remarks: Mudline was encountered at 4.0' below the water level during drilling operations.

Drilled By: Gary Logged By: Matthew

HVJ Associates, Inc.

PLATE A-122

LOG OF BORING M789-16-1

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13805398; E: 3255299
STATION : 14+99
RANGE : 3.2 FT
SURFACE ELEVATION: 3.2 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 60 FT
DATE: 2/2/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 2 FT
WET ROTARY: 2 TO 60 FT

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	40										
-40	45			Firm, gray, FAT CLAY WITH SAND (CH)	7	84.9		95	117	32	85
-45	50			Medium dense, gray, POORLY GRADED SAND WITH CLAY (SP-SC)	22			22			
-50	55			Dense, brown, POORLY GRADED SAND WITH CLAY (SP-SC)	31	11.0		21			
-55	60			-brown and gray 58'-60' -w/ shells and clay inclusions 58'-60'	34			18			

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

95% DRAFT

COH HG-16-10009.GPJ 3/4/16

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: ---
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE

LOG OF BORING M789-16-2

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13805584; E: 3256797
STATION : 30+08
RANGE : 21.5 FT
SURFACE ELEVATION: 3.6 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 55 FT
DATE: 2/3/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 2 FT
WET ROTARY: 2 TO 55 FT

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0										
				Firm, reddish brown and gray, FAT CLAY (CH) (Levee Fill)			99	26	52	21	31
				-w/ sand and calcareous nodules 0'-2'							
				Firm, gray and brownish yellow, FAT CLAY (CH) (Levee Fill)				31			
0	5			-w/ sand pockets 2'-4'							
				Soft to firm, reddish brown and gray, FAT CLAY (CH) (Levee Fill)		98.9	95	31	57	24	33
				-w/ sand seams and shells 6'-8'				25			
-5	10			-w/ sand and calcareous nodules 8'-10'							
				Loose, brown, CLAYEY SAND (SC)							
-10	15							25			
				Loose, gray, CLAYEY SAND (SC)							
-15	20			-w/ shells 18'-30'	9			22			
-20	25				6	31.6		22			
-25	30				4	17.0		26	27	18	9
-30	35				8			43			
				Very soft, gray, FAT CLAY WITH SAND (CH)							
-35	40					82.8		72	67	28	39

95% DRAFT

COH HG-16-10009.GPJ 3/4/16

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: ---
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE

LOG OF BORING M789-16-2

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13805584; E: 3256797
STATION : 30+08
RANGE : 21.5 FT
SURFACE ELEVATION: 3.6 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 55 FT
DATE: 2/3/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 2 FT
WET ROTARY: 2 TO 55 FT

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, TSF
	40			Soft, gray, FAT CLAY WITH SAND (CH)								
-40	45							98				
				Very stiff, gray, FAT CLAY WITH SAND (CH)								
-45	50							22				1.17
				Dense, brown, POORLY GRADED SAND (SP) -w/ shells								
-50	55				46	3.6		21				

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

95% DRAFT

COH HG-16-10009.GPJ 3/4/16

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: ---
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE

LOG OF BORING M789-16-3

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13805226; E: 3258082
STATION : 45+18
RANGE : 88.1 FT
SURFACE ELEVATION: 2.2 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 65 FT
DATE: 2/4/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 2 FT
WET ROTARY: 2 TO 65 FT

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0			Brown, SILTY CLAYEY SAND (SC-SM) (Levee Fill)				23			
0				Very soft to soft, reddish brown, FAT CLAY (CH) (Levee Fill)		87.1		36	54	23	31
	5			-w/ sand pockets and rocks 4'-6'							
-5				Very Soft, Gray and brown, SANDY FAT CLAY (CH) (Levee Fill)		61.2		28			
	10			Very soft, gray, FAT CLAY WITH SAND (CH) (Levee Fill)	0	81.1		62	98	38	60
-10				Loose, gray, SILTY CLAYEY SAND (SC-SM)							
	15			-w/ shells 13'-25'		31.2		26			
-15											
	20				4	43.6		26	22	17	5
-20											
	25				9			22			
-25				Firm, gray, SANDY FAT CLAY (CH)							
	30				6	65.8		36	51	21	30
-30											
	35			-w/ shells 33'-35'	4			52			
-35											
	40			-w/ wood 38'-40'	5			91	128	37	91

95% DRAFT

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: ---
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE

HVJ Associates, Inc.

PLATE A-3

COH HG-16-10009.GPJ 3/4/16

LOG OF BORING M789-16-3

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13805226; E: 3258082
STATION : 45+18
RANGE : 88.1 FT
SURFACE ELEVATION: 2.2 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 65 FT
DATE: 2/4/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 2 FT
WET ROTARY: 2 TO 65 FT

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	40			Medium dense, gray, CLAYEY SAND (SC)							
-40					21	13.0		22			
	45										
-45					22			24			
	50			Loose, light brown, CLAYEY SAND (SC)							
-50					7	21.0		25			
	55			Dense, gray, CLAYEY SAND (SC)							
-55					38			22			
	60										
-60				-w/ shells 63'-65'							
	65				32	12.0		15			

95% DRAFT

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: ---
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE

HVJ Associates, Inc.

PLATE A-3

COH HG-16-10009.GPJ 3/4/16

LOG OF BORING M789-16-4

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13803862; E: 3258666
STATION : 60+01
RANGE : 26.8 FT
SURFACE ELEVATION: 2.3 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 50 FT
DATE: 2/4/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 8 FT
WET ROTARY: 8 TO 50 FT

UNDRAINED SHEAR STRENGTH, TSF
HAND PENETROMETER
UNCONFINED COMPRESSION
UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
TORVANE
0.1 0.2 0.3 0.4 0.5

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Very soft to firm, reddish brown and gray, LEAN CLAY WITH SAND (CL) (Levee Fill)		77.3	100	23	38	14	24
0		-w/ calcareous nodules and sand seams 0'-2'				23			
	5	-w/ sand pockets 2'-4'							
		-w/ rocks 4'-6'							
		-w/ sand seams 6'-8'							
-5 ▽						23	39	16	23
	10					29			
		Loose, gray, SILTY SAND (SM) (Levee Fill)							
-10		-w/ shells 13'-20'	5			29			
	15								
-15									
	20			30.1		24	23	22	1
		Very soft to soft, gray, SANDY LEAN CLAY (CL)							
-20									
	25				99	29	29	18	11
-25									
	30			79.9		39	41	17	24
		Very soft to soft, gray to dark gray, FAT CLAY (CH)							
-30									
	35			95.9		53	70	24	46
-35									
		-w/ wood 38'-40'							
	40					86			

95% DRAFT

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 8.0 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE

HVJ Associates, Inc.

PLATE A-4

COH HG-16-10009.GPJ 3/4/16

LOG OF BORING M789-16-4

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13803862; E: 3258666
STATION : 60+01
RANGE : 26.8 FT
SURFACE ELEVATION: 2.3 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 50 FT
DATE: 2/4/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 8 FT
WET ROTARY: 8 TO 50 FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	40	Very soft to soft, gray to dark gray, FAT CLAY (CH) [Continued...]							
-40		Very stiff, gray to dark gray, LEAN CLAY (CL)	20			25	44	16	28
	45								
-45		Dense, gray, CLAYEY SAND (SC)	36	17.1		19			
	50								

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

95% DRAFT

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 8.0 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE

HVJ Associates, Inc.

PLATE A-4

COH HG-16-10009.GPJ 3/4/16

LOG OF BORING M789-16-5

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13802948; E: 3258589
STATION : 70+00
RANGE : 27.3 FT
SURFACE ELEVATION: 4.4 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 55 FT
DATE: 2/5/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 15 FT
WET ROTARY: 15 TO 55 FT

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Soft to firm, reddish brown and gray, FAT CLAY WITH SAND (CH) (Levee Fill)				39			
				83.0			63	23	40
0	5	-w/ sand pockets and rocks 4'-6'				30			
		-w/ sand layers 6'-8'			90	34	57	25	32
		Very soft, reddish brown and gray, FAT CLAY WITH SAND (CH) (Levee Fill)							
-5	10								
		Firm, reddish brown and gray, FAT CLAY WITH SAND (CH) (Levee Fill)							
-10	15		5	70.9		28	54	21	33
		Very loose, gray, CLAYEY SAND (SC)							
		-w/ shells 18'-30'							
-15	20		2	25.3		26			
				39.6		24	26	14	12
-20	25								
						25			
-25	30								
		Medium dense, brown, POORLY GRADED SAND WITH CLAY (SP-SC)	17	6.3		19			
-30	35								
			13			18			
-35	40								

95% DRAFT

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: ---
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE

HVJ Associates, Inc.

PLATE A-5

COH HG-16-10009.GPJ 3/4/16

LOG OF BORING M789-16-5

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13802948; E: 3258589
STATION : 70+00
RANGE : 27.3 FT
SURFACE ELEVATION: 4.4 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 55 FT
DATE: 2/5/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 15 FT
WET ROTARY: 15 TO 55 FT

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	40										
-40	45			Stiff to very stiff, brown, SILTY CLAY WITH SAND (CL-ML) -w/ sand layers 43'-45'	20	83.7	84	36	26	21	5
-45	50			Firm, gray, FAT CLAY WITH SAND (CH) -w/ possible wood 48'-50'					92	32	60
-50	55			Very stiff, brown, SANDY LEAN CLAY (CL) -w/ sand 53'-54'	18	53.4		26	48	18	30

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

0.63

95% DRAFT

COH HG-16-10009.GPJ 3/4/16

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: ---
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE

LOG OF BORING M789-16-6

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13802021; E: 3258216
STATION : 79+98
RANGE : 45.4 FT
SURFACE ELEVATION: 5.3 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 45 FT
DATE: 2/8/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 6 FT
WET ROTARY: 6 TO 45 FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0								
5		Soft, reddish brown and gray, SANDY LEAN CLAY (CL) (Levee Fill) -w/ roots and sand seams				23			
				61.9	101	24	40	15	25
0	5	Firm, brownish yellow and gray, SANDY LEAN CLAY (CL) (Levee Fill) -w/ sand pockets							
		Very soft, brownish yellow and gray, SANDY LEAN CLAY (CL) (Levee Fill) -w/ sand pockets				24			
	10	Soft, brownish yellow and gray, SANDY LEAN CLAY (CL) (Levee Fill) -w/ sand pockets		60.7		23	41	16	25
-5						26			
	15	Firm, reddish brown and gray, LEAN CLAY WITH SAND (CL) (Levee Fill) -w/ sand pockets		74.8		24	43	18	25
-10									
	20	Medium dense, gray, CLAYEY SAND (SC) (Levee Fill) -w/ shells	11	38.0		25			
-15		Very soft to soft, gray, SANDY LEAN CLAY (CL)							
	25	-w/ shells 23'-25'		47.0		27	29	17	12
-20									
	30			53.6		29	36	16	20
-25		Loose, gray, CLAYEY SAND (SC) - w/ clay layer 38'-40'							
	35		9	12.6		24			
-30									
	40		6			25			

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

95% DRAFT

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 6.0 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE

HVJ Associates, Inc.

PLATE A-6

COH HG-16-10009.GPJ 3/4/16

LOG OF BORING M789-16-6

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13802021; E: 3258216
STATION : 79+98
RANGE : 45.4 FT
SURFACE ELEVATION: 5.3 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 45 FT
DATE: 2/8/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 6 FT
WET ROTARY: 6 TO 45 FT

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, TSF
-35	40											
	45			Very dense, brown, CLAYEY SAND (SC) -w/ gravel and clay layer	90	36.5		23				

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

95% DRAFT

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 6.0 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE

HVJ Associates, Inc.

PLATE A-6

COH HG-16-10009.GPJ 3/4/16

LOG OF BORING M789-16-7

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13801661; E: 3257343
STATION : 89+97
RANGE : 28.5 FT
SURFACE ELEVATION: 3.9 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 45 FT
DATE: 2/8/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 8 FT
WET ROTARY: 8 TO 45 FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Firm, reddish brown and gray, SANDY LEAN CLAY (CL) (Levee Fill) -w/ sand seams				21			
0	5			66.1	104	25	39	17	22
		Soft to firm, brown and gray, LEAN CLAY WITH SAND (CL) (Levee Fill) -w/ sand seams							
				71.5		26	46	19	27
-5	10	Soft to firm, reddish brown and gray, LEAN CLAY WITH SAND (CL) (Levee Fill) -w/ sand seams			96	30			
				74.6		32	48	19	29
-10	15								
-15	20	Loose, gray, SANDY SILT (ML) (Levee Fill) -w/ shells 18'-20'		55.6		26	23	22	1
		Soft, gray, SANDY LEAN CLAY (CL) -w/ shells 23'-25'							
-20	25			64.6		30	34	15	19
-25	30				102	28			
		Loose, gray, CLAYEY SAND (SC)							
-30	35		7	25.3		27			
		Medium dense, gray, POORLY GRADED SAND WITH CLAY (SP-SC)							
-35	40		18	5.8		19			

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

95% DRAFT

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 8.0 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE

HVJ Associates, Inc.

PLATE A-7

COH HG-16-10009.GPJ 3/4/16

LOG OF BORING M789-16-7

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13801661; E: 3257343
STATION : 89+97
RANGE : 28.5 FT
SURFACE ELEVATION: 3.9 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 45 FT
DATE: 2/8/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 8 FT
WET ROTARY: 8 TO 45 FT

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, TSF
	40											HAND PENETROMETER ○ UNCONFINED COMPRESSION ● UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION ■ TORVANE △ 0.1 0.2 0.3 0.4 0.5
-40	45			Dense, light brown, POORLY GRADED SAND WITH CLAY (SP-SC)	50			15				

95% DRAFT

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 8.0 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE

HVJ Associates, Inc.

PLATE A-7

COH HG-16-10009.GPJ 3/4/16

LOG OF BORING M789-16-8

PROJECT: Cells M789 and M10 Levee Raising
PROJECT NO.: HG1610009
LOCATION: N: 13801317; E: 3256400
STATION : 100+00
COMPLETION DEPTH: 50 FT
RANGE : 23.5 FT
SURFACE ELEVATION: 3.5 FT
DATE: 2/10/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 16 FT
WET ROTARY: 16 TO 50 FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0								
0	5	Very soft to firm, reddish brown and gray, SANDY LEAN CLAY (CL) (Levee Fill) -w/ rocks 0'-2' -w/ sand seams 0'-4'		65.2	97	29 26 26	37	16	21
-5	10	-w/ sand seams 8'-10'			85	38			
-10	15	Very soft to soft, reddish brown and gray, LEAN CLAY WITH SAND (CL) (Levee Fill) -w/ sand seams 10'-12' -w/ sand layer 14'-16'		73.2 71.5		32 31	49 45	21 18	28 27
-15	20	Loose, gray, CLAYEY SAND (SC) (Levee Fill) -w/ shells		43.5		27			
-20	25	Very soft to soft, gray, SANDY LEAN CLAY (CL) -w/ shells							
-25	30			56.3		33	33	19	14
-30	35	Soft, gray, FAT CLAY (CH) -w/ sand layer and shells 38'-40'		91.5	65	60	79	29	50
-35	40				69	56			

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

95% DRAFT

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 16.0 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE

HVJ Associates, Inc.

PLATE A-8

COH HG-16-10009.GPJ 3/4/16

LOG OF BORING M789-16-8

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13801317; E: 3256400
STATION : 100+00
RANGE : 23.5 FT
SURFACE ELEVATION: 3.5 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 50 FT
DATE: 2/10/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 16 FT
WET ROTARY: 16 TO 50 FT

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	40										
-40	45			Very soft, gray, FAT CLAY (CH)		94.8		79	107	41	66
-45	50			Medium dense, gray, CLAYEY SAND (SC)	22	19.3		18			

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

95% DRAFT

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 16.0 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE

HVJ Associates, Inc.

PLATE A-8

COH HG-16-10009.GPJ 3/4/16

LOG OF BORING M10-16-1

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13798374; E: 3257723
STATION : 15+74
RANGE : 13.7 FT
SURFACE ELEVATION: 5.1 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 50 FT
DATE: 2/10/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 8 FT
WET ROTARY: 8 TO 50 FT

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
5	0	Firm, reddish brown and gray, FAT CLAY (CH) (Levee Fill) -w/ sand seams				33			
				29.4		15	54	23	31
0	5	Firm, gray and reddish brown, LEAN CLAY WITH SAND (CL) (Levee Fill) -w/ calcareous nodules 4'-6' -w/ sand seams and ferrous stains 6'-8'		77.2		23	42	18	24
▽					92	33			
		Firm, gray and brown, FAT CLAY WITH SAND (CH) (Levee Fill)				30			
-5	10								
					99	25	50	19	31
		-w/ sand pockets and sand seams 12'-16'							
	15								
-10						35			
		Firm, gray and brown, LEAN CLAY WITH SAND (CL) (Levee Fill) -w/ sand pockets and sand seams 18'-20'							
	20			78.5		29	49	21	28
-15		Very soft to soft, gray and brown, LEAN CLAY WITH SAND (CL)							
-20	25								
	30								
-25		Firm, brown, LEAN CLAY (CL) -w/ sand pockets 33'-35'							
	35			93.9		30	45	25	20
-30		Stiff, brown, FAT CLAY (CH) -w/ sand pockets 38'-40'							
	40				86	37	70	28	42

0.33
0.78

95% DRAFT

COH HG-16-10009.GPJ 3/4/16

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 8.0 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE

LOG OF BORING M10-16-1

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13798374; E: 3257723
STATION : 15+74
RANGE : 13.7 FT
SURFACE ELEVATION: 5.1 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 50 FT
DATE: 2/10/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 8 FT
WET ROTARY: 8 TO 50 FT

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
-35	40			Stiff, reddish brown and gray, FAT CLAY (CH) -w/ sand pockets 38'-40'							
	45						80	39			
-40				Stiff, brown, LEAN CLAY (CL) -w/ sand layer 48'-50'							
	50					99.5	94	29	40	24	16

0.33
0.74

95% DRAFT

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 8.0 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE

HVJ Associates, Inc.

PLATE A-9

COH HG-16-10009.GPJ 3/4/16

LOG OF BORING M10-16-2

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13798160; E: 3258605
STATION : 24+96
RANGE : 26.1 FT
SURFACE ELEVATION: 0.8 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 75 FT
DATE: 2/11/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 6 FT
WET ROTARY: 6 TO 75 FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
0	0	Soft to firm, light gray and brown, SANDY LEAN CLAY (CL) (Levee Fill)				22			
				56.3		12	35	18	17
▽	5	-w/ sand seams 4'-6'							
-5		Soft to firm, light gray and brown, SANDY FAT CLAY (CH) (Levee Fill) -w/ sand seams 6'-12'			99	29			
	10			65.4		25	51	19	32
-10									
		Firm, light gray and brown, SANDY LEAN CLAY (CL) (Levee Fill) -w/ sand seams and calcareous nodules				29			
	15			64.0		27	46	19	27
-15		Very soft, light gray and brown, SANDY LEAN CLAY (CL) (Levee Fill) -w/ sand seams							
		Loose, gray, CLAYEY SAND (SC) (Levee Fill) -w/ shells 18'-20'		47.2		31	31	18	13
	20								
-20		Very soft to soft, gray, FAT CLAY (CH) -w/ silt 23'-25'							
	25								
-25									
	30								
-30									
	35			93.8	74	58	71	30	41
-35									
	40								

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

95% DRAFT

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 4.0 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE/NK

HVJ Associates, Inc.

PLATE A-10

COH HG-16-10009.GPJ 3/4/16

LOG OF BORING M10-16-2

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13798160; E: 3258605
STATION : 24+96
RANGE : 26.1 FT
SURFACE ELEVATION: 0.8 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 75 FT
DATE: 2/11/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 6 FT
WET ROTARY: 6 TO 75 FT

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
-40	40			Very soft to soft, gray, FAT CLAY (CH) -w/ silt 23'-25' [Continued...]							
	45							67	93	37	56
-45											
	50						58	72	97	38	59
-50				-w/ sand layers 53'-55'		89.0		66	85	34	51
-55	55										
	60			-w/ sand layers 58'-60'				52			
-60				Stiff to very stiff, FAT CLAY (CH)							
	65							50	105	33	72
-65											
	70										
-70						93.8		49	103	34	69
	75						63	60			

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

0.75
0.33
1.03

95% DRAFT

COH HG-16-10009.GPJ 3/4/16

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 4.0 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE/NK

LOG OF BORING M10-16-3

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13797667; E: 3259492
STATION : 35+10
RANGE : 54.3 FT
SURFACE ELEVATION: -0.4 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 75 FT
DATE: 2/11/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: N/A TO N/A FT
WET ROTARY: 0 TO 75 FT

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
▽ 0	0										
				Firm, brown and gray, LEAN CLAY WITH SAND (CL) (Levee Fill)		78.3		33	43	18	25
-5	5			Very soft to firm, brown and gray, FAT CLAY WITH SAND (CH) (Levee Fill)			94	31			
				-w/ calcareous nodules 6'-8'							
-10	10					81.8		30	56	22	34
				-w/ calcareous nodules 12'-14'			93	31	55	20	35
-15	15										
				Very soft, gray, SANDY LEAN CLAY (CL)							
-20	20					65.0		39	28	17	11
				w/ silt 23'-30'							
-25	25										
-30	30										
				Very soft to soft, gray, FAT CLAY (CH)							
-35	35							54	55	20	35
-40	40							46			

95% DRAFT

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 0.0 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE/NK

HVJ Associates, Inc.

PLATE A-11

COH HG-16-10009.GPJ 3/4/16

LOG OF BORING M10-16-3

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13797667; E: 3259492
STATION : 35+10
RANGE : 54.3 FT
SURFACE ELEVATION: -0.4 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 75 FT
DATE: 2/11/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: N/A TO N/A FT
WET ROTARY: 0 TO 75 FT

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	40			Very soft to soft, gray, FAT CLAY (CH) [Continued...]							
-45	45			-w/ shells 43'-45'				61	89	28	61
-50	50			Firm, gray, FAT CLAY (CH)			56	71			
-55	55					99.2	54	76	113	34	79
-60	60			Soft, gray, FAT CLAY (CH)				82			
-65	65			Medium dense, gray, CLAYEY SAND (SC) -w/ shells 63'-65' and 68'-70'				28			
-70	70				15	23.3		24			
				Very dense, gray, CLAYEY SAND (SC)							
-75	75				58			27			

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

95% DRAFT

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 0.0 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE/NK

HVJ Associates, Inc.

PLATE A-11

COH HG-16-10009.GPJ 3/4/16

LOG OF BORING M10-16-4

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13796914; E: 3259957
STATION : 44+82
RANGE : 38.1 FT
SURFACE ELEVATION: 3.7 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 50 FT
DATE: 2/12/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: N/A TO N/A FT
WET ROTARY: 0 TO 50 FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0	Soft, brown and gray, FAT CLAY (CH) (Levee Fill)							
0	5	Very soft to soft, gray, FAT CLAY (CH) (Levee Fill) -w/ sand seams 2'-4'		87.7	69	60	98	39	59
		Soft to firm, gray, FAT CLAY WITH SAND (CH) (Levee Fill)				33			
-5	10			80.9		32	50	22	28
					101	26			
		Soft to firm, gray, LEAN CLAY WITH SAND (CL) (Levee Fill)							
-10	15	-w/ shells 14'-16'			88	34	42	21	21
		Very soft to soft, gray, SANDY LEAN CLAY (CL)							
-15		-w/ shells 18'-30'				32			
	20								
-20	25			57.6		27	26	17	9
-25	30								
		Stiff to very stiff, dark brown, FAT CLAY (CH)							
-30	35				107	16	65	32	33
-35	40					32			

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

0.92
0.85
1.42

95% DRAFT

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: ---
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: NK

HVJ Associates, Inc.

PLATE A-12

COH HG-16-10009.GPJ 3/4/16

LOG OF BORING M10-16-4

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13796914; E: 3259957
STATION : 44+82
RANGE : 38.1 FT
SURFACE ELEVATION: 3.7 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 50 FT
DATE: 2/12/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: N/A TO N/A FT
WET ROTARY: 0 TO 50 FT

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, TSF
	40											HAND PENETROMETER ○ UNCONFINED COMPRESSION ■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION △ TORVANE 0.1 0.2 0.3 0.4 0.5
-40	45			Firm, dark brown, LEAN CLAY (CL) -w/ calcareous nodules 43'-45'		89.0		28	43	24	19	○
-45	50			Stiff, brown, LEAN CLAY (CL)			90	33				○ 0.83 ■ 0.77

95% DRAFT

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: ---
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: NK

COH HG-16-10009.GPJ 3/4/16

LOG OF BORING M10-16-5

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13795960; E: 3260319
STATION : 55+02
RANGE : 27.9 FT
SURFACE ELEVATION: 1.2 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 45 FT
DATE: 2/13/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 4 FT
WET ROTARY: 4 TO 45 FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
0	0	Firm, gray and reddish brown, FAT CLAY WITH SAND (CH) (Levee Fill)				28			
	5			80.8	95	30	52	23	29
						25			
-5		Soft to firm, dark gray and reddish brown, FAT CLAY WITH SAND (CH) (Levee Fill)			100	29			
	10	Soft to firm, gray and reddish brown, LEAN CLAY WITH SAND (CL) (Levee Fill)				26			
-10					101	23	41	20	21
	15			72.2		27	49	20	29
-15		Soft, gray, LEAN CLAY (CL)							
	20								
-20		Firm, reddish brown, LEAN CLAY (CL)							
	25			90.9		28	40	21	19
-25									
	30								
-30		Stiff to very stiff, reddish brown, LEAN CLAY (CL) -w/ silt layer 33'-35'							
	35			99.0	97	29			
-35		Stiff to very stiff, reddish brown and gray , LEAN CLAY (CL)							
	40				89	31			

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

1.02
1.17
1.13

95% DRAFT

COH HG-16-10009.GPJ 3/4/16

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 4.0 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE

LOG OF BORING M10-16-5

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13795960; E: 3260319
STATION : 55+02
RANGE : 27.9 FT
SURFACE ELEVATION: 1.2 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 45 FT
DATE: 2/13/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 4 FT
WET ROTARY: 4 TO 45 FT

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, TSF
	40											
-40				Stiff to very stiff, reddish brown and gray , LEAN CLAY (CL) [Continued...]								
	45							31				0.33

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

95% DRAFT

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 4.0 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE

COH HG-16-10009.GPJ 3/4/16

LOG OF BORING M10-16-6

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13795111; E: 3260503
STATION : 65+01
RANGE : 15.9 FT
SURFACE ELEVATION: 4.0 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 50 FT
DATE: 2/13/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 4 FT
WET ROTARY: 4 TO 50 FT

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	0										
				Stiff, reddish brown and gray, FAT CLAY WITH SAND (CH) (Levee Fill)							
				-w/ sand layer 3'-4'		81.7	99	27	52	24	28
▽ 0	5			Medium dense, brown, CLAYEY SAND (SC) (Levee Fill)	17						
				Medium dense, gray, POORLY GRADED SAND WITH CLAY (SP-SC) (Levee Fill)	15	7.4		18			
-5	10			-w/ clay layer 8'-10'	14			19			
				Medium dense, gray, CLAYEY SAND (SC) (Levee Fill)	16						
					14	30.9		24			
-10	15				20						
				Firm, gray, SANDY LEAN CLAY (CL) (Levee Fill)							
-15	20				6	52.8		30	34	19	15
				Stiff, reddish brown, SANDY LEAN CLAY (CL) (Levee Fill)							
-20	25				15			33			
-25	30										
				Stiff to very stiff, reddish brown and gray, FAT CLAY (CH)	14	96.6		43	54	28	26
				w/ sand seams 33'-35'							
-30	35							33			
-35	40							35	81	29	52

0.75
1.38

95% DRAFT

COH HG-16-10009.GPJ 3/4/16

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 4.0 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE

HVJ Associates, Inc.

PLATE A-14

LOG OF BORING M10-16-6

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13795111; E: 3260503
STATION : 65+01
RANGE : 15.9 FT
SURFACE ELEVATION: 4.0 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 50 FT
DATE: 2/13/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 4 FT
WET ROTARY: 4 TO 50 FT

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	40										
				Stiff, gray, FAT CLAY (CH)							
-40	45							26			
				Medium dense, gray, CLAYEY SAND (SC)							
-45	50				21	24.8		25	23	13	10

0.82

95% DRAFT

COH HG-16-10009.GPJ 3/4/16

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 4.0 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE

LOG OF BORING M10-16-7

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13794613; E: 3259641
STATION : 74+96
RANGE : 18.4 FT
SURFACE ELEVATION: 1.7 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 75 FT
DATE: 2/14/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 2 FT
WET ROTARY: 2 TO 75 FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
0	0	Firm, brown and gray, SANDY LEAN CLAY (CL) (Levee Fill) -w/ sand layers and pockets 0'-2'	6	58.2		32 17	43	24	19
-5	5	-w/ sand pockets and shells 6'-8'		62.4		29	45	21	24
	10	-w/ sand layers and pockets 8'-10'	6						
-10		Soft, gray, SANDY LEAN CLAY (CL)				43	42	19	23
	15					32			
-15		Soft, reddish brown, LEAN CLAY WITH SAND (CL) -w/ silt and sand seams		79.5		29	31	17	14
-20	20	Soft, gray, FAT CLAY (CH) -w/ shells							
	25			86.9		37	55	27	28
-25		Firm, reddish brown, FAT CLAY (CH)							
	30								
-30		Stiff to very stiff, reddish brown, FAT CLAY (CH)							
	35				91	30	74	35	39
-35									
	40								

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

0.75
1.13

95% DRAFT

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 2.0 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE

HVJ Associates, Inc.

PLATE A-15

COH HG-16-10009.GPJ 3/4/16

LOG OF BORING M10-16-7

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13794613; E: 3259641
STATION : 74+96
RANGE : 18.4 FT
SURFACE ELEVATION: 1.7 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 75 FT
DATE: 2/14/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 2 FT
WET ROTARY: 2 TO 75 FT

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %	UNDRAINED SHEAR STRENGTH, TSF
	40			Very stiff, reddish brown and brownish yellow, FAT CLAY (CH) -w/ silt layer		99.2		33	70	34	36	1.17
-40				Very stiff, reddish brown, FAT CLAY (CH) -w/ sand 44'-45'								1.08
	45			Stiff, brown and gray, FAT CLAY (CH) -w/ sand seams and shells 48'-50'								
-45												
	50							46	78	37	41	
				Firm to stiff, gray, FAT CLAY (CH)								
-50												0.67
	55						83	38	84	36	48	0.76
-55												
				-w/ wood 58'-60'								
	60											
-60												0.67
	65						85	35				0.78
-65												
				-w/ sand layers 68'-70'								0.75
	70							23				
				Hard, gray, SANDY LEAN CLAY (CL) -w/ clay layers								
-70												
	75				36	54.9		28	26	18	8	

95% DRAFT

COH HG-16-10009.GPJ 3/4/16

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 2.0 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE

LOG OF BORING M10-16-8

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13793862; E: 3258375
STATION : 89+68
RANGE : 5.1 FT
SURFACE ELEVATION: 2.7 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 50 FT
DATE: 2/14/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 4 FT
WET ROTARY: 4 TO 50 FT

ELEVATION, FT	DEPTH, FT	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
0	0	Very soft to soft, reddish brown and gray, FAT CLAY WITH SAND (CH) (Levee Fill) -w/ rocks 0'-2' -w/ sand pockets 2'-4'		84.0		34 37	53	23	30
-5	5	Very soft to soft, reddish brown and brownish yellow, FAT CLAY (CH) (Levee Fill)		95.0		43	62	25	37
-10	10	Very soft, dark gray, LEAN CLAY (CL)				27			
-15	15	Very soft to soft, gray, LEAN CLAY (CL)				33	36	16	20
-20	20	-w/ sand and shells 18'-20'				22			
-25	25	Stiff, brownish yellow, LEAN CLAY (CL)							
-30	30	Very stiff, reddish brown and gray, FAT CLAY (CH) -w/ calcareous nodules 33'-35' and 38'-40'							
-35	35				106	23	54	19	35
	40					29			

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

0.82
1.42

95% DRAFT

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 4.0 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE

HVJ Associates, Inc.

PLATE A-16

COH HG-16-10009.GPJ 3/4/16

LOG OF BORING M10-16-8

PROJECT: Cells M789 and M10 Levee Raising
LOCATION: N: 13793862; E: 3258375
STATION : 89+68
RANGE : 5.1 FT
SURFACE ELEVATION: 2.7 FT

PROJECT NO.: HG1610009
COMPLETION DEPTH: 50 FT
DATE: 2/14/2016

SAMPLER: Shelby Tube/Split Spoon
DRY AUGER: 0 TO 4 FT
WET ROTARY: 4 TO 50 FT

ELEVATION, FT	DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL	STANDARD PENETRATION TEST, BLOWS PER FOOT	PERCENT PASSING NO. 200 SIEVE	DRY UNIT WEIGHT, PCF	MOISTURE CONTENT, %	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX, %
	40			Hard, light brown and light gray, SANDY LEAN CLAY (CL)							
-40	45				34						
-45	50			Stiff to very stiff, reddish brown and gray, LEAN CLAY (CL) -w/ sand layers			88	36	41	18	23

UNDRAINED SHEAR STRENGTH, TSF
○ HAND PENETROMETER
● UNCONFINED COMPRESSION
■ UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION
△ TORVANE
0.1 0.2 0.3 0.4 0.5

1.5
0.31

95% DRAFT

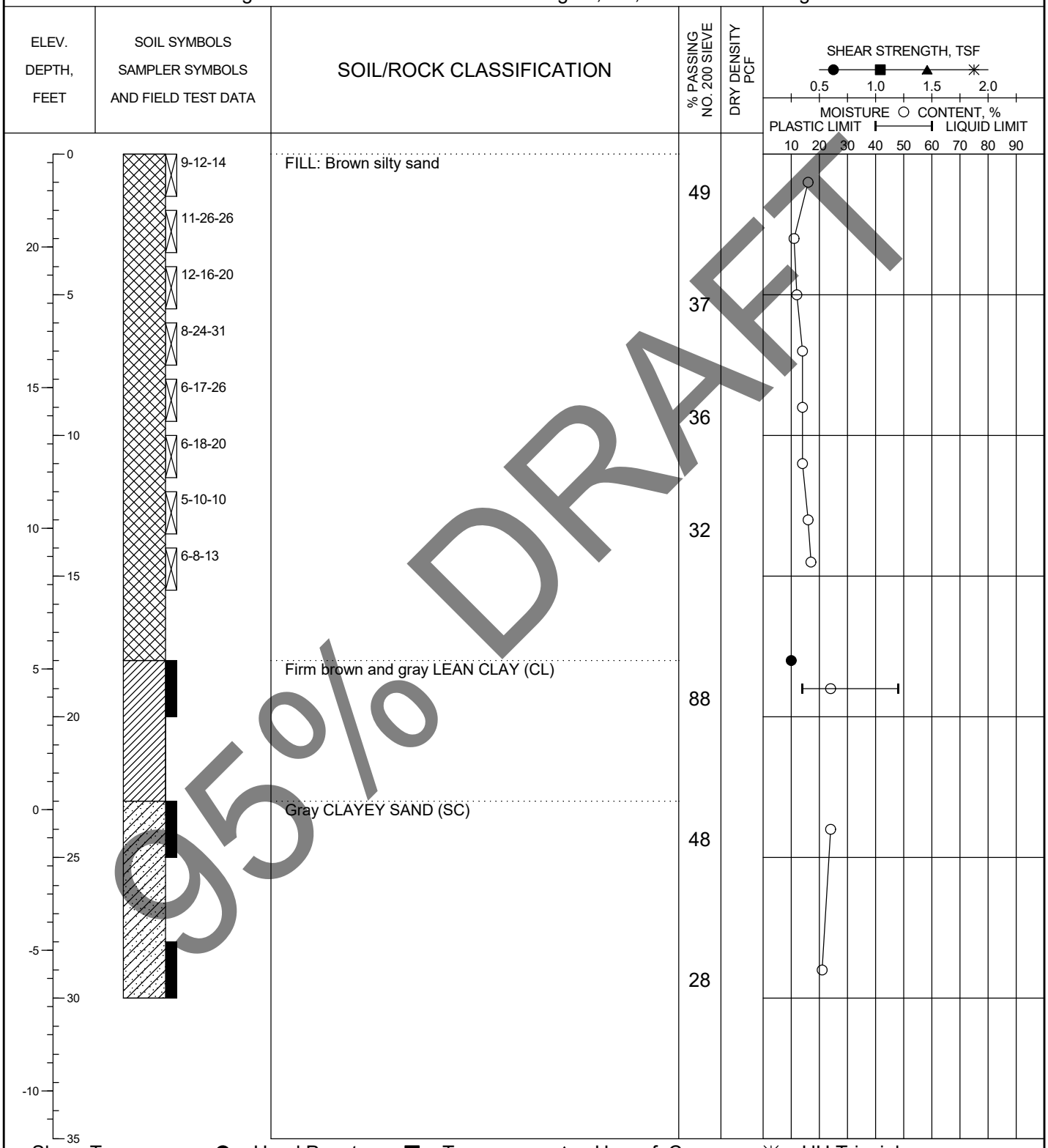
COH HG-16-10009.GPJ 3/4/16

DEPTH TO WATER IN BORING:
▽ FREE WATER DURING DRILLING: 4.0 FT
▼ WATER DEPTH 24 HOURS AFTER DRILLING: ---

Drilled By: Fauchex Logged By: EE

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-01
Date: 12/6/2012
Elevation (MLT): 23.3 feet
Groundwater during drilling: Caved in at 12'
Northing: 13,806,640.2
Station: 02+87.72
Groundwater after drilling: ---
Easting: 3,250,118.0
Range: -27.57



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

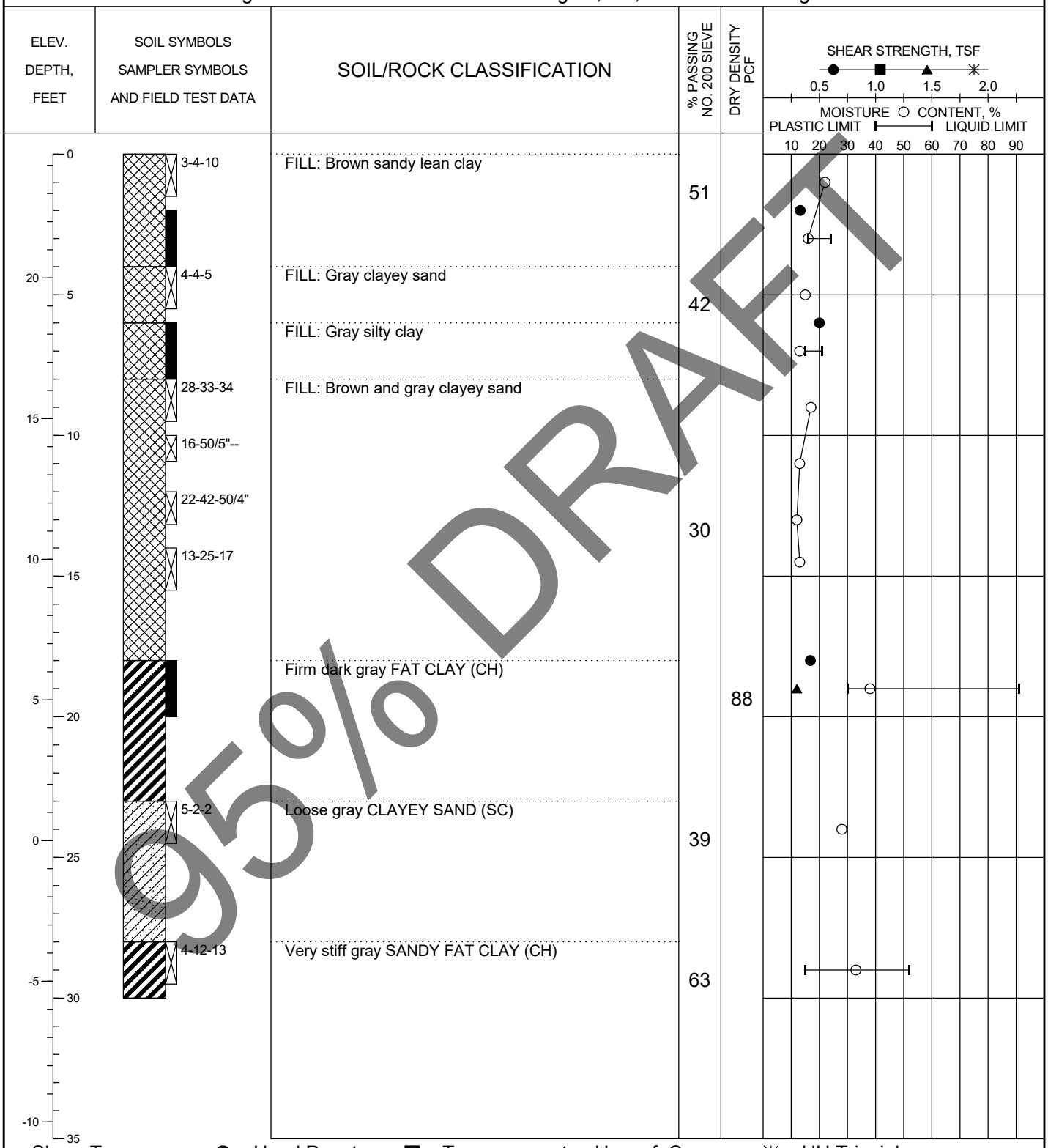
PLATE A-1

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-02
Date: 12/6/2012
Elevation (MLT): 24.4 feet
Groundwater during drilling: ---
Northing: 13,806,707.0
Station: 08+17.34
Groundwater after drilling: ---
Easting: 3,250,645.3
Range: 5.60



Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-2

95% DRAFT

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

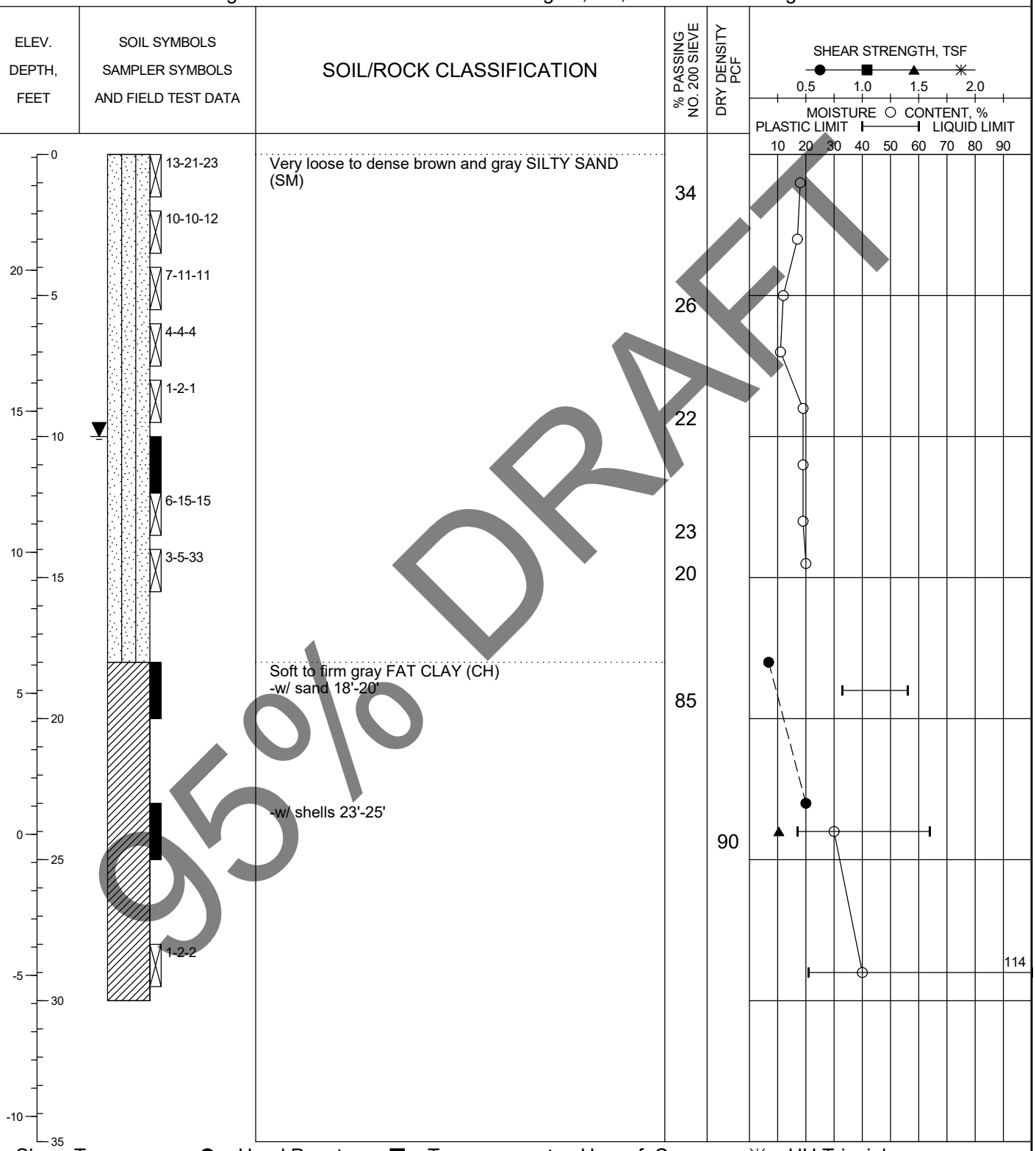
HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Boring No.: 12-03
Groundwater during drilling: 10 feet
Groundwater after drilling: ---

Date: 12/7/2012
Northing: 13,806,439.6
Easting: 3,251,157.8

Project No.: HG1019744
Elevation (MLT): 24.1 feet
Station: 14+15.62
Range: -3.97



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-3

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

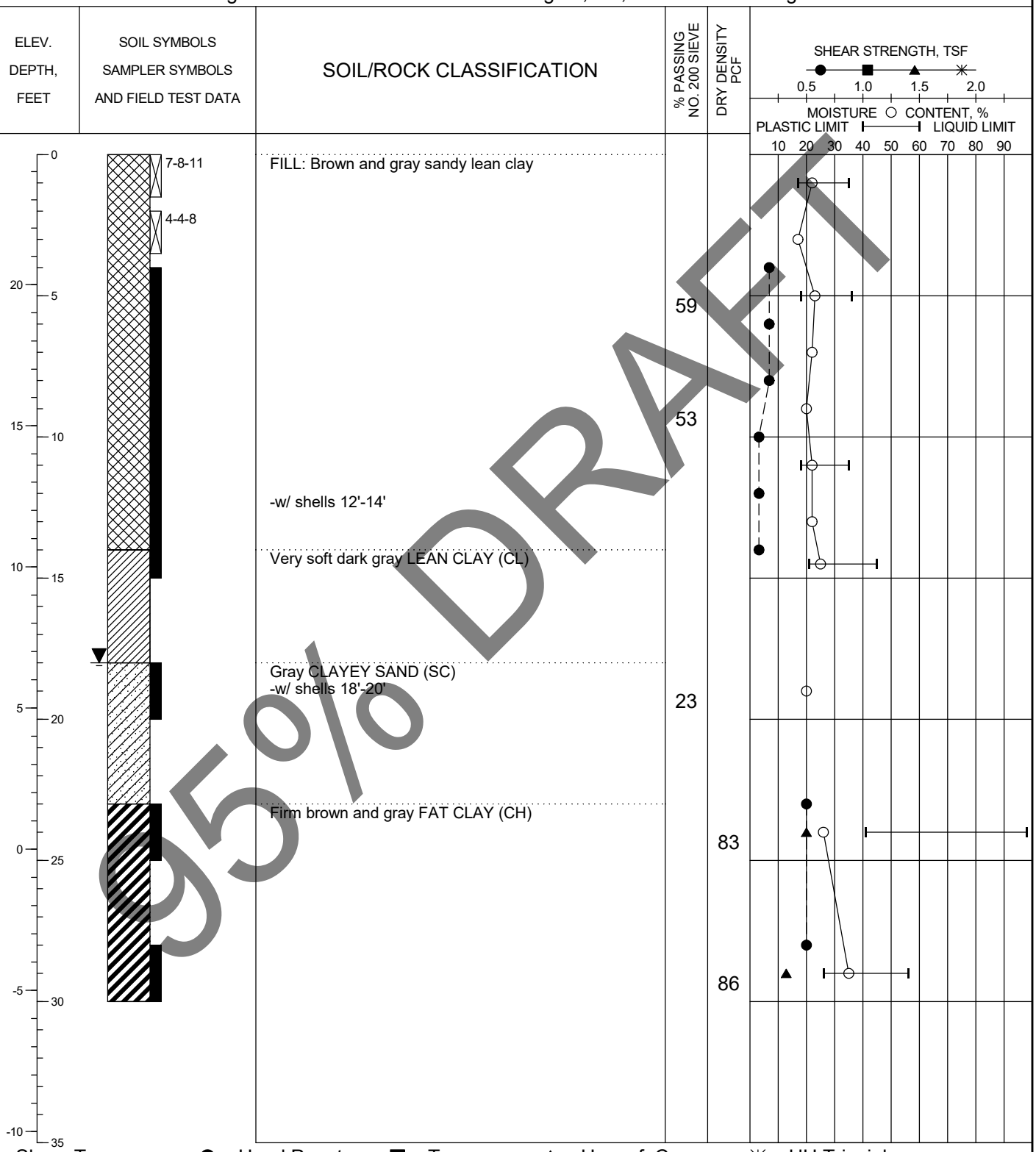
HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Boring No.: 12-04
Groundwater during drilling: 18 feet
Groundwater after drilling: ---

Date: 12/7/2012
Northing: 13,805,912.4
Easting: 3,252,394.3

Project No.: HG1019744
Elevation (MLT): 24.6 feet
Station: 27+76.78
Range: 14.66



Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

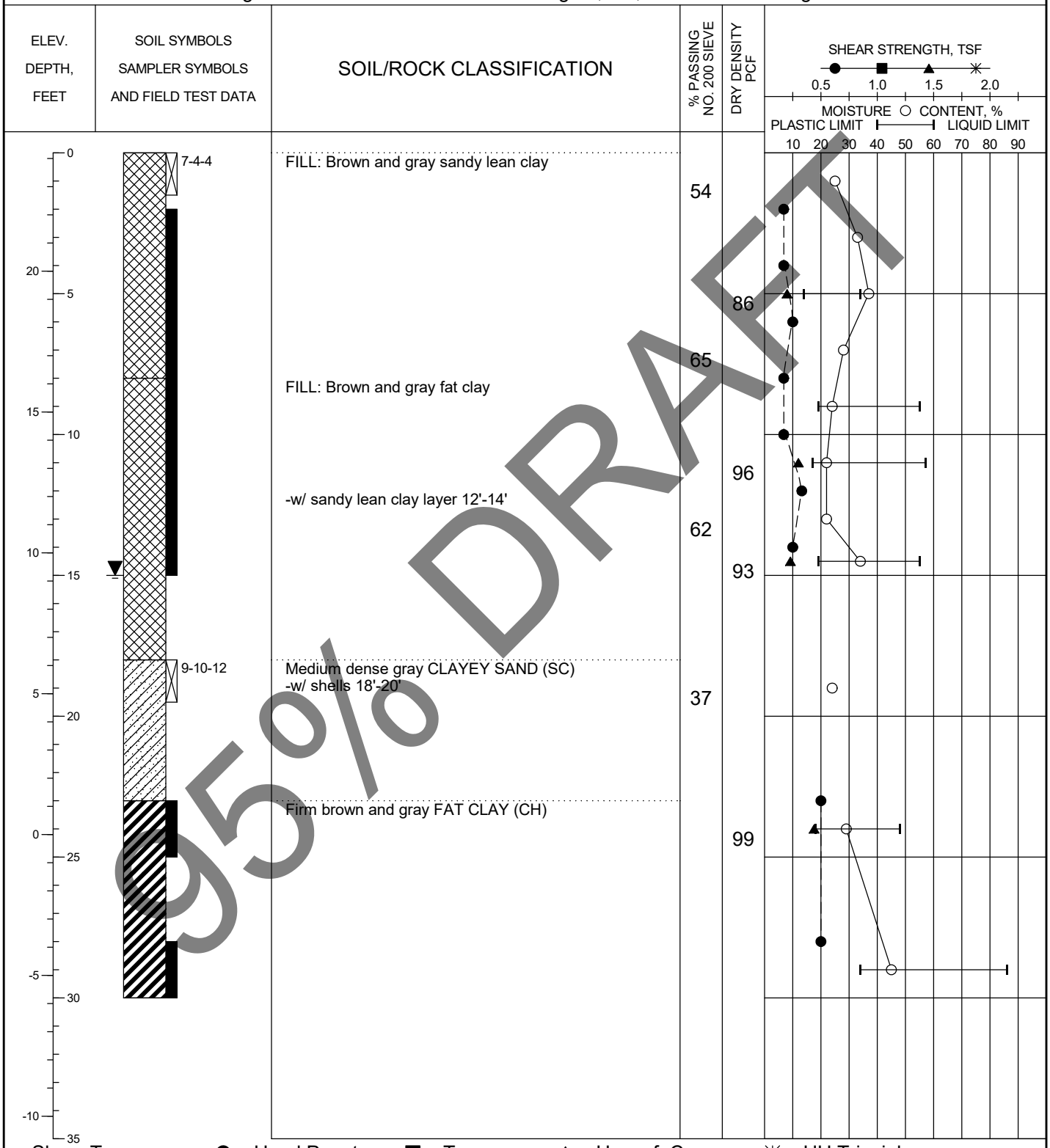
See Plate 2 for boring location.

PLATE A-4

95% DRAFT

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-05
Date: 12/7/2012
Elevation (MLT): 24.2 feet
Groundwater during drilling: 15 feet
Northing: 13,805,469.8
Station: 37+66.86
Groundwater after drilling: ---
Easting: 3,253,273.0
Range: -2.83



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

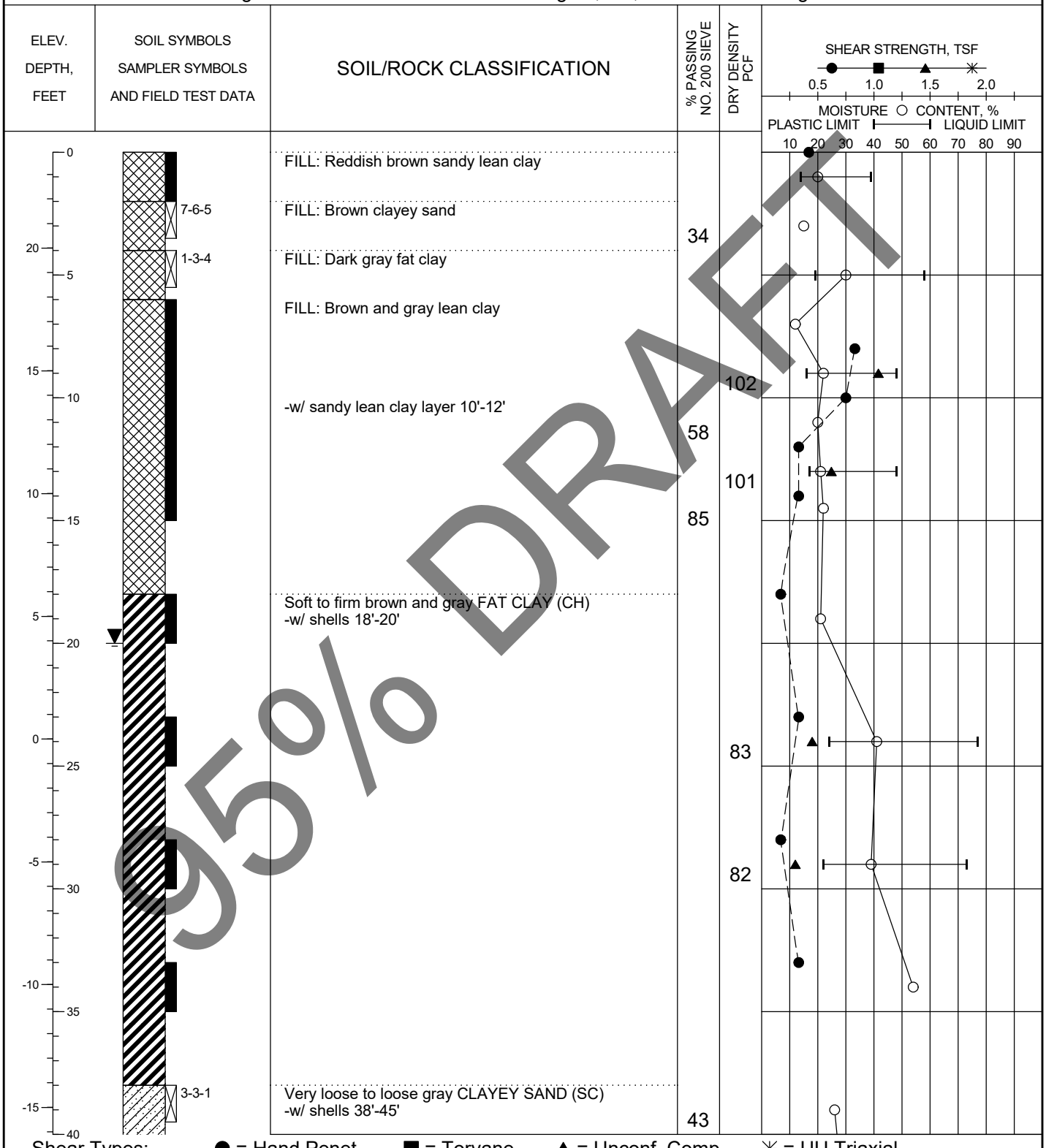
PLATE A-5

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-06
Date: 11/30/2012
Elevation (MLT): 23.9 feet
Groundwater during drilling: 20 feet
Northing: 13,805,289.9
Station: 42+23.21
Groundwater after drilling: ---
Easting: 3,253,681.8
Range: -4.92



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

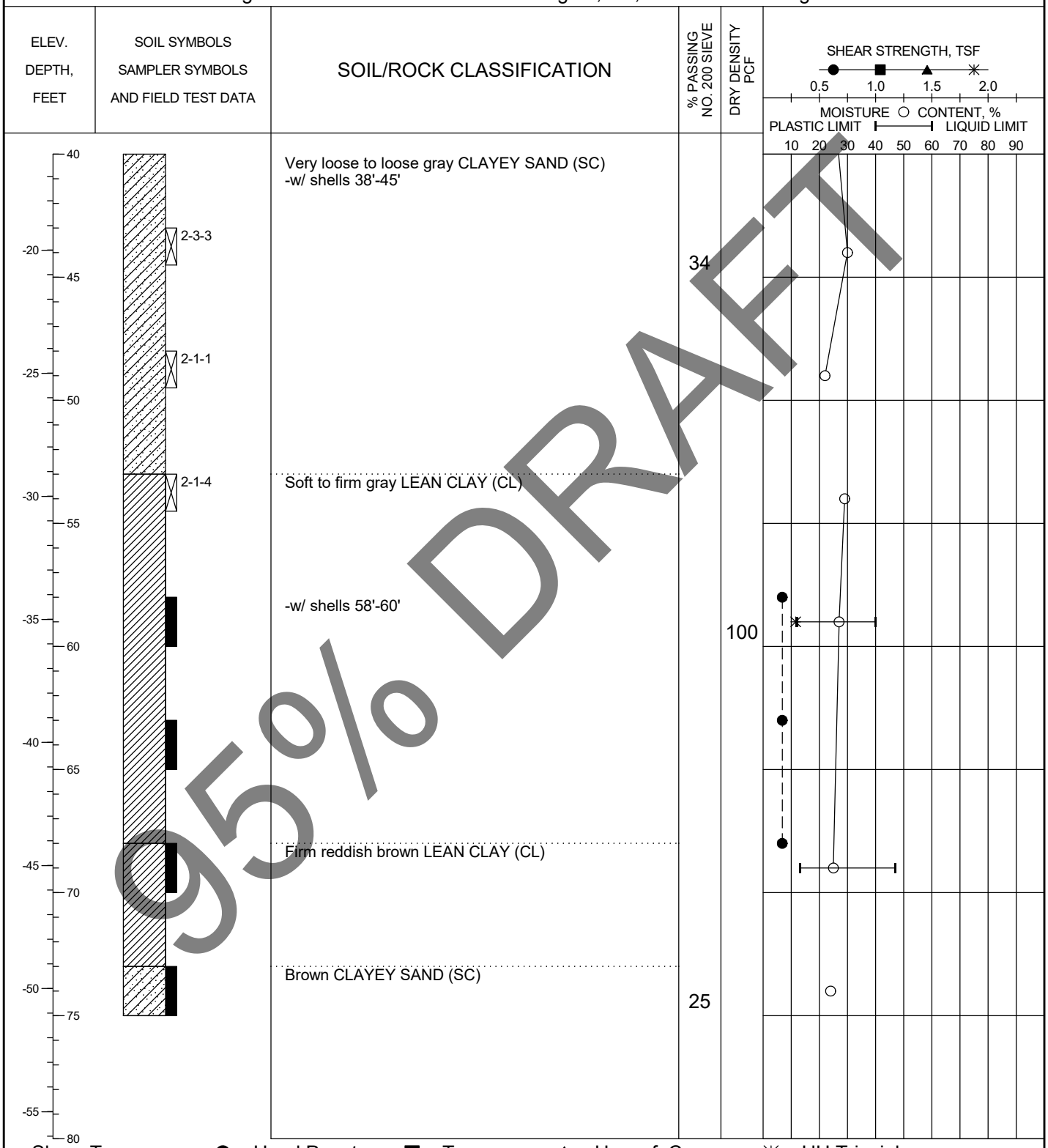
PLATE A-6a

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-06
Date: 11/30/2012
Elevation (MLT): 23.9 feet
Groundwater during drilling: 20 feet
Northing: 13,805,289.9
Station: 42+23.21
Groundwater after drilling: ---
Easting: 3,253,681.8
Range: -4.92



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-6b

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

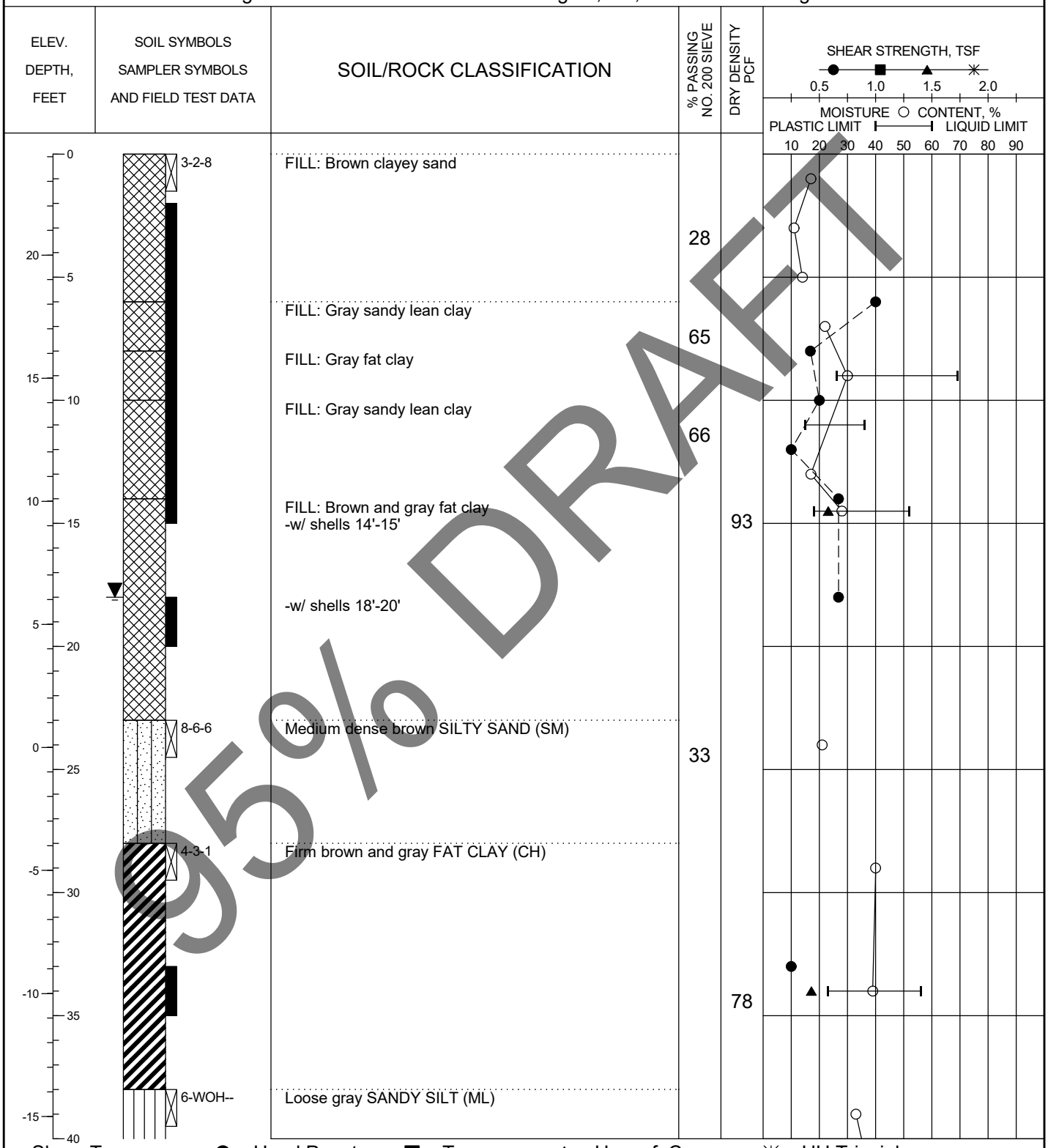
HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Boring No.: 12-07
Groundwater during drilling: 18 feet
Groundwater after drilling: ---

Date: 11/30/2012
Northing: 13,804,834.7
Easting: 3,253,845.8

Project No.: HG1019744
Elevation (MLT): 24.1 feet
Station: 47+10.7
Range: 11.36



Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-7a

95% DRAFT

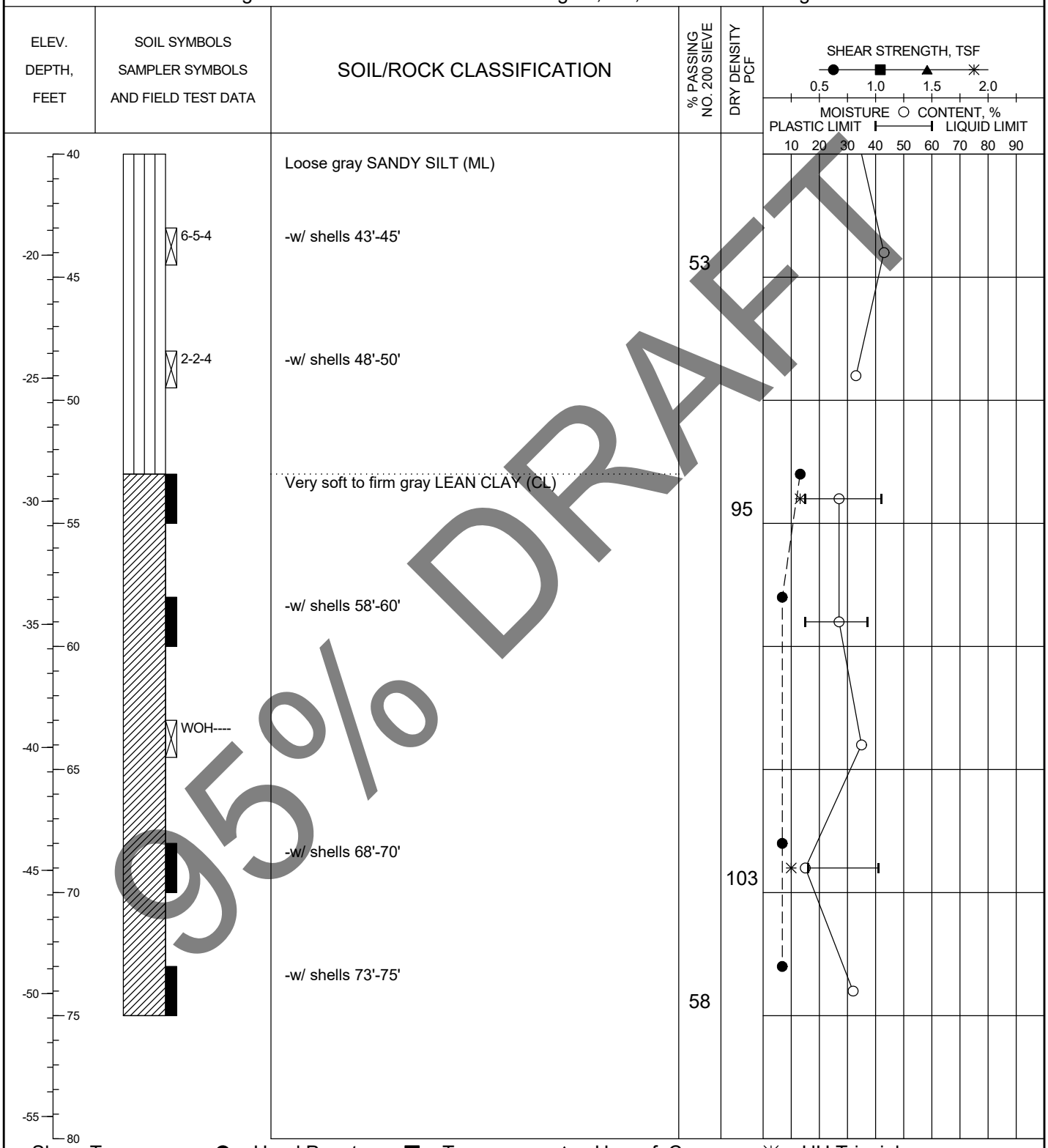
HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Boring No.: 12-07
Groundwater during drilling: 18 feet
Groundwater after drilling: ---

Date: 11/30/2012
Northing: 13,804,834.7
Easting: 3,253,845.8

Project No.: HG1019744
Elevation (MLT): 24.1 feet
Station: 47+10.7
Range: 11.36



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-7b

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

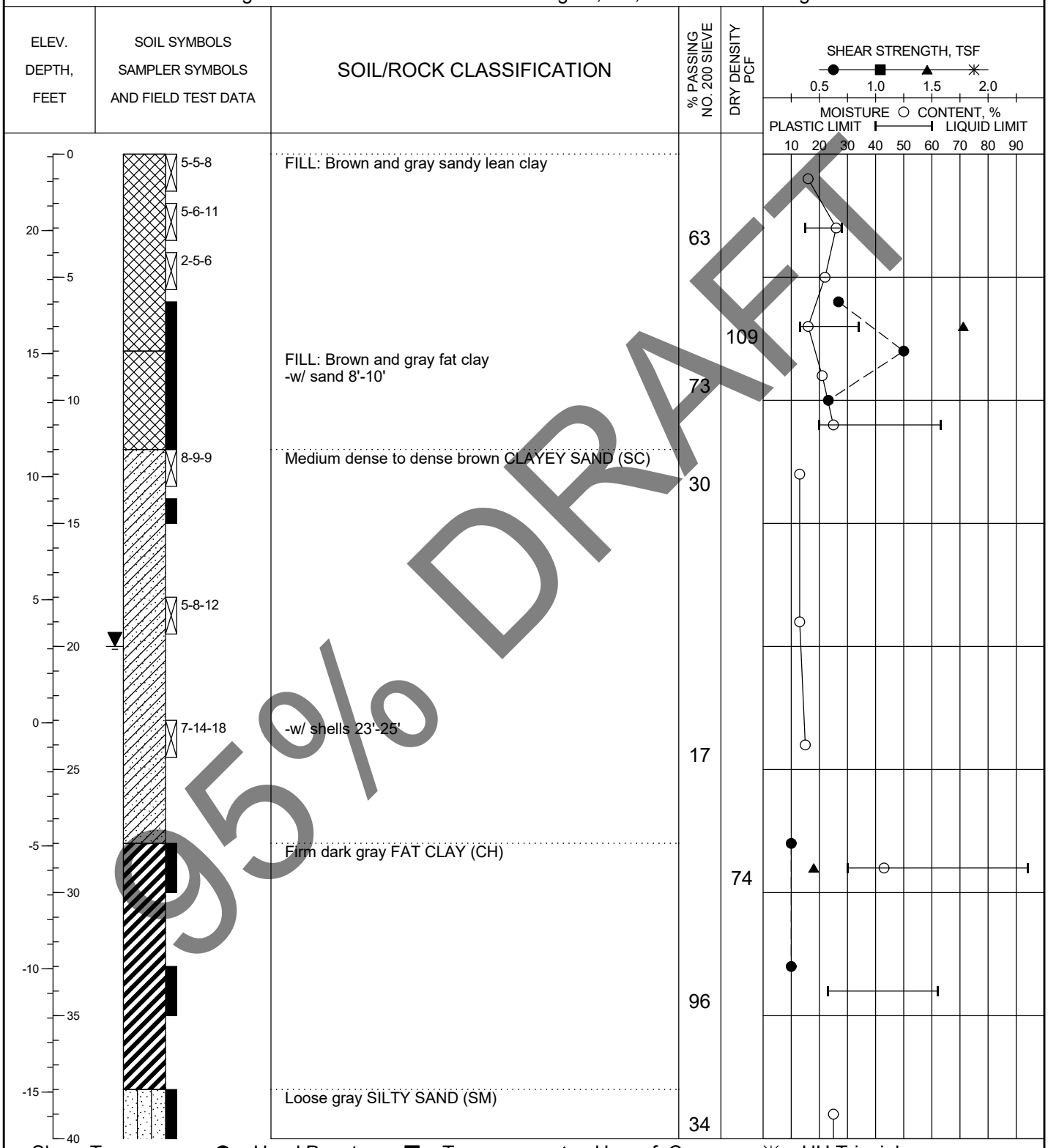
HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Boring No.: 12-08
Groundwater during drilling: 20 feet
Groundwater after drilling: ---

Date: 12/1/2012
Northing: 13,804,378.8
Easting: 3,253,988.8

Project No.: HG1019744
Elevation (MLT): 23.1 feet
Station: 51+88.41
Range: 2.46



Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

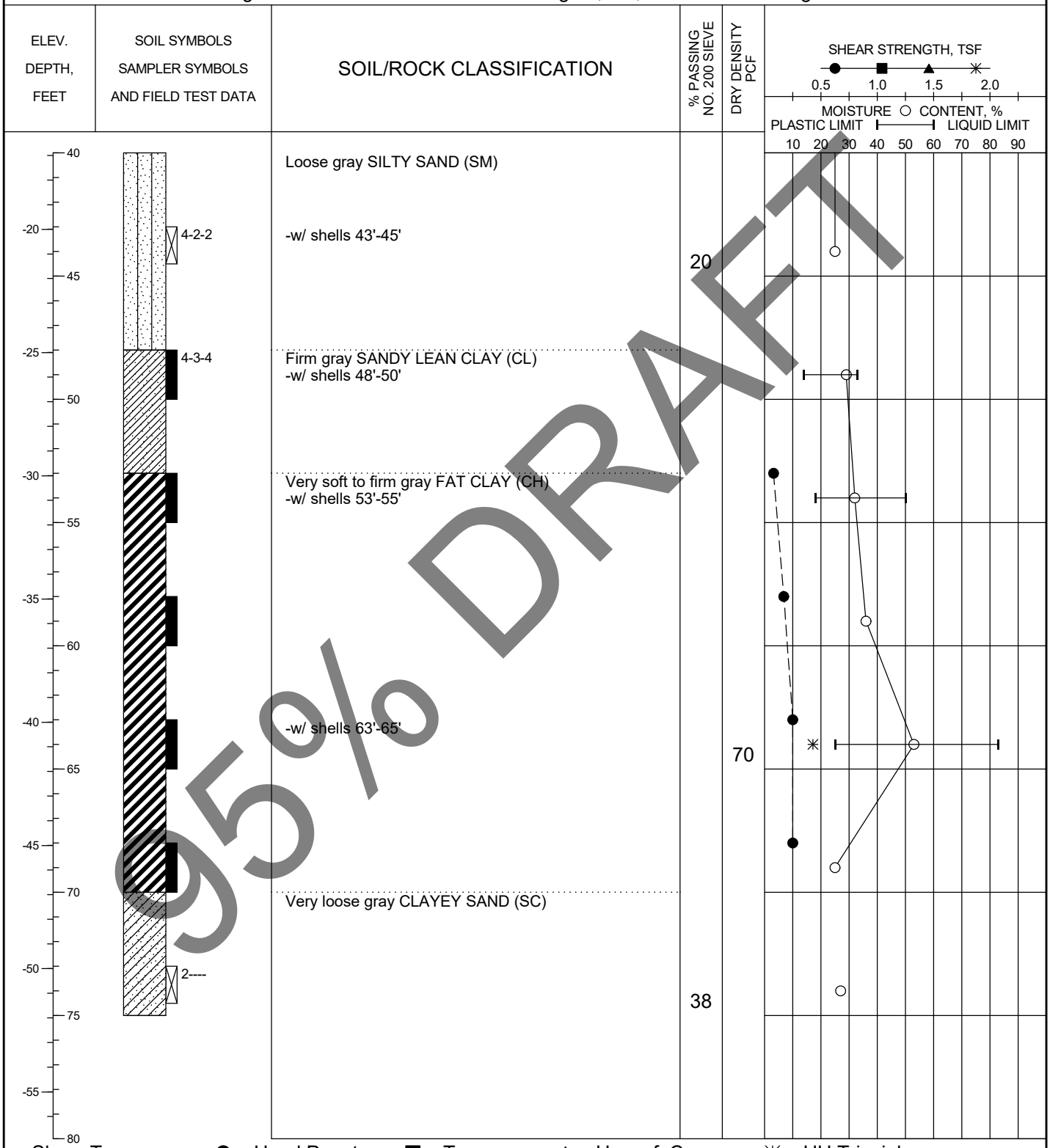
See Plate 2 for boring location.

PLATE A-8a

95% DRAFT

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-08
Date: 12/1/2012
Elevation (MLT): 23.1 feet
Groundwater during drilling: 20 feet
Northing: 13,804,378.8
Station: 51+88.41
Groundwater after drilling: ---
Easting: 3,253,988.8
Range: 2.46



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-8b

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

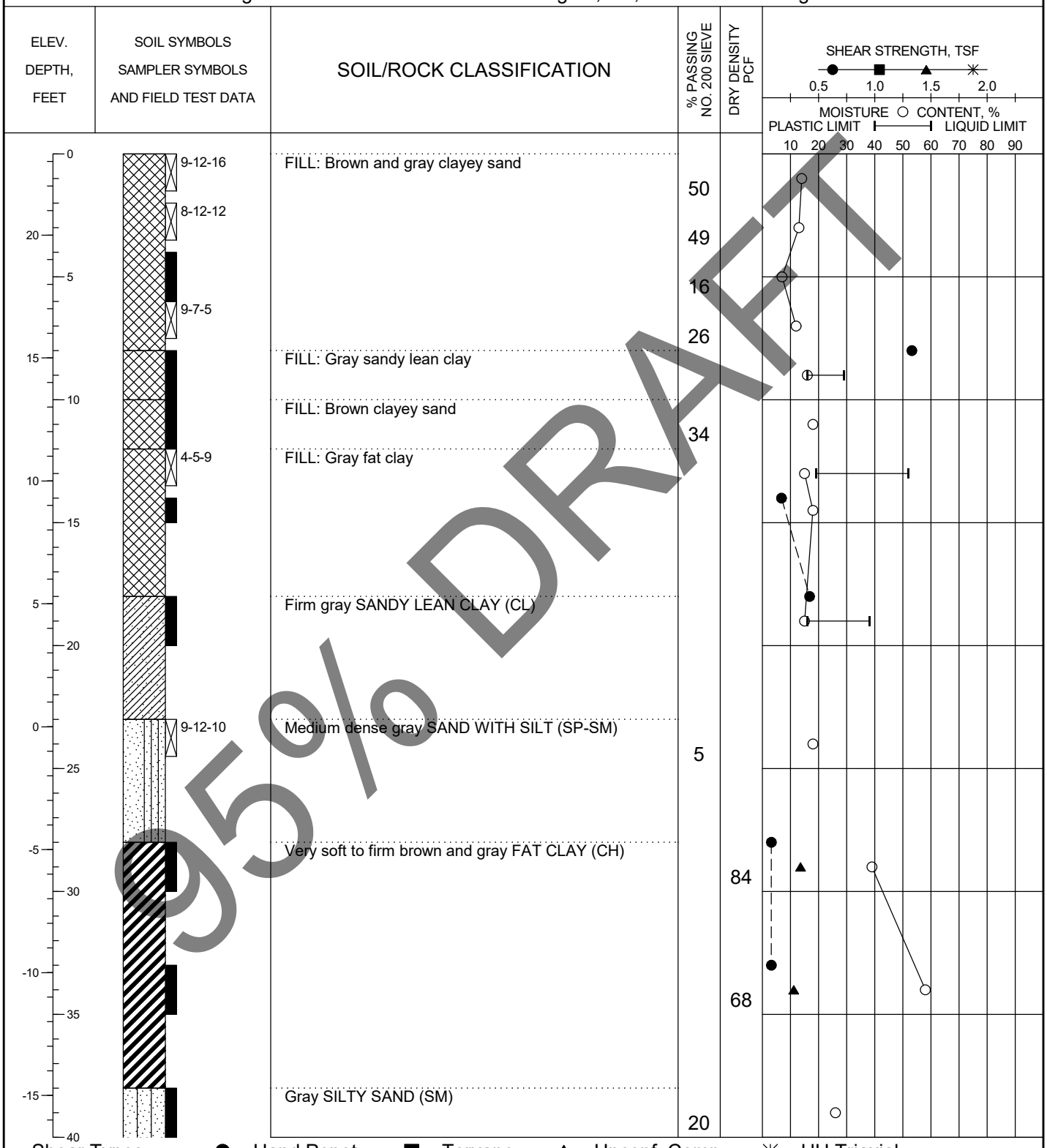
HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Boring No.: 12-09
Groundwater during drilling: ---
Groundwater after drilling: ---

Date: 12/1/2012
Northing: 13,803,880.3
Easting: 3,254,127.9

Project No.: HG1019744
Elevation (MLT): 23.3 feet
Station: 57+05.91
Range: 9.20



Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

95% DRAFT

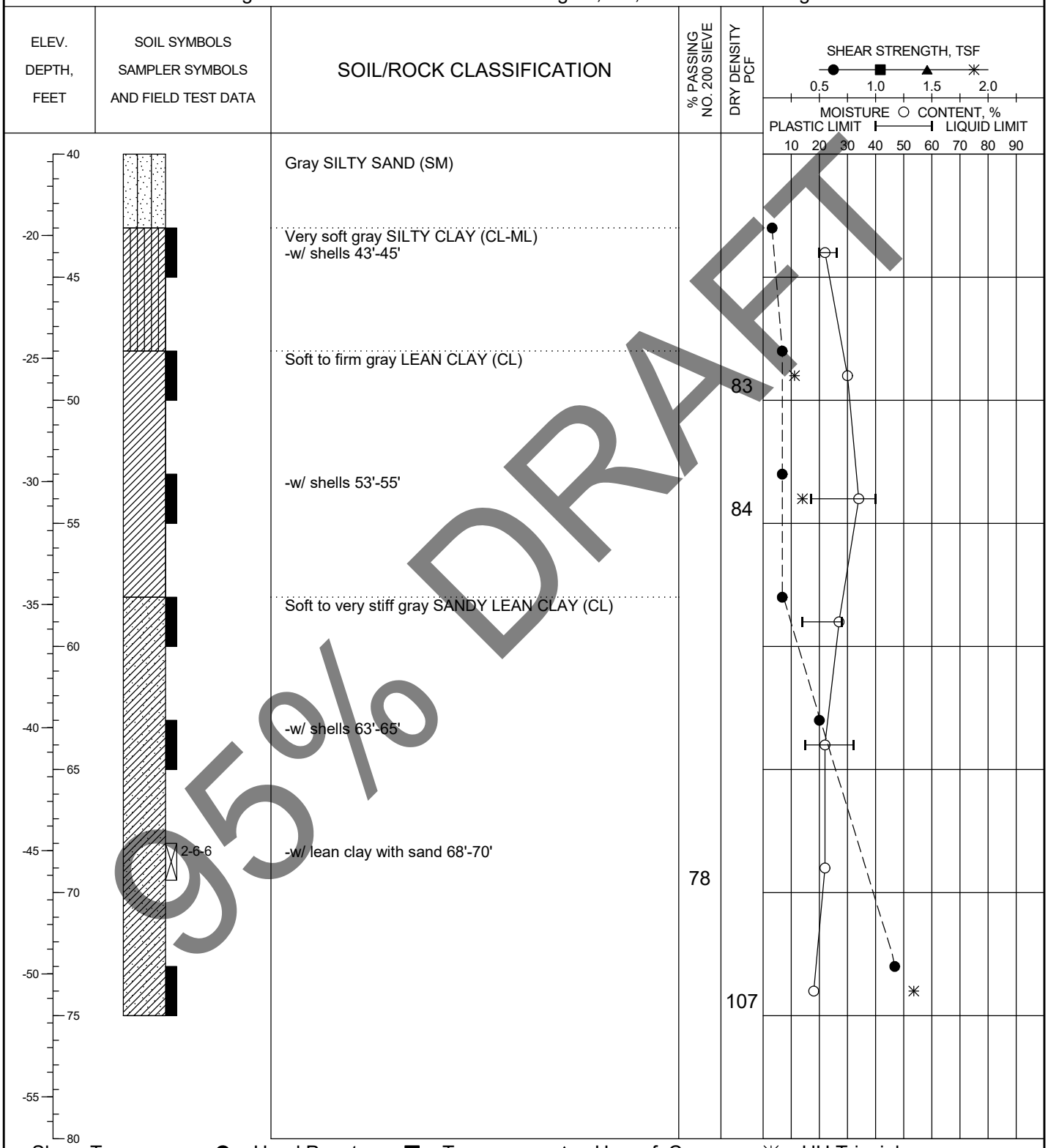
See Plate 2 for boring location.

PLATE A-9a

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-09
Date: 12/1/2012
Elevation (MLT): 23.3 feet
Groundwater during drilling: ---
Northing: 13,803,880.3
Station: 57+05.91
Groundwater after drilling: ---
Easting: 3,254,127.9
Range: 9.20



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

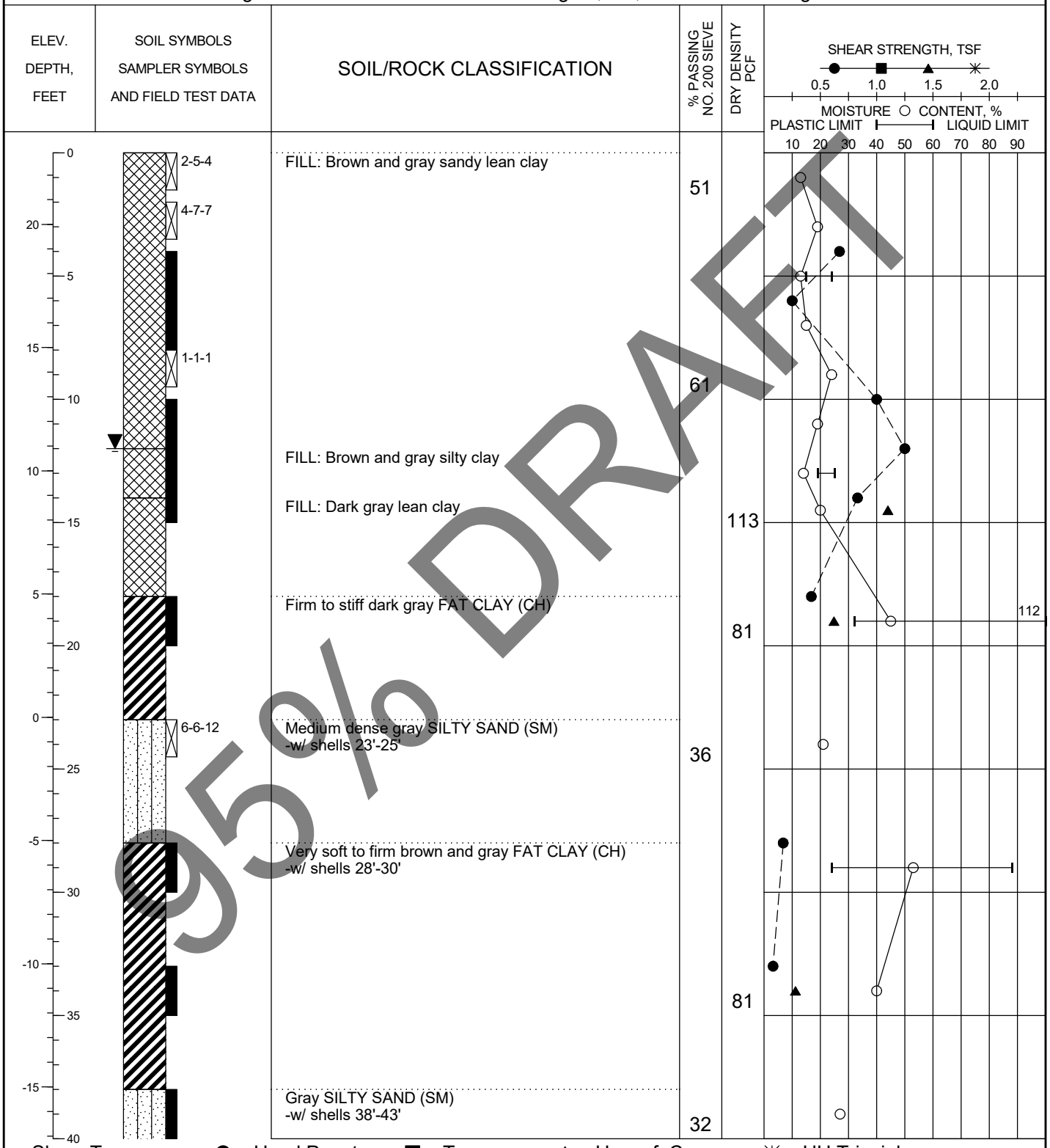
PLATE A-9b

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-10
Date: 12/2/2012
Elevation (MLT): 22.9 feet
Groundwater during drilling: 12 feet
Northing: 13,803,393.3
Station: 62+07.72
Groundwater after drilling: ---
Easting: 3,254,250.7
Range: 28.31



Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

95% DRAFT

See Plate 2 for boring location.

PLATE A-10a

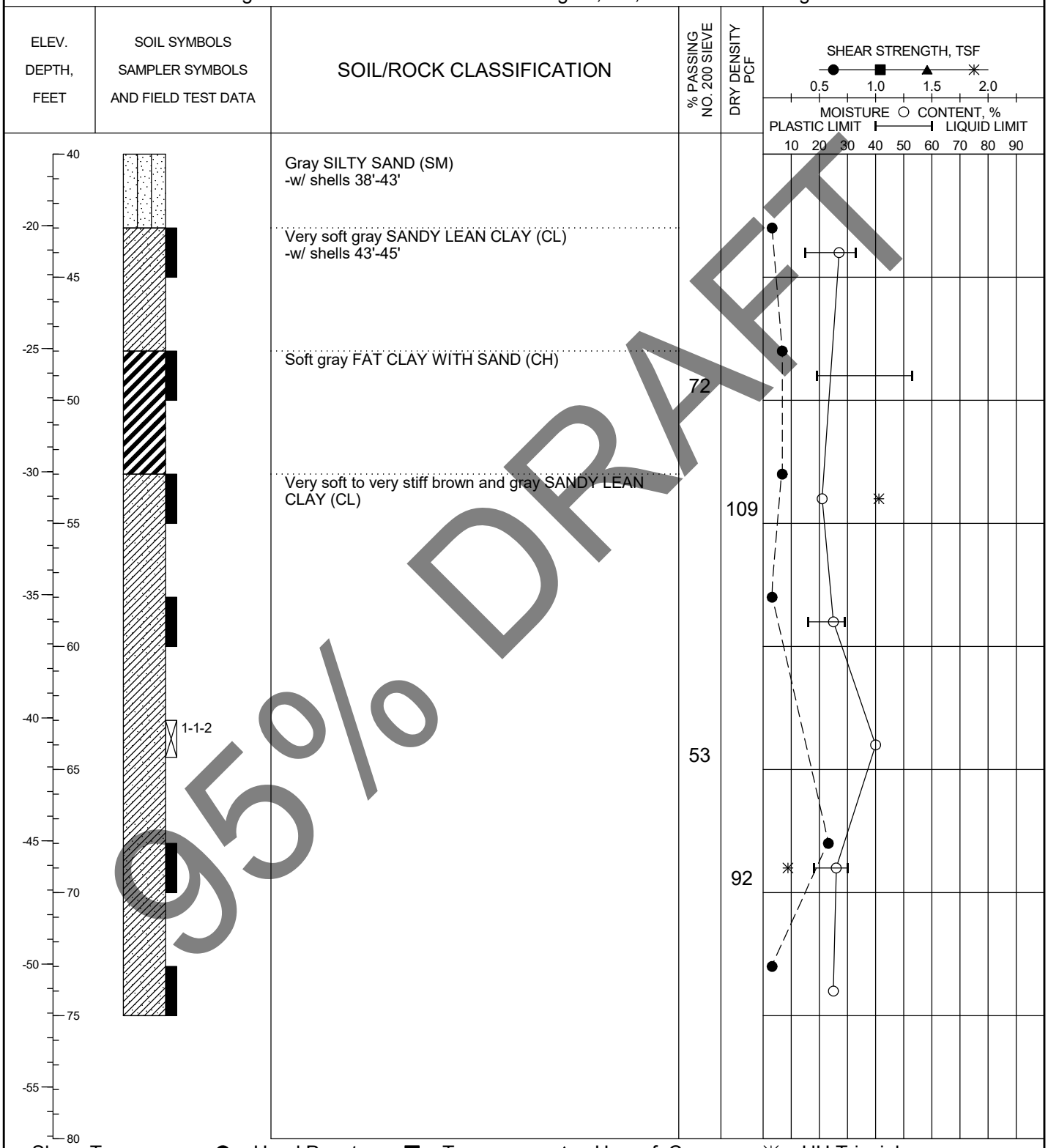
HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Boring No.: 12-10
Groundwater during drilling: 12 feet
Groundwater after drilling: ---

Date: 12/2/2012
Northing: 13,803,393.3
Easting: 3,254,250.7

Project No.: HG1019744
Elevation (MLT): 22.9 feet
Station: 62+07.72
Range: 28.31



Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-10b

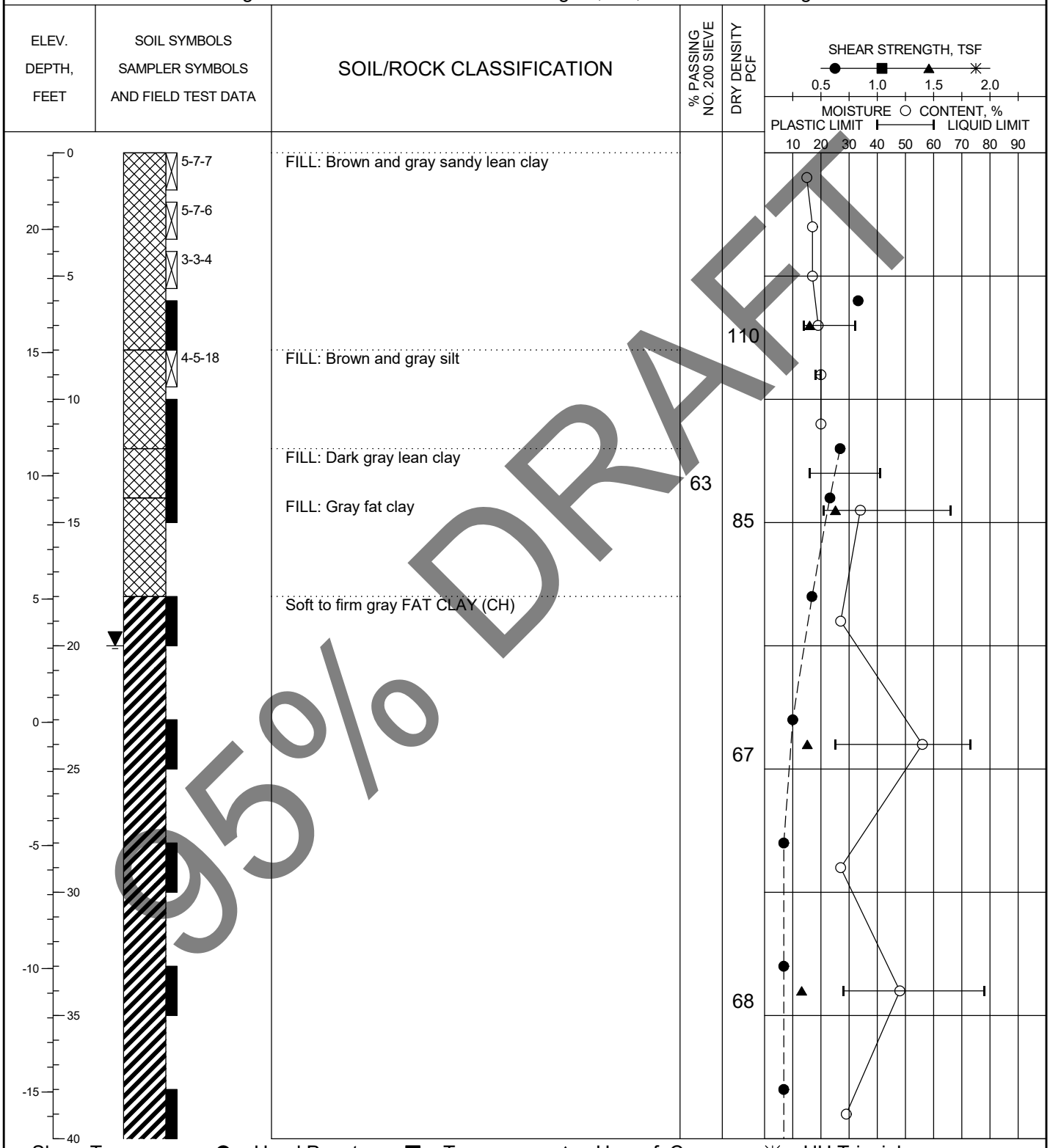
95% DRAFT

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-11
Date: 12/3/2012
Elevation (MLT): 23.1 feet
Groundwater during drilling: 20 feet
Northing: 13,802,919.6
Station: 67+05.67
Groundwater after drilling: ---
Easting: 3,254,404.8
Range: 13.66



Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-11a

95% DRAFT

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

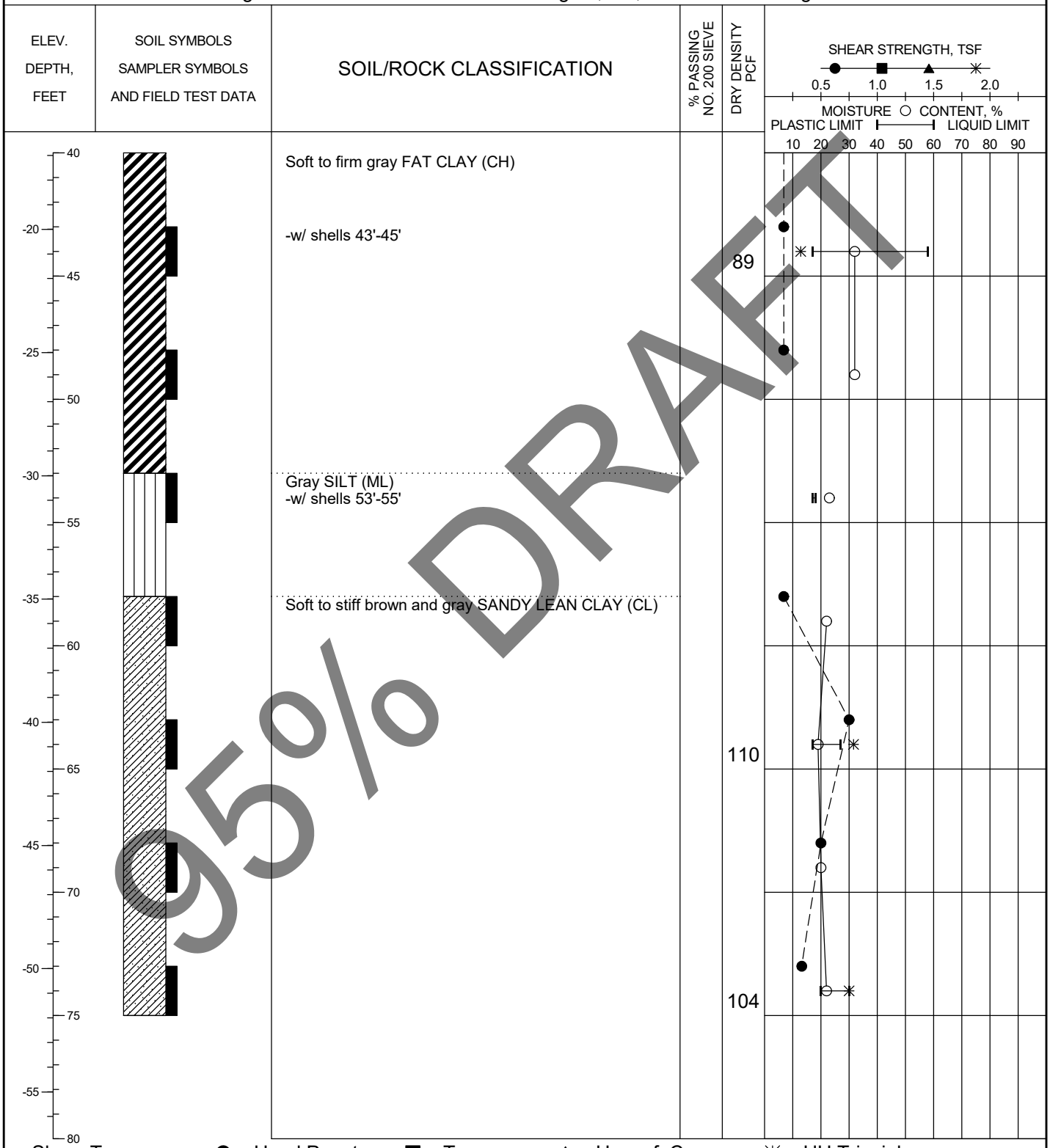
HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Boring No.: 12-11
Groundwater during drilling: 20 feet
Groundwater after drilling: ---

Date: 12/3/2012
Northing: 13,802,919.6
Easting: 3,254,404.8

Project No.: HG1019744
Elevation (MLT): 23.1 feet
Station: 67+05.67
Range: 13.66



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

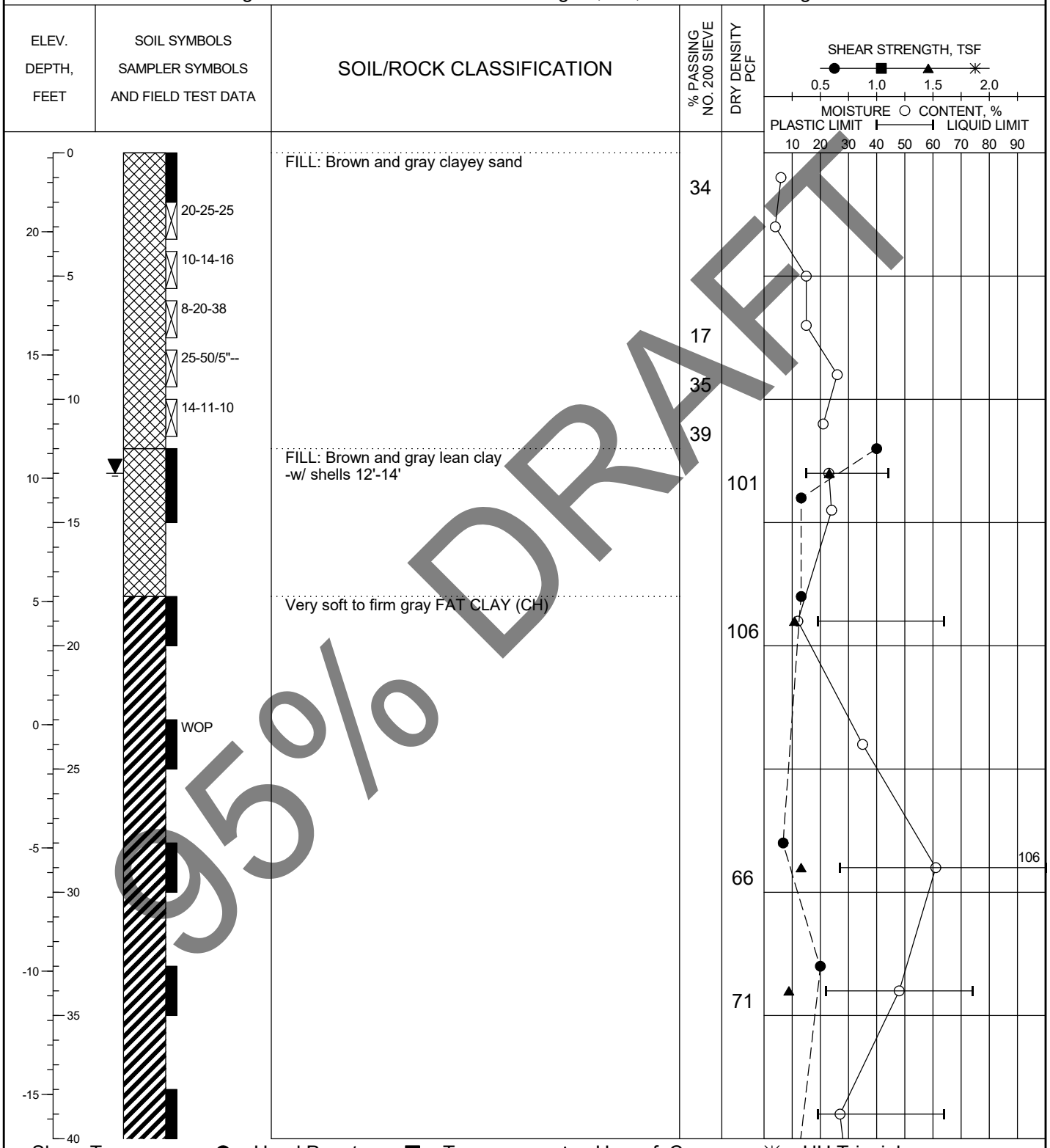
PLATE A-11b

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-12
Date: 12/4/2012
Elevation (MLT): 23.2 feet
Groundwater during drilling: 13 feet
Northing: 13,802,439.4
Station: 72+06.09
Groundwater after drilling: ---
Easting: 3,254,545.4
Range: 13.82



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

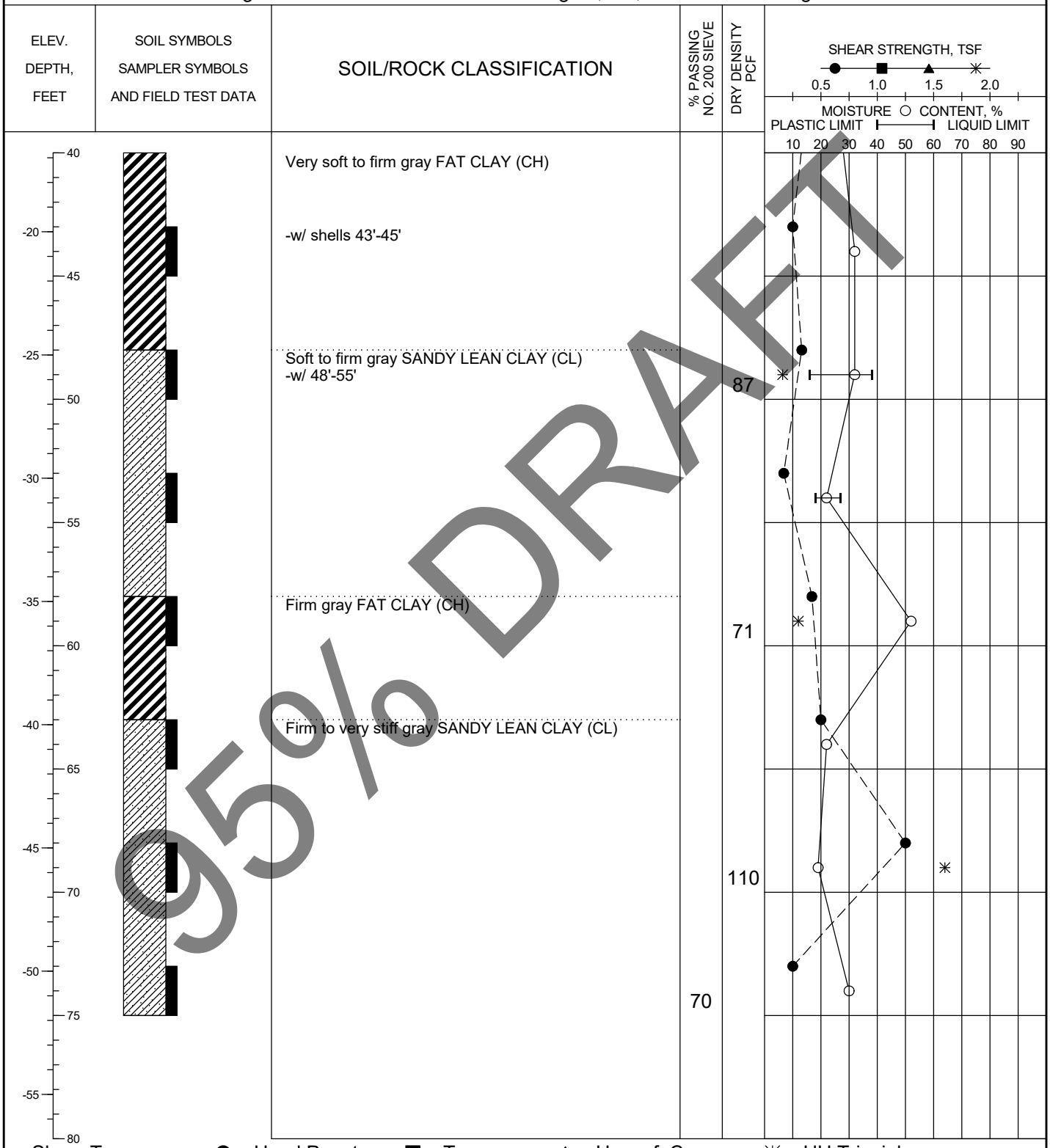
PLATE A-12a

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-12
Date: 12/4/2012
Elevation (MLT): 23.2 feet
Groundwater during drilling: 13 feet
Northing: 13,802,439.4
Station: 72+06.09
Groundwater after drilling: ---
Easting: 3,254,545.4
Range: 13.82



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

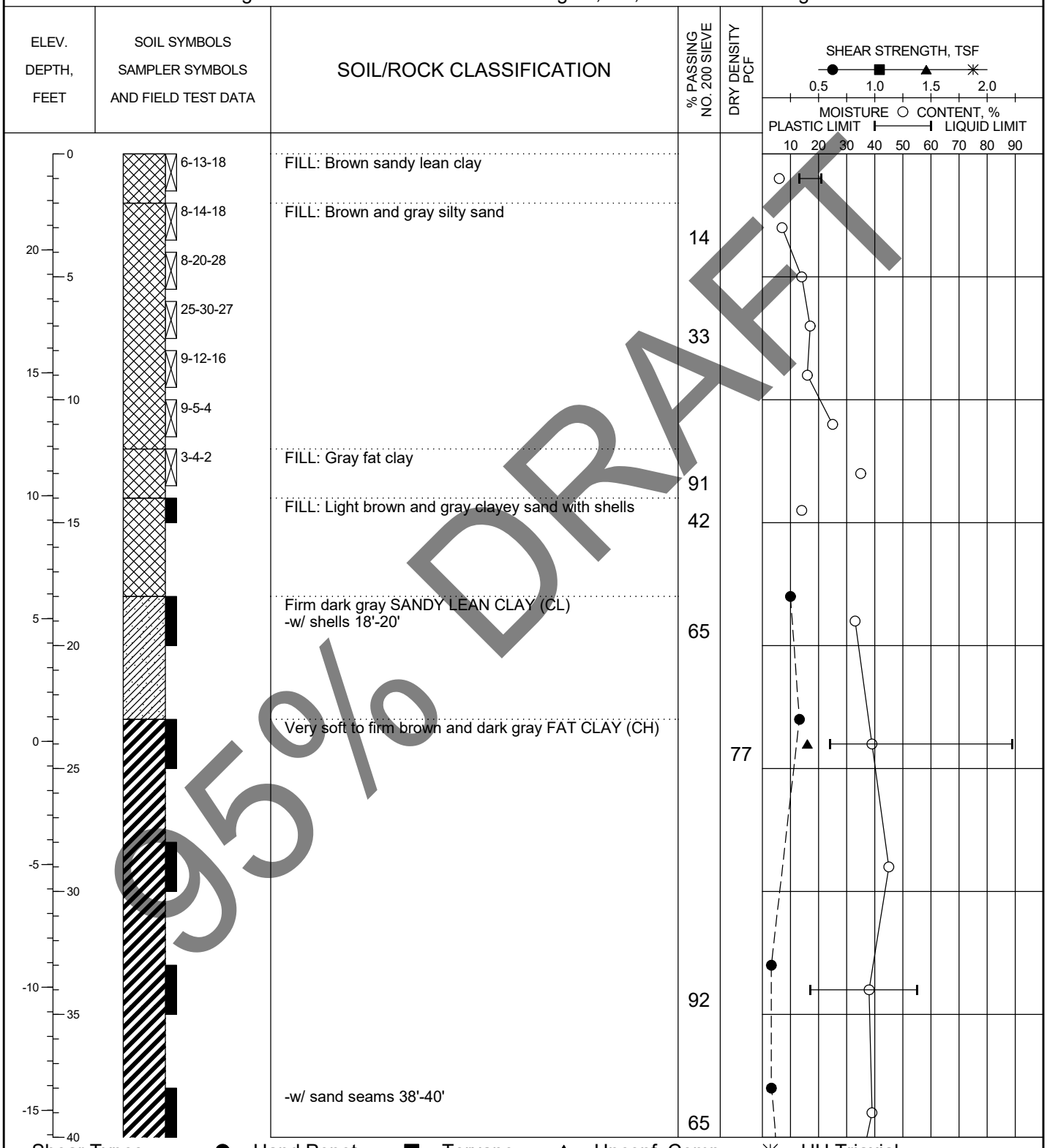
PLATE A-12b

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-13
Date: 12/4/2012
Elevation (MLT): 23.9 feet
Groundwater during drilling: Caved in at 8'
Northing: 13,801,935.1
Station: 77+31.56
Groundwater after drilling: ---
Easting: 3,254,693.2
Range: 13.85



Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

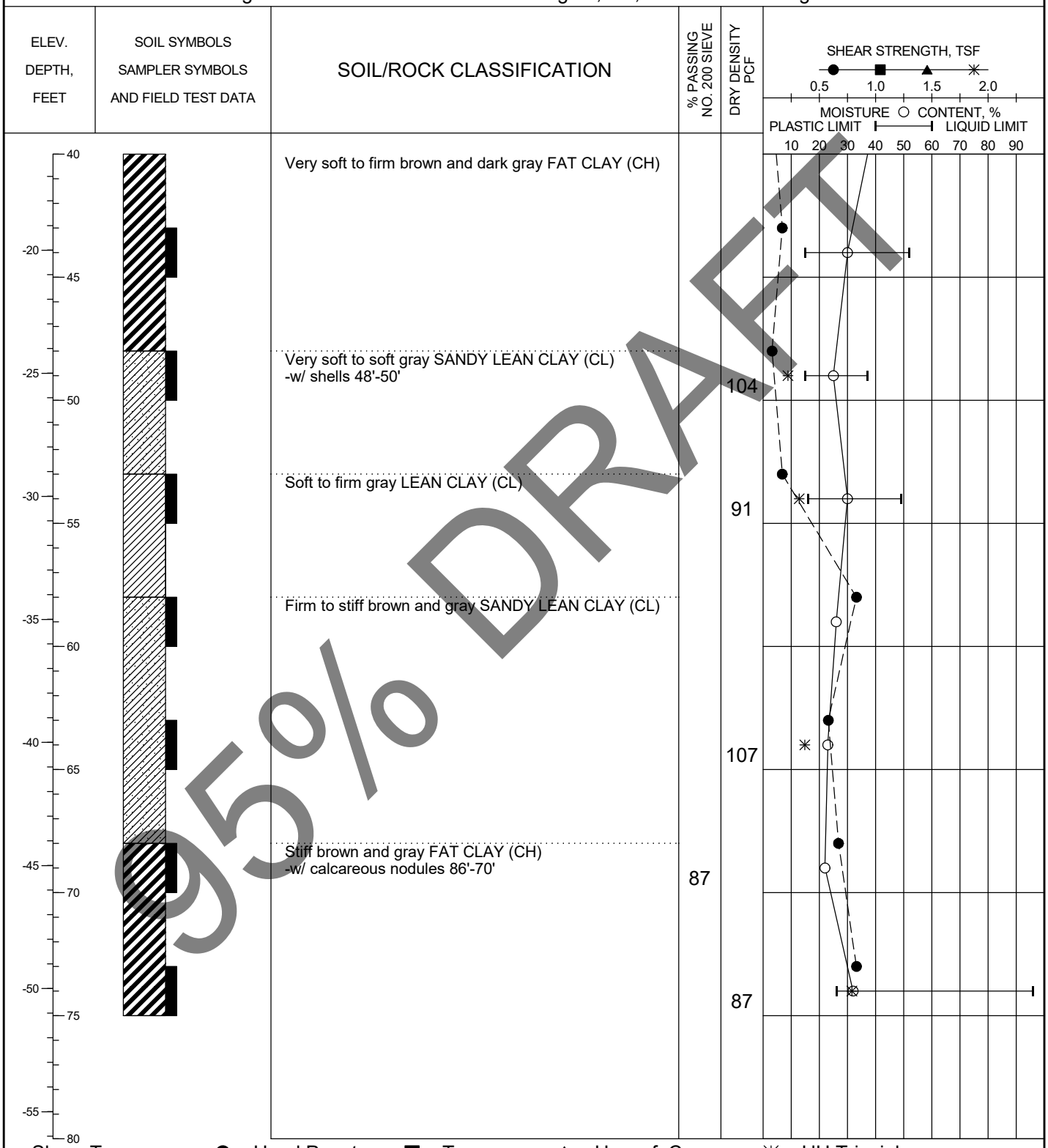
PLATE A-13a

95% DRAFT

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-13
Date: 12/4/2012
Elevation (MLT): 23.9 feet
Groundwater during drilling: Caved in at 8'
Northing: 13,801,935.1
Station: 77+31.56
Groundwater after drilling: ---
Easting: 3,254,693.2
Range: 13.85



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

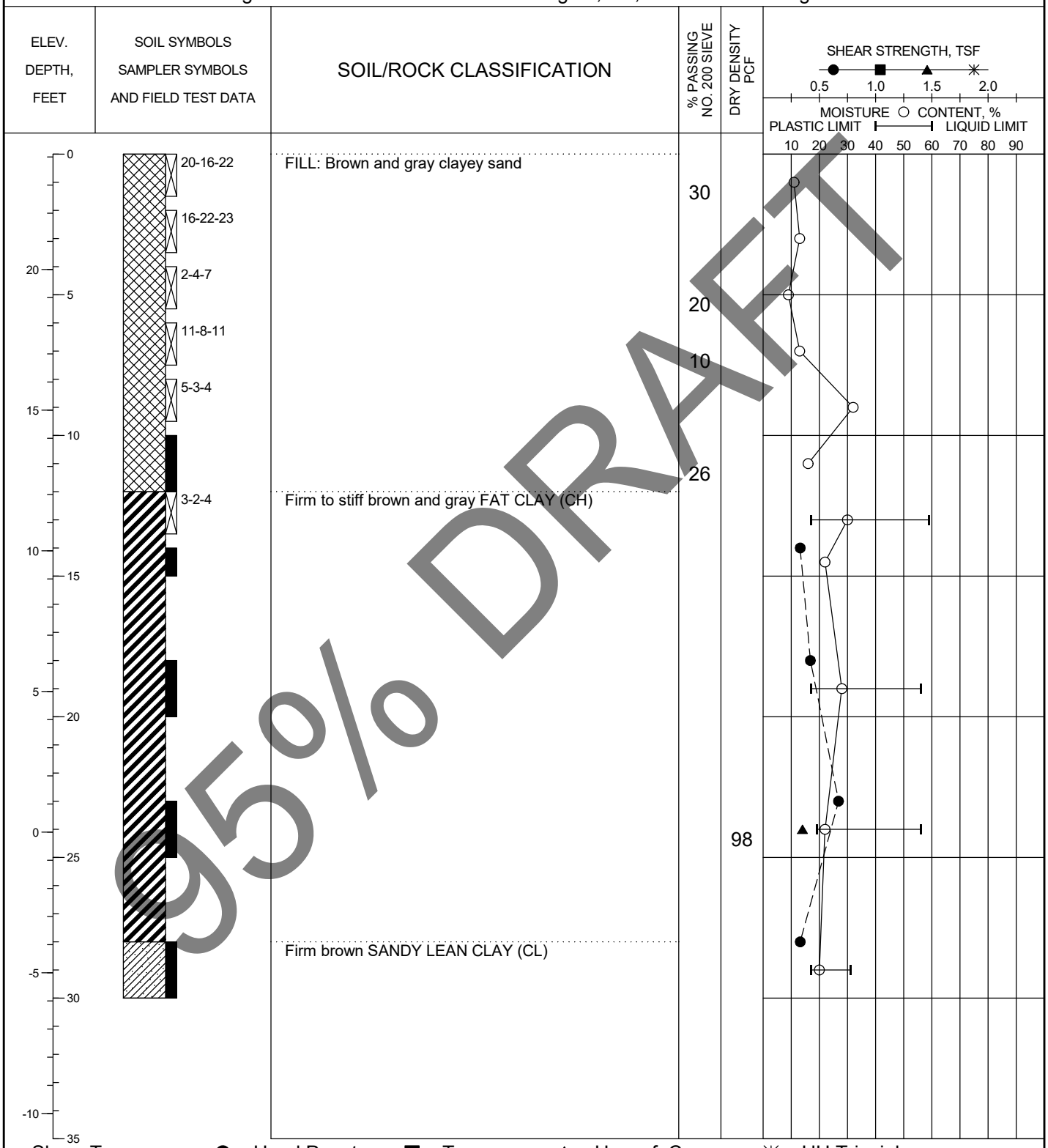
PLATE A-13b

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-14
Date: 12/5/2012
Elevation (MLT): 24.1 feet
Groundwater during drilling: Caved in at 10'
Northing: 13,801,030.1
Station: 86+88.24
Groundwater after drilling: ---
Easting: 3,255,000.0
Range: 1.09



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

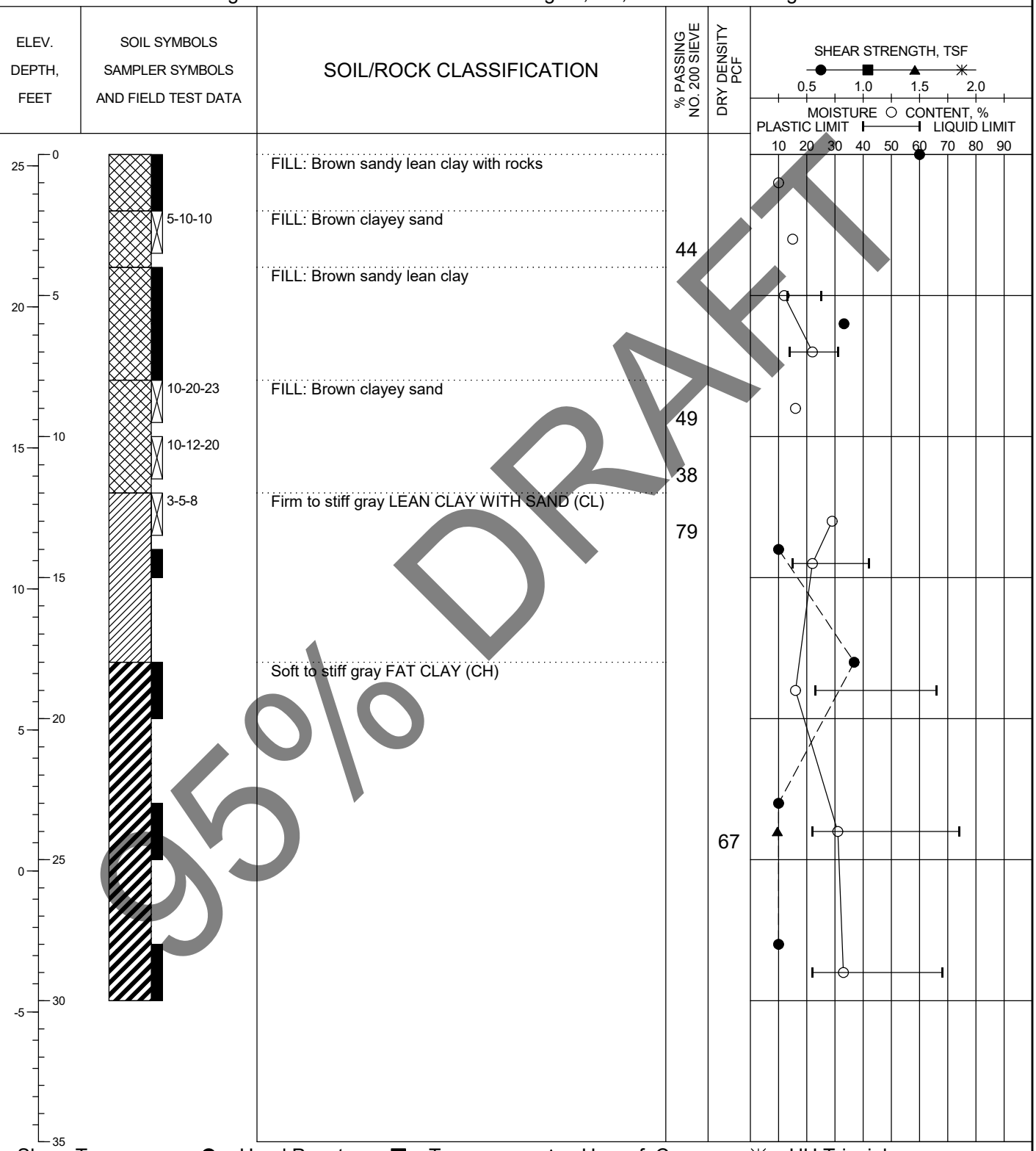
PLATE A-14

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-15
Date: 12/5/2012
Elevation (MLT): 25.4 feet
Groundwater during drilling: ---
Northing: 13,800,327.7
Station: 96+14.02
Groundwater after drilling: ---
Easting: 3,254,505.2
Range: 10.7



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-15

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

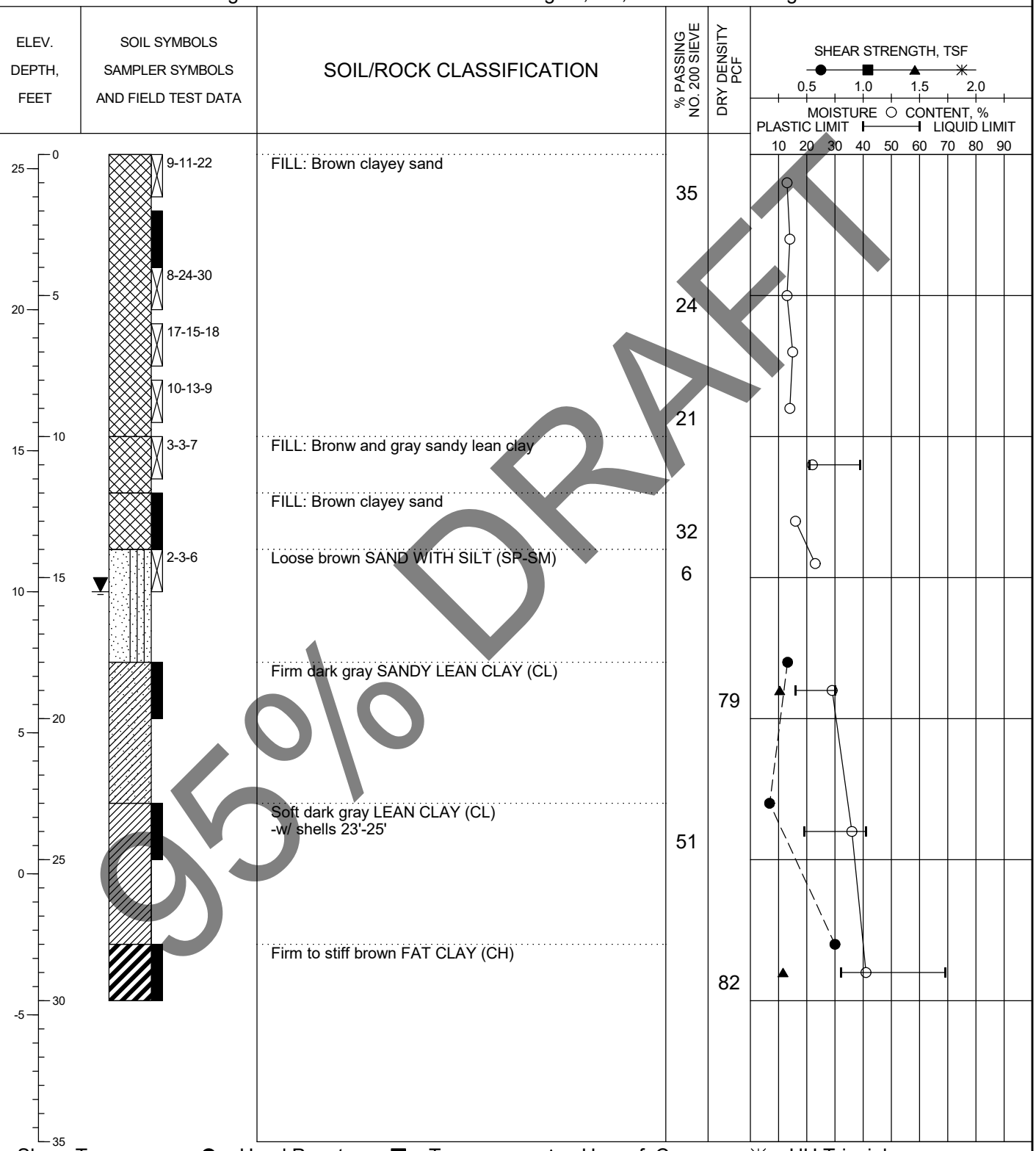
HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Boring No.: 12-16
Groundwater during drilling: 15.5 feet
Groundwater after drilling: ---

Date: 12/5/2012
Northing: 13,799,933.5
Easting: 3,253,628.8

Project No.: HG1019744
Elevation (MLT): 25.5 feet
Station: 105+72.46
Range: -8.05



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-16

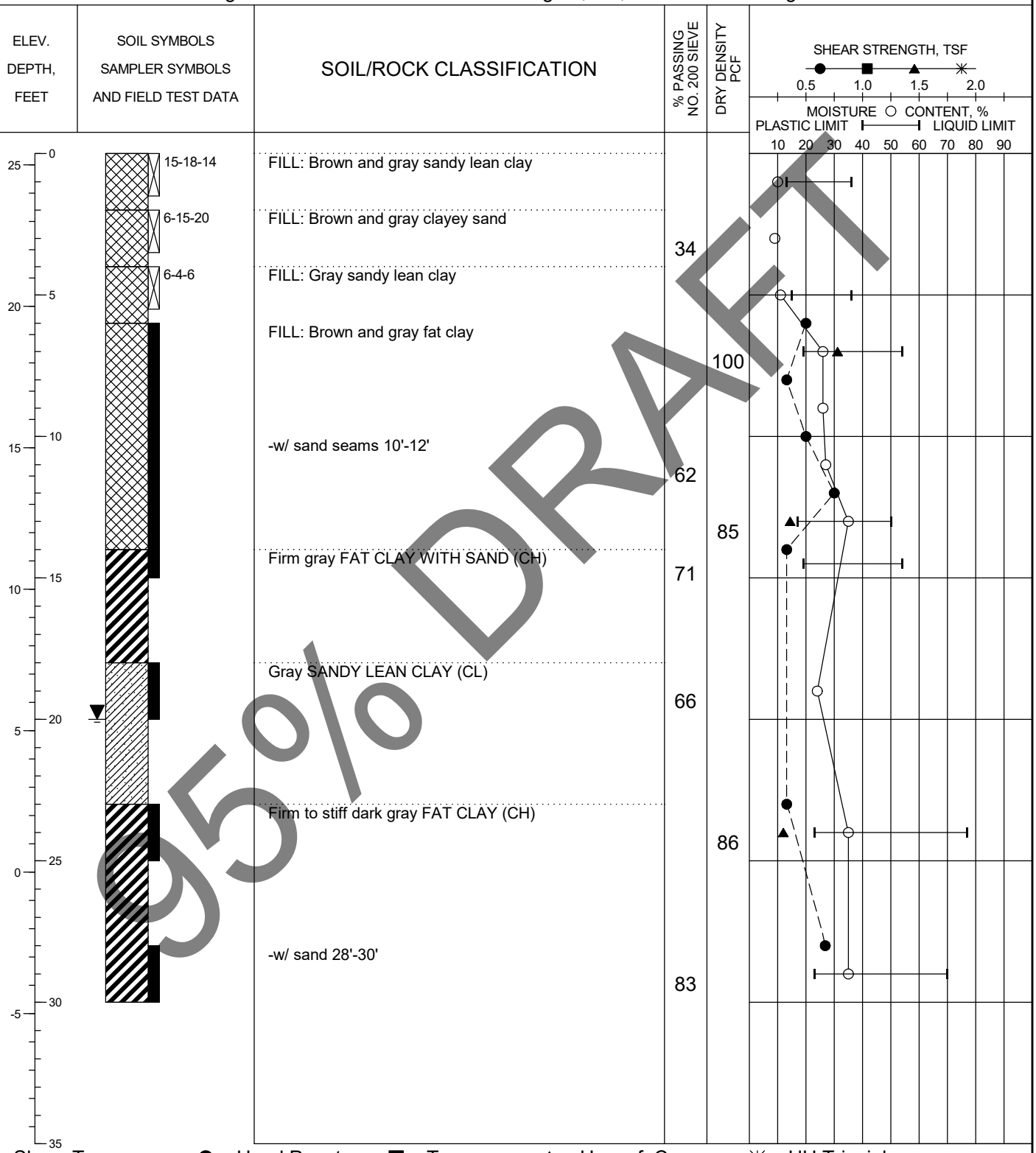
LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

LOG OF BORING

Project: Placement Area 15 Levee Raising
Boring No.: 12-17
Groundwater during drilling: 20 feet
Groundwater after drilling: ---

Date: 12/6/2012
Northing: 13,800,494.6
Easting: 3,252,846.5

Project No.: HG1019744
Elevation (MLT): 25.4 feet
Station: 115+48.59
Range: 16.33



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

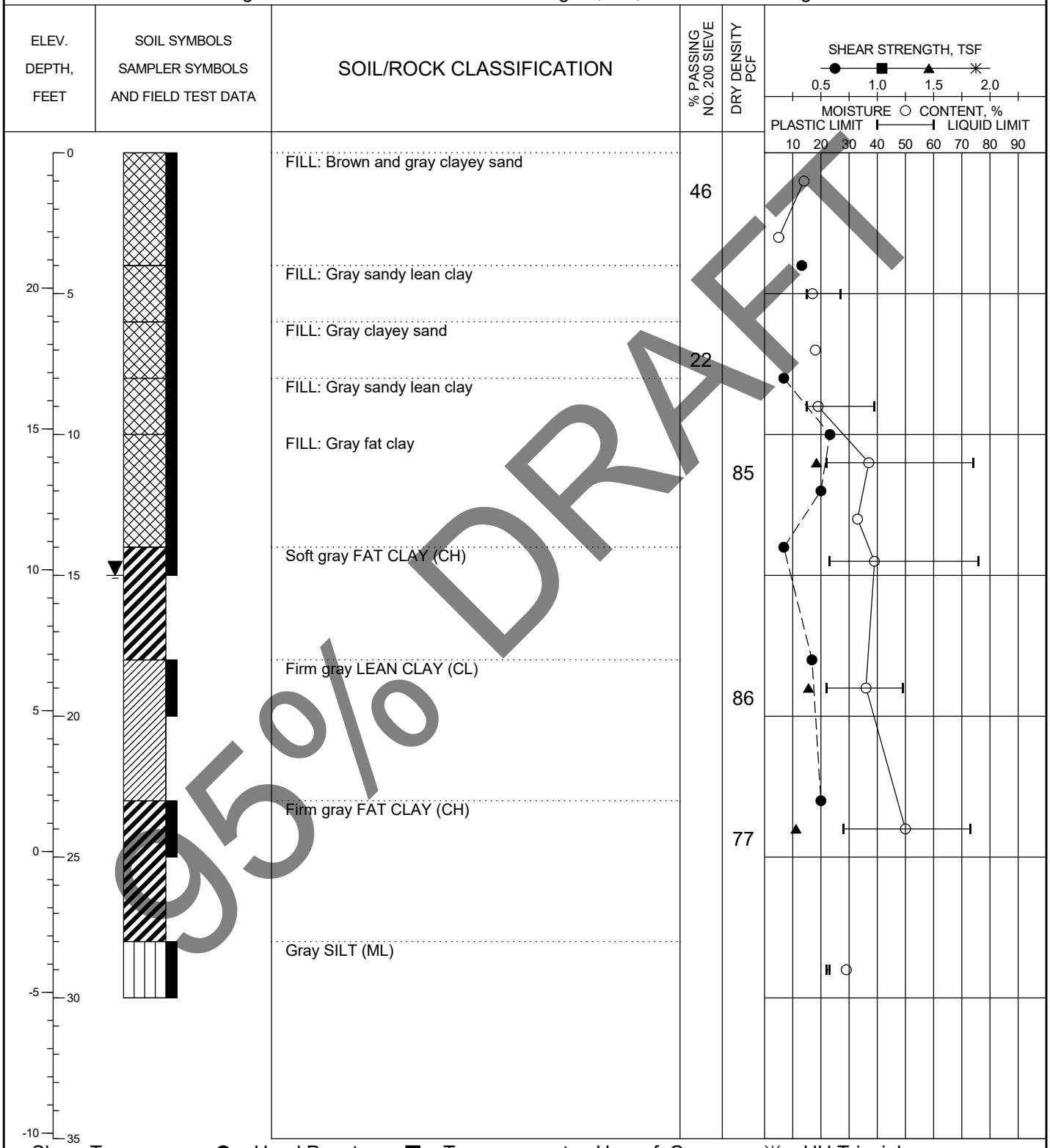
PLATE A-17

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-18
Date: 12/6/2012
Elevation (MLT): 24.8 feet
Groundwater during drilling: 15 feet
Northing: 13,800,863.1
Station: 122+36.23
Groundwater after drilling: ---
Easting: 3,252,277.5
Range: -6.72



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

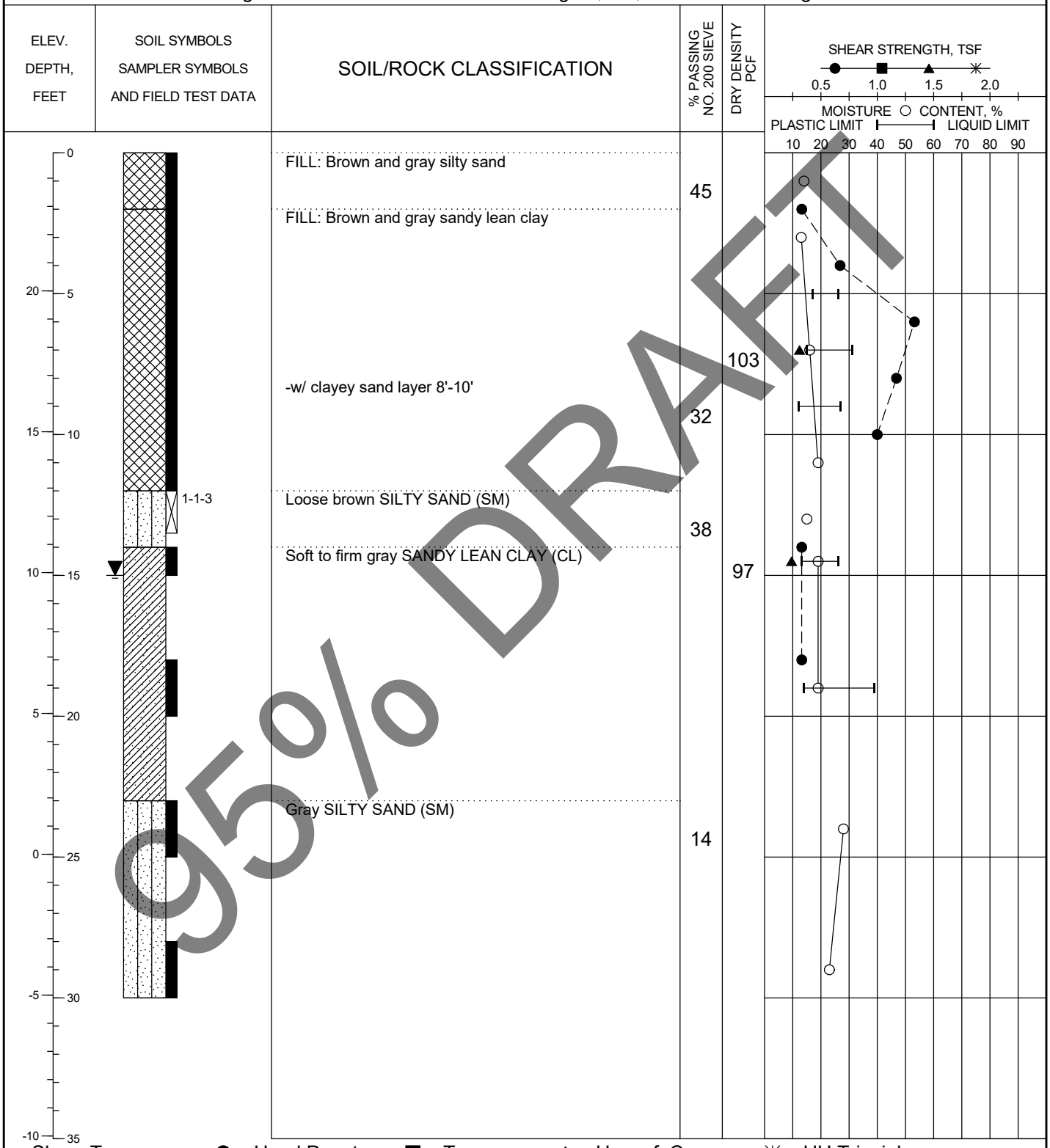
PLATE A-18

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-19
Date: 12/6/2012
Elevation (MLT): 24.9 feet
Groundwater during drilling: 15 feet
Northing: 13,801,778.8
Station: 132+16.37
Groundwater after drilling: ---
Easting: 3,251,928.0
Range: -4.31



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-19

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

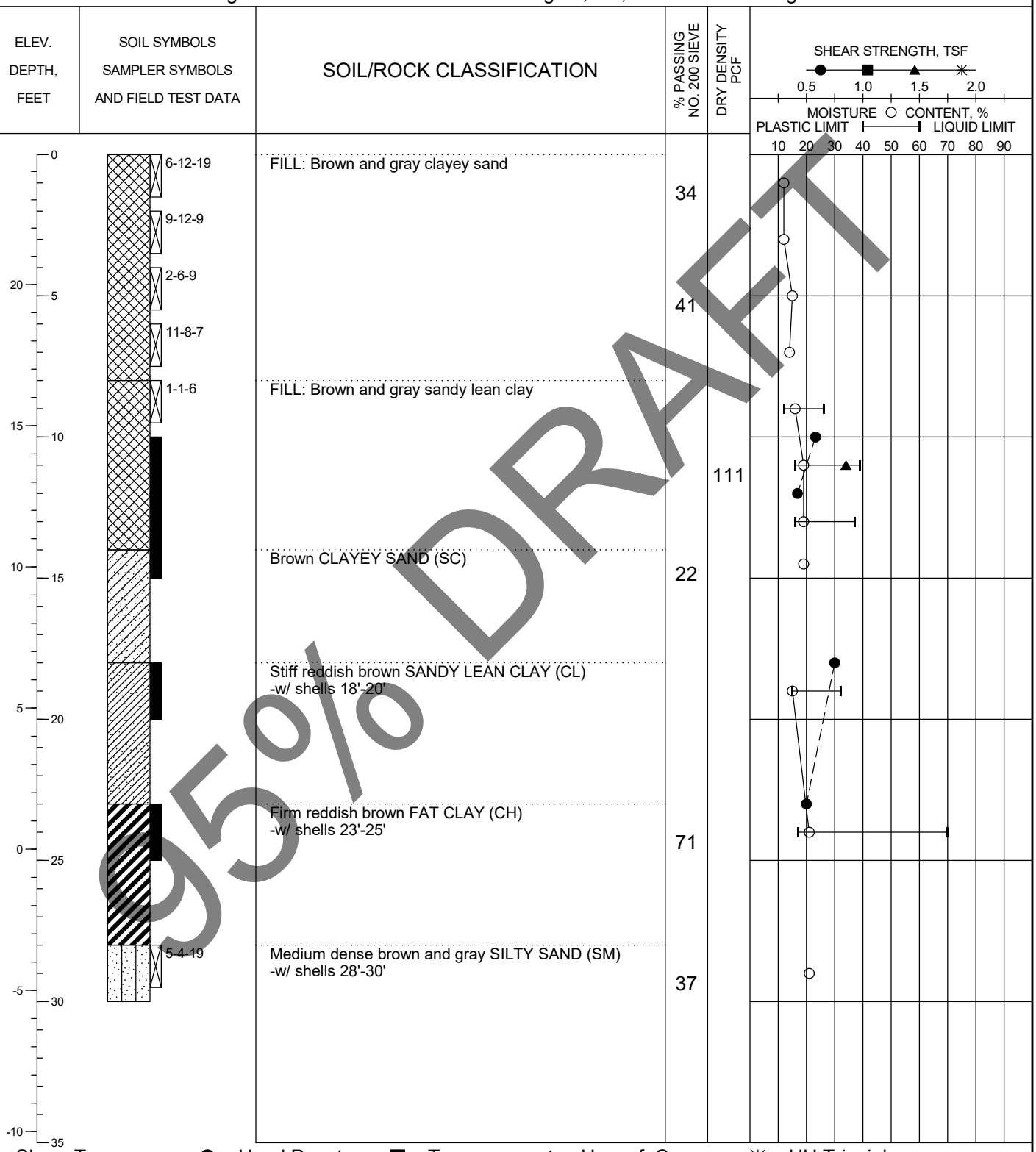
HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Boring No.: 12-20
Groundwater during drilling: Caved in at 10'
Groundwater after drilling: ---

Date: 12/6/2012
Northing: 13,802,574.4
Easting: 3,251,614.4

Project No.: HG1019744
Elevation (MLT): 24.6 feet
Station: 140+71.57
Range: -11.89



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

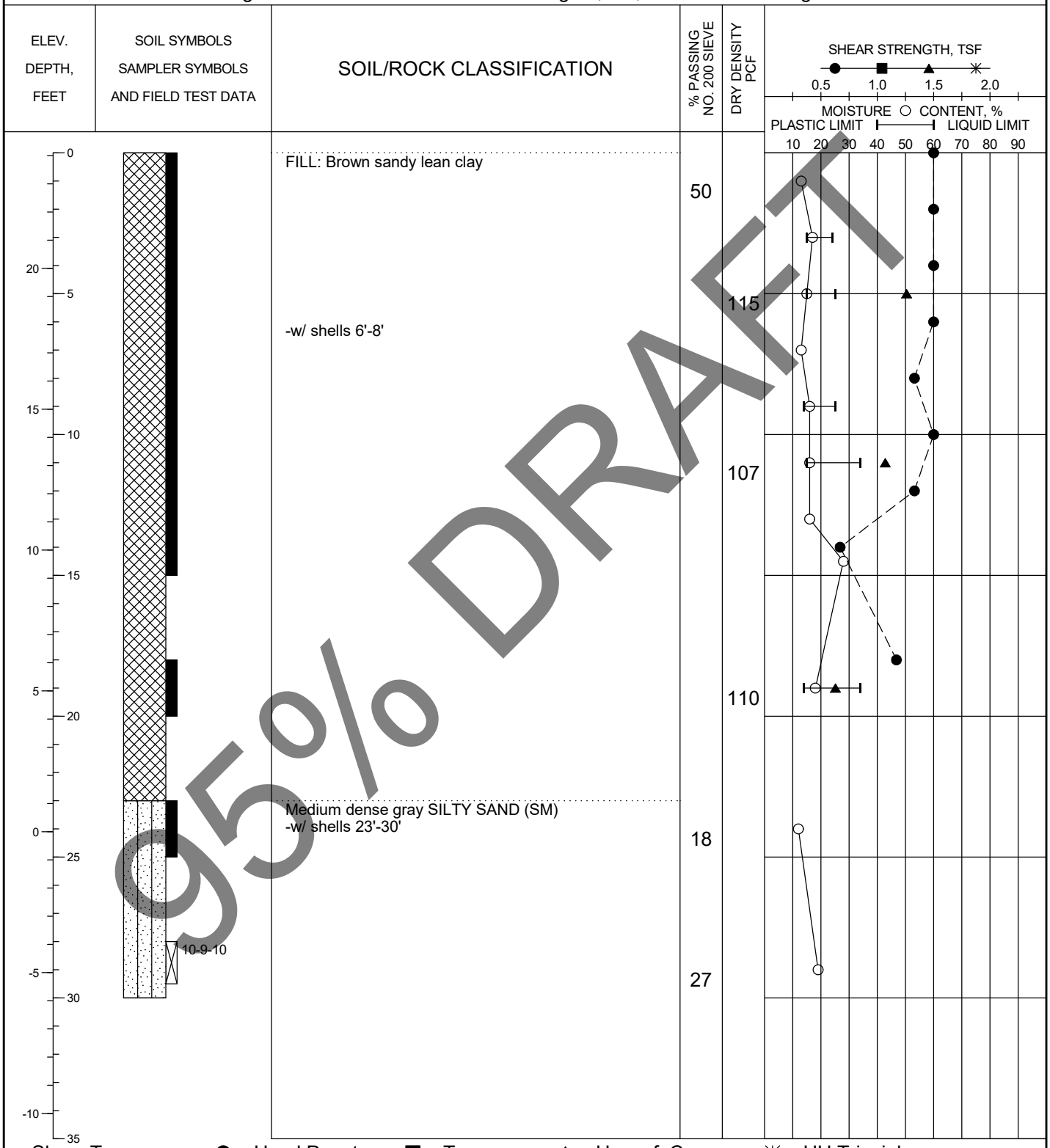
PLATE A-20

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-21
Date: 12/6/2012
Elevation (MLT): 24.1 feet
Groundwater during drilling: ---
Northing: 13,803,501.9
Station: 150+66.62
Groundwater after drilling: ---
Easting: 3,251,254.0
Range: -16.05



Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-21

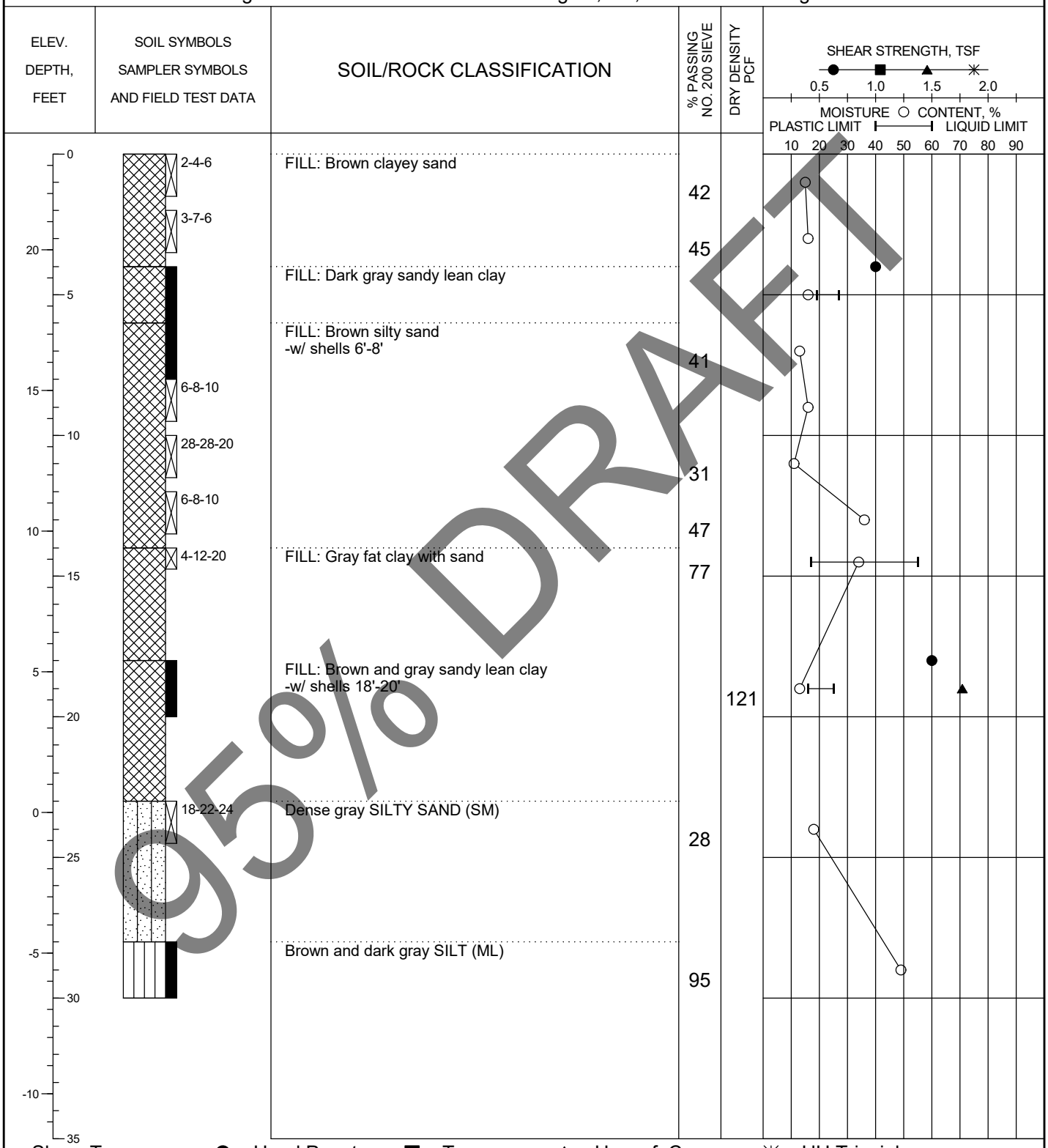
95% DRAFT

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-22
Date: 12/6/2012
Elevation (MLT): 23.4 feet
Groundwater during drilling: Caved in at 12'
Northing: 13,804,423.9
Station: 160+50.76
Groundwater after drilling: ---
Easting: 3,250,909.6
Range: -7.15



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

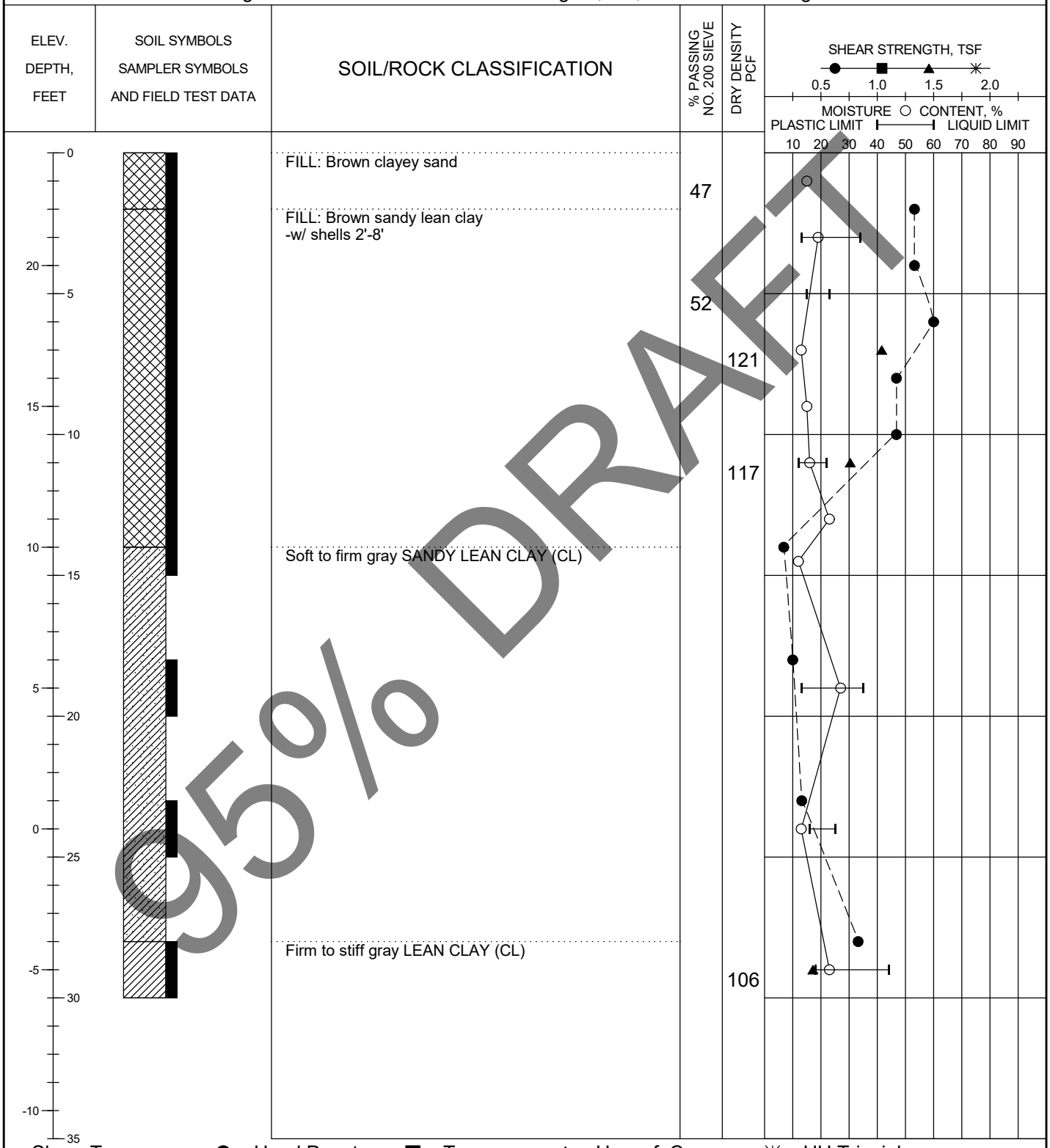
PLATE A-22

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-23
Date: 12/6/2012
Elevation (MLT): 24 feet
Groundwater during drilling: ---
Northing: 13,805,357.4
Station: 170+51.53
Groundwater after drilling: ---
Easting: 3,250,548.9
Range: -9.30



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-23

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

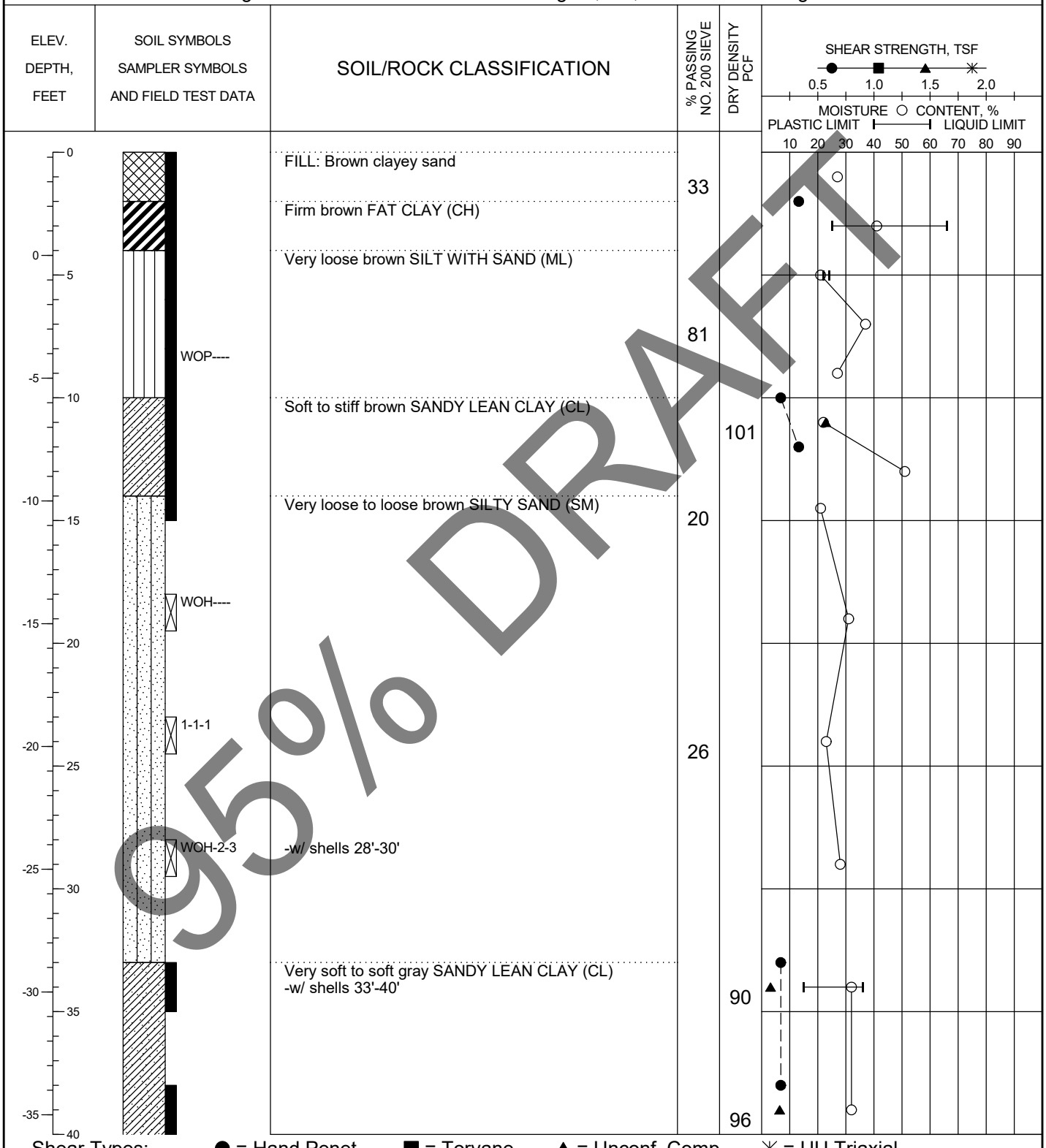
HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Boring No.: 12-24
Groundwater during drilling: ---
Groundwater after drilling: ---

Date: 11/30/2012
Northing: 13,804,869.9
Easting: 3,253,987.6

Project No.: HG1019744
Elevation (MLT): 4.2 feet
Station: 47+16.78
Range: -134.63



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-24a

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-24
Date: 11/30/2012
Elevation (MLT): 4.2 feet
Groundwater during drilling: ---
Northing: 13,804,869.9
Station: 47+16.78
Groundwater after drilling: ---
Easting: 3,253,987.6
Range: -134.63

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF
-40 / 40		Very soft to soft gray SANDY LEAN CLAY (CL) -w/ shells 33'-40'		
-40 / 45	6-6-7	Medium dense gray SILT WITH SAND (ML)	75	
-45 / 50	8-5-8	Medium dense gray SILTY SAND (SM)	21	
-50 / 55				
-55 / 60				
-60 / 65				
-65 / 70				
-70 / 75				
-75 / 80				

SHEAR STRENGTH, TSF
0.5 1.0 1.5 2.0
MOISTURE ○ CONTENT, %
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 50 60 70 80 90

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

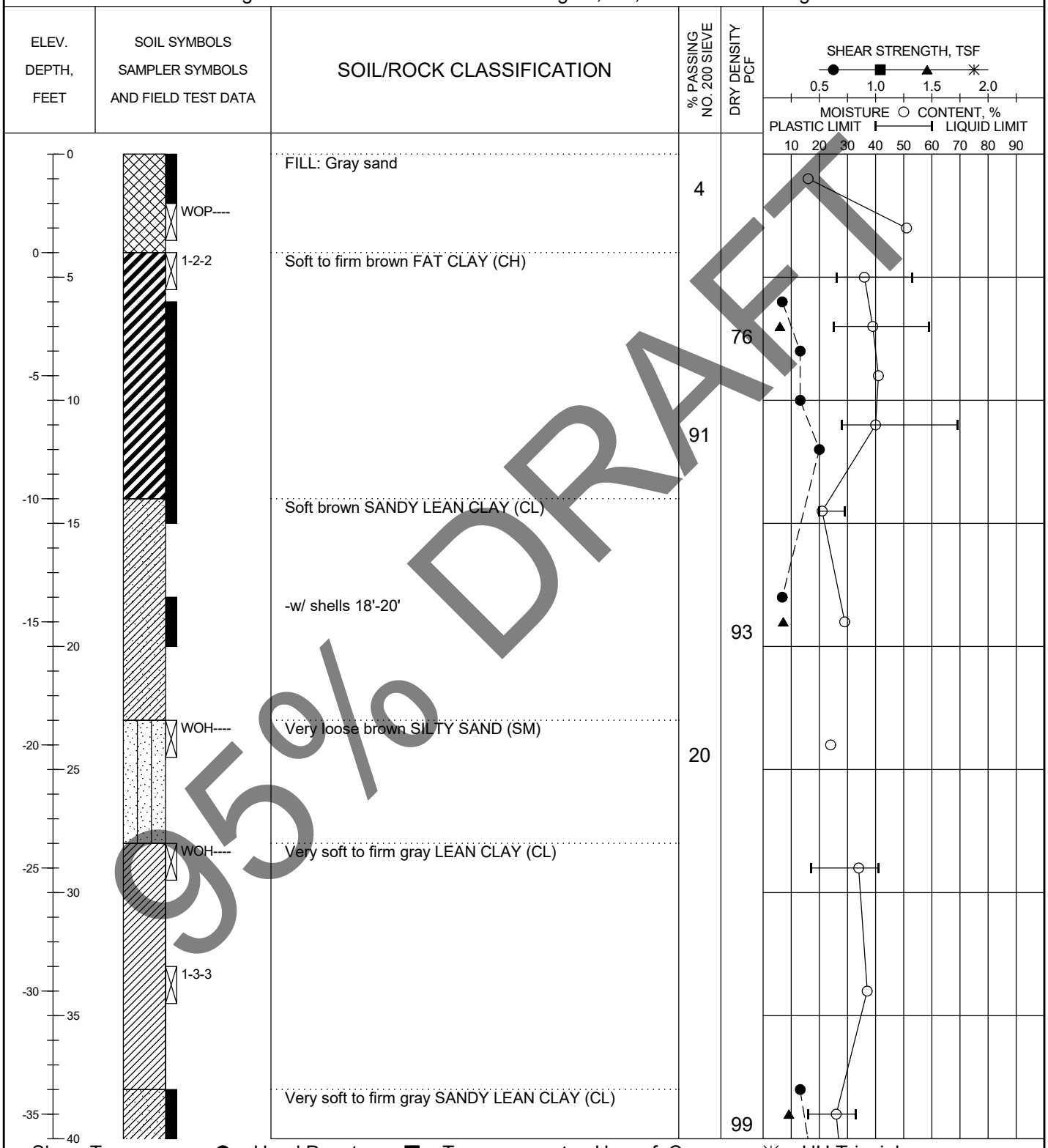
See Plate 2 for boring location.

PLATE A-24b

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-25
Date: 12/1/2012
Elevation (MLT): 4.0 feet
Groundwater during drilling: ---
Northing: 13,804,444.5
Station: 51+66.44
Groundwater after drilling: ---
Easting: 3,254,134.8
Range: -156.17



Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

95% DRAFT

See Plate 2 for boring location.

PLATE A-25a

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-25
Date: 12/1/2012
Elevation (MLT): 4.0 feet
Groundwater during drilling: ---
Northing: 13,804,444.5
Station: 51+66.44
Groundwater after drilling: ---
Easting: 3,254,134.8
Range: -156.17

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF
-40 / 45		Very soft to firm gray SANDY LEAN CLAY (CL)		
		-w/ shells 43'-45'	93	
-45 / 50	WOH----	Very loose gray SILTY SAND (SM)	21	

SHEAR STRENGTH, TSF
0.5 1.0 1.5 2.0
MOISTURE ○ CONTENT, %
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 50 60 70 80 90

-50 / 55
-55 / 60
-60 / 65
-65 / 70
-70 / 75
-75 / 80

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

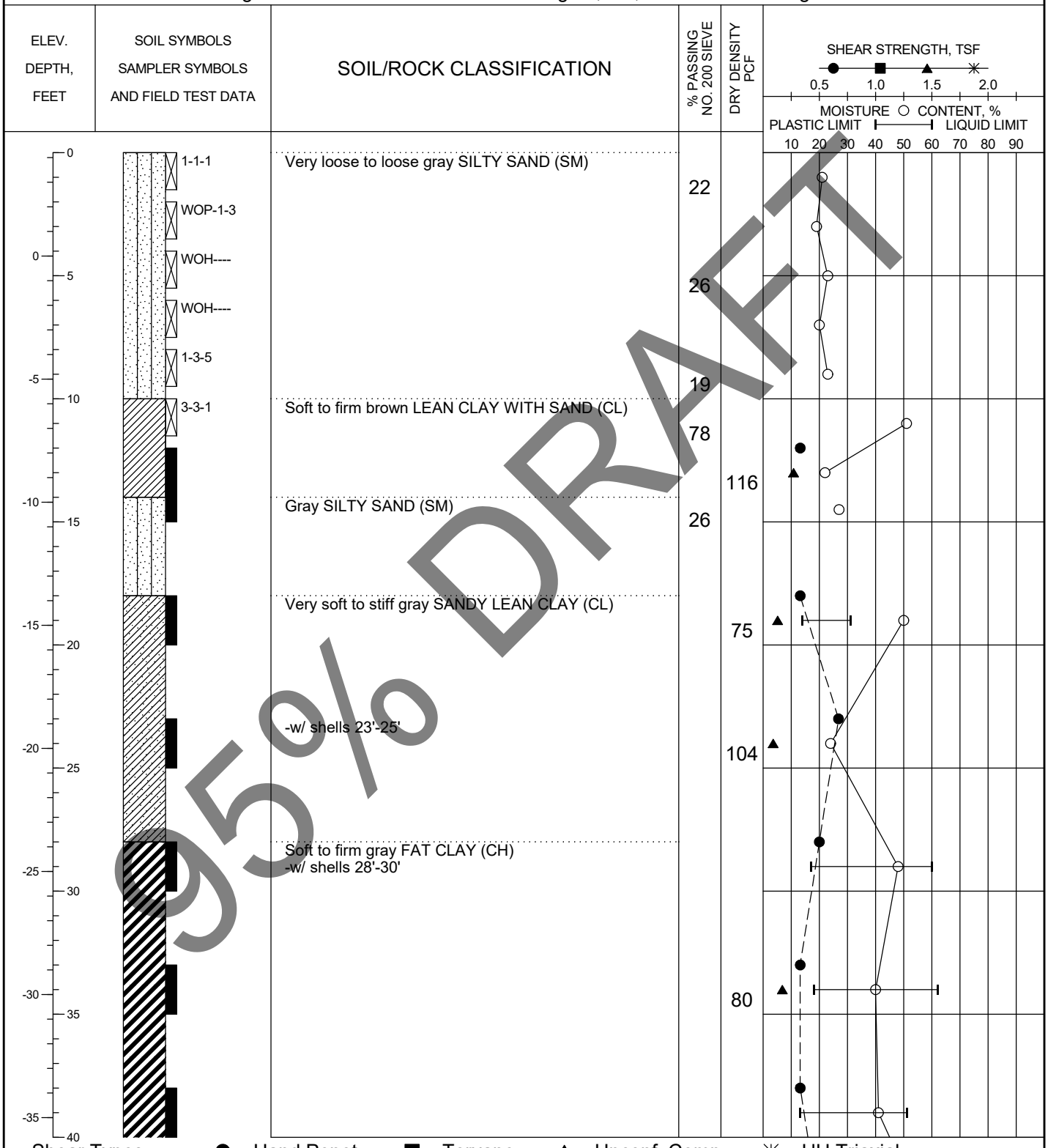
See Plate 2 for boring location.

PLATE A-25b

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-26
Date: 12/1/2012
Elevation (MLT): 4.2 feet
Groundwater during drilling: ---
Northing: 13,803,976.2
Station: 56+54.59
Groundwater after drilling: ---
Easting: 3,254,272.9
Range: -156.94



Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

95% DRAFT

See Plate 2 for boring location.

PLATE A-26a

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-26
Date: 12/1/2012
Elevation (MLT): 4.2 feet
Groundwater during drilling: ---
Northing: 13,803,976.2
Station: 56+54.59
Groundwater after drilling: ---
Easting: 3,254,272.9
Range: -156.94

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF	SHEAR STRENGTH, TSF / MOISTURE CONTENT, %
-40 / 40		Soft to firm gray FAT CLAY (CH) -w/ shells 28'-30'			
-45 / 45					
-50 / 50					
-55 / 55					
-60 / 60					
-65 / 65					
-70 / 70					
-75 / 75					
80					

SHEAR STRENGTH, TSF
0.5 1.0 1.5 2.0
MOISTURE ○ CONTENT, %
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 50 60 70 80 90

66

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

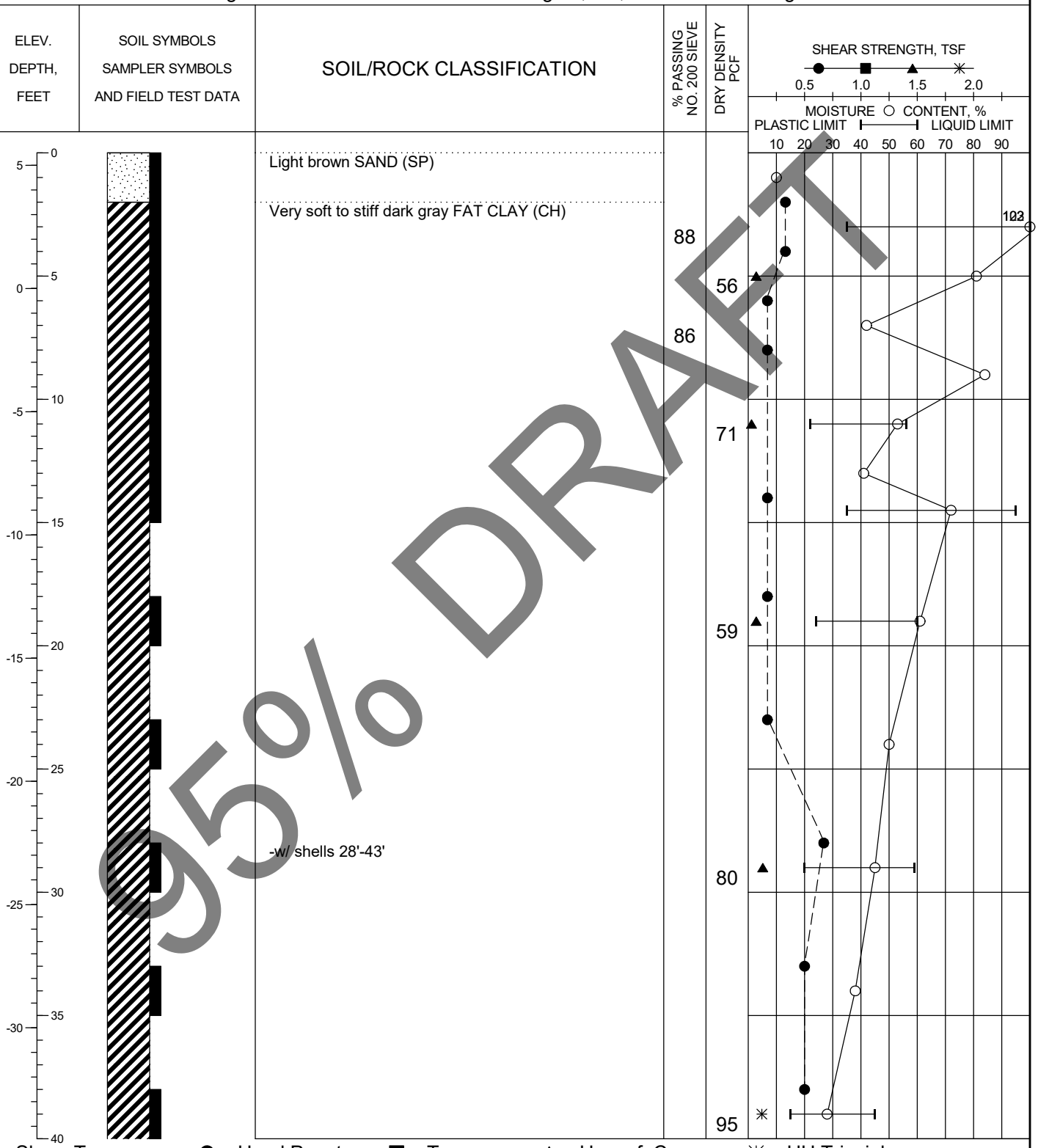
See Plate 2 for boring location.

PLATE A-26b

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-27
Date: 12/2/2012
Elevation (MLT): 5.5 feet
Groundwater during drilling: ---
Northing: 13,803,435.0
Station: 62+10.56
Groundwater after drilling: ---
Easting: 3,254,402.8
Range: -129.44



Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-27a

95% DRAFT

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-27
Date: 12/2/2012
Elevation (MLT): 5.5 feet
Groundwater during drilling: ---
Northing: 13,803,435.0
Station: 62+10.56
Groundwater after drilling: ---
Easting: 3,254,402.8
Range: -129.44

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF
-35 / 40		Very soft to stiff dark gray FAT CLAY (CH)		
	WOH----	Very loose gray SILTY SAND (SM -w/ shells 43'-45'	46	
-40 / 45				
	WOH----	Very soft gray LEAN CLAY (CL)		
-45 / 50				
-50 / 55				
-55 / 60				
-60 / 65				
-65 / 70				
-70 / 75				
80				

SHEAR STRENGTH, TSF
● ■ ▲ ✳
0.5 1.0 1.5 2.0
MOISTURE ○ CONTENT, %
PLASTIC LIMIT ⊢ LIQUID LIMIT
10 20 30 40 50 60 70 80 90

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

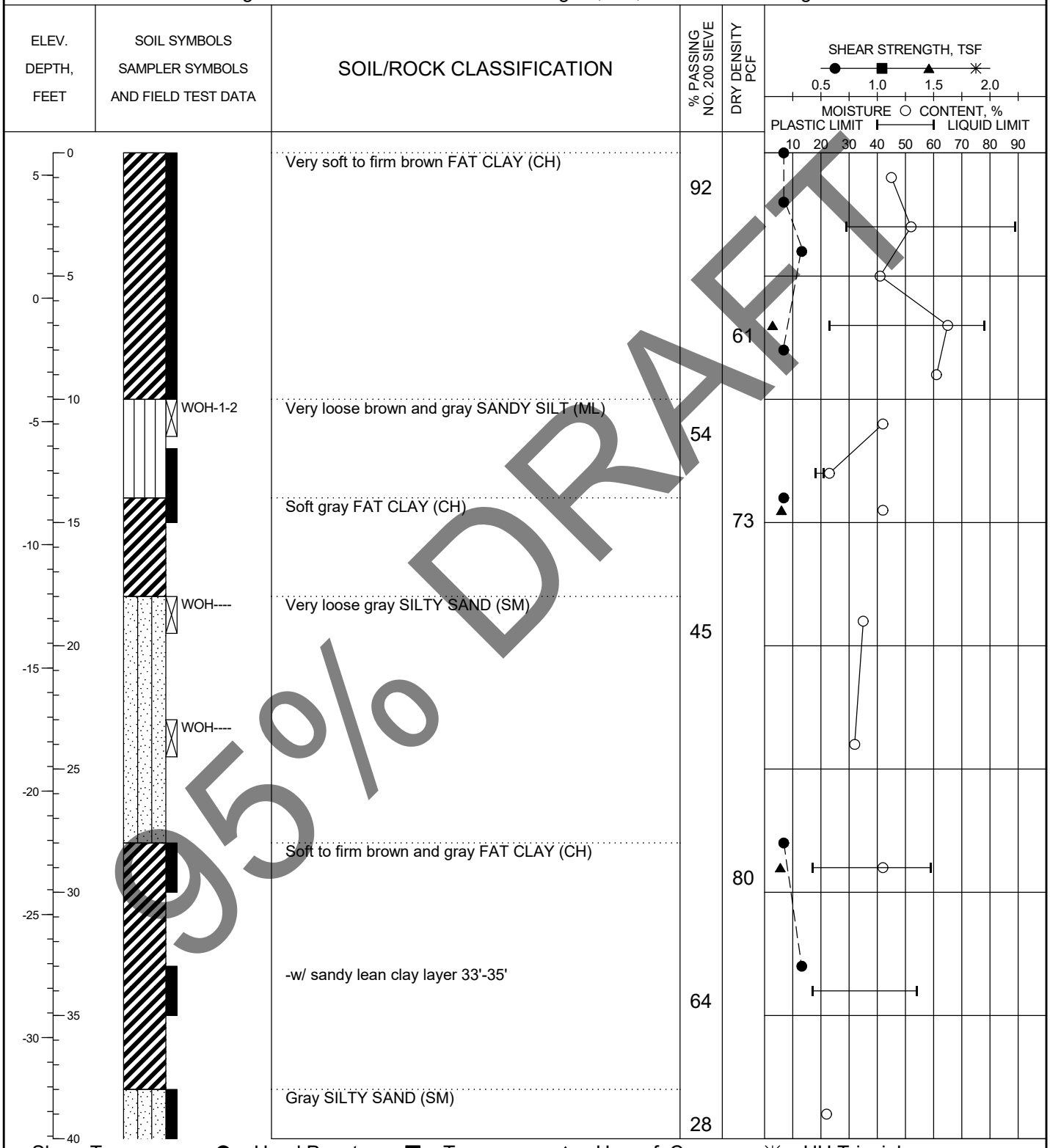
PLATE A-27b

HVJ ASSOCIATES

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-28
Date: 12/2/2012
Elevation (MLT): 5.9 feet
Groundwater during drilling: ---
Northing: 13,802,961.1
Station: 67+07.19
Groundwater after drilling: ---
Easting: 3,254,551.7
Range: -138.97



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-28a

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-28
Date: 12/2/2012
Elevation (MLT): 5.9 feet
Groundwater during drilling: ---
Northing: 13,802,961.1
Station: 67+07.19
Groundwater after drilling: ---
Easting: 3,254,551.7
Range: -138.97

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF	SHEAR STRENGTH, TSF / MOISTURE CONTENT, %
-35 / 40		Gray SILTY SAND (SM)			
-40 / 45		Soft to stiff gray SANDY LEAN CLAY (CL)		107	
-45 / 50					
-50 / 55					
-55 / 60					
-60 / 65					
-65 / 70					
-70 / 75					
80					

SHEAR STRENGTH, TSF
0.5 1.0 1.5 2.0
MOISTURE ○ CONTENT, %
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 50 60 70 80 90

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

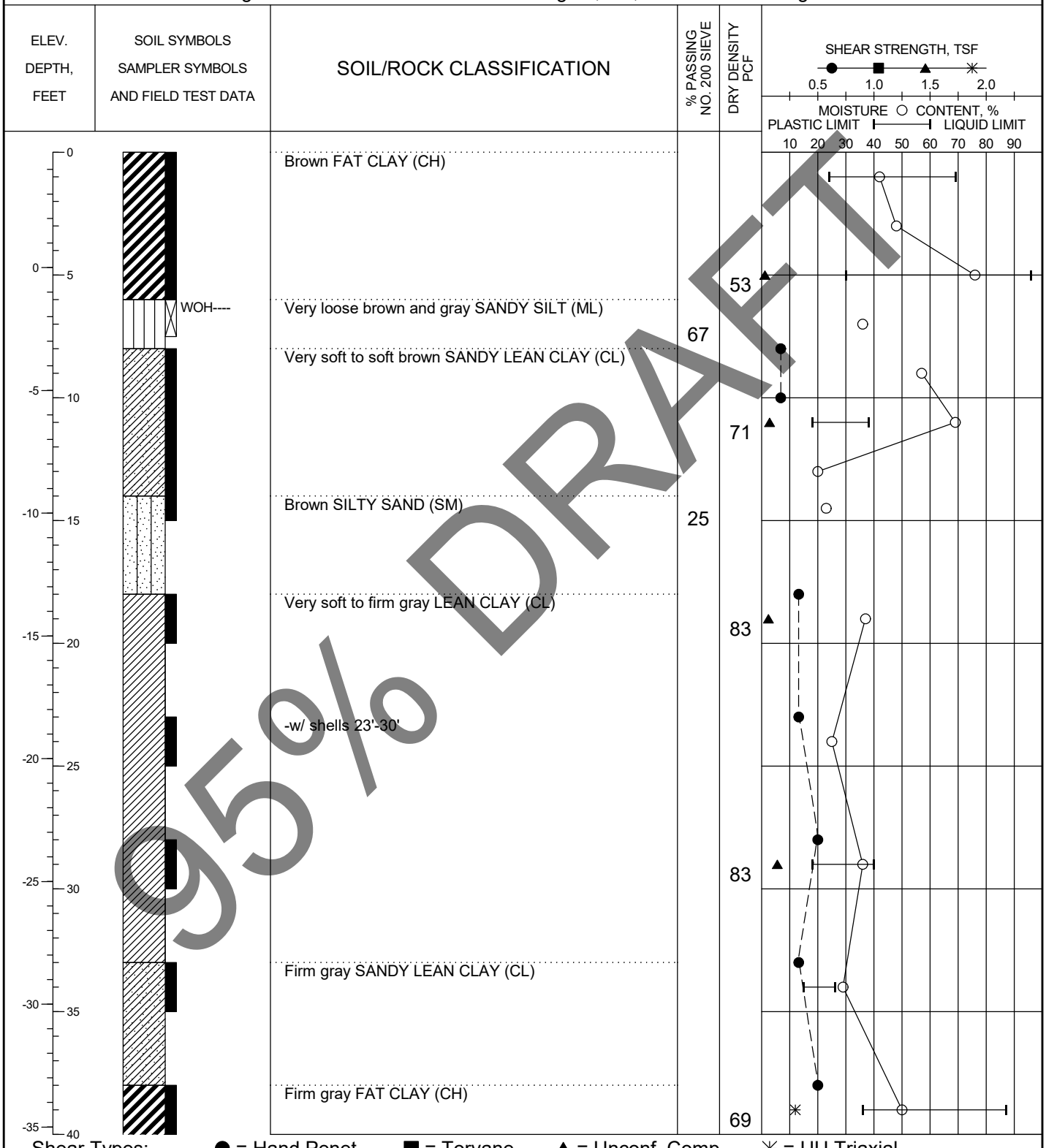
See Plate 2 for boring location.

PLATE A-28b

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-29
Date: 12/2/2012
Elevation (MLT): 4.7 feet
Groundwater during drilling: ---
Northing: 13,802,475.1
Station: 72+15.58
Groundwater after drilling: ---
Easting: 3,254,701.0
Range: -145.5



Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

95% DRAFT

See Plate 2 for boring location.

PLATE A-29a

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-29
Date: 12/2/2012
Elevation (MLT): 4.7 feet
Groundwater during drilling: ---
Northing: 13,802,475.1
Station: 72+15.58
Groundwater after drilling: ---
Easting: 3,254,701.0
Range: -145.5

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF
-40 / 40		Firm gray FAT CLAY (CH)		
-40 / 45		Gray CLAYEY SAND (SC)	38	
-45 / 50		Stiff gray LEAN CLAY (CL)		101
-50 / 55				
-55 / 60				
-60 / 65				
-65 / 70				
-70 / 75				
-75 / 80				

SHEAR STRENGTH, TSF
0.5 1.0 1.5 2.0
MOISTURE ○ CONTENT, %
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 50 60 70 80 90

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-29b

HVJ ASSOCIATES

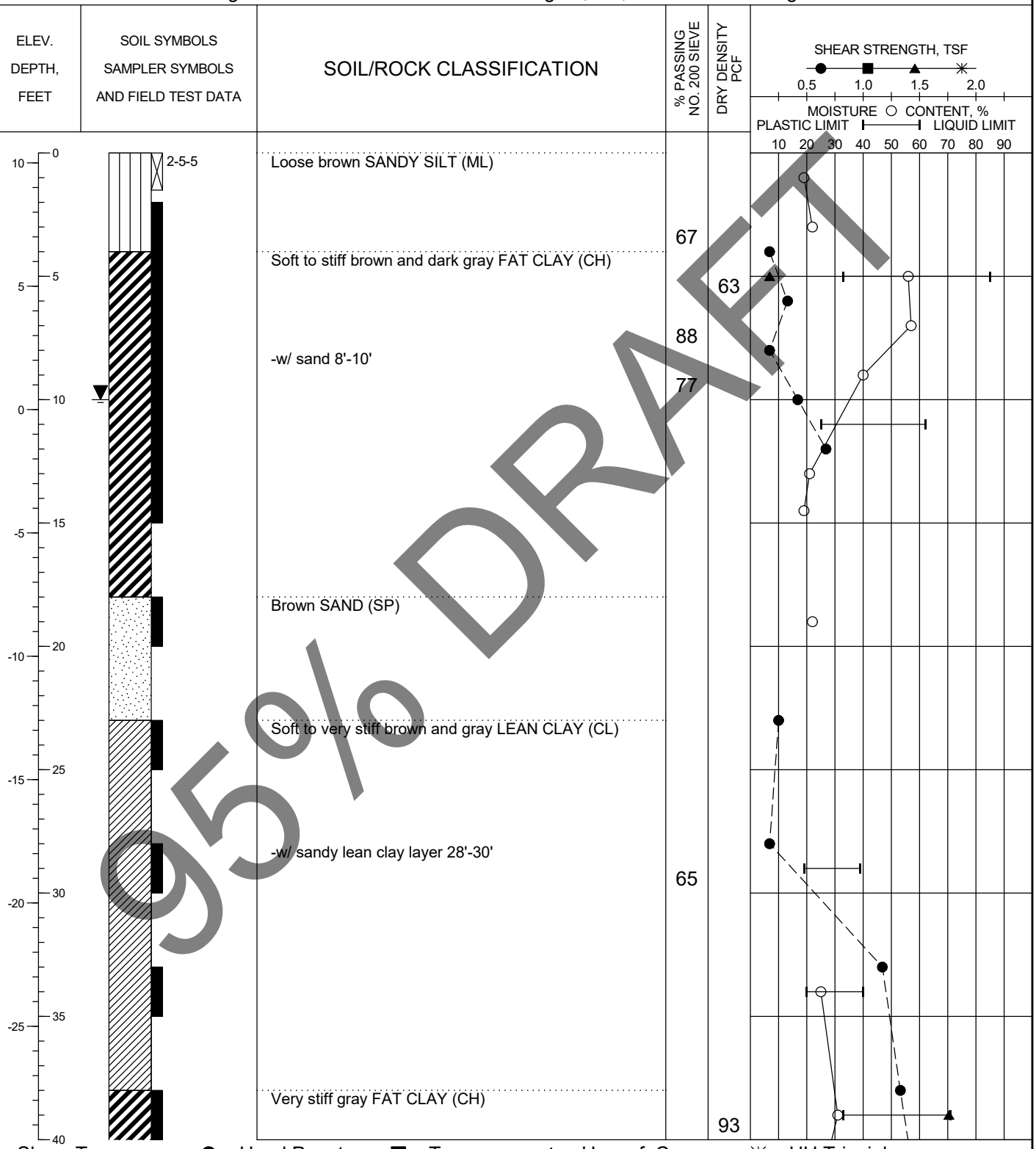
LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

LOG OF BORING

Project: Placement Area 15 Levee Raising
Boring No.: 12-30
Groundwater during drilling: 10 feet
Groundwater after drilling: ---

Date: 12/5/2012
Northing: 13,800,599.5
Easting: 3,254,999.0

Project No.: HG1019744
Elevation (MLT): 10.4 feet
Station: 07+06.72
Range: 301.05



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-30a

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Project No.: HG1019744
Boring No.: 12-30
Date: 12/5/2012
Elevation (MLT): 10.4 feet
Groundwater during drilling: 10 feet
Northing: 13,800,599.5
Station: 07+06.72
Groundwater after drilling: ---
Easting: 3,254,999.0
Range: 301.05

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF	SHEAR STRENGTH, TSF / MOISTURE CONTENT, %
-30 / 40		Very stiff gray FAT CLAY (CH)		102	
-35 / 45					
-40 / 50					
-45 / 55					
-50 / 60					
-55 / 65					
-60 / 70					
-65 / 75					
80					

SHEAR STRENGTH, TSF
0.5 1.0 1.5 2.0
MOISTURE ○ CONTENT, %
PLASTIC LIMIT LIQUID LIMIT
10 20 30 40 50 60 70 80 90

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-30b

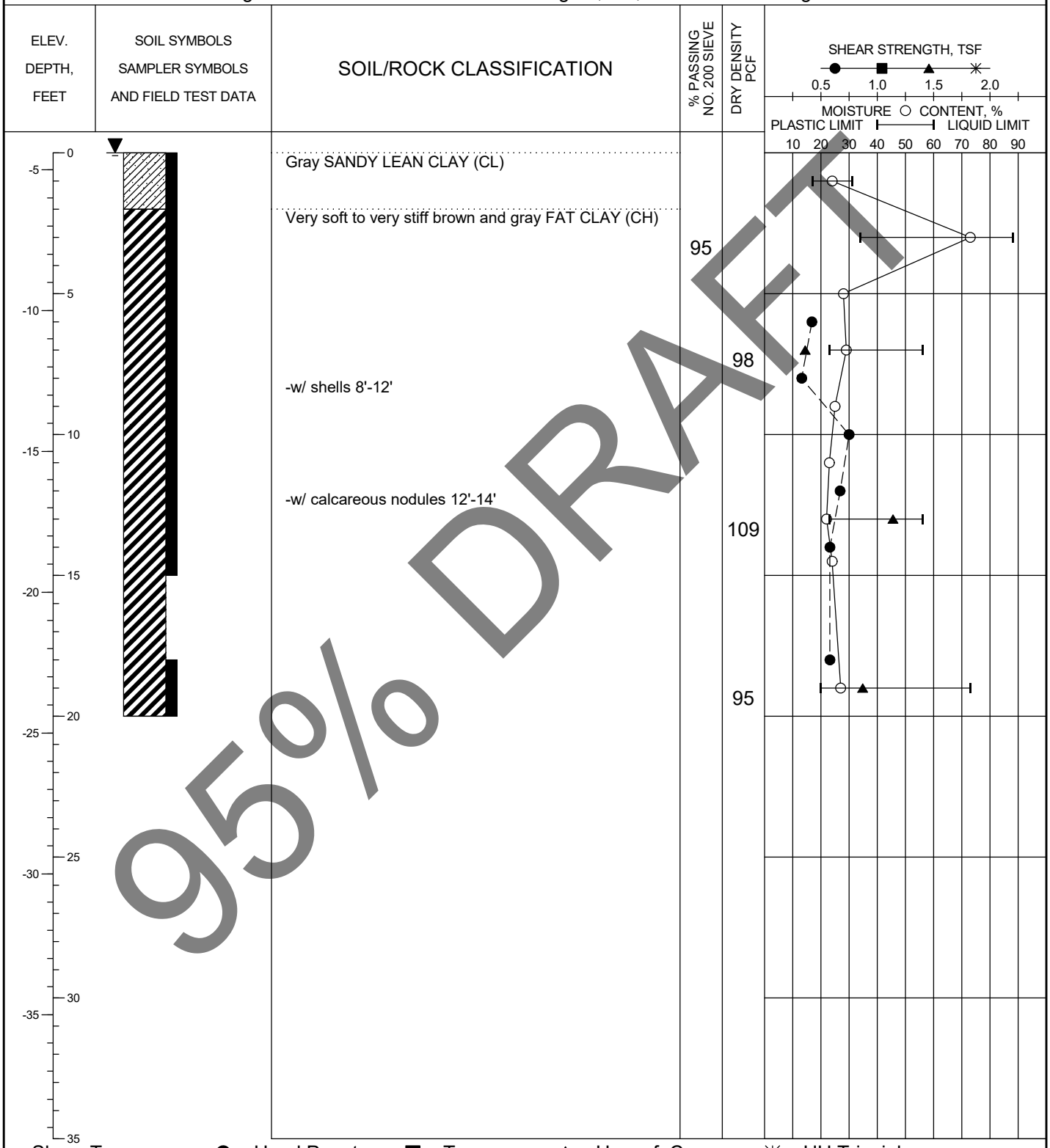
HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 15 Levee Raising
Boring No.: 12-33 (Depth of Water = 7 feet)
Groundwater during drilling: 0 feet
Groundwater after drilling: ---

Date: 12/7/2012
Northing: 13,800,204.7
Easting: 3,252,423.2

Project No.: HG1019744
Elevation (MLT): -4.4 feet
Station: 11+04.55
Range: -122.07



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

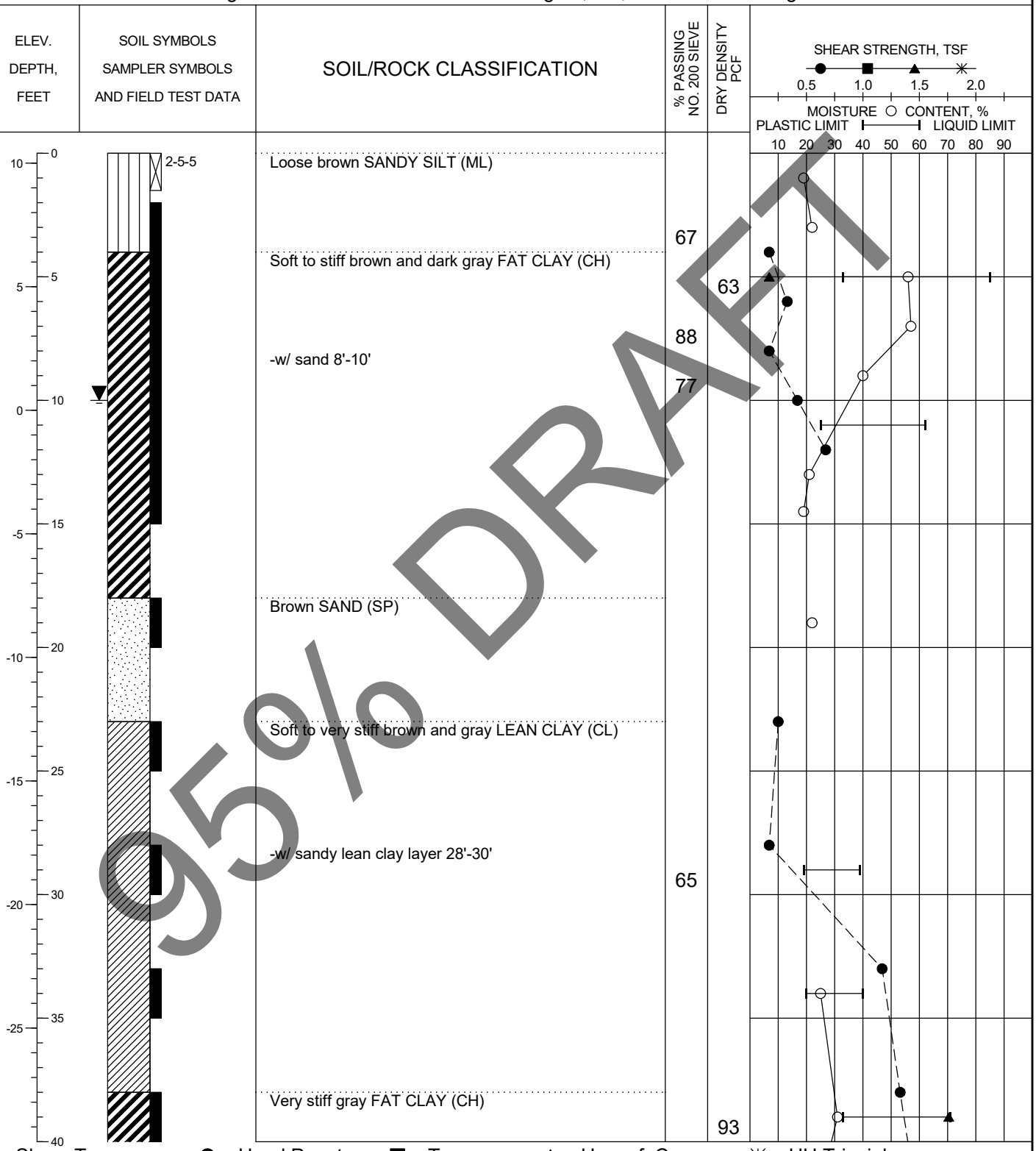
PLATE A-31

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/3/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-30
Date: 12/5/2012
Elevation (MLT): 10.4 feet
Groundwater during drilling: 10 feet
Northing: 13,800,599.5
Station: 07+06.72
Groundwater after drilling: ---
Easting: 3,254,999.0
Range: 301.05



Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-1a

95% DRAFT

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising | Project No.: HG1019744

Boring No.: 12-30 | Date: 12/5/2012 | Elevation (MLT): 10.4 feet

Groundwater during drilling: 10 feet | Northing: 13,800,599.5 | Station: 07+06.72

Groundwater after drilling: --- | Easting: 3,254,999.0 | Range: 301.05

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF	SHEAR STRENGTH, TSF / MOISTURE CONTENT, %
-30 / 40		Very stiff gray FAT CLAY (CH)		102	
-35 / 45					
-40 / 50					
-45 / 55					
-50 / 60					
-55 / 65					
-60 / 70					
-65 / 75					
80					

SHEAR STRENGTH, TSF: 0.5 1.0 1.5 2.0

MOISTURE ○ CONTENT, %

PLASTIC LIMIT — LIQUID LIMIT

10 20 30 40 50 60 70 80 90

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

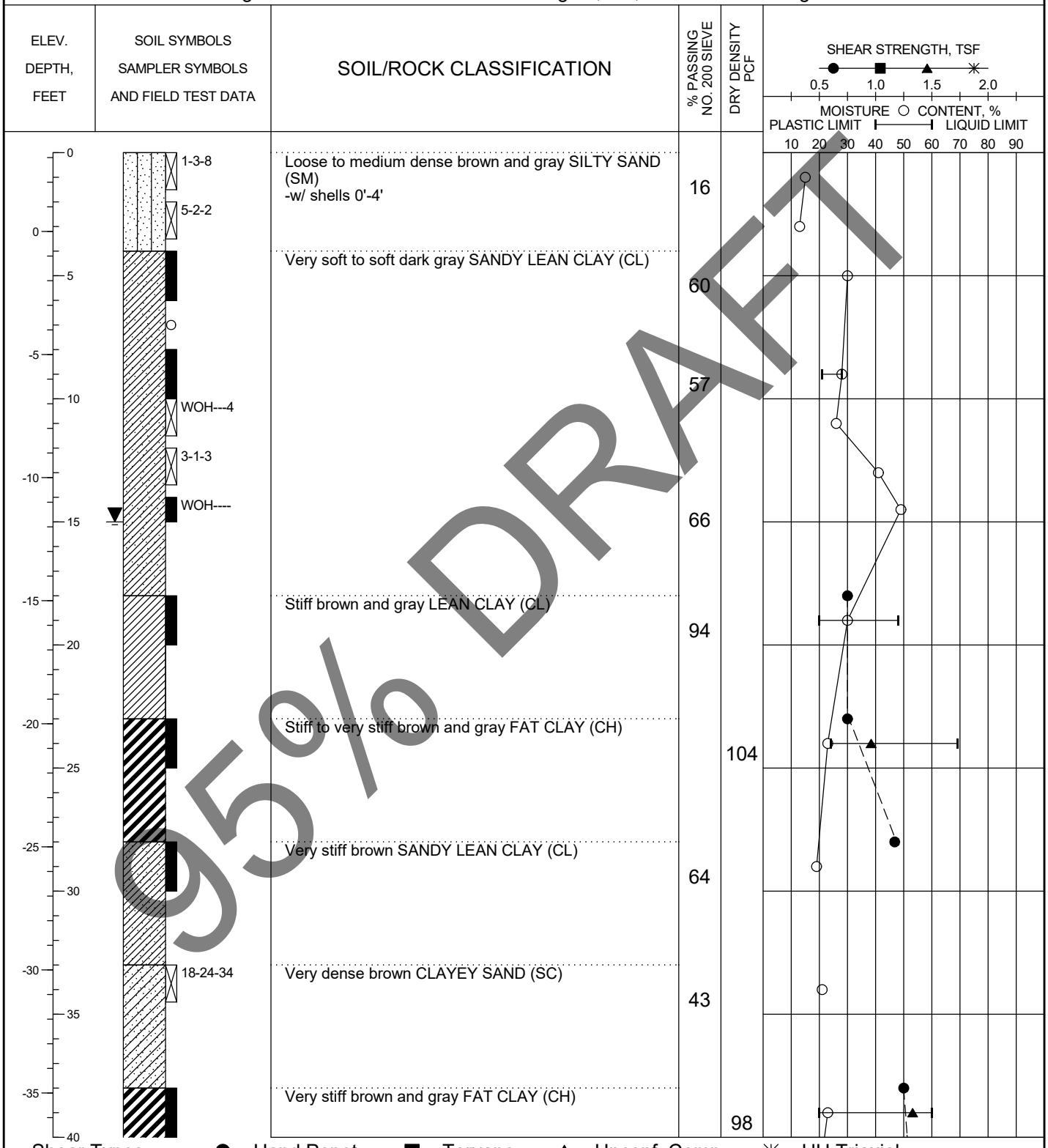
PLATE A-1b

HVJ ASSOCIATES

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-31
Date: 12/7/2012
Elevation (MLT): 3.2 feet
Groundwater during drilling: 15 feet
Northing: 13,799,304.4
Station: 19+94.31
Groundwater after drilling: ---
Easting: 3,255,250.5
Range: 588.27



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-2a

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-31
Date: 12/7/2012
Elevation (MLT): 3.2 feet
Groundwater during drilling: 15 feet
Northing: 13,799,304.4
Station: 19+94.31
Groundwater after drilling: ---
Easting: 3,255,250.5
Range: 588.27

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF
40 / -40		Very stiff brown and gray FAT CLAY (CH)		
45 / -45		Very stiff brown and gray SANDY LEAN CLAY (CL)		
50 / -50		Very stiff to hard brown and gray LEAN CLAY (CL)		112
55 / -55				
60 / -60				
65 / -65				
70 / -70				
75 / -75				
80				

SHEAR STRENGTH, TSF
0.5 1.0 1.5 2.0
MOISTURE ○ CONTENT, %
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 50 60 70 80 90

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

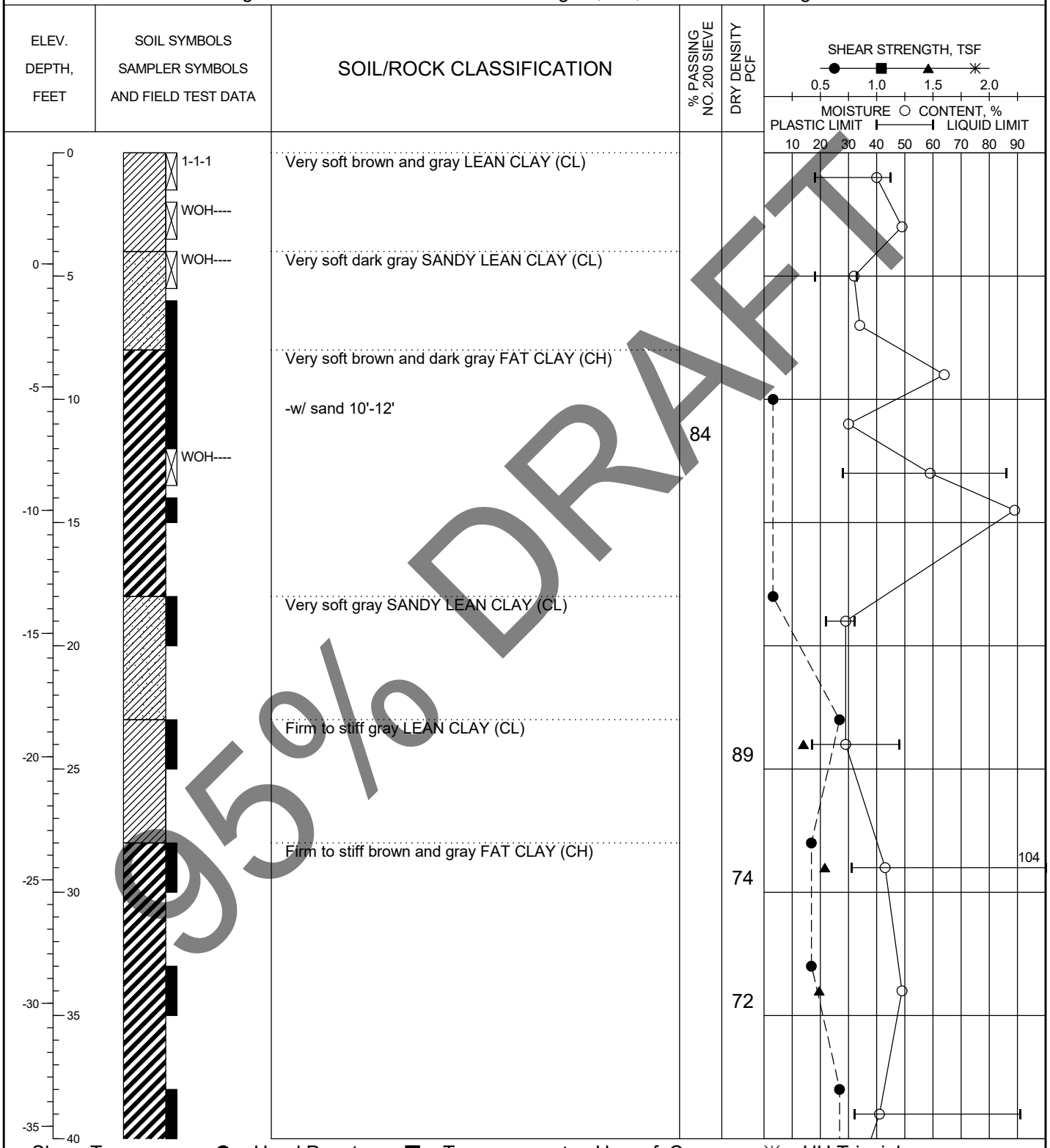
See Plate 2 for boring location.

PLATE A-2b

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-32
Date: 12/8/2012
Elevation (MLT): 4.5 feet
Groundwater during drilling: ---
Northing: 13,798,466.4
Station: 30+28.25
Groundwater after drilling: ---
Easting: 3,255,915.3
Range: 313.94



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-3a

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-32
Date: 12/8/2012
Elevation (MLT): 4.5 feet
Groundwater during drilling: ---
Northing: 13,798,466.4
Station: 30+28.25
Groundwater after drilling: ---
Easting: 3,255,915.3
Range: 313.94

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF
-40 / 45		Firm to stiff brown and gray FAT CLAY (CH)		
		Stiff brown and gray LEAN CLAY (CL)	98	
-45 / 50		Stiff reddish brown FAT CLAY (CH)		

SHEAR STRENGTH, TSF
0.5 1.0 1.5 2.0
MOISTURE ○ CONTENT, %
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 50 60 70 80 90

-50 / 55
-55 / 60
-60 / 65
-65 / 70
-70 / 75
-75 / 80

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

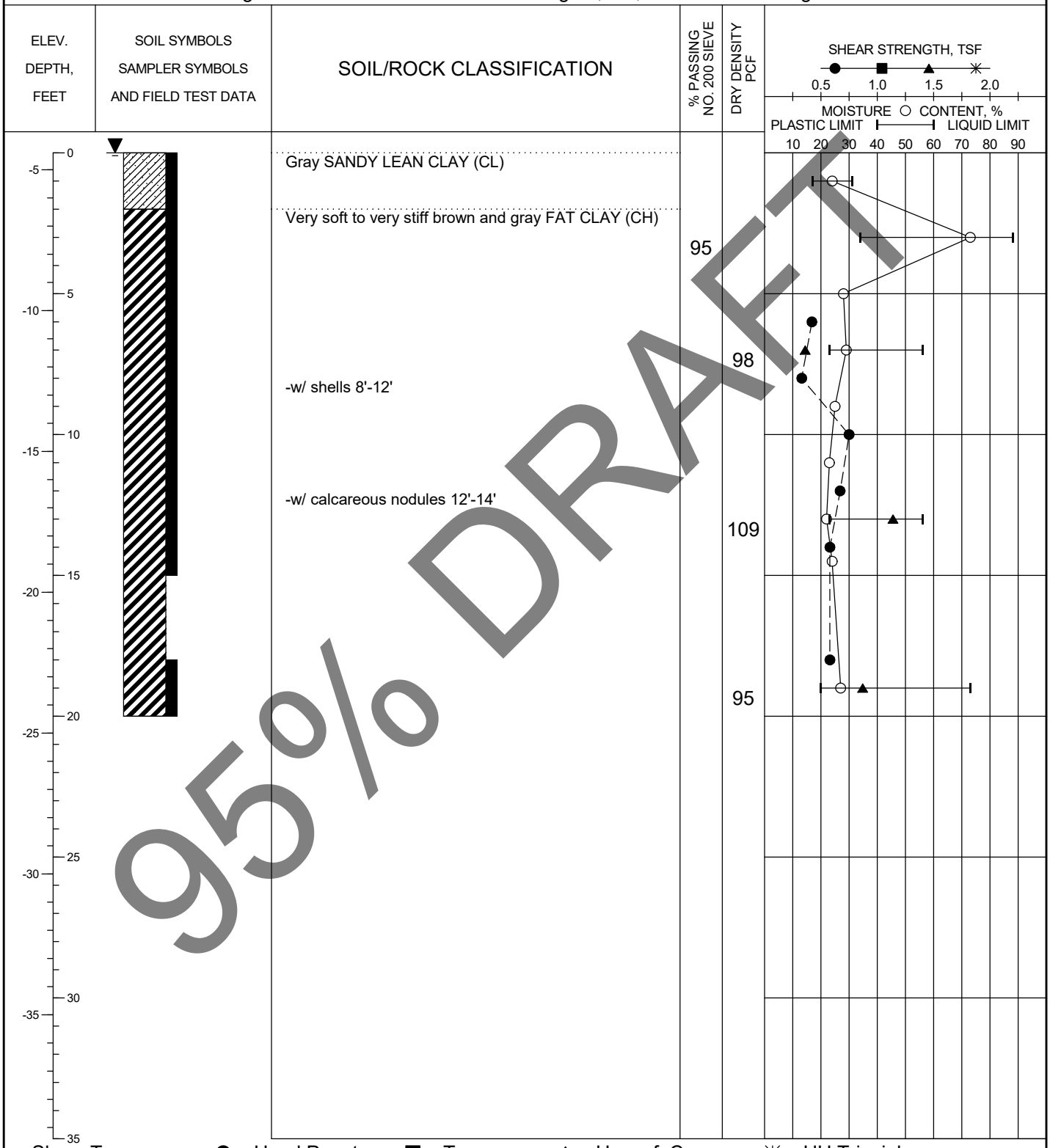
See Plate 2 for boring location.

PLATE A-3b

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-33 (Depth of Water = 7 feet)
Date: 12/7/2012
Elevation (MLT): -4.4 feet
Groundwater during drilling: 0 feet
Northing: 13,800,204.7
Station: 11+04.55
Groundwater after drilling: ---
Easting: 3,252,423.2
Range: -122.07



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

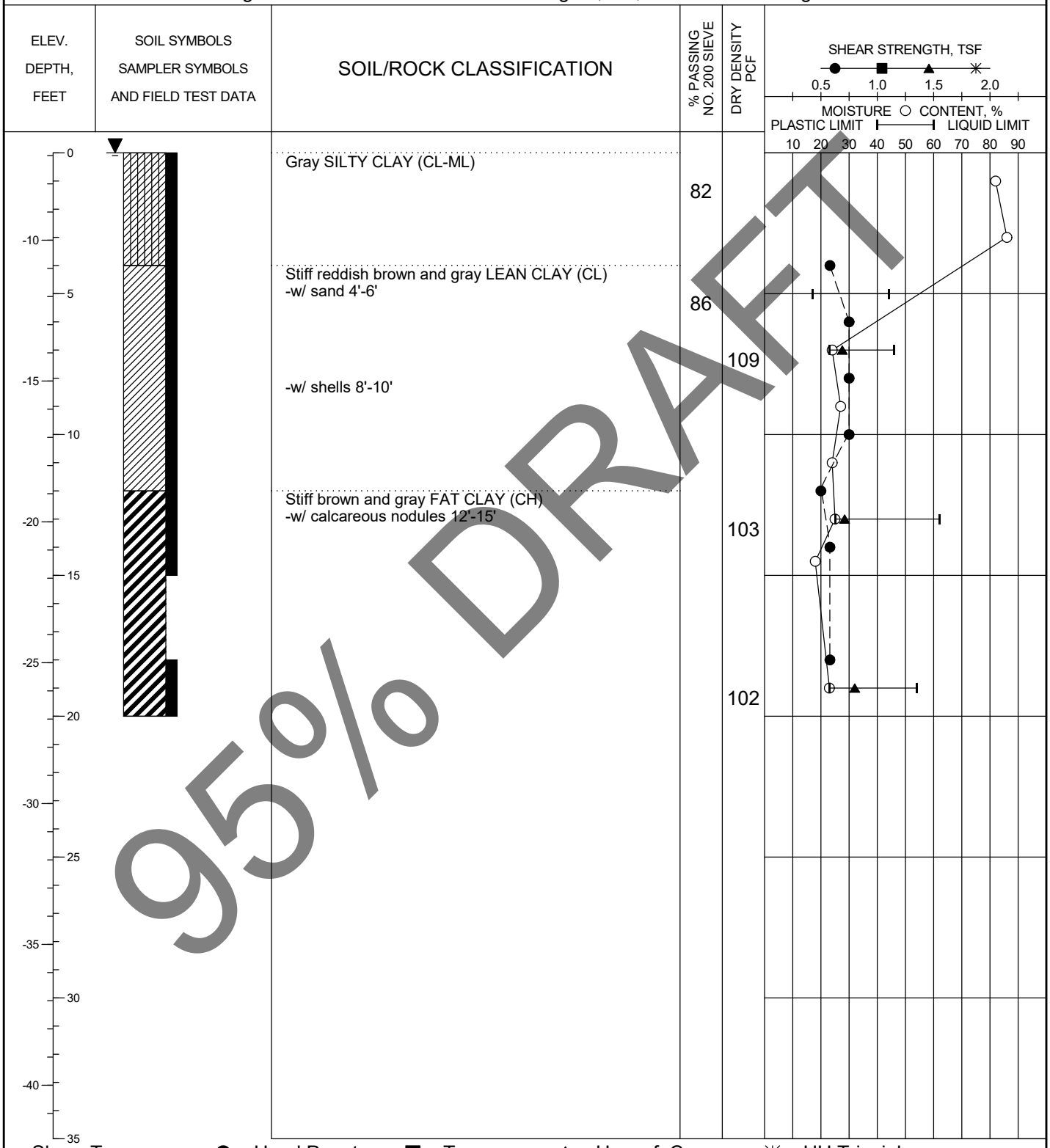
PLATE A-4

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-34 (Depth of Water = 10 feet)
Date: 12/7/2012
Elevation (MLT): -6.9 feet
Groundwater during drilling: 0 feet
Northing: 13,798,698.3
Station: 26+99
Groundwater after drilling: ---
Easting: 3,252,945.7
Range: -132.28



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

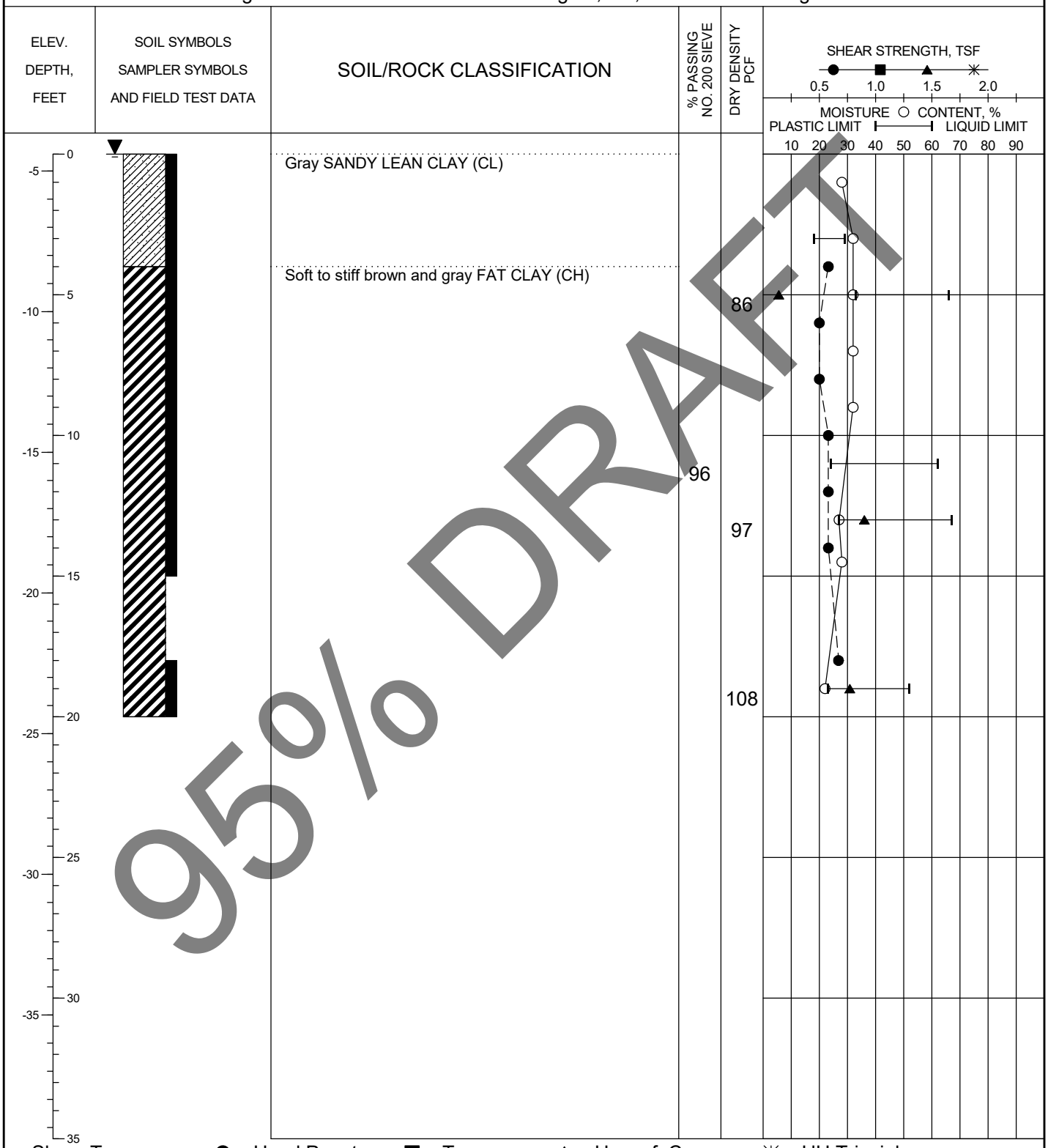
PLATE A-5

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-35 (Depth of Water = 7.2 feet)
Date: 12/7/2012
Elevation (MLT): -4.4 feet
Groundwater during drilling: 0 feet
Northing: 13,797,359.0
Station: 40+99.56
Groundwater after drilling: ---
Easting: 3,253,357.6
Range: -91.49



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

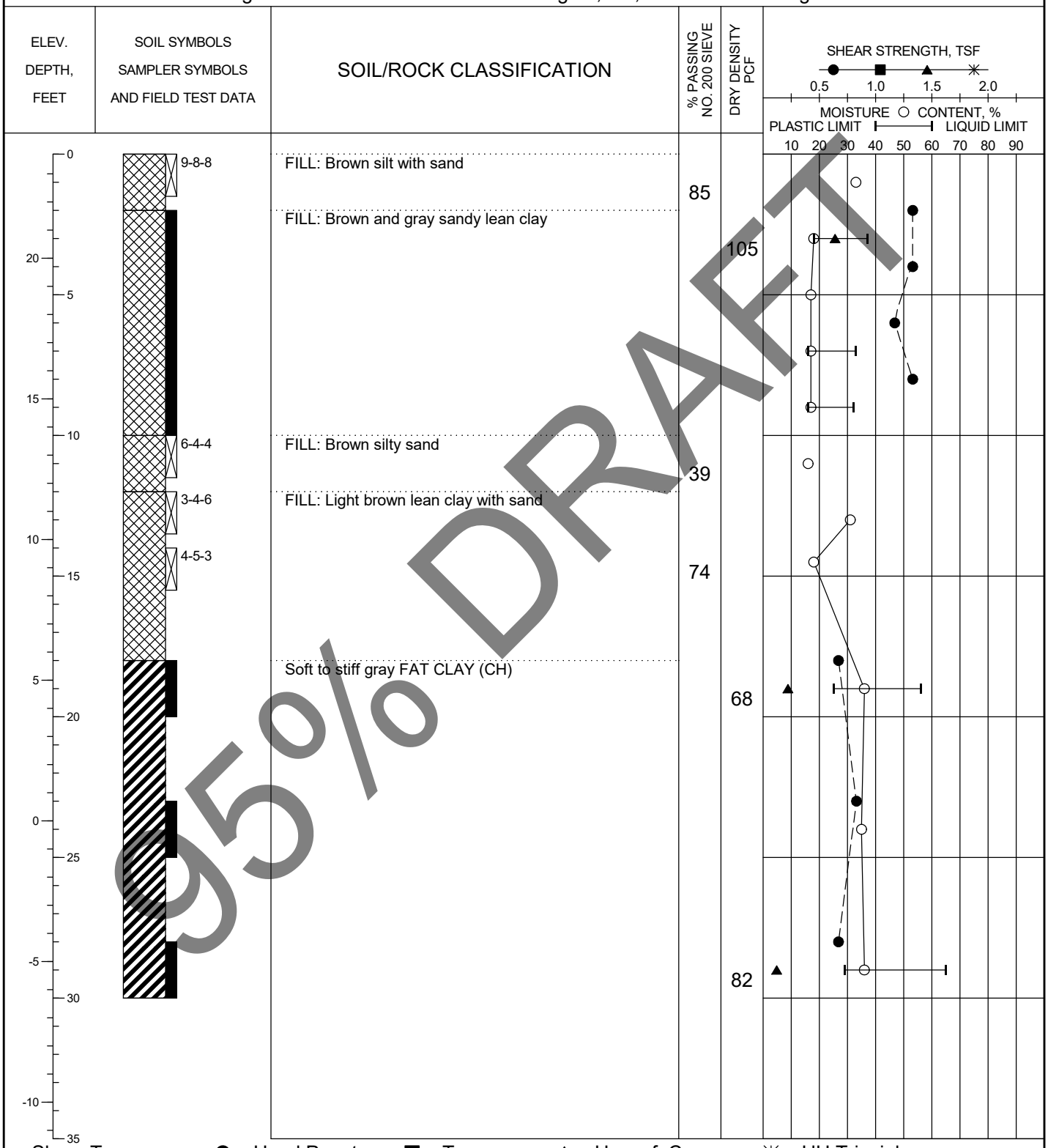
PLATE A-6

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-36
Date: 12/11/2012
Elevation (MLT): 23.7 feet
Groundwater during drilling: ---
Northing: 13,797,433.1
Station: 0+11.5
Groundwater after drilling: ---
Easting: 3,256,544.5
Range: -0.52



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

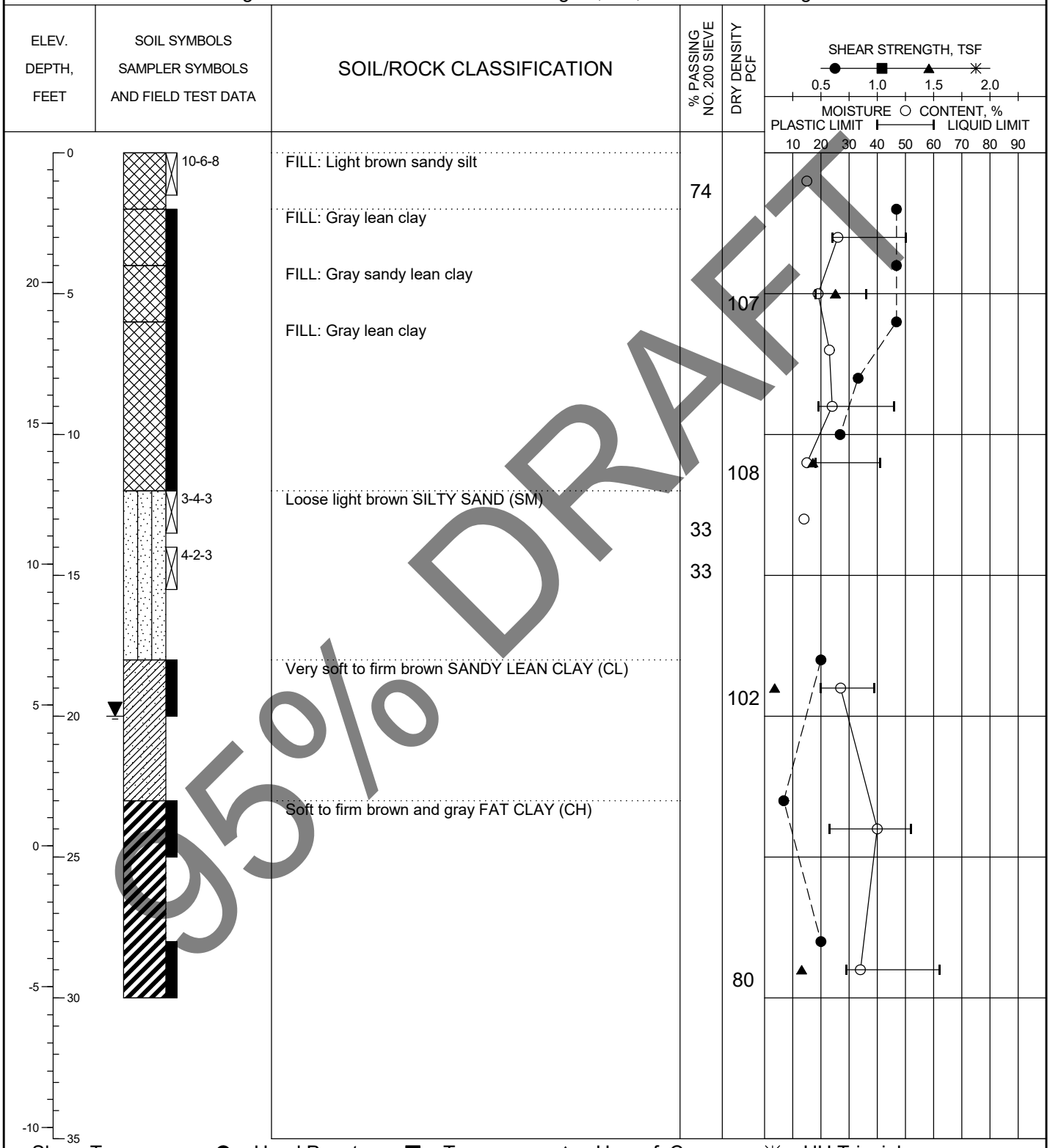
PLATE A-7

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-37
Date: 12/11/2012
Elevation (MLT): 24.6 feet
Groundwater during drilling: 20 feet
Northing: 13,796,505.3
Station: 10+03.13
Groundwater after drilling: ---
Easting: 3,256,894.6
Range: 1.22



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

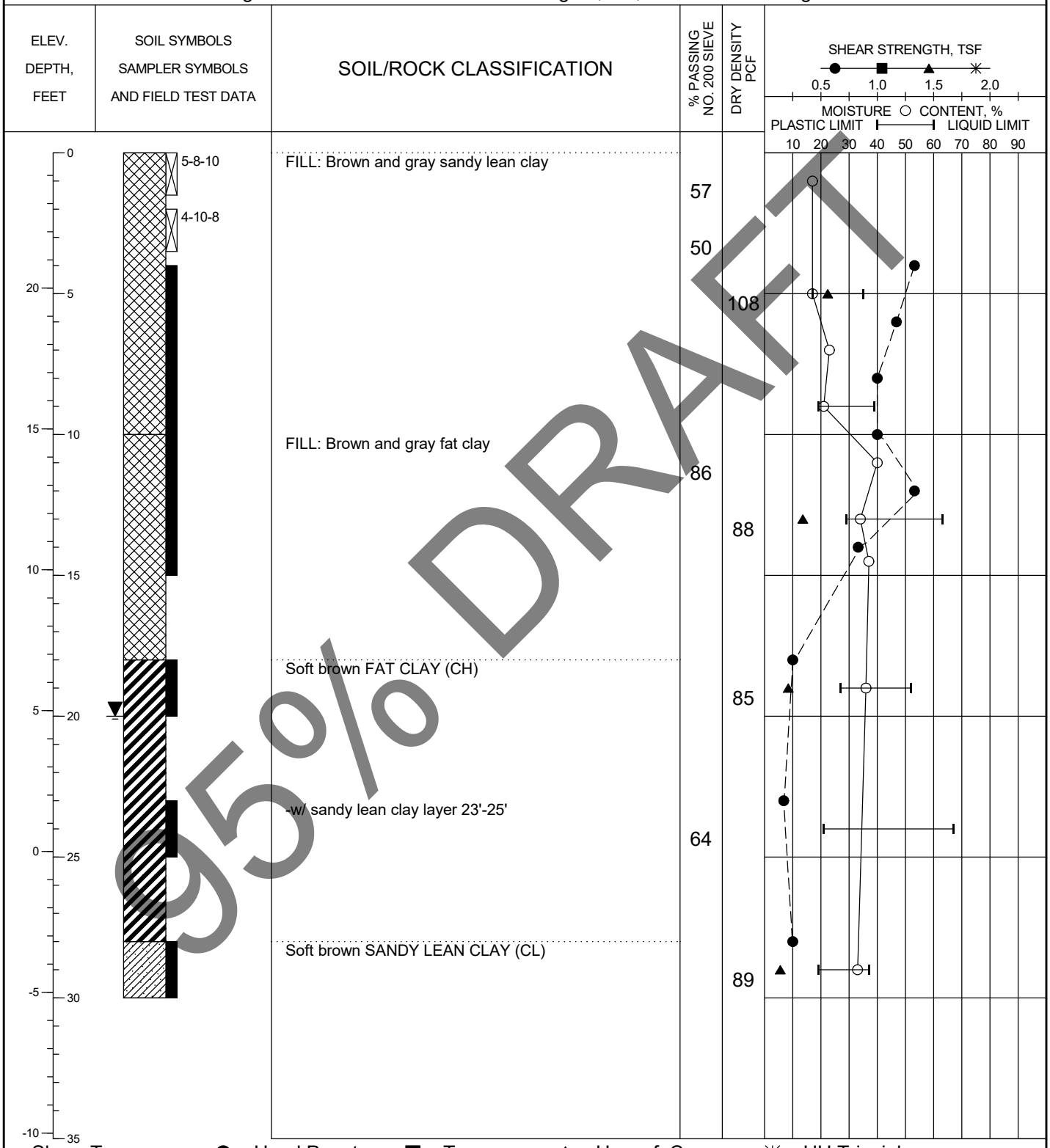
PLATE A-8

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-38
Date: 12/11/2012
Elevation (MLT): 24.8 feet
Groundwater during drilling: 20 feet
Northing: 13,795,571.8
Station: 20+03.9
Groundwater after drilling: ---
Easting: 3,257,255.5
Range: -5.82



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-9

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-39
Date: 12/11/2012
Elevation (MLT): 24.8 feet
Groundwater during drilling: 20 feet
Northing: 13,794,642.9
Station: 29+87.25
Groundwater after drilling: ---
Easting: 3,257,573.9
Range: -0.08

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF
0 / 20 / 15 / 10 / 5 / 0 / -5 / -10	4-3-4	FILL: Brown and gray lean clay with sand	73	
5 / 0		FILL: Gray sandy lean clay		
20 / 15		FILL: Gray lean clay		124
10 / 5		FILL: Brown and gray fat clay		
		FILL: Brown and gray sandy lean clay		85
10 / 5		Firm to stiff gray SANDY LEAN CLAY (CL)		86
0 / -5		Soft to firm gray FAT CLAY (CH)		90
-10	WOP----	Very soft gray SANDY LEAN CLAY (CL)	57	
35 / 30 / 25 / 20 / 15 / 10 / 5				

SHEAR STRENGTH, TSF
0.5 1.0 1.5 2.0
MOISTURE ○ CONTENT, %
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 50 60 70 80 90

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-10

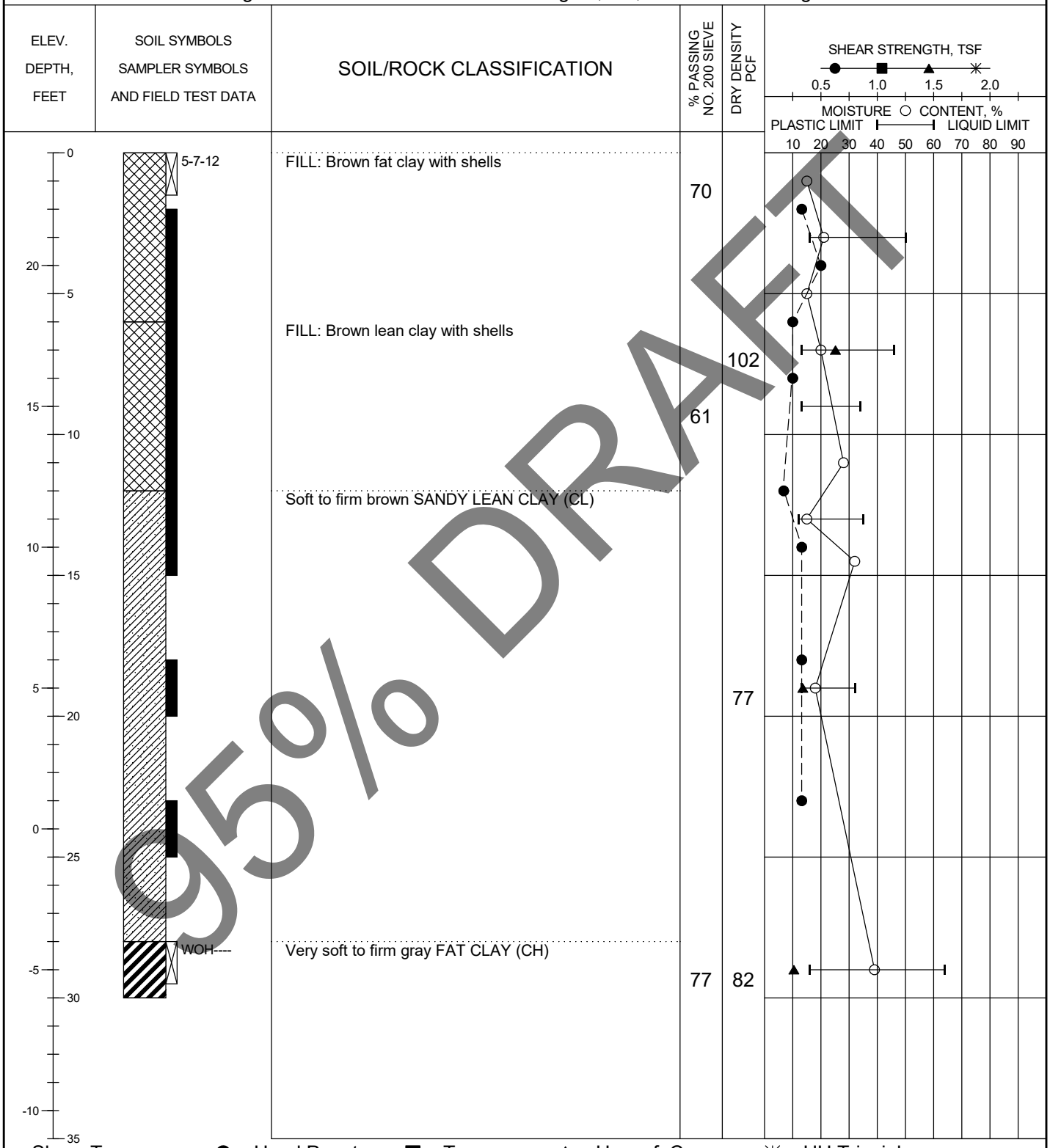
LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising | Project No.: HG1019744

Boring No.: 12-40 | Date: 12/12/2012 | Elevation (MLT): 24.0 feet

Groundwater during drilling: --- | Northing: 13,793,752.2 | Station: 39+49.21

Groundwater after drilling: --- | Easting: 3,257,244.5 | Range: 4.44



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

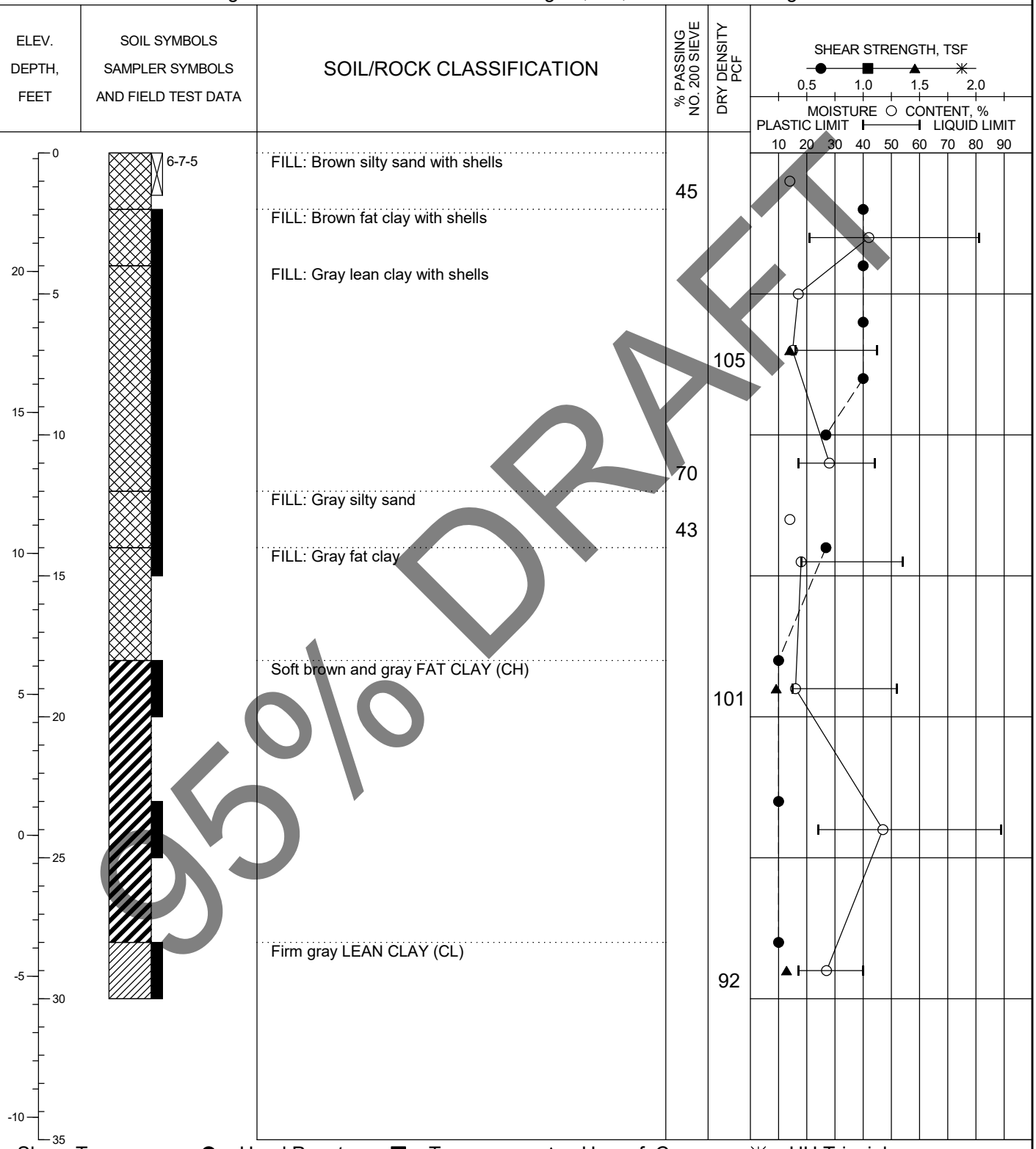
PLATE A-11

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-41
Date: 12/12/2012
Elevation (MLT): 24.2 feet
Groundwater during drilling: ---
Northing: 13,792,949.3
Station: 48+67.36
Groundwater after drilling: ---
Easting: 3,256,821.9
Range: 3.28



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

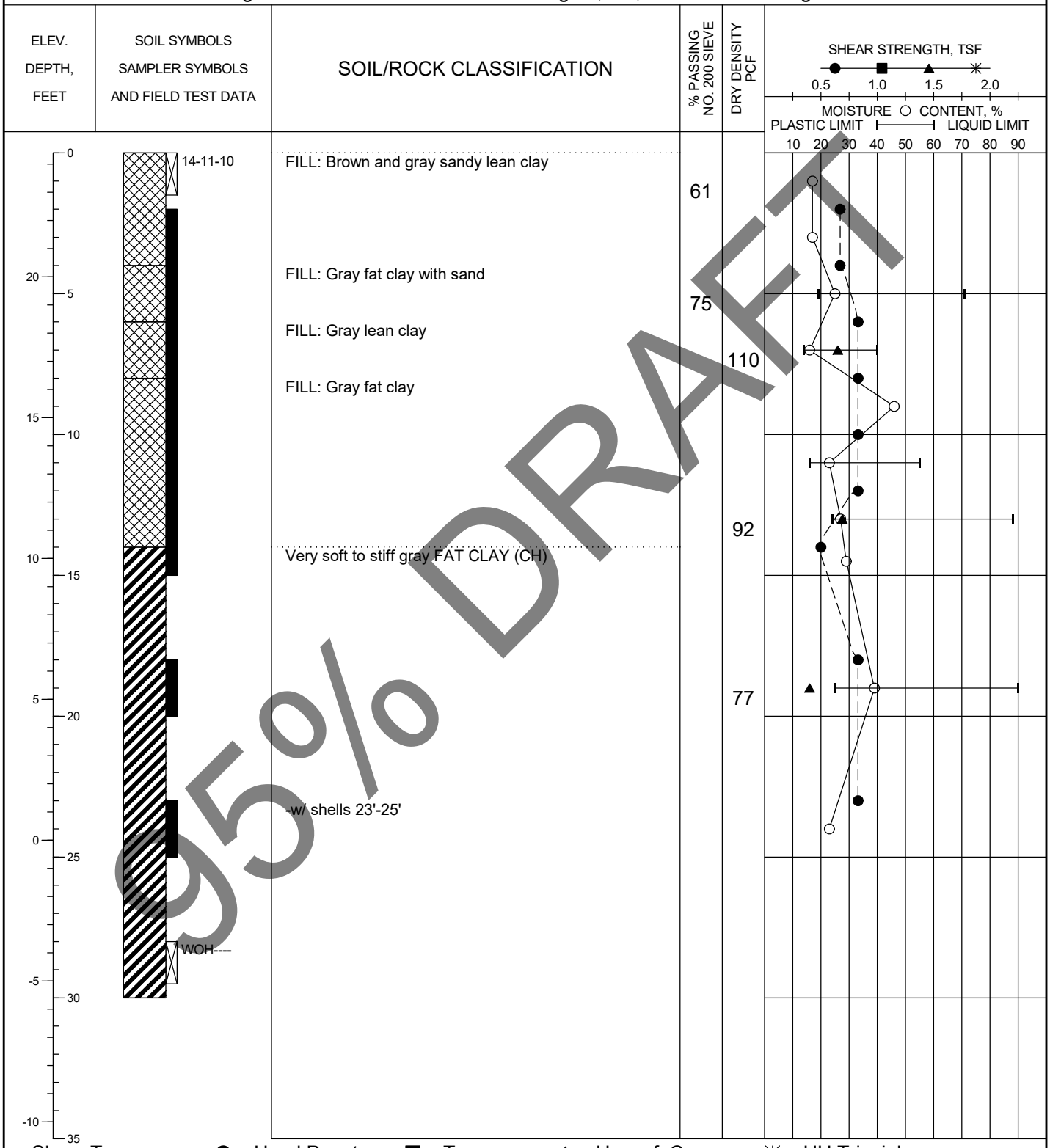
PLATE A-12

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-42
Date: 12/12/2012
Elevation (MLT): 24.4 feet
Groundwater during drilling: Caved in at 15'
Northing: 13,793,207.5
Station: 58+68.58
Groundwater after drilling: ---
Easting: 3,255,875.1
Range: -5.54



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

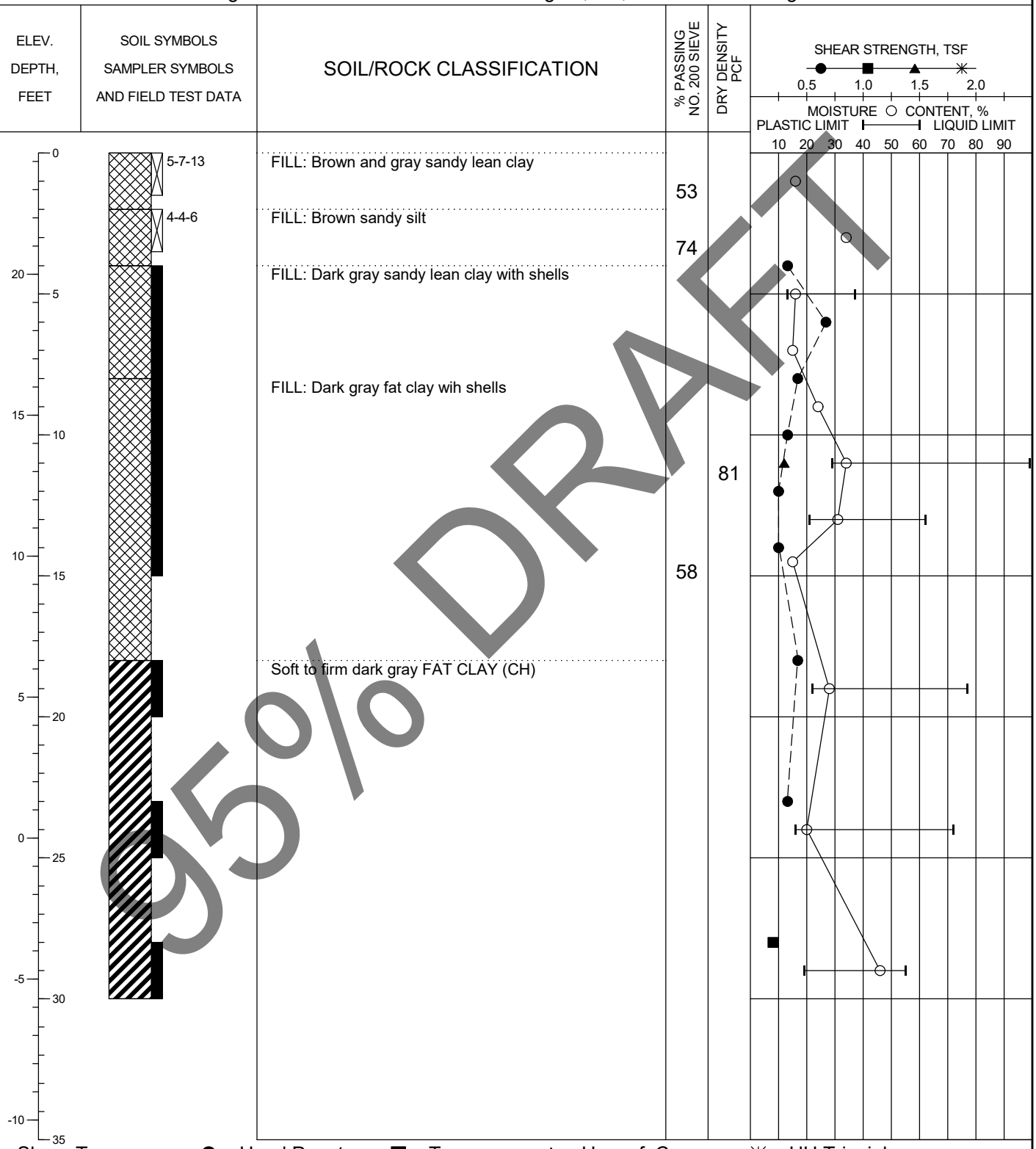
PLATE A-13

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-43
Date: 12/12/2012
Elevation (MLT): 24.3 feet
Groundwater during drilling: ---
Northing: 13,793,827.7
Station: 69+04.78
Groundwater after drilling: ---
Easting: 3,255,048.2
Range: -7.46



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

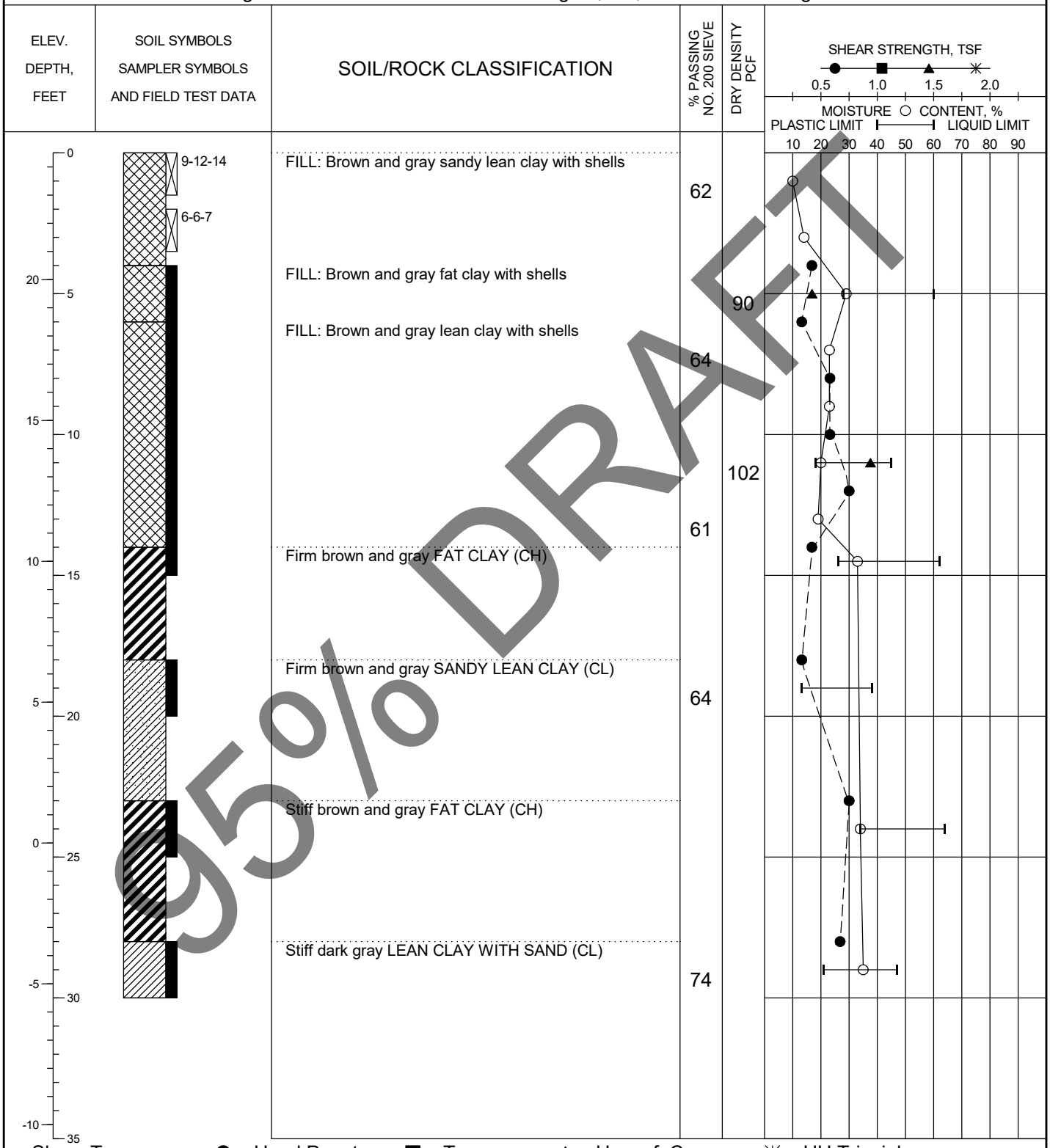
PLATE A-14

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-44
Date: 12/13/2012
Elevation (MLT): 24.5 feet
Groundwater during drilling: ---
Northing: 13,794,533.2
Station: 78+57.56
Groundwater after drilling: ---
Easting: 3,254,409.1
Range: -12.13



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

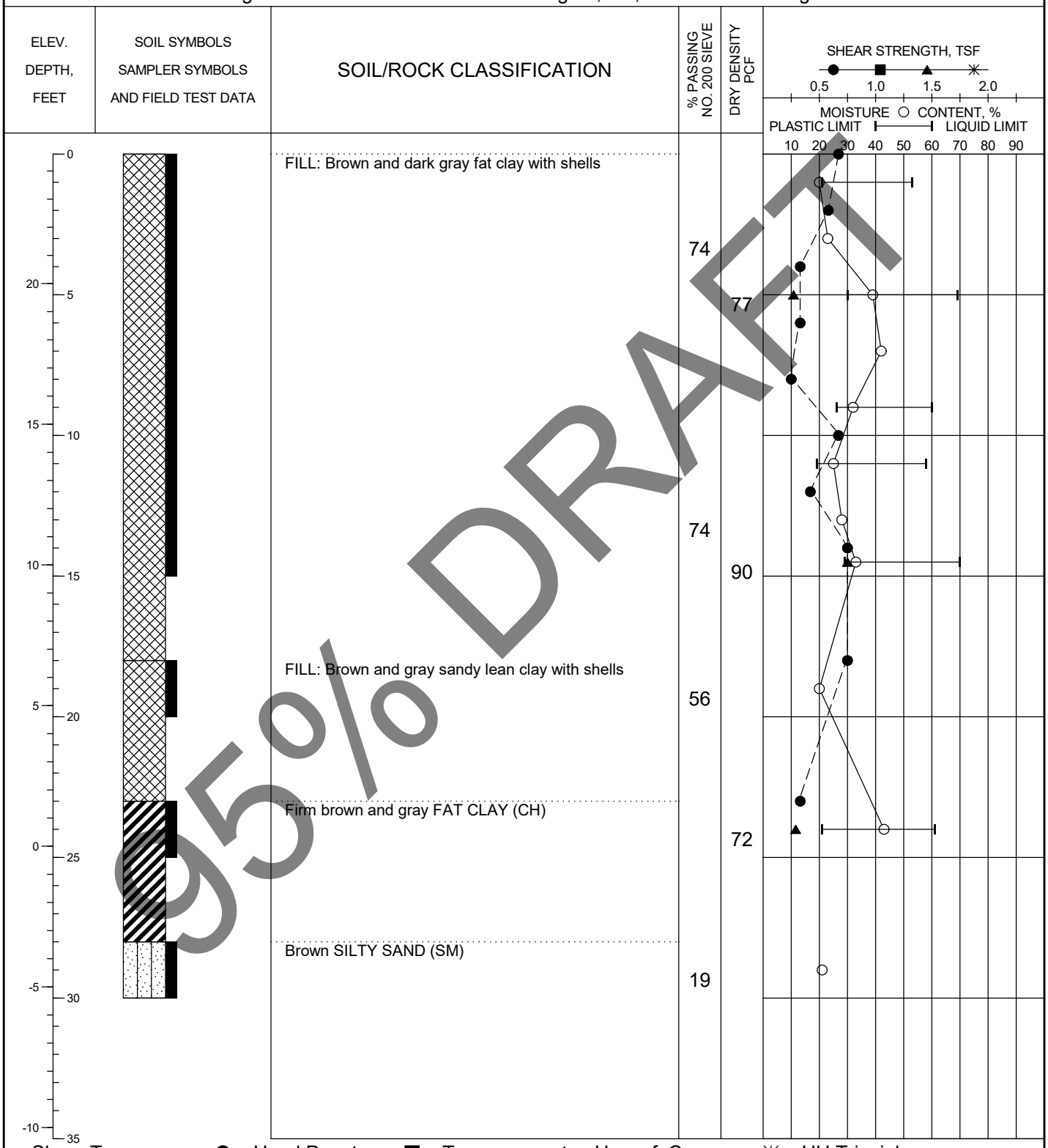
PLATE A-15

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-45
Date: 12/13/2012
Elevation (MLT): 24.6 feet
Groundwater during drilling: ---
Northing: 13,795,388.5
Station: 87+99.24
Groundwater after drilling: ---
Easting: 3,254,066.9
Range: -3.58



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

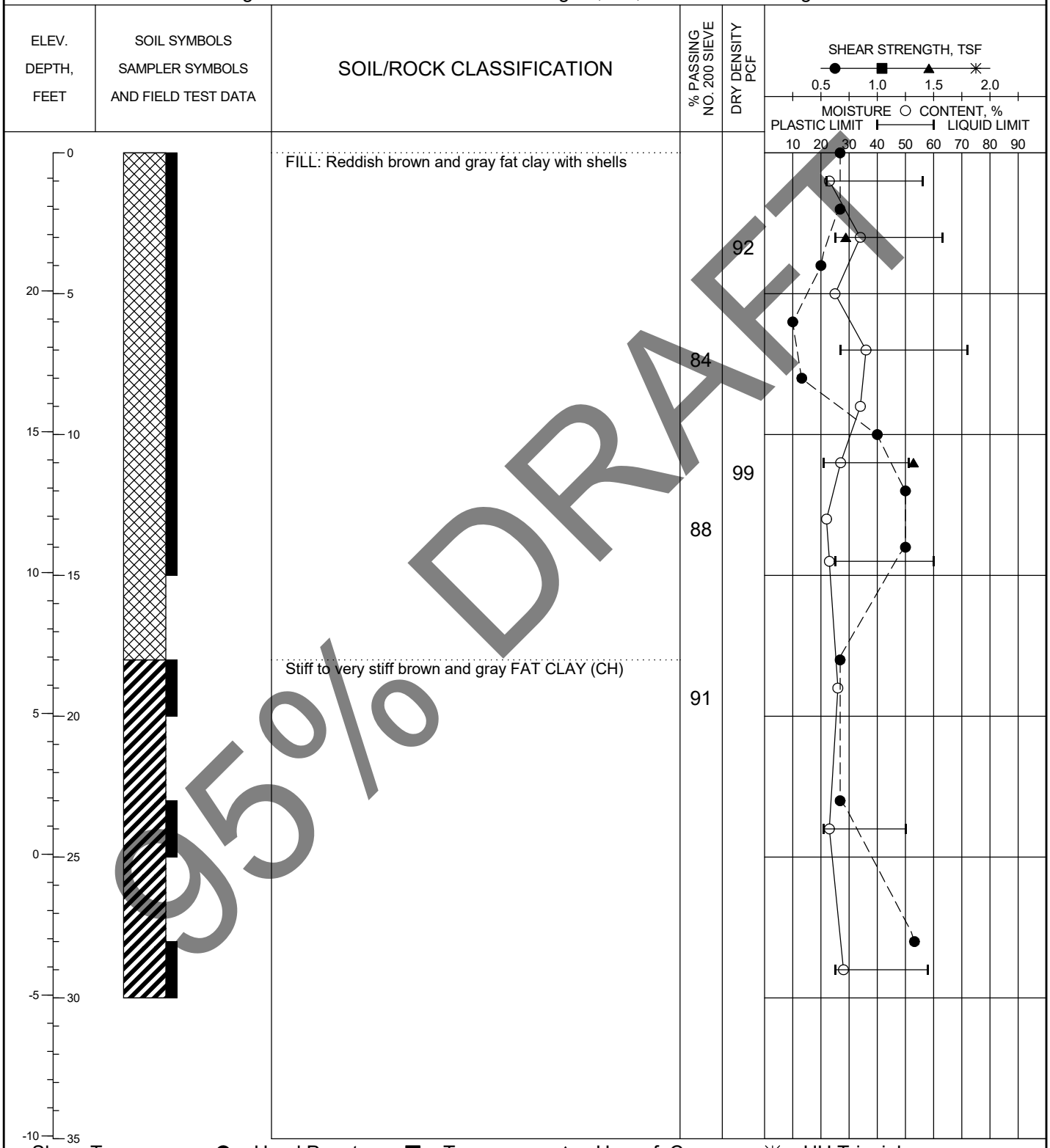
PLATE A-16

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-46
Date: 12/13/2012
Elevation (MLT): 24.9 feet
Groundwater during drilling: ---
Northing: 13,796,311.9
Station: 97+70.8
Groundwater after drilling: ---
Easting: 3,253,764.7
Range: -8.97



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

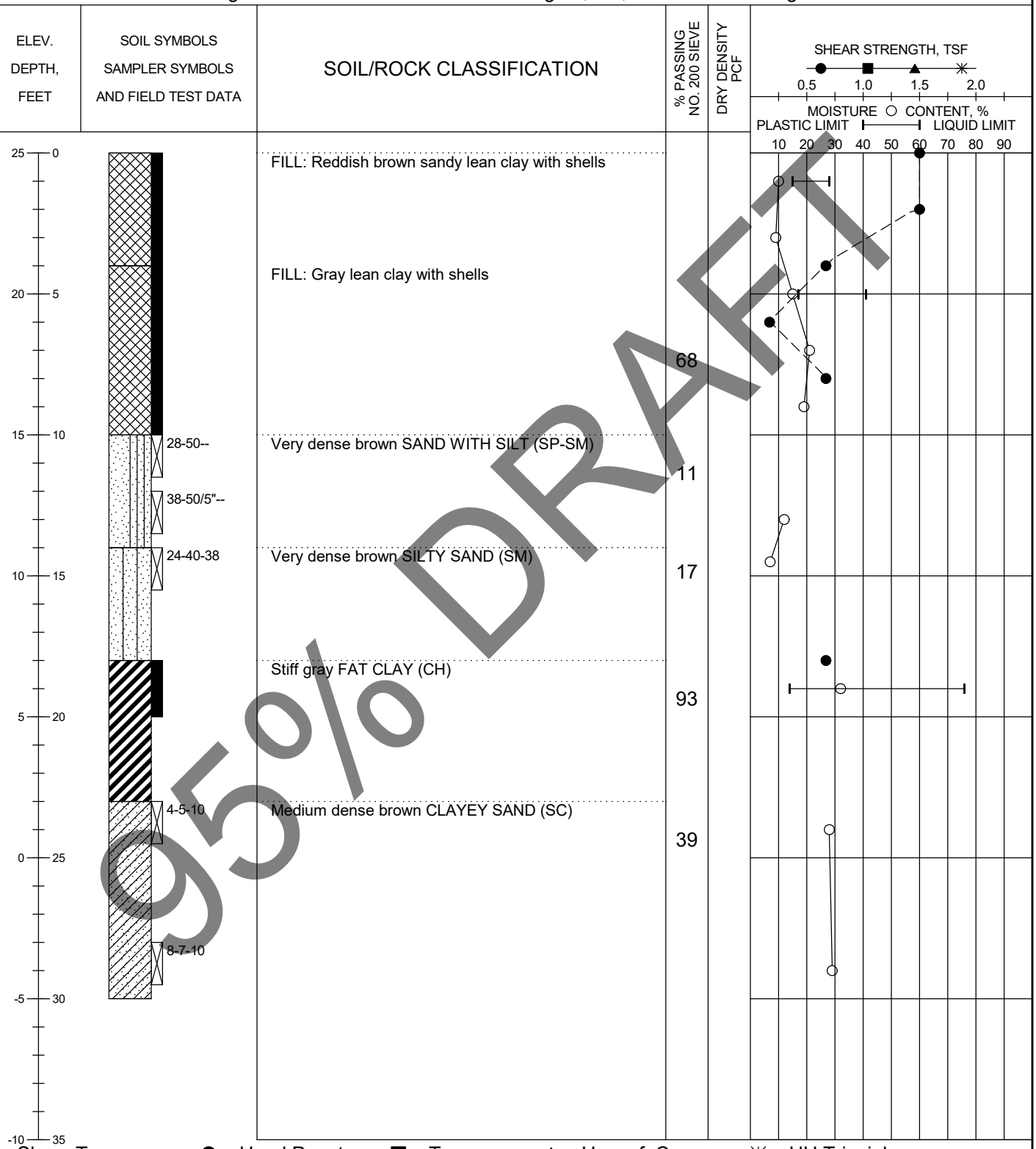
PLATE A-17

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-47
Date: 12/13/2012
Elevation (MLT): 25.0 feet
Groundwater during drilling: ---
Northing: 13,797,270.9
Station: 107+57.22
Groundwater after drilling: ---
Easting: 3,253,789.8
Range: 20.42



Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

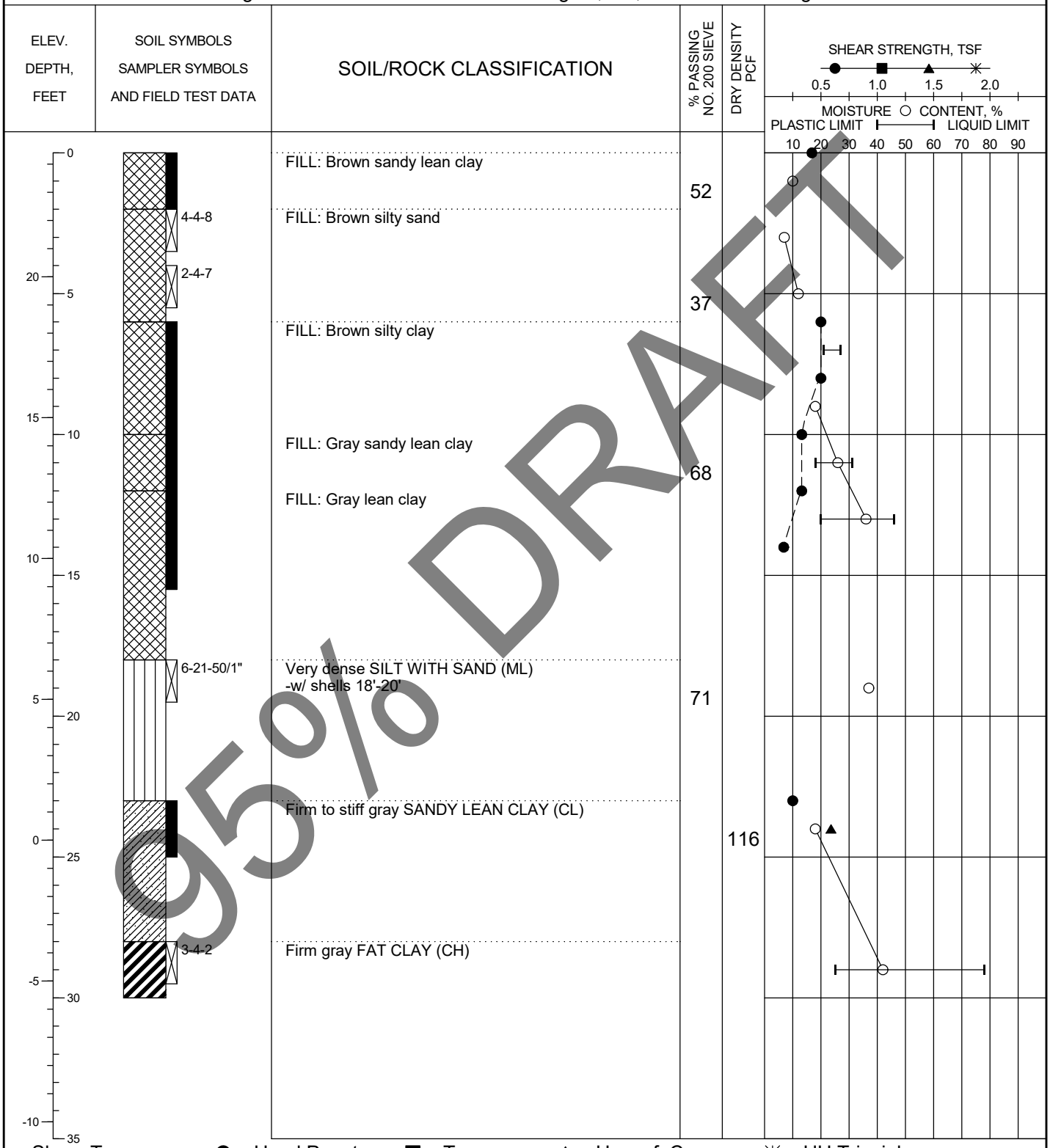
PLATE A-18

95% DRAFT

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-48
Date: 12/7/2012
Elevation (MLT): 24.4 feet
Groundwater during drilling: ---
Northing: 13,797,966.9
Station: 117+05.13
Groundwater after drilling: ---
Easting: 3,254,274.4
Range: -4.53



Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

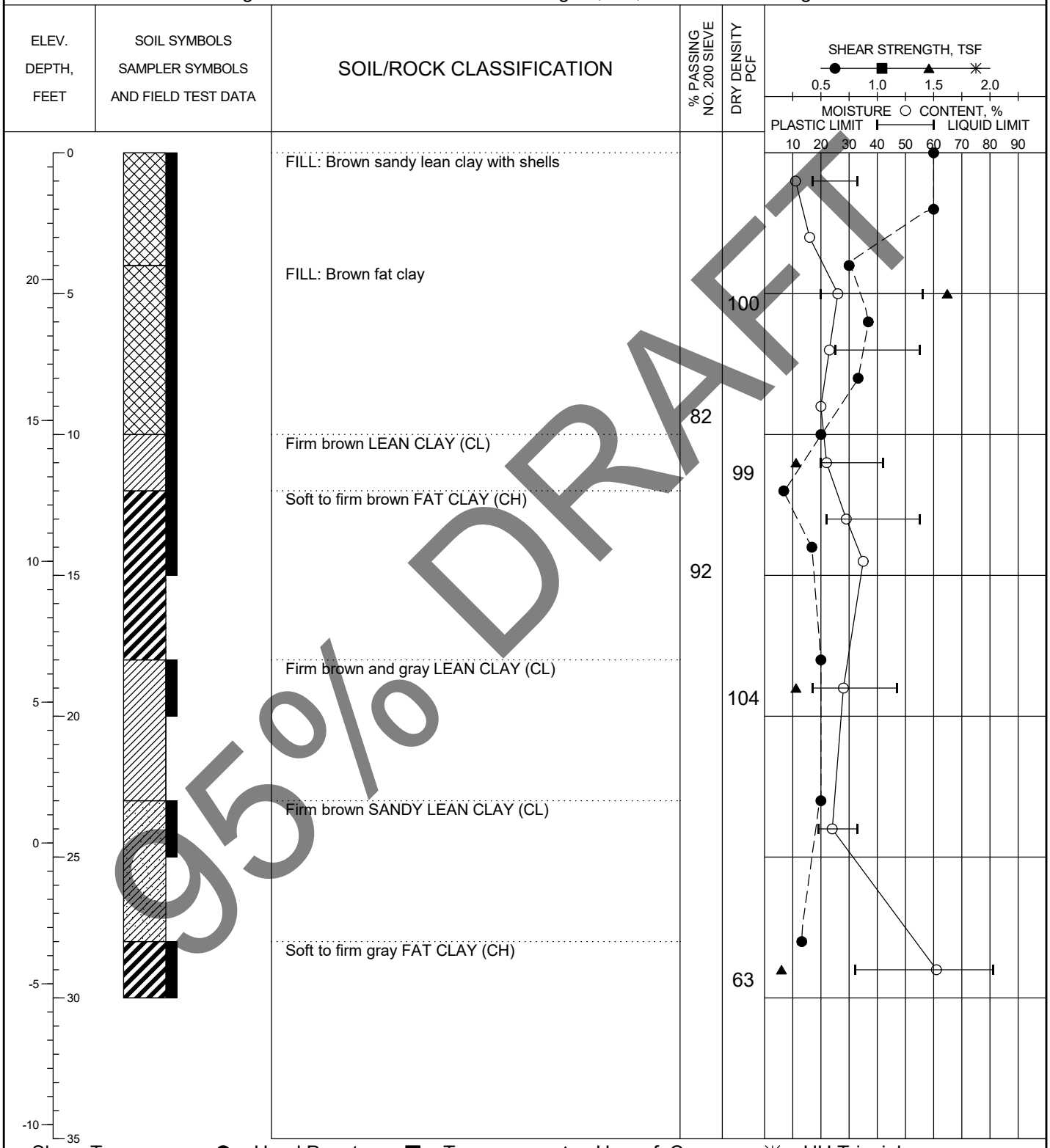
PLATE A-19

95% DRAFT

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-49
Date: 12/7/2012
Elevation (MLT): 24.5 feet
Groundwater during drilling: ---
Northing: 13,798,284.7
Station: 127+05.97
Groundwater after drilling: ---
Easting: 3,255,222.3
Range: 0.38



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-20

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-50
Date: 12/8/2012
Elevation (MLT): 23.8 feet
Groundwater during drilling: ---
Northing: 13,798,124.1
Station: 136+23.03
Groundwater after drilling: ---
Easting: 3,256,012.0
Range: -15.21

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF
0 / 20		FILL: Brown sandy lean clay with shells	54	
5 / 15		FILL: Brown lean clay with shells		
10 / 10		FILL: Gray sandy lean clay		96
15 / 5		Firm to stiff brown and gray FAT CLAY (CH)	62	
20 / 0				
25 / -5				
30 / -10				
35				

SHEAR STRENGTH, TSF
0.5 1.0 1.5 2.0
MOISTURE ○ CONTENT, %
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 50 60 70 80 90

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

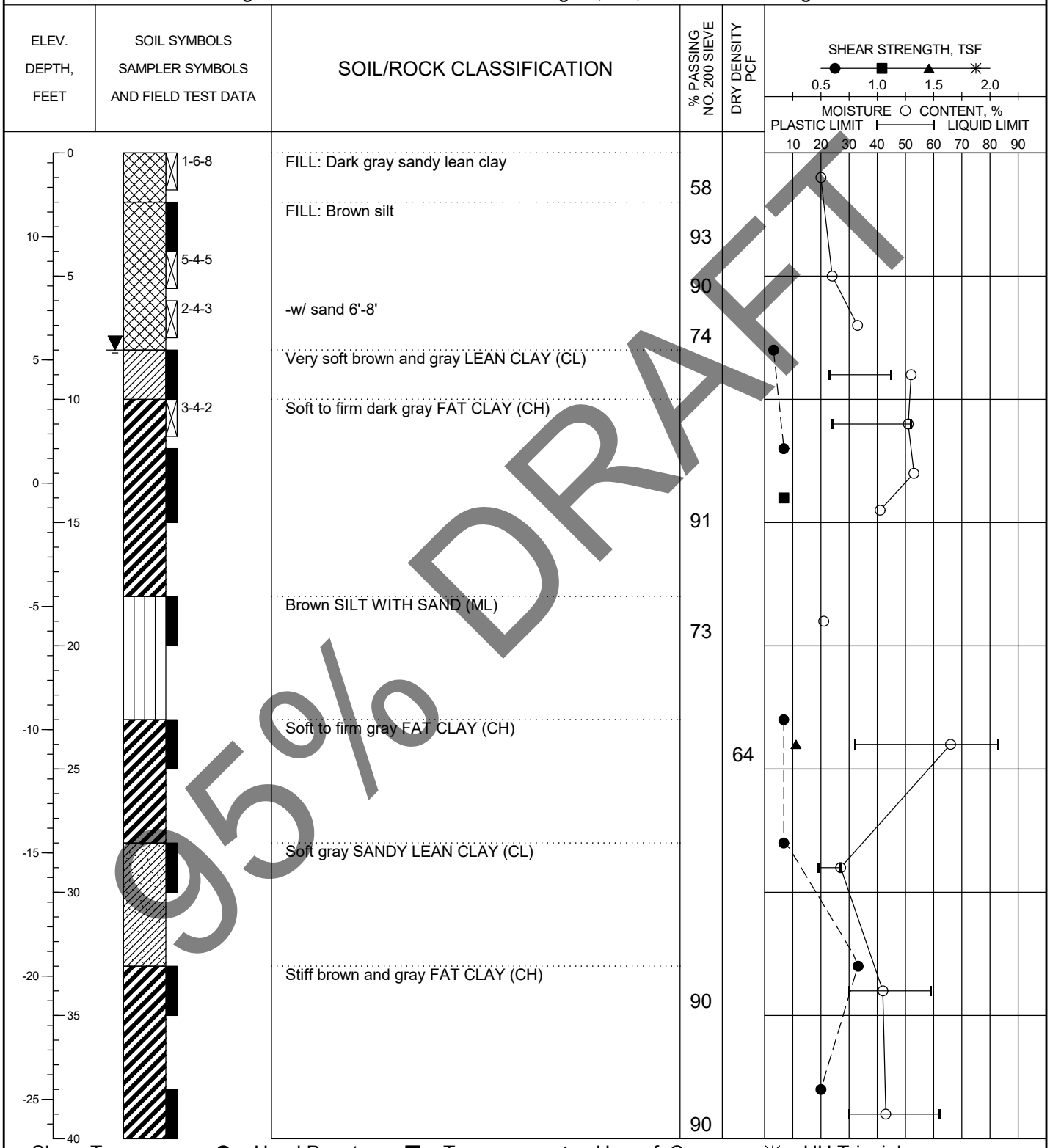
PLATE A-21

HVJ ASSOCIATES

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-51
Date: 12/9/2012
Elevation (MLT): 13.4 feet
Groundwater during drilling: 8 feet
Northing: 13,797,463.7
Station: 144+19.95
Groundwater after drilling: ---
Easting: 3,256,379.2
Range: 143.28



Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-22

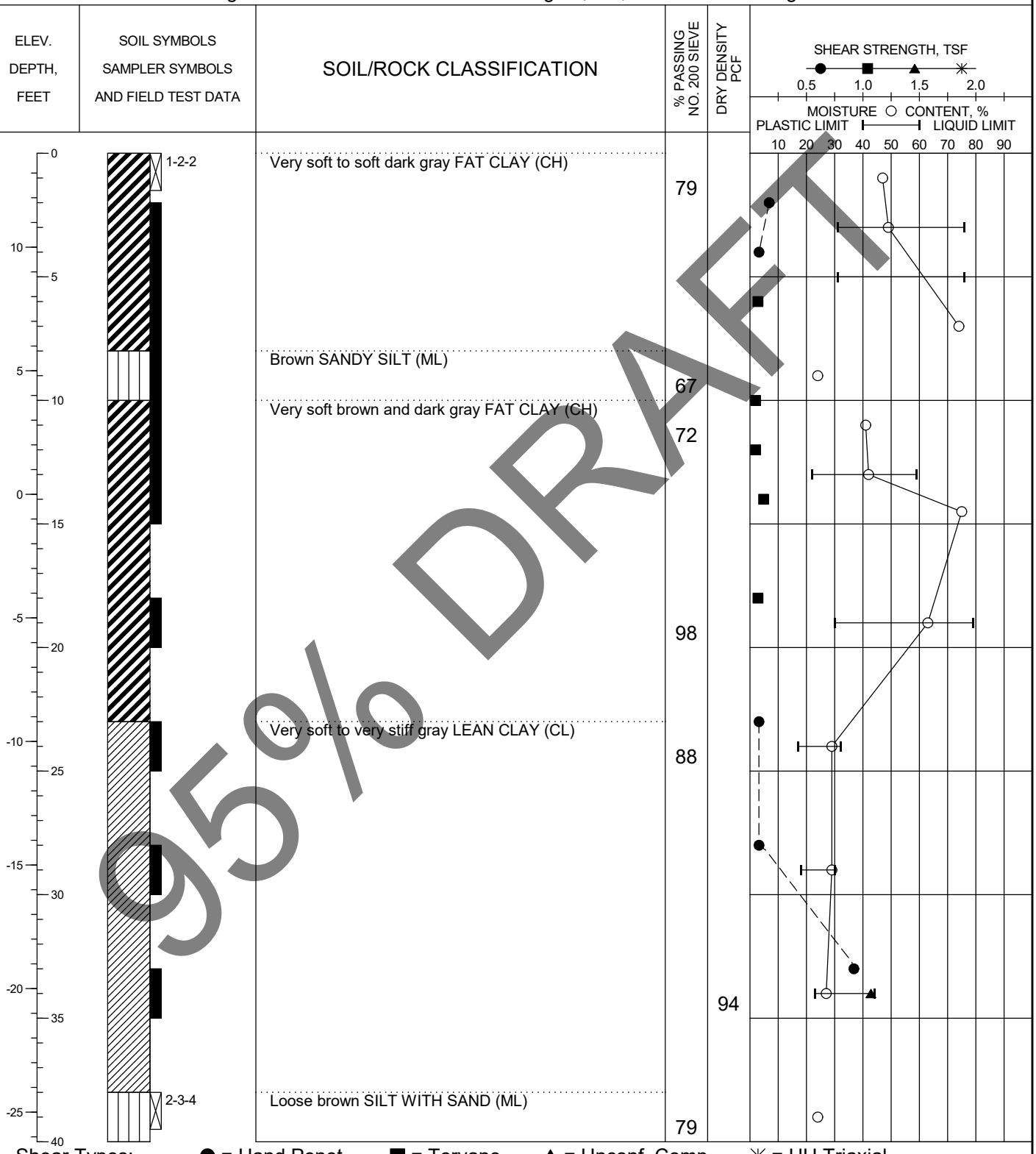
95% DRAFT

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-52
Date: 12/11/2012
Elevation (MLT): 13.8 feet
Groundwater during drilling: ---
Northing: 13,796,451.7
Station: 10+01.39
Groundwater after drilling: ---
Easting: 3,256,748.1
Range: 157.20



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

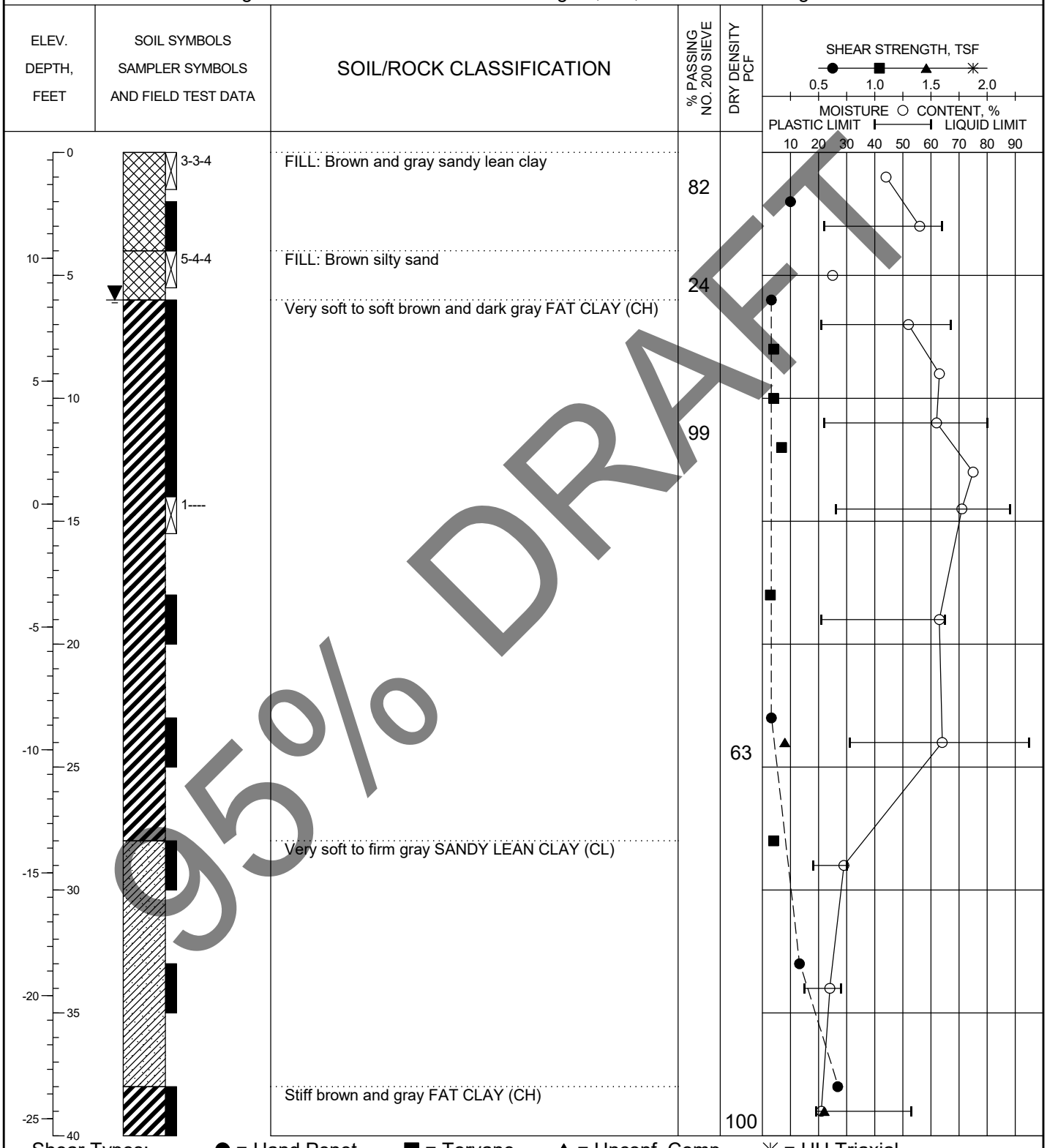
PLATE A-23

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-53
Date: 12/11/2012
Elevation (MLT): 14.3 feet
Groundwater during drilling: 6 feet
Northing: 13,795,524.5
Station: 19+98.13
Groundwater after drilling: ---
Easting: 3,257,114.1
Range: 143.21



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

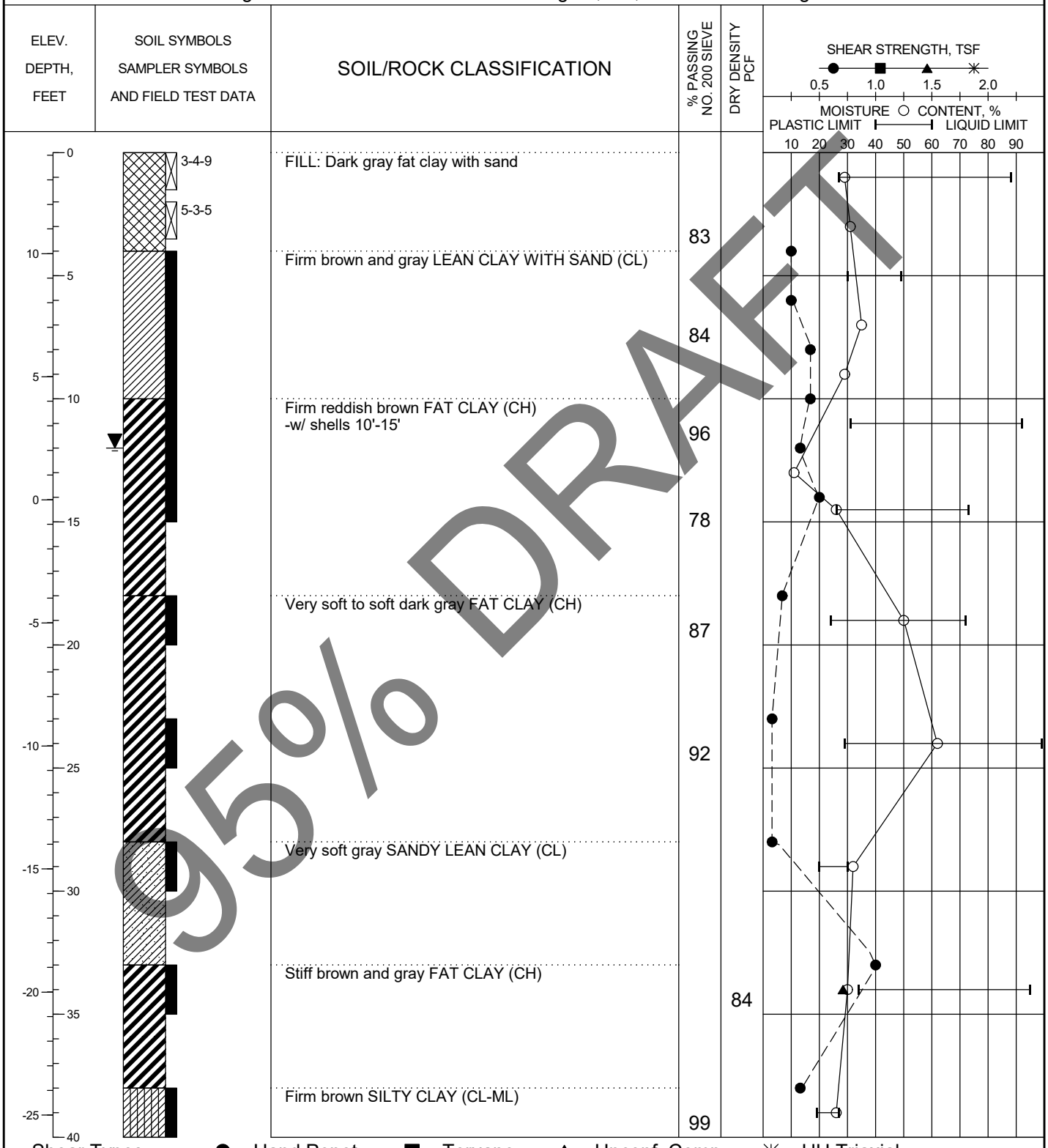
PLATE A-24

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-54
Date: 12/12/2012
Elevation (MLT): 14.1 feet
Groundwater during drilling: 12 feet
Northing: 13,794,619.3
Station: 29+75.72
Groundwater after drilling: ---
Easting: 3,257,415.7
Range: 159.40



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

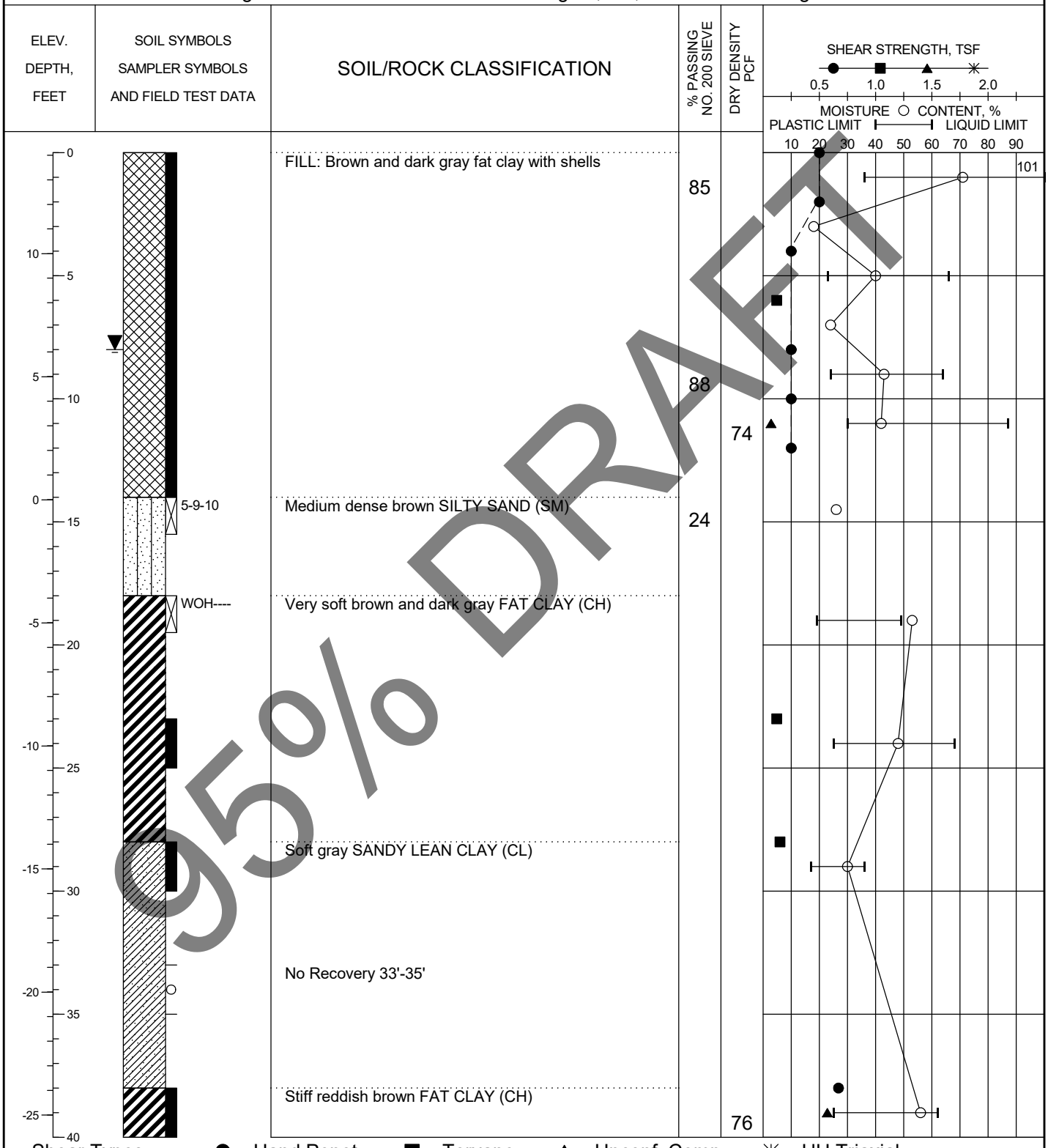
PLATE A-25

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-55
Date: 12/12/2012
Elevation (MLT): 14.1 feet
Groundwater during drilling: 8 feet
Northing: 13,793,802.3
Station: 39+52.27
Groundwater after drilling: ---
Easting: 3,257,115.6
Range: 142.7



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

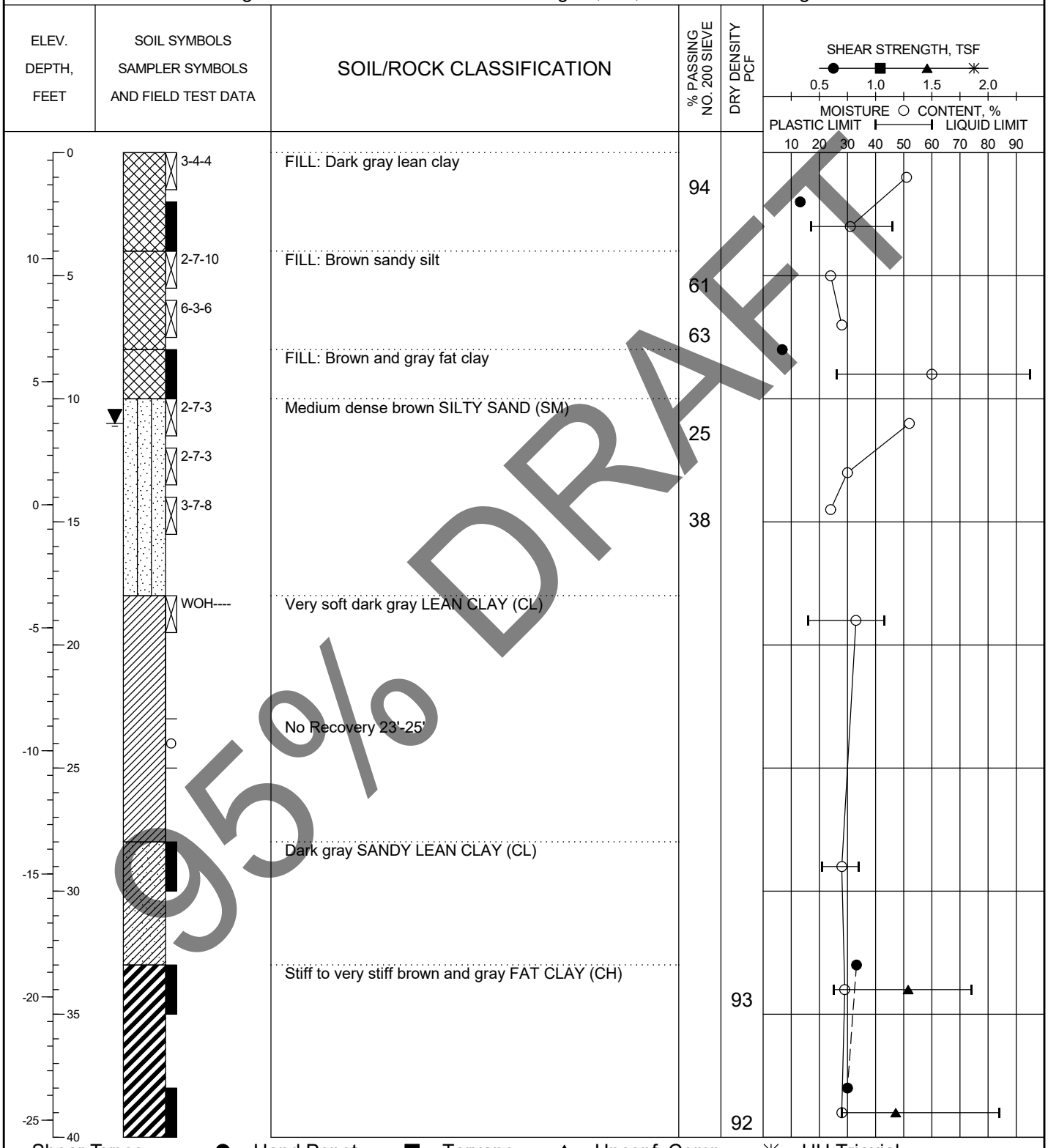
PLATE A-26

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-56
Date: 12/8/2012
Elevation (MLT): 14.3 feet
Groundwater during drilling: 11 feet
Northing: 13,797,829.4
Station: 116+97.86
Groundwater after drilling: ---
Easting: 3,254,332.1
Range: 144.41



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

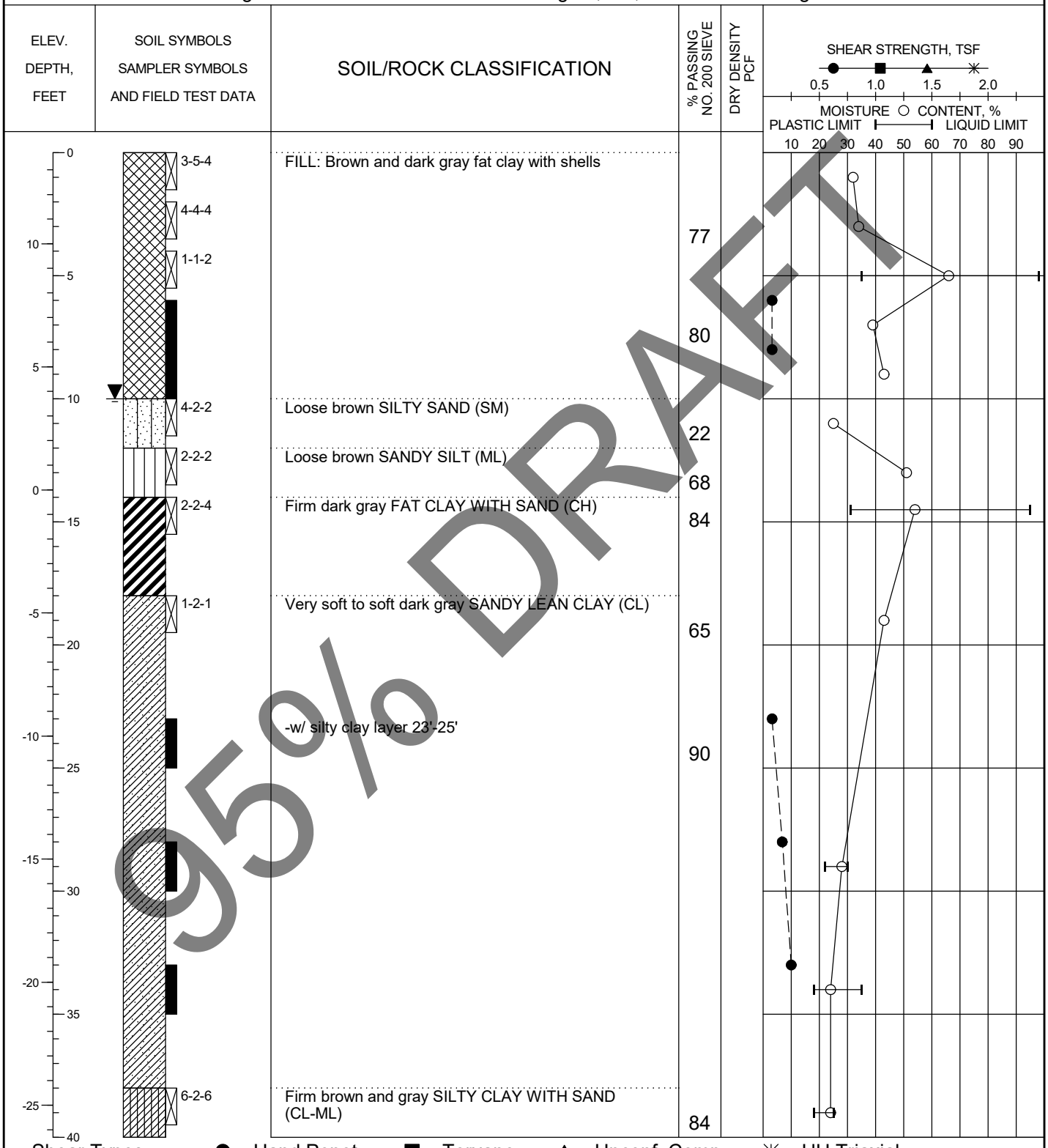
PLATE A-27

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-57
Date: 12/8/2012
Elevation (MLT): 13.7 feet
Groundwater during drilling: 10 feet
Northing: 13,798,141.2
Station: 127+07.28
Groundwater after drilling: ---
Easting: 3,255,280.2
Range: 155.16



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

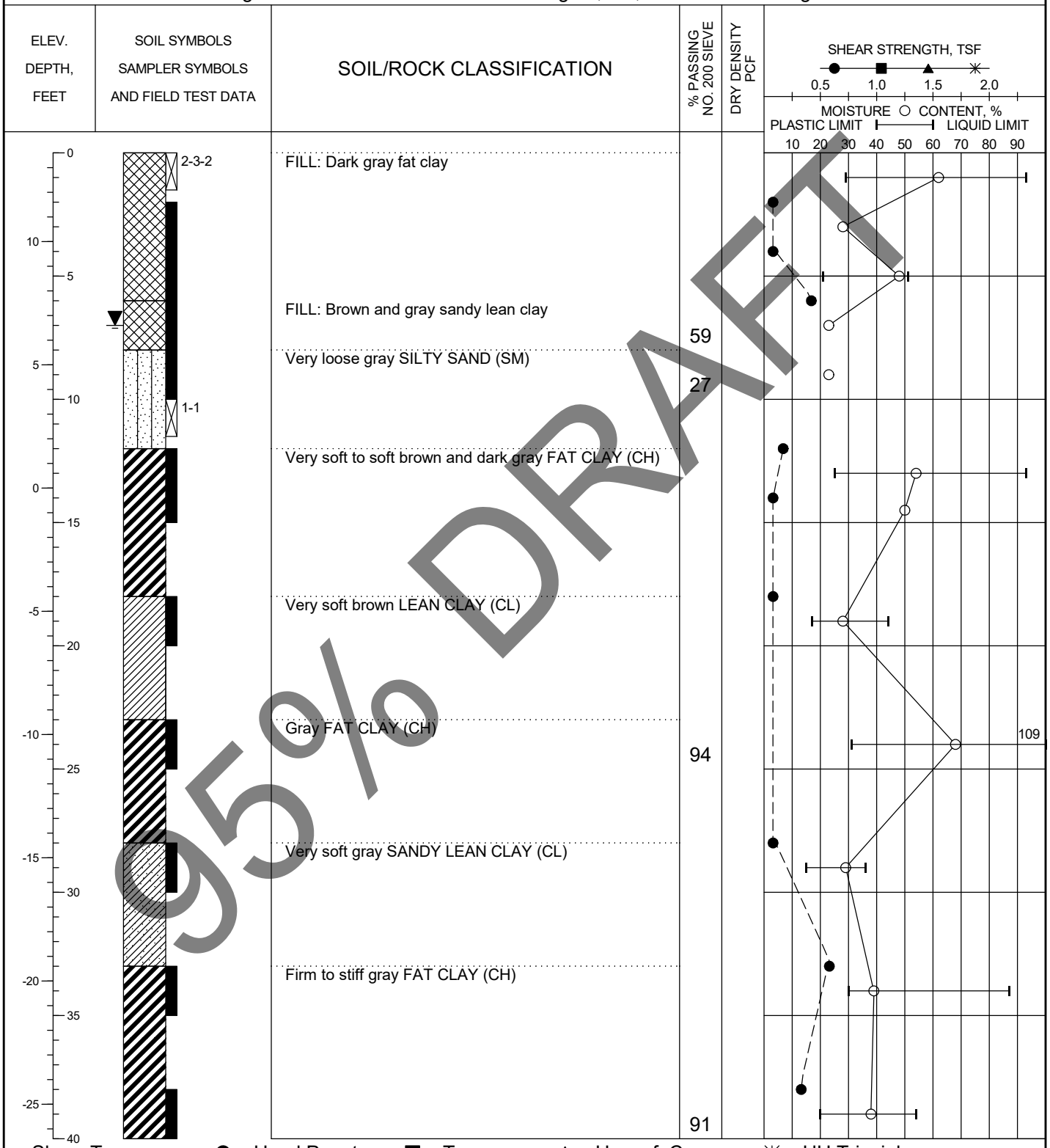
PLATE A-28

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

HVJ ASSOCIATES

LOG OF BORING

Project: Placement Area 14 and Connector Levee Raising
Project No.: HG1019744
Boring No.: 12-58
Date: 12/9/2012
Elevation (MLT): 13.6 feet
Groundwater during drilling: 7 feet
Northing: 13,798,017.3
Station: 136+17.84
Groundwater after drilling: ---
Easting: 3,255,904.4
Range: 136.29



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

See Plate 2 for boring location.

PLATE A-29

LOG OF SOIL BORING HG-10-19744.GPJ HVJ.GDT 4/10/13

HVJ ASSOCIATES

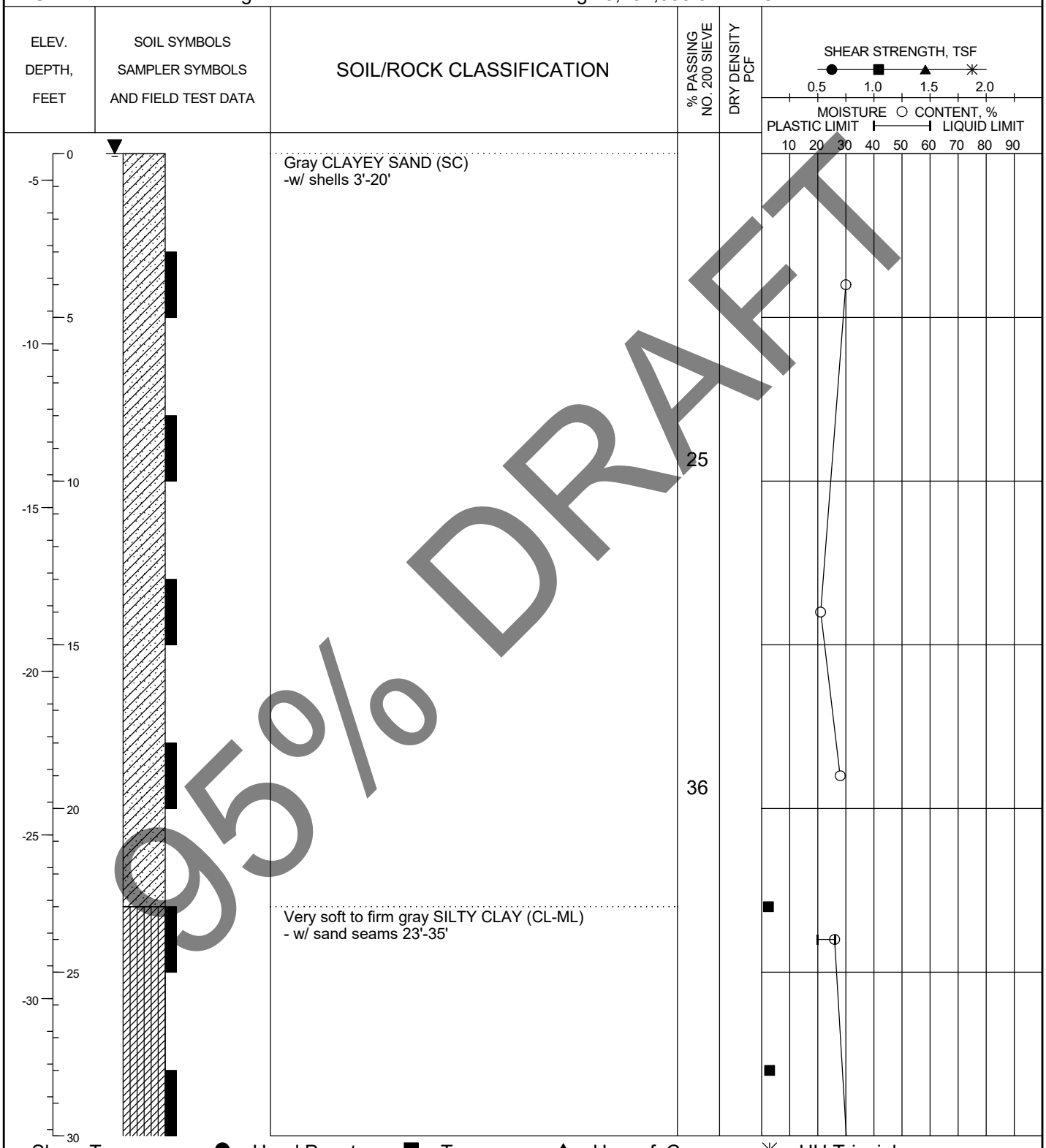
LOG OF BORING

Project: Atkinson Marsh Cells 7,8 & 9 — Project No.: HG0915780

Boring No.: ATK-B-1 (Depth of Water = 7.33 feet) — Date: 7/24/2009 — Elevation: -4.19 feet

Groundwater during drilling: 0 feet — Northing: 13,805,710.4 — Station: --

Groundwater after drilling: --- — Easting: 3,257,888.3 — Offset: --



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

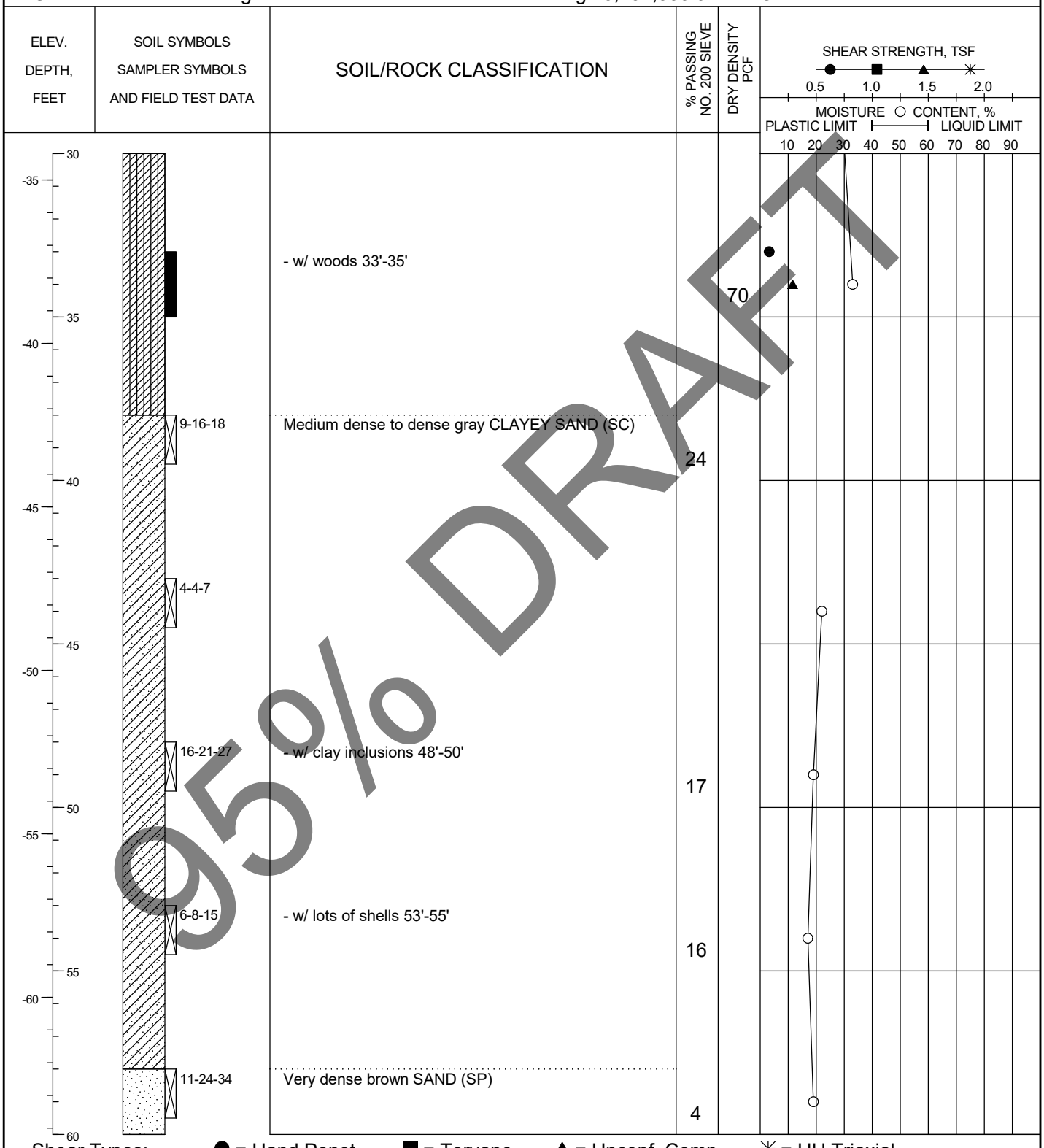
PLATE A-1a

LOG OF SOIL BORING HG-09-15780.GPJ HVJ.GDT 1/5/10

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson Marsh Cells 7,8 & 9 — Project No.: HG0915780
Boring No.: ATK-B-1 (Depth of Water = 7.33 feet) — Date: 7/24/2009 — Elevation: -4.19 feet
Groundwater during drilling: 0 feet — Northing: 13,805,710.4 — Station: --
Groundwater after drilling: --- — Easting: 3,257,888.3 — Offset: --



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

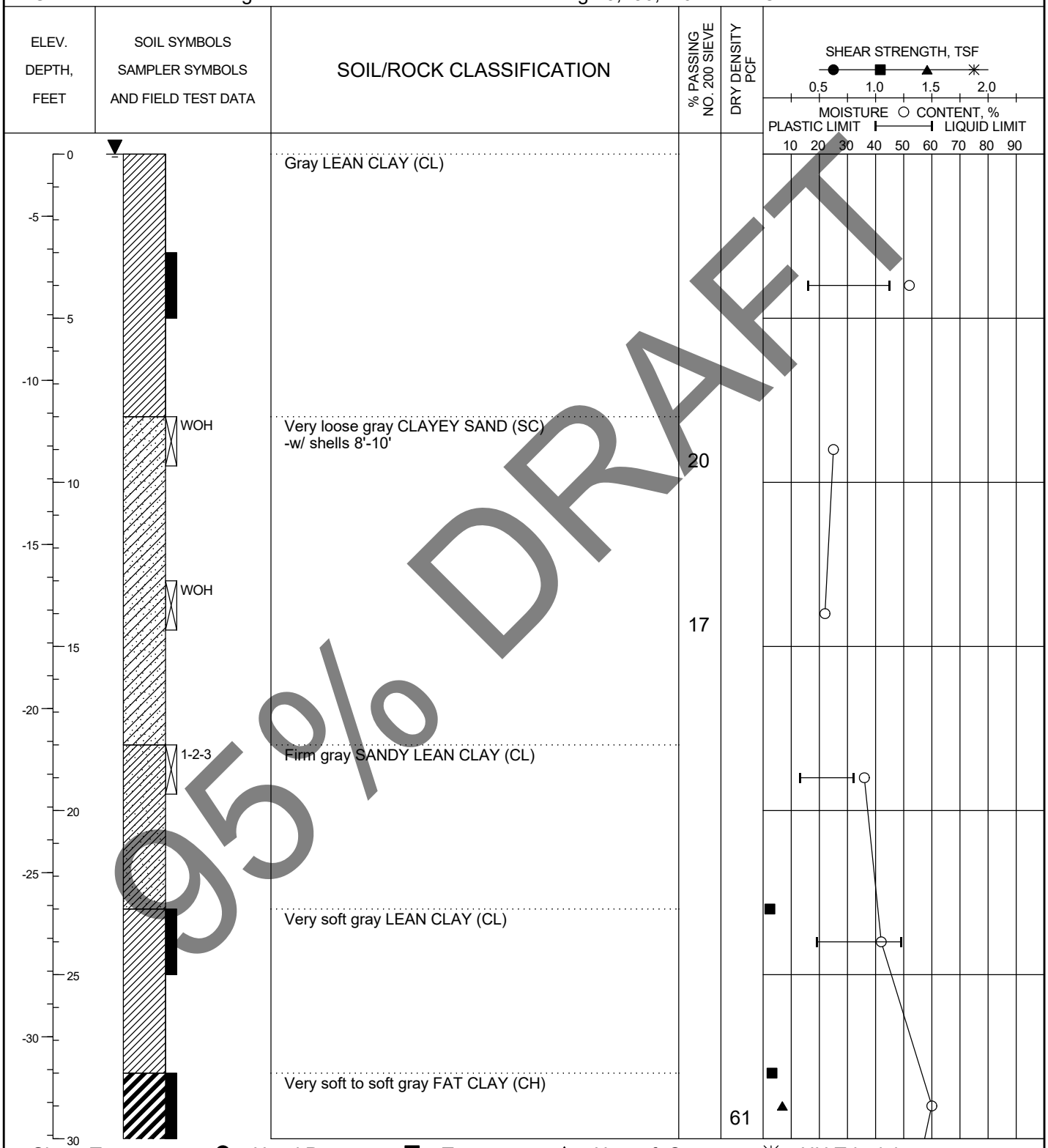
PLATE A-1b

LOG OF SOIL BORING HG-09-15780.GPJ HVJ.GDT 1/5/10

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson Marsh Cells 7,8 & 9 | Project No.: HG0915780
Boring No.: ATK-B-2 (Depth of Water = 5.83 feet) | Date: 7/22/2009 | Elevation: -3.11 feet
Groundwater during drilling: 0 feet | Northing: 13,805,555.4 | Station: --
Groundwater after drilling: --- | Easting: 3,256,776.1 | Offset: --



Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

95% DRAFT

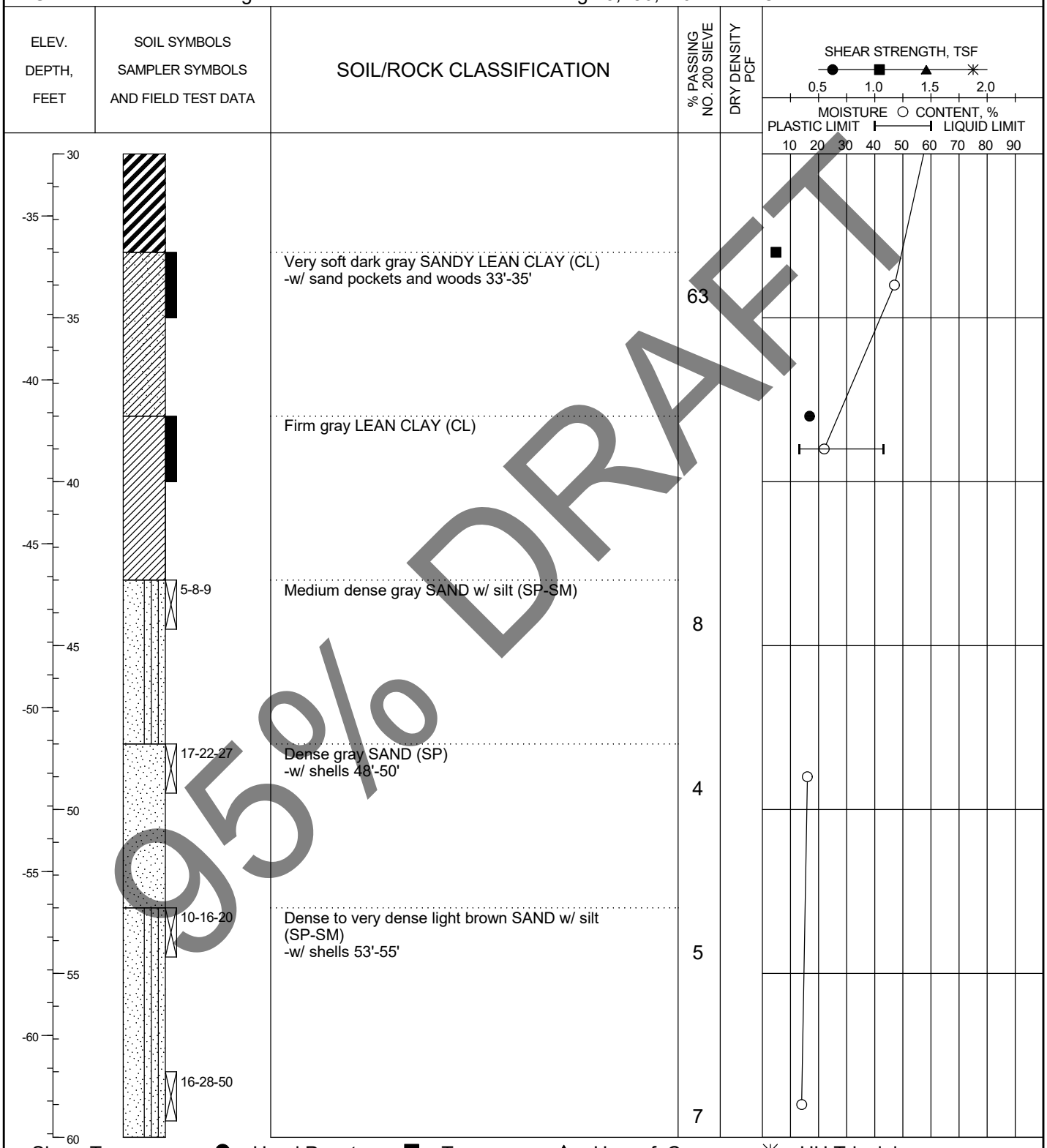
PLATE A-2a

LOG OF SOIL BORING HG-09-15780.GPJ HVJ.GDT 1/5/10

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson Marsh Cells 7,8 & 9 | Project No.: HG0915780
Boring No.: ATK-B-2 (Depth of Water = 5.83 feet) | Date: 7/22/2009 | Elevation: -3.11 feet
Groundwater during drilling: 0 feet | Northing: 13,805,555.4 | Station: --
Groundwater after drilling: --- | Easting: 3,256,776.1 | Offset: --



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

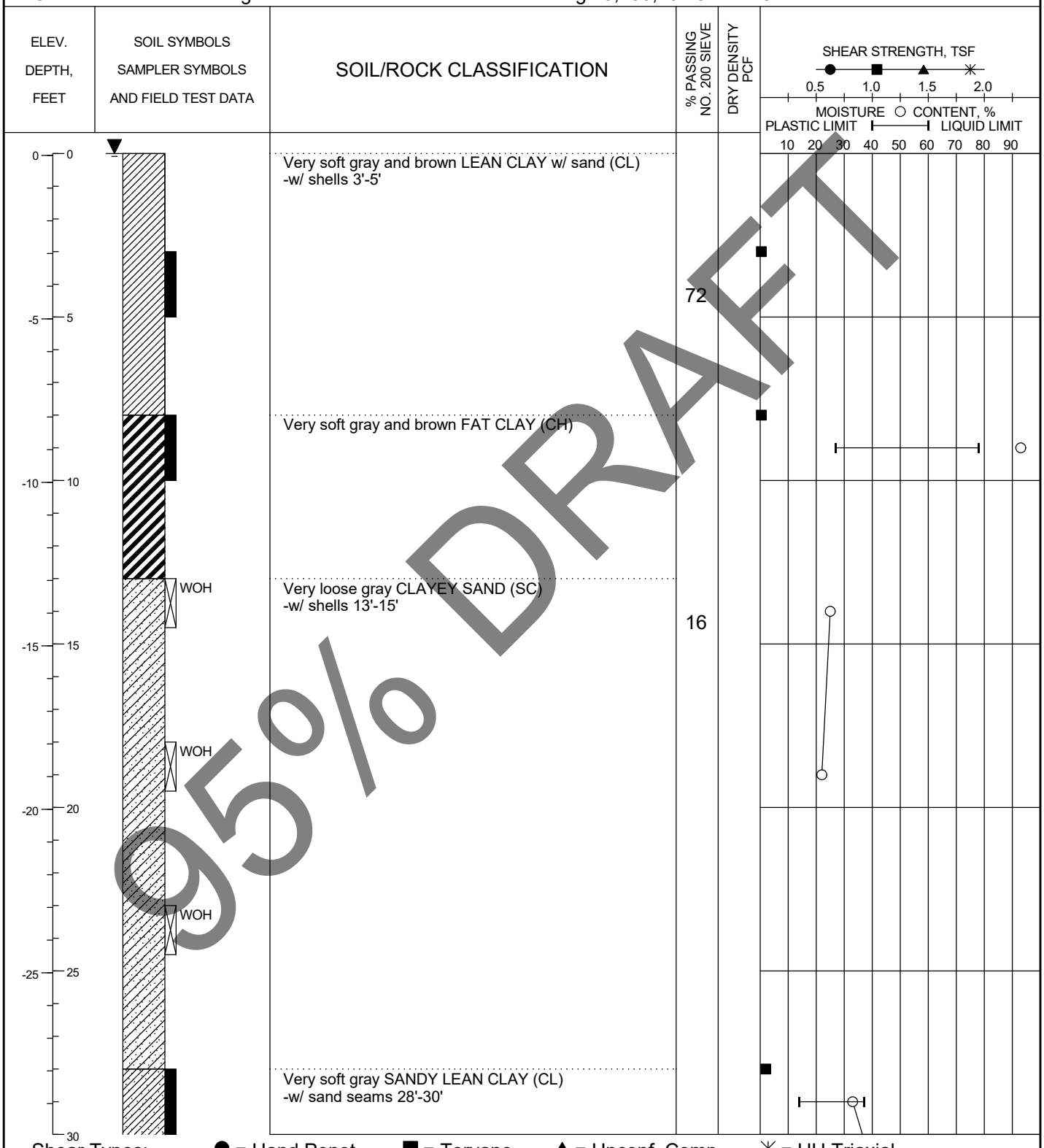
PLATE A-2b

LOG OF SOIL BORING HG-09-15780.GPJ HVJ.GDT 1/5/10

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson Marsh Cells 7,8 & 9 | Project No.: HG0915780
Boring No.: ATK-B-3 (Depth of Water = 3 feet) | Date: 7/22/2009 | Elevation: 0.06 feet
Groundwater during drilling: 0 feet | Northing: 13,805,349.8 | Station: --
Groundwater after drilling: --- | Easting: 3,255,237.5 | Offset: --



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

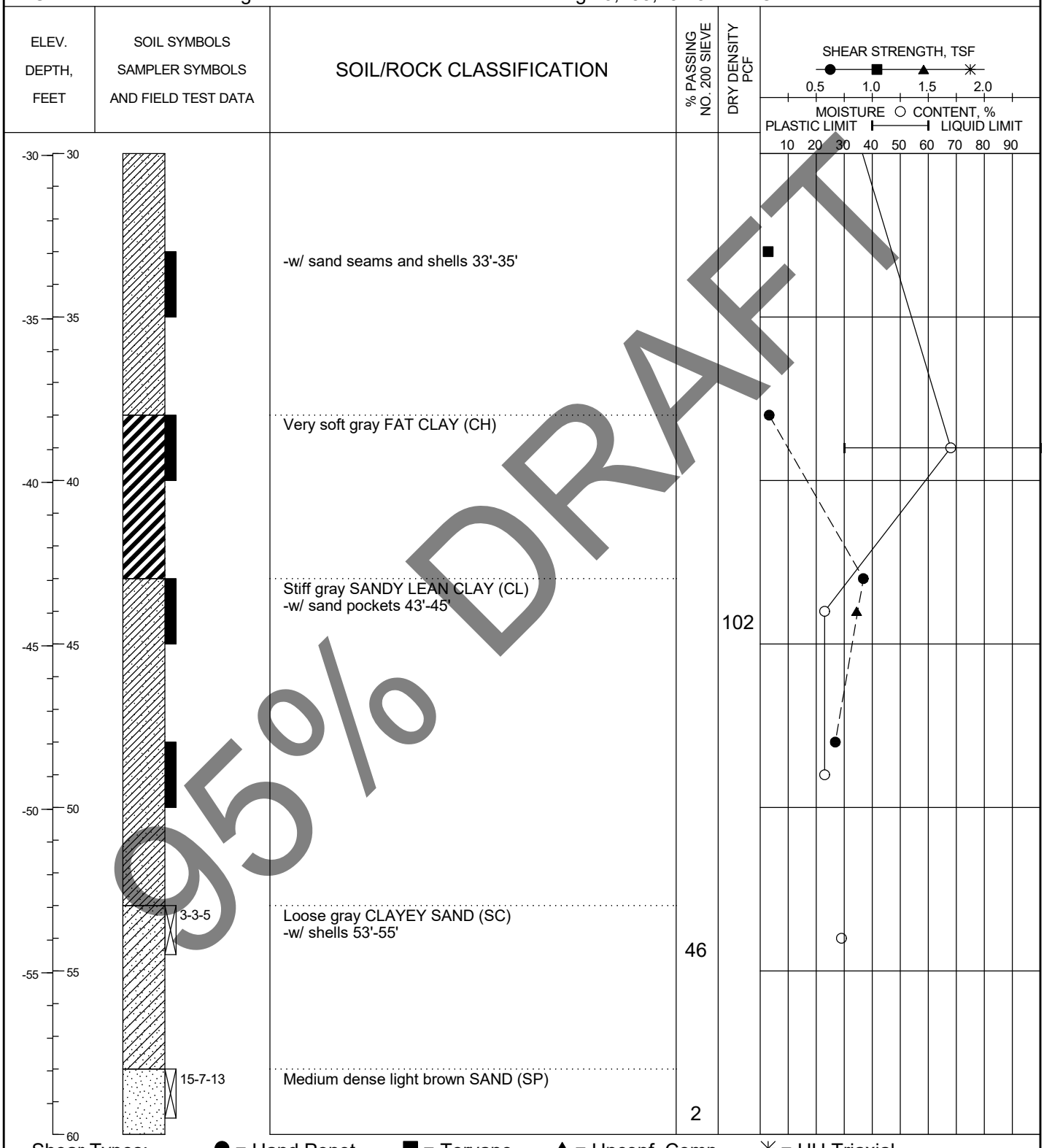
PLATE A-3a

LOG OF SOIL BORING HG-09-15780.GPJ HVJ.GDT 1/5/10

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson Marsh Cells 7,8 & 9 | Project No.: HG0915780
Boring No.: ATK-B-3 (Depth of Water = 3 feet) | Date: 7/22/2009 | Elevation: 0.06 feet
Groundwater during drilling: 0 feet | Northing: 13,805,349.8 | Station: --
Groundwater after drilling: --- | Easting: 3,255,237.5 | Offset: --



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-3b

LOG OF SOIL BORING HG-09-15780.GPJ HVJ.GDT 1/5/10

HVJ ASSOCIATES

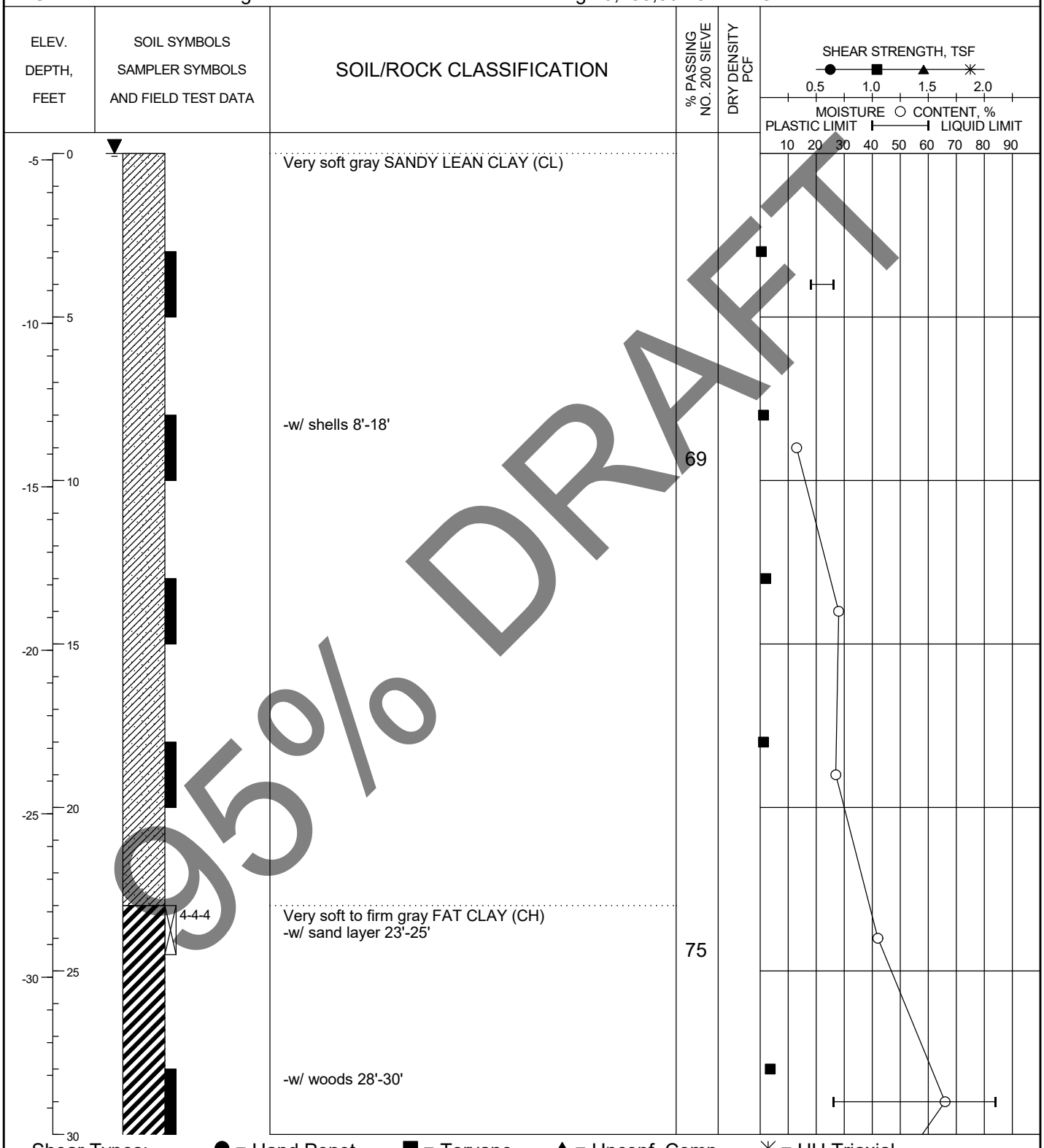
LOG OF BORING

Project: Atkinson Marsh Cells 7,8 & 9 | Project No.: HG0915780

Boring No.: ATK-B-4 (Depth of Water = 7 feet) | Date: 7/24/2009 | Elevation: -4.81 feet

Groundwater during drilling: 0 feet | Northing: 13,804,156.5 | Station: --

Groundwater after drilling: --- | Easting: 3,258,507.5 | Offset: --



Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-4a

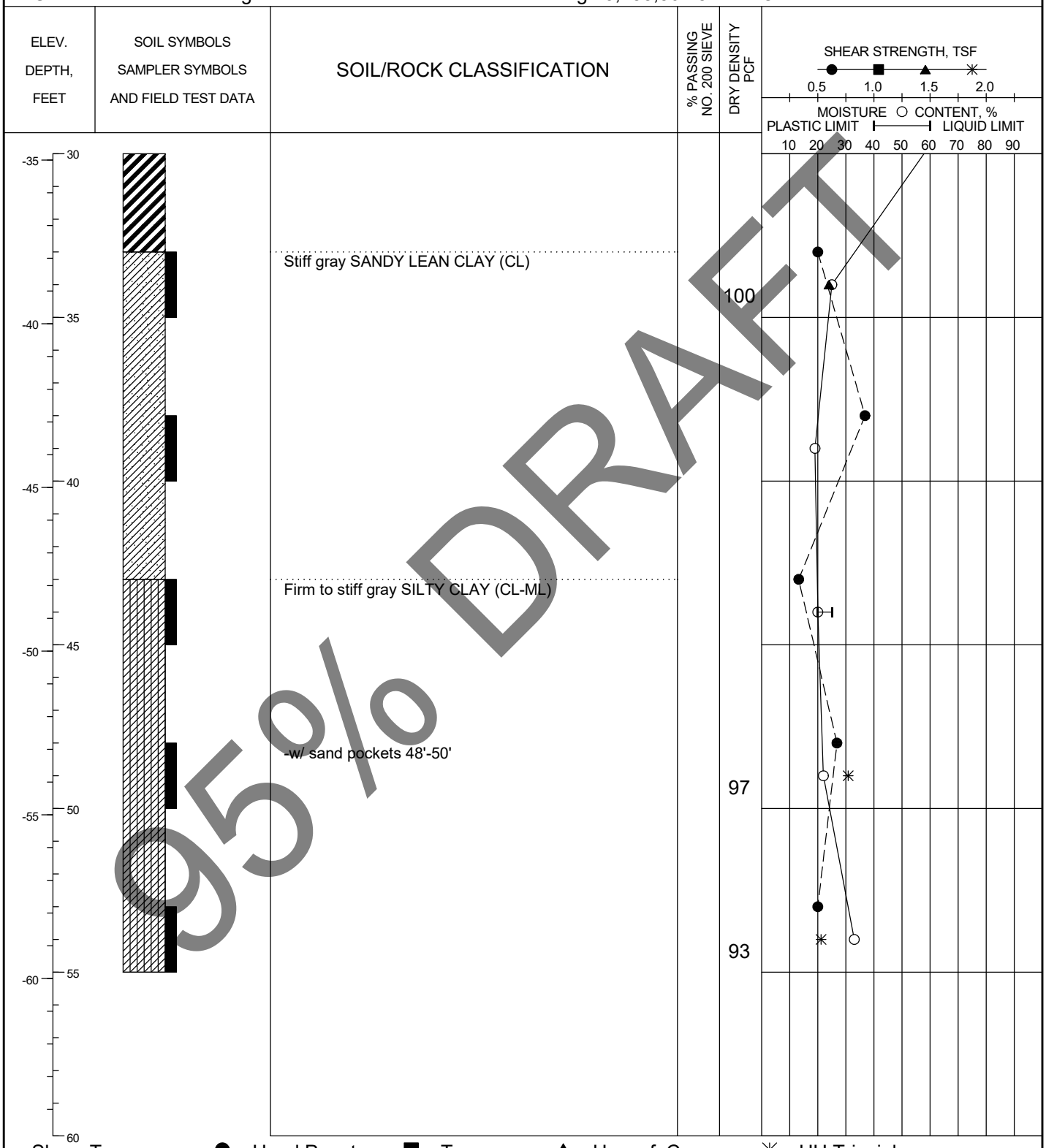
95% DRAFT

LOG OF SOIL BORING HG-09-15780.GPJ HVJ.GDT 1/5/10

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson Marsh Cells 7,8 & 9 | Project No.: HG0915780
Boring No.: ATK-B-4 (Depth of Water = 7 feet) | Date: 7/24/2009 | Elevation: -4.81 feet
Groundwater during drilling: 0 feet | Northing: 13,804,156.5 | Station: --
Groundwater after drilling: --- | Easting: 3,258,507.5 | Offset: --



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

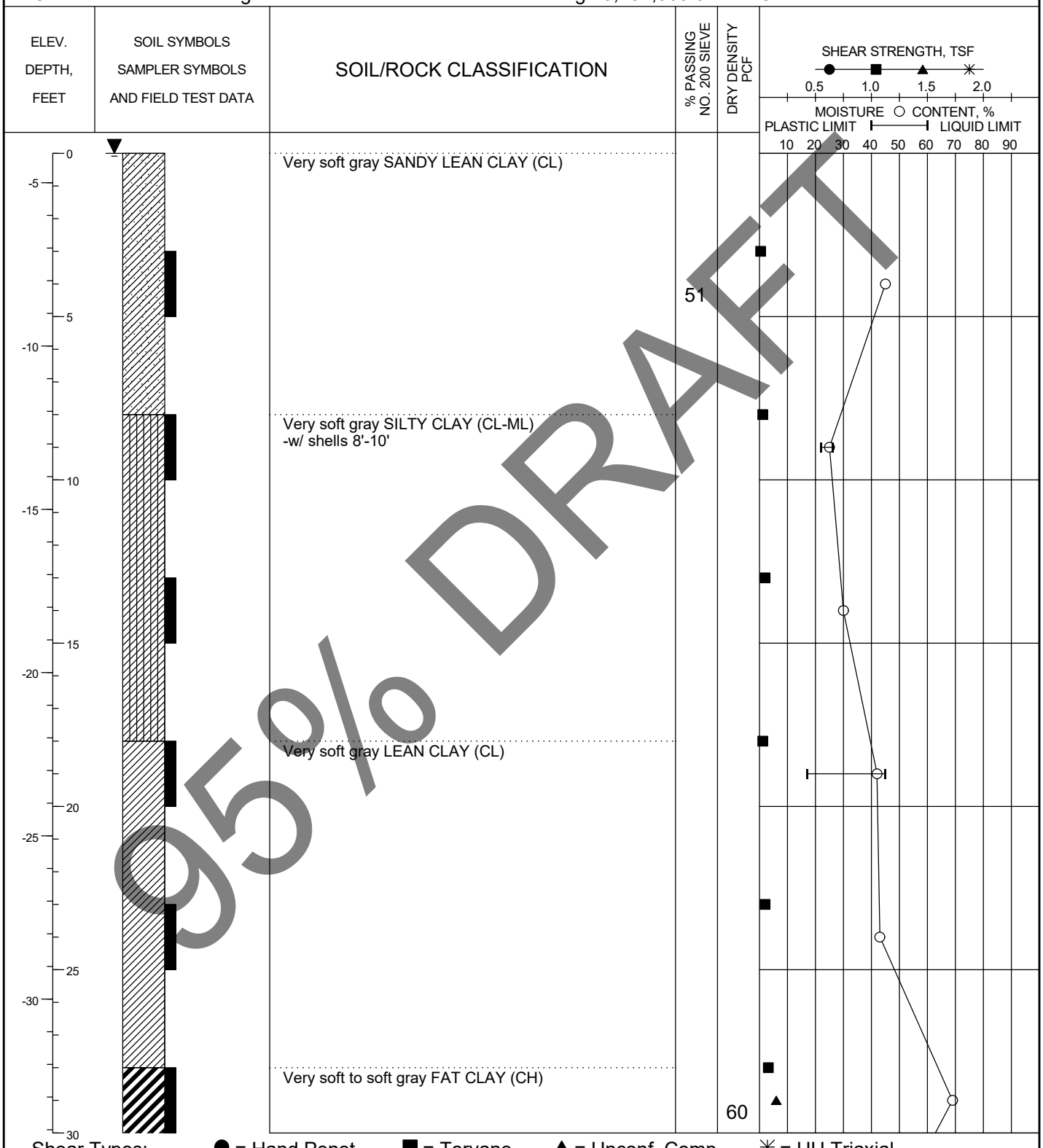
PLATE A-4b

LOG OF SOIL BORING HG-09-15780.GPJ HVJ.GDT 1/5/10

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson Marsh Cells 7,8 & 9 | Project No.: HG0915780
Boring No.: ATK-B-5 (Depth of Water = 5.5 feet) | Date: 7/23/2009 | Elevation: -4.1 feet
Groundwater during drilling: 0 feet | Northing: 13,803,986.0 | Station: --
Groundwater after drilling: --- | Easting: 3,257,369.3 | Offset: --



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

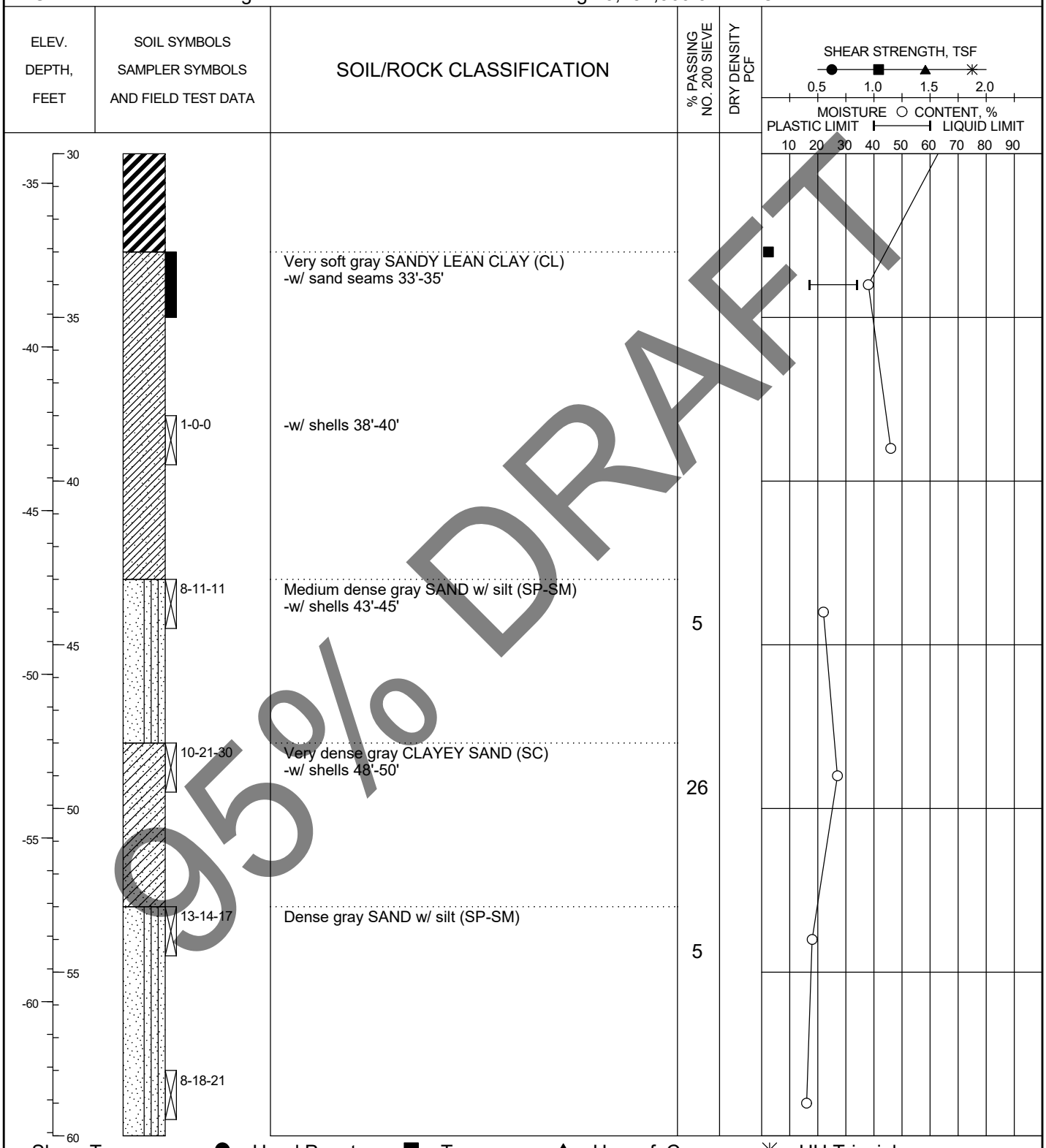
PLATE A-5a

LOG OF SOIL BORING HG-09-15780.GPJ HVJ.GDT 1/5/10

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson Marsh Cells 7,8 & 9 | Project No.: HG0915780
Boring No.: ATK-B-5 (Depth of Water = 5.5 feet) | Date: 7/23/2009 | Elevation: -4.1 feet
Groundwater during drilling: 0 feet | Northing: 13,803,986.0 | Station: --
Groundwater after drilling: --- | Easting: 3,257,369.3 | Offset: --



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

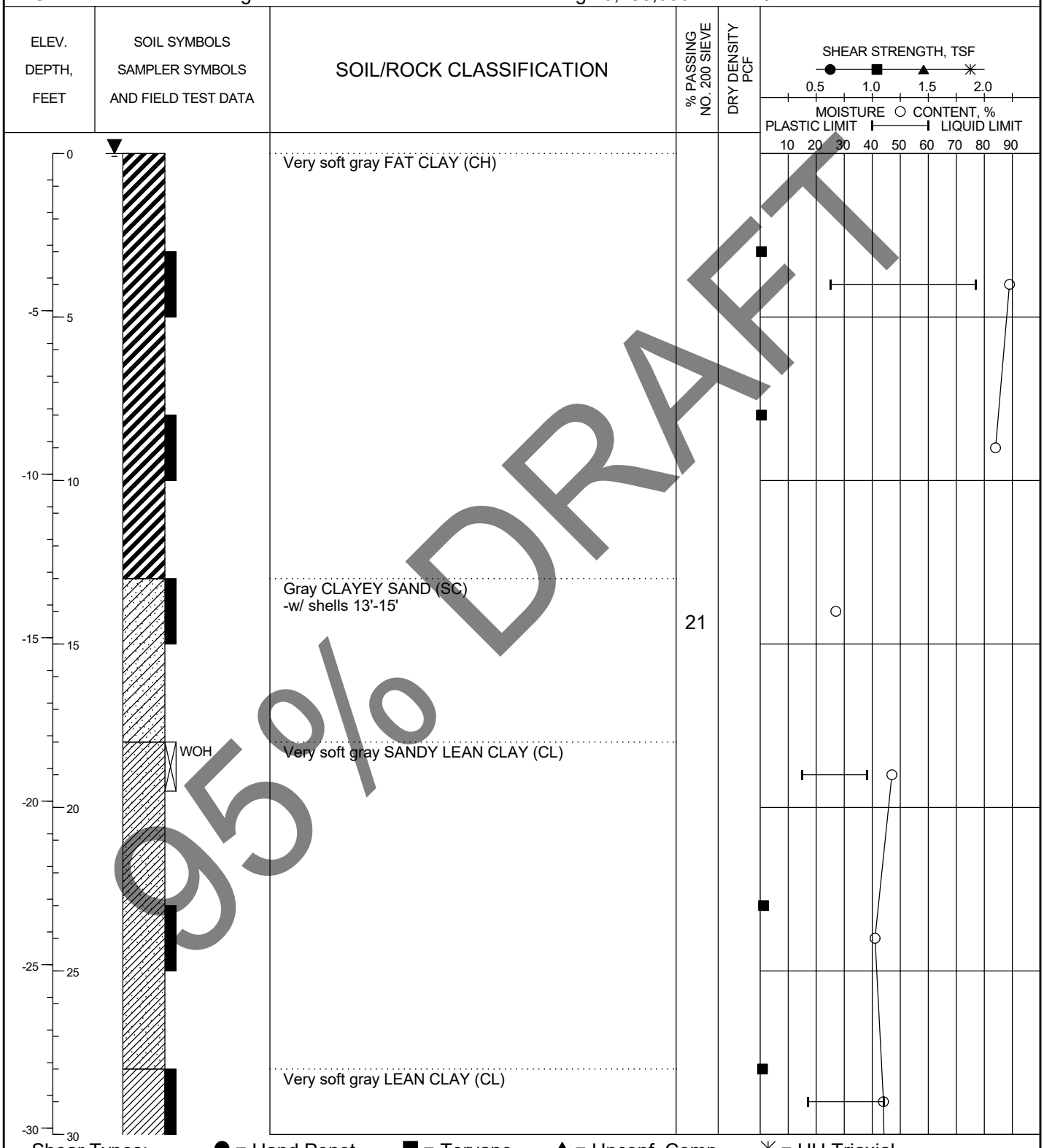
PLATE A-5b

LOG OF SOIL BORING HG-09-15780.GPJ HVJ.GDT 1/5/10

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson Marsh Cells 7,8 & 9 | Project No.: HG0915780
Boring No.: ATK-B-6 (Depth of Water = 3 feet) | Date: 7/22/2009 | Elevation: -0.19 feet
Groundwater during drilling: 0 feet | Northing: 13,803,798.7 | Station: --
Groundwater after drilling: --- | Easting: 3,255,850.2 | Offset: --



Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

95% DRAFT

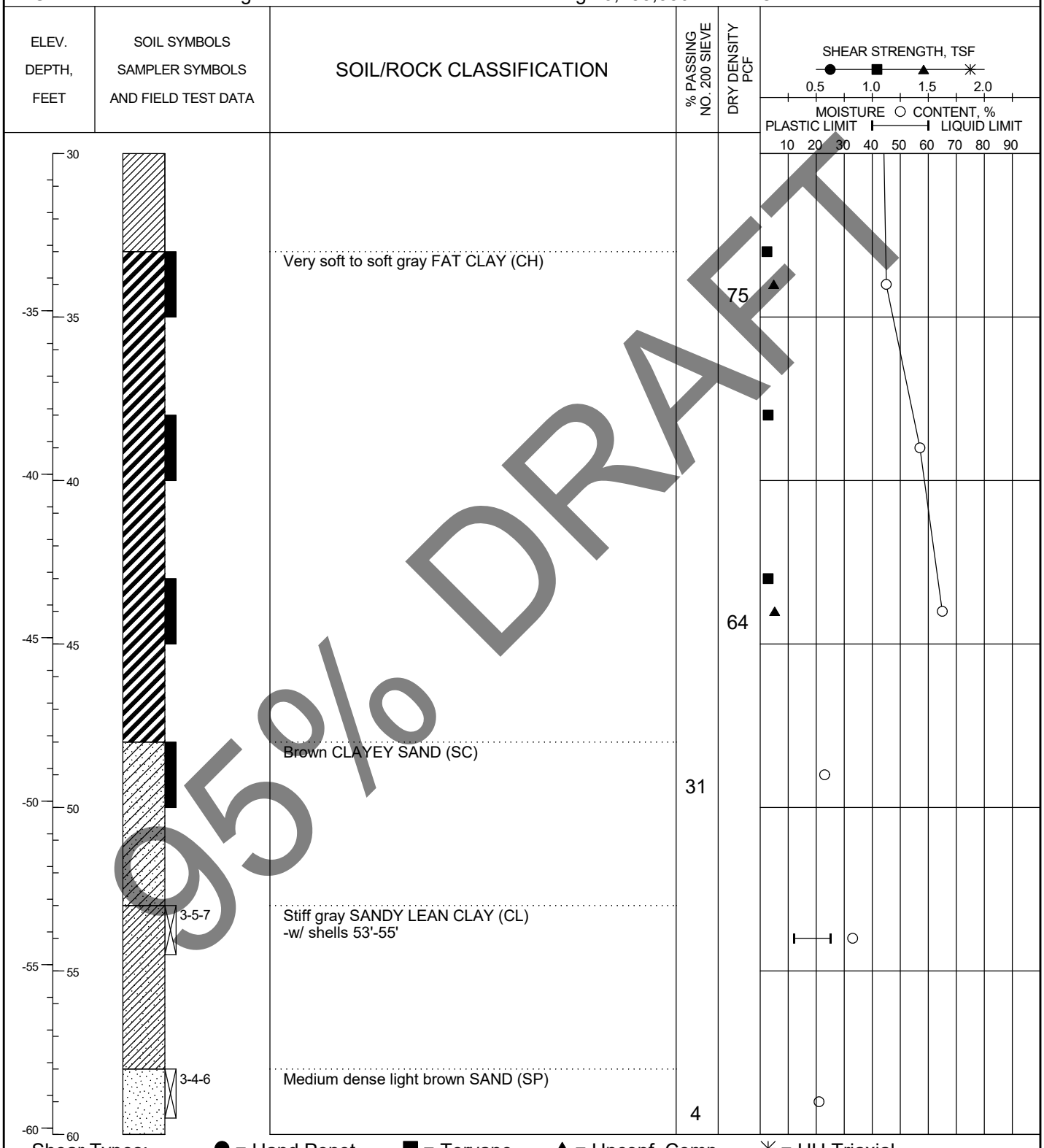
PLATE A-6a

LOG OF SOIL BORING HG-09-15780.GPJ HVJ.GDT 1/5/10

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson Marsh Cells 7,8 & 9 | Project No.: HG0915780
Boring No.: ATK-B-6 (Depth of Water = 3 feet) | Date: 7/22/2009 | Elevation: -0.19 feet
Groundwater during drilling: 0 feet | Northing: 13,803,798.7 | Station: --
Groundwater after drilling: --- | Easting: 3,255,850.2 | Offset: --



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

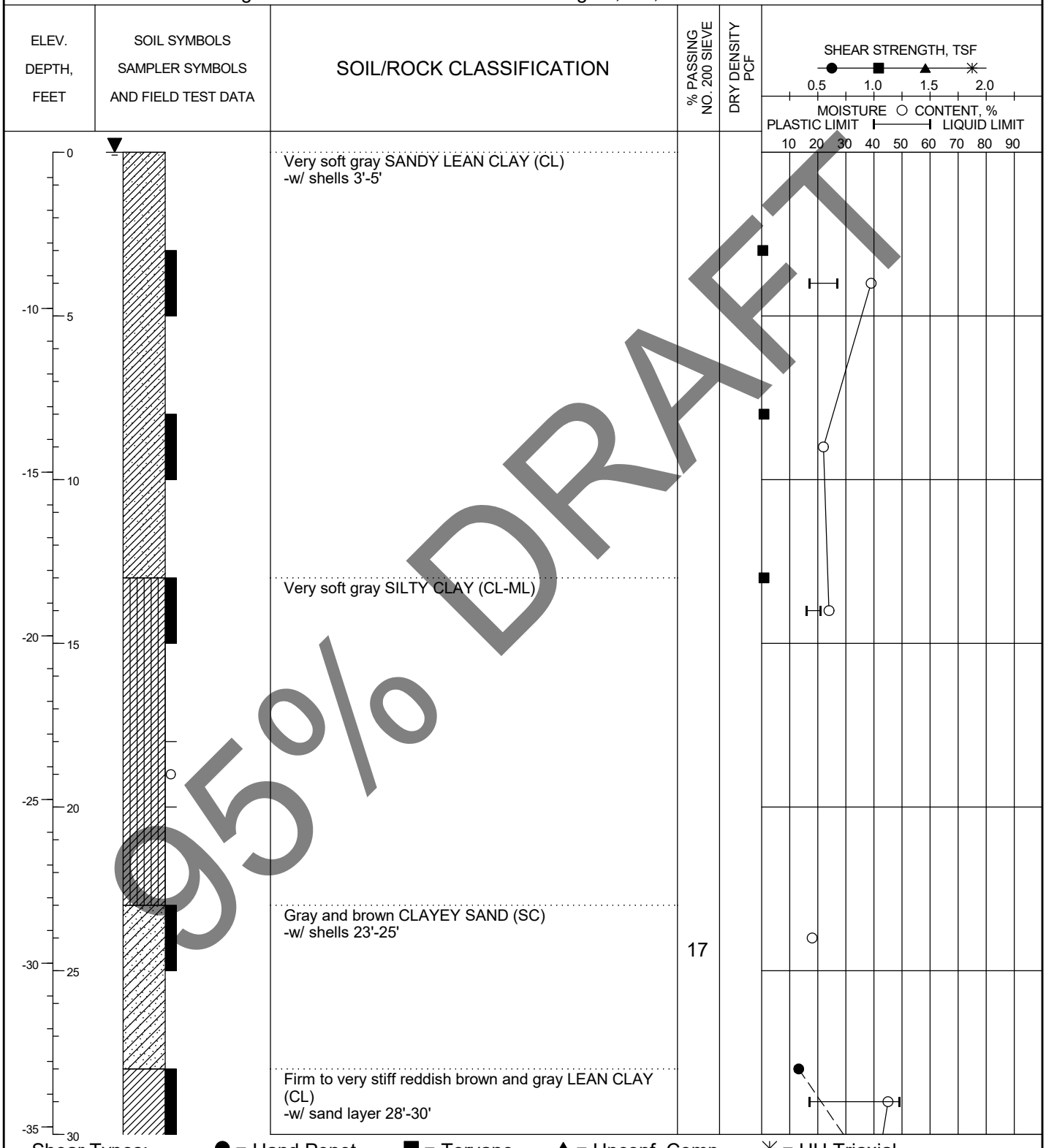
PLATE A-6b

LOG OF SOIL BORING HG-09-15780.GPJ HVJ.GDT 1/5/10

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson Marsh Cells 7,8 & 9 | Project No.: HG0915780
Boring No.: ATK-B-7 (Depth of Water = 6 feet) | Date: 7/24/2009 | Elevation: -5.23 feet
Groundwater during drilling: 0 feet | Northing: 13,802,622.3 | Station: --
Groundwater after drilling: --- | Easting: 3,259,065.7 | Offset: --



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-7a

LOG OF SOIL BORING HG-09-15780.GPJ HVJ.GDT 1/5/10

HVJ ASSOCIATES

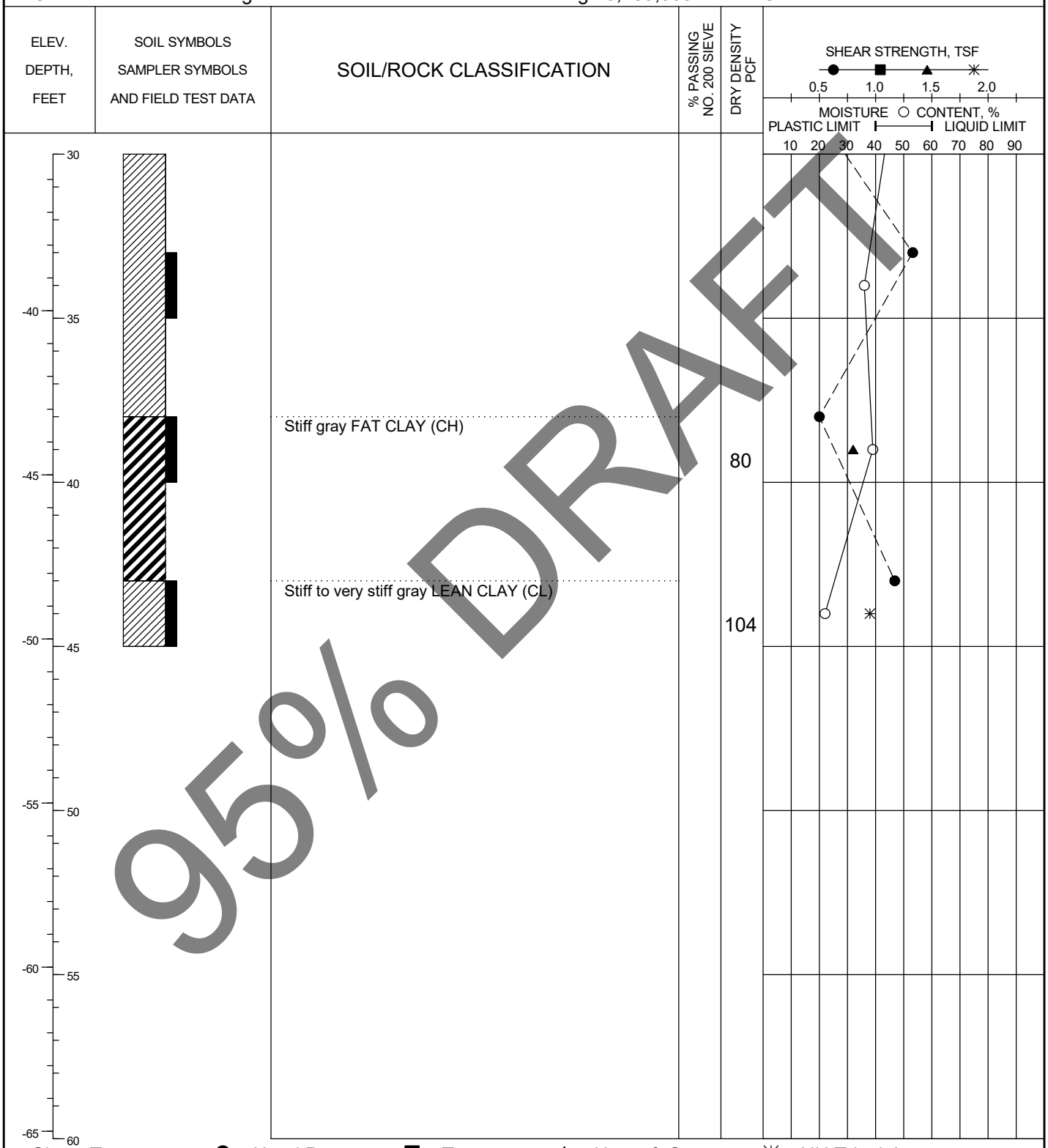
LOG OF BORING

Project: Atkinson Marsh Cells 7,8 & 9 | Project No.: HG0915780

Boring No.: ATK-B-7 (Depth of Water = 6 feet) | Date: 7/24/2009 | Elevation: -5.23 feet

Groundwater during drilling: 0 feet | Northing: 13,802,622.3 | Station: --

Groundwater after drilling: --- | Easting: 3,259,065.7 | Offset: --



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

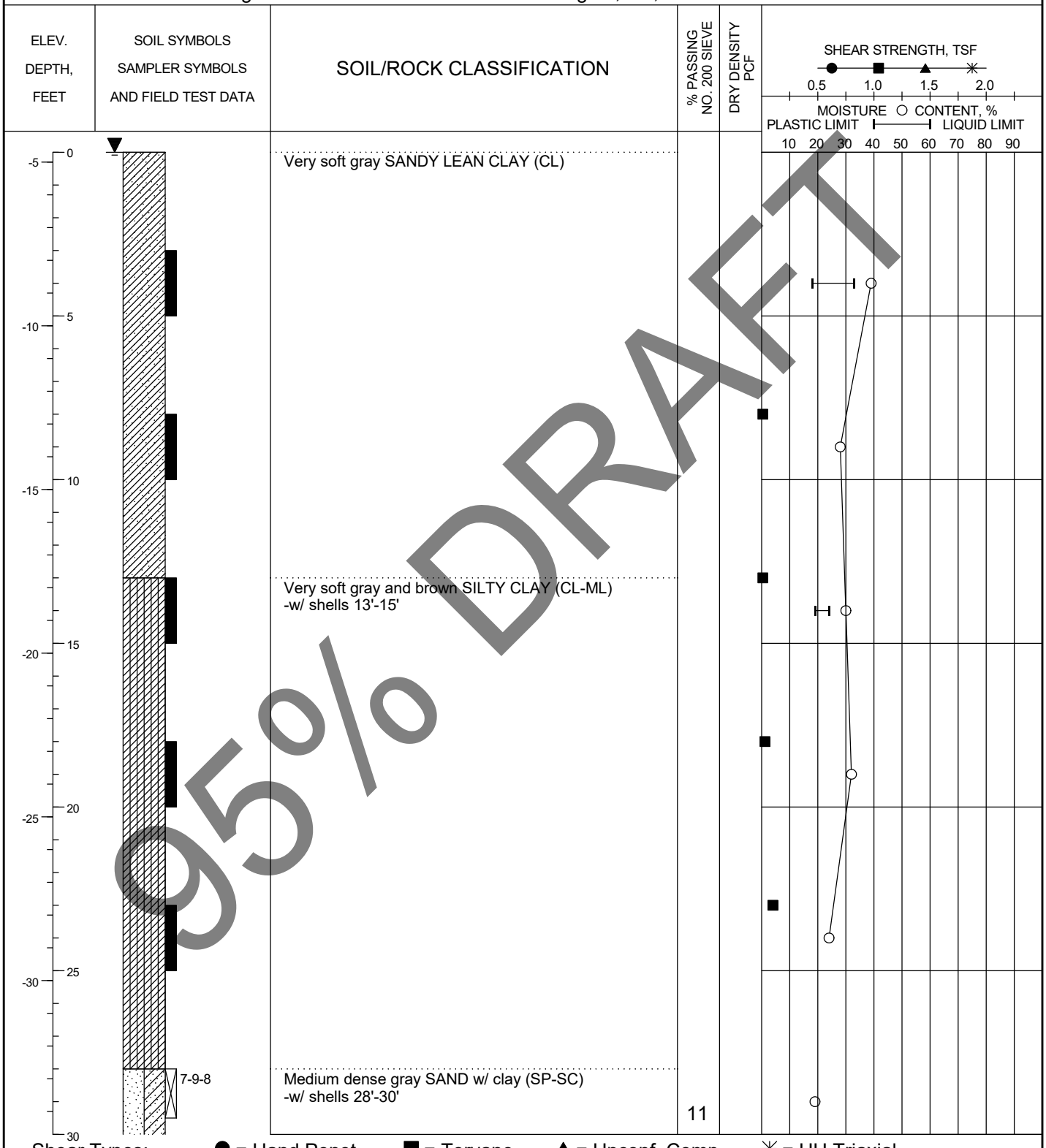
PLATE A-7b

LOG OF SOIL BORING HG-09-15780.GPJ HVJ.GDT 1/5/10

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson Marsh Cells 7,8 & 9 | Project No.: HG0915780
Boring No.: ATK-B-8 (Depth of Water = 6.5 feet) | Date: 7/23/2009 | Elevation: -4.7 feet
Groundwater during drilling: 0 feet | Northing: 13,802,467.6 | Station: --
Groundwater after drilling: --- | Easting: 3,257,930.5 | Offset: --



95% DRAFT

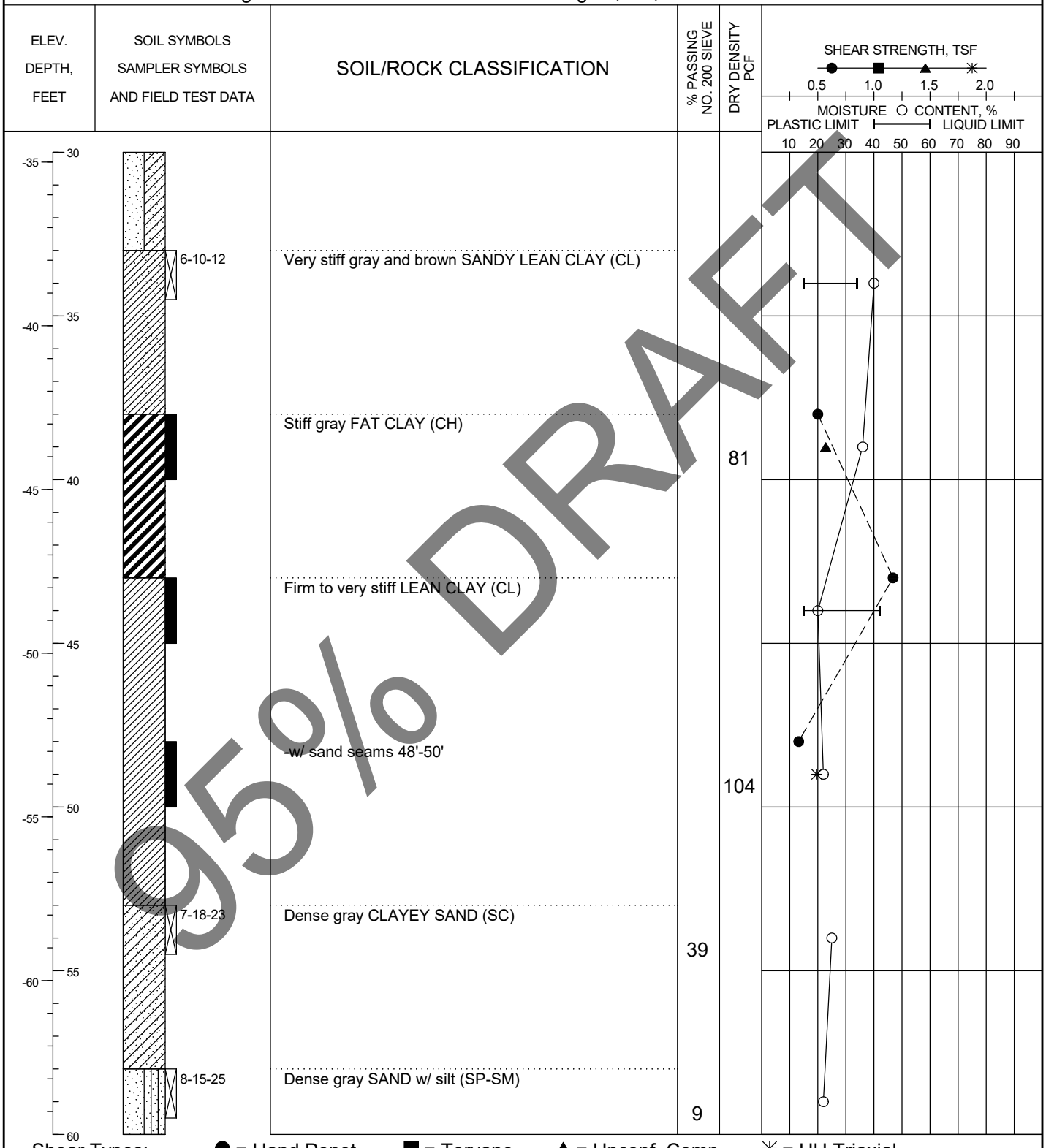
Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-8a

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson Marsh Cells 7,8 & 9 | Project No.: HG0915780
Boring No.: ATK-B-8 (Depth of Water = 6.5 feet) | Date: 7/23/2009 | Elevation: -4.7 feet
Groundwater during drilling: 0 feet | Northing: 13,802,467.6 | Station: --
Groundwater after drilling: --- | Easting: 3,257,930.5 | Offset: --



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

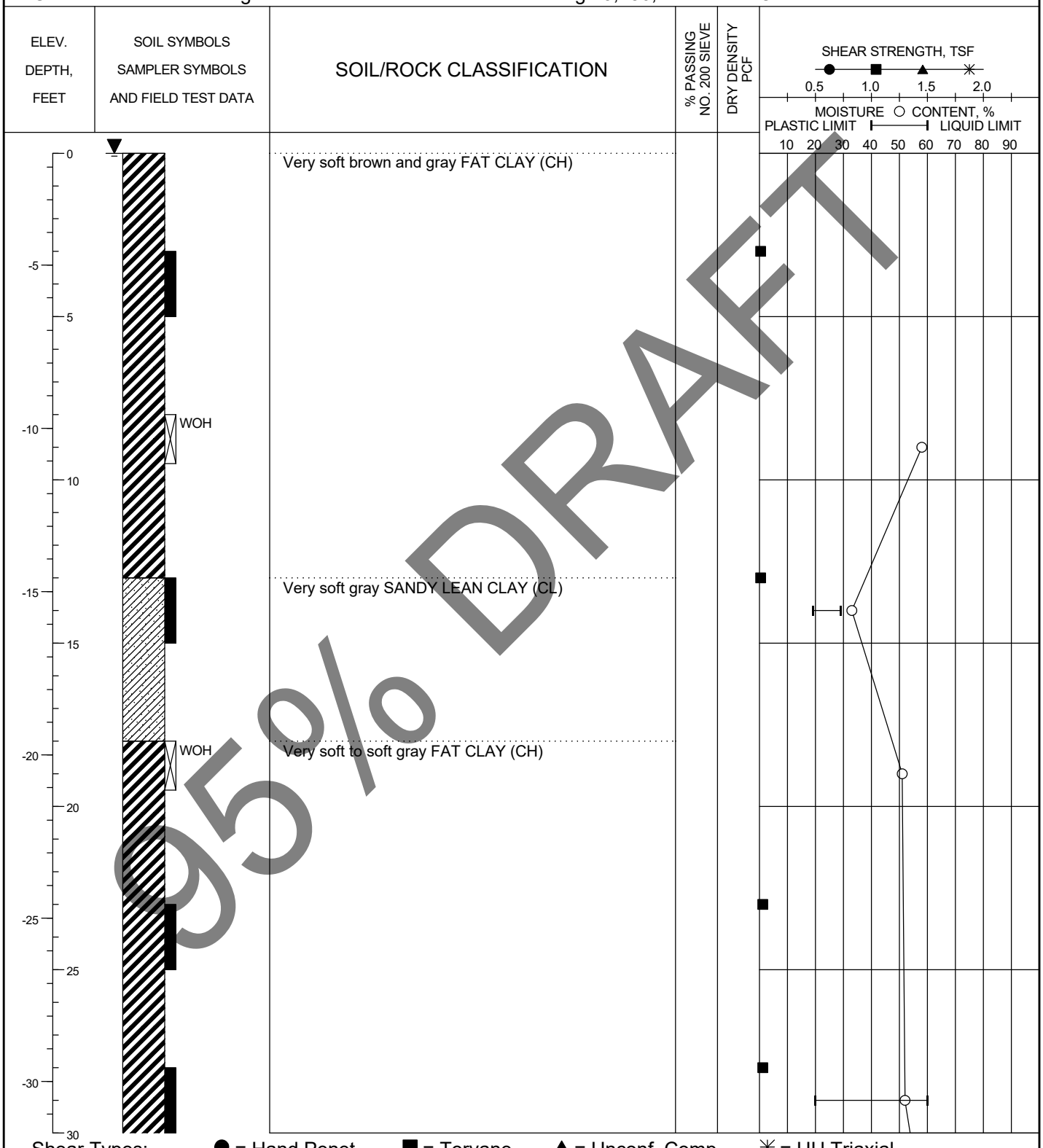
PLATE A-8b

LOG OF SOIL BORING HG-09-15780.GPJ HVJ.GDT 1/5/10

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson Marsh Cells 7,8 & 9 | Project No.: HG0915780
Boring No.: ATK-B-9 (Depth of Water = 6.5 feet) | Date: 7/21/2009 | Elevation: -1.58 feet
Groundwater during drilling: 0 feet | Northing: 13,802,261.2 | Station: --
Groundwater after drilling: --- | Easting: 3,256,422.1 | Offset: --



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

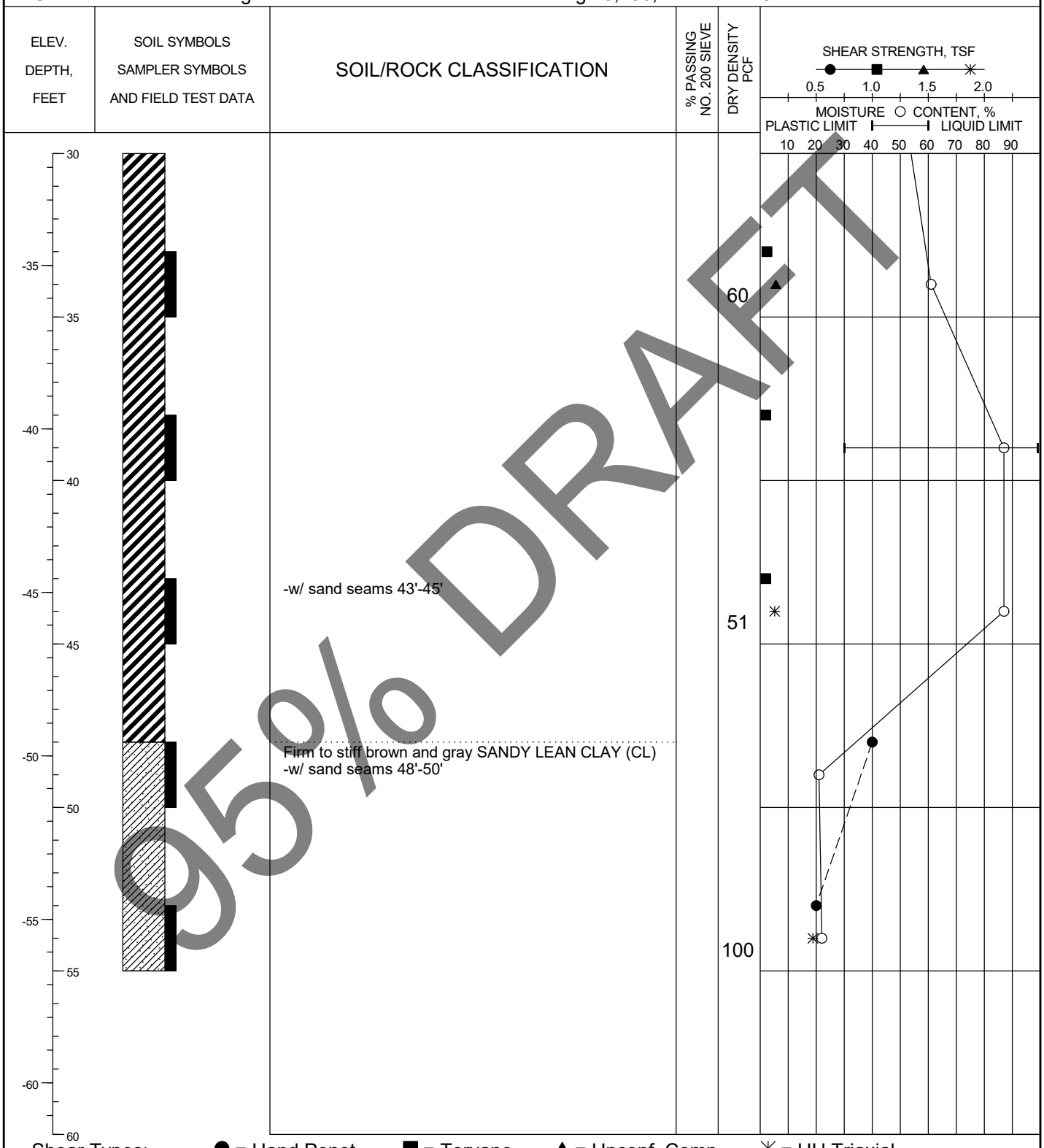
PLATE A-9a

LOG OF SOIL BORING HG-09-15780.GPJ HVJ.GDT 1/5/10

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson Marsh Cells 7,8 & 9 — Project No.: HG0915780
Boring No.: ATK-B-9 (Depth of Water = 6.5 feet) — Date: 7/21/2009 — Elevation: -1.58 feet
Groundwater during drilling: 0 feet — Northing: 13,802,261.2 — Station: --
Groundwater after drilling: --- — Easting: 3,256,422.1 — Offset: --



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

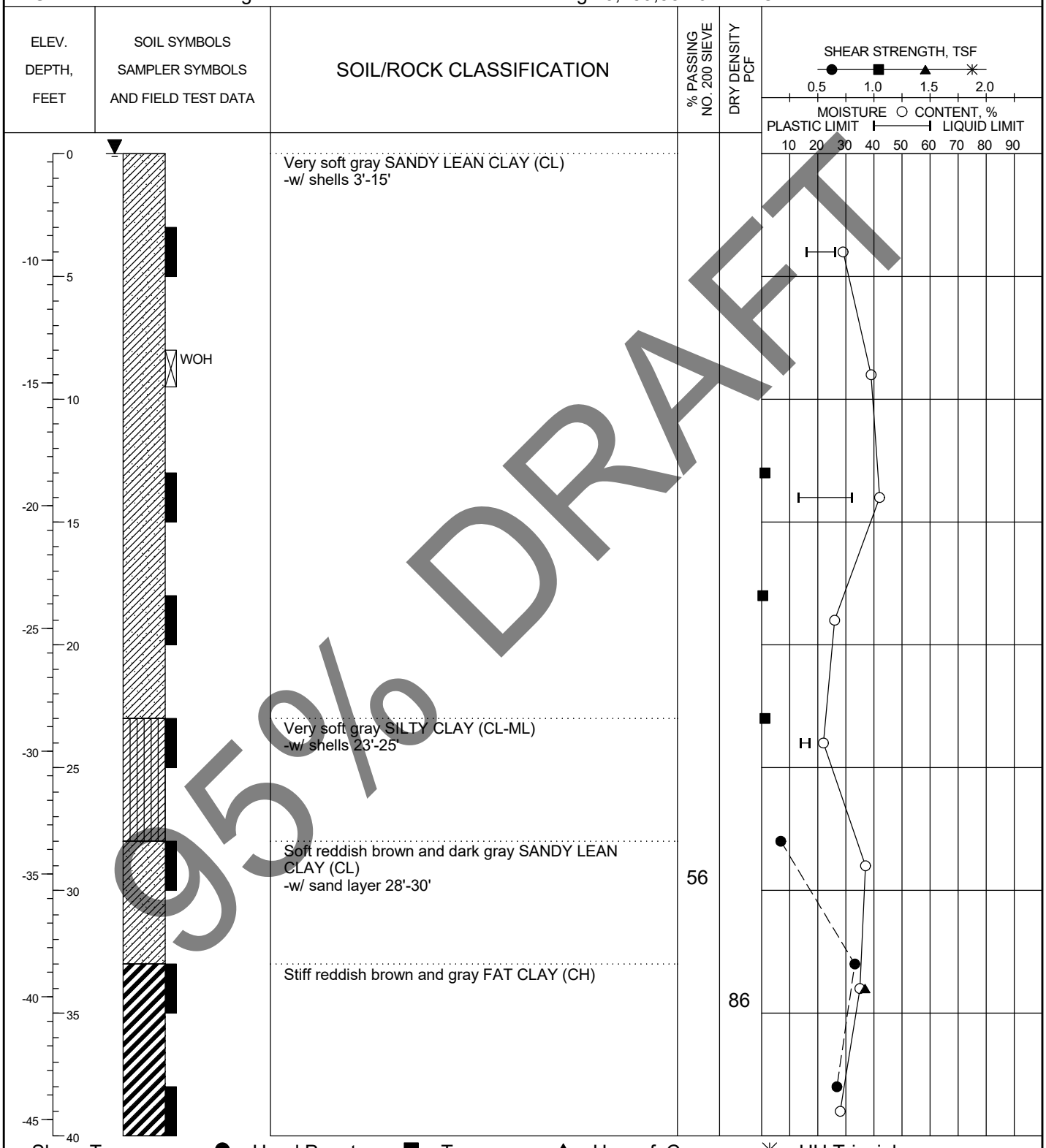
PLATE A-9b

LOG OF SOIL BORING HG-09-15780.GPJ HVJ.GDT 1/5/10

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson Marsh Cells 7,8 & 9 | Project No.: HG0915780
Boring No.: ATK-B-10 (Depth of Water = 10 feet) | Date: 7/20/2009 | Elevation: -5.67 feet
Groundwater during drilling: 0 feet | Northing: 13,801,240.3 | Station: --
Groundwater after drilling: --- | Easting: 3,259,587.6 | Offset: --



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

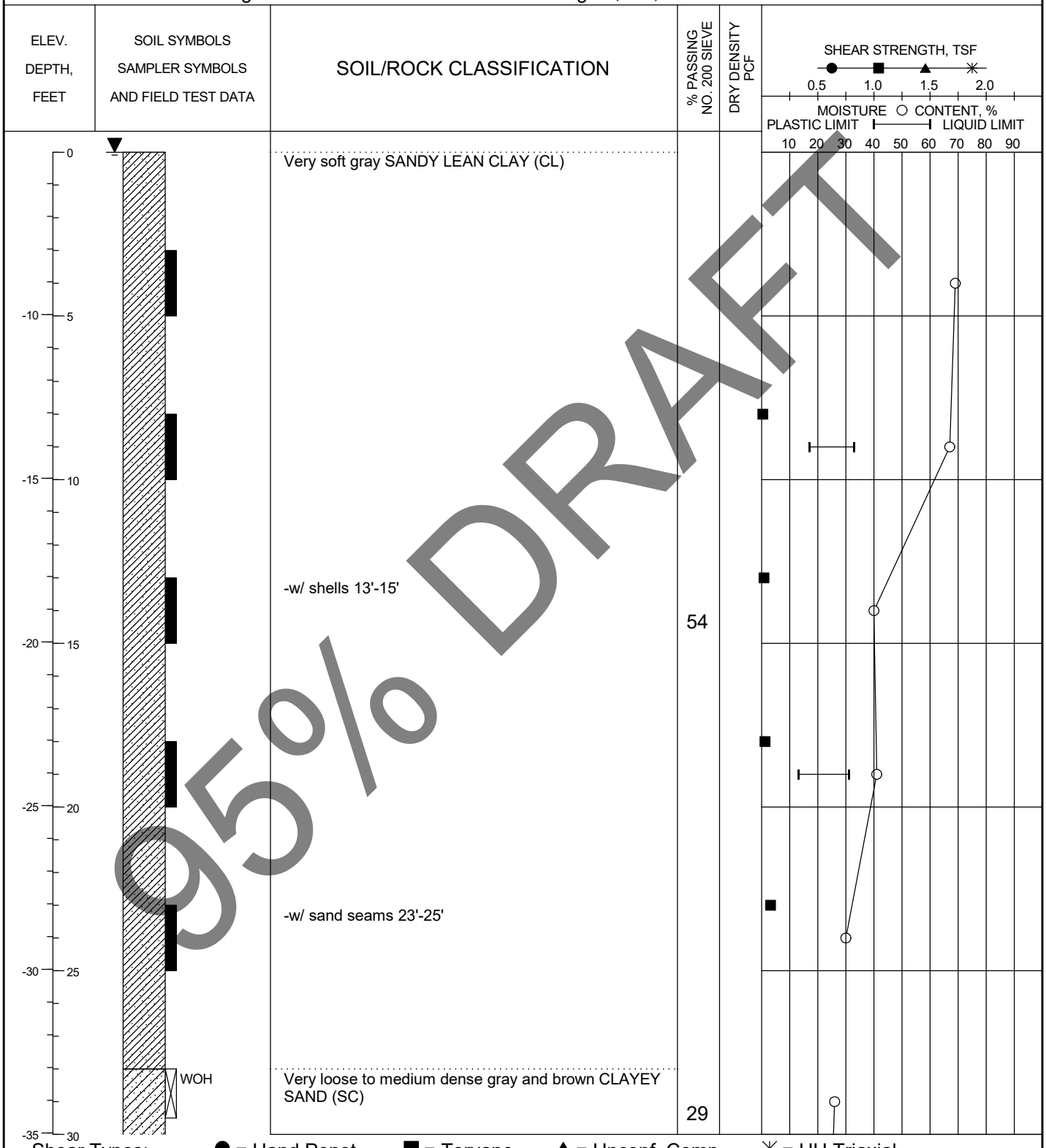
PLATE A-10

LOG OF SOIL BORING HG-09-15780.GPJ HVJ.GDT 1/5/10

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson Marsh Cells 7,8 & 9 | Project No.: HG0915780
Boring No.: ATK-B-11 (Depth of Water = 7.17 feet) | Date: 7/23/2009 | Elevation: -5.04 feet
Groundwater during drilling: 0 feet | Northing: 13,800,917.5 | Station: --
Groundwater after drilling: --- | Easting: 3,258,519.4 | Offset: --



Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-11a

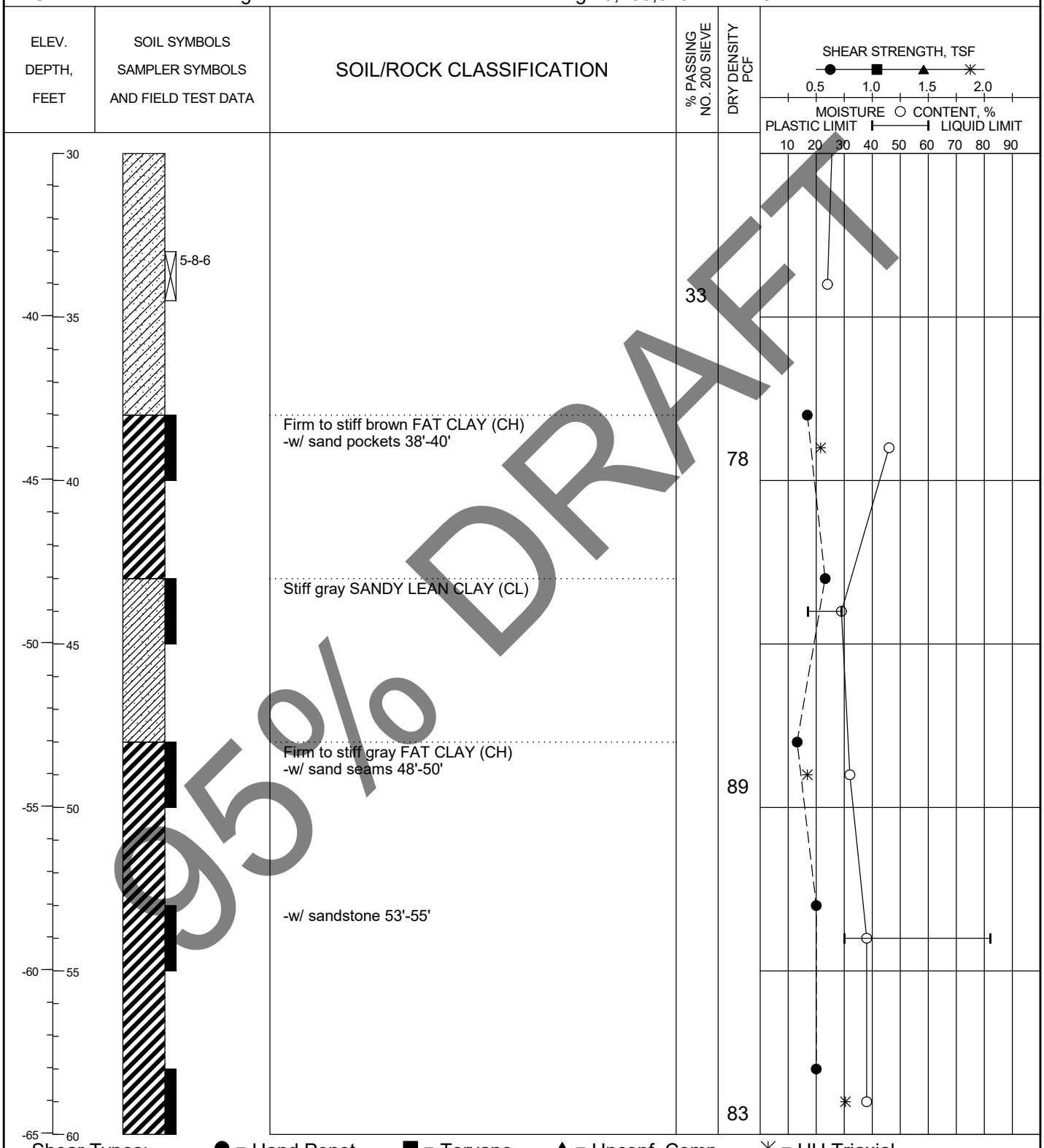
95% DRAFT

LOG OF SOIL BORING HG-09-15780.GPJ HVJ.GDT 1/5/10

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson Marsh Cells 7,8 & 9 — Project No.: HG0915780
Boring No.: ATK-B-11 (Depth of Water = 7.17 feet) — Date: 7/23/2009 — Elevation: -5.04 feet
Groundwater during drilling: 0 feet — Northing: 13,800,917.5 — Station: --
Groundwater after drilling: --- — Easting: 3,258,519.4 — Offset: --



95% DRAFT

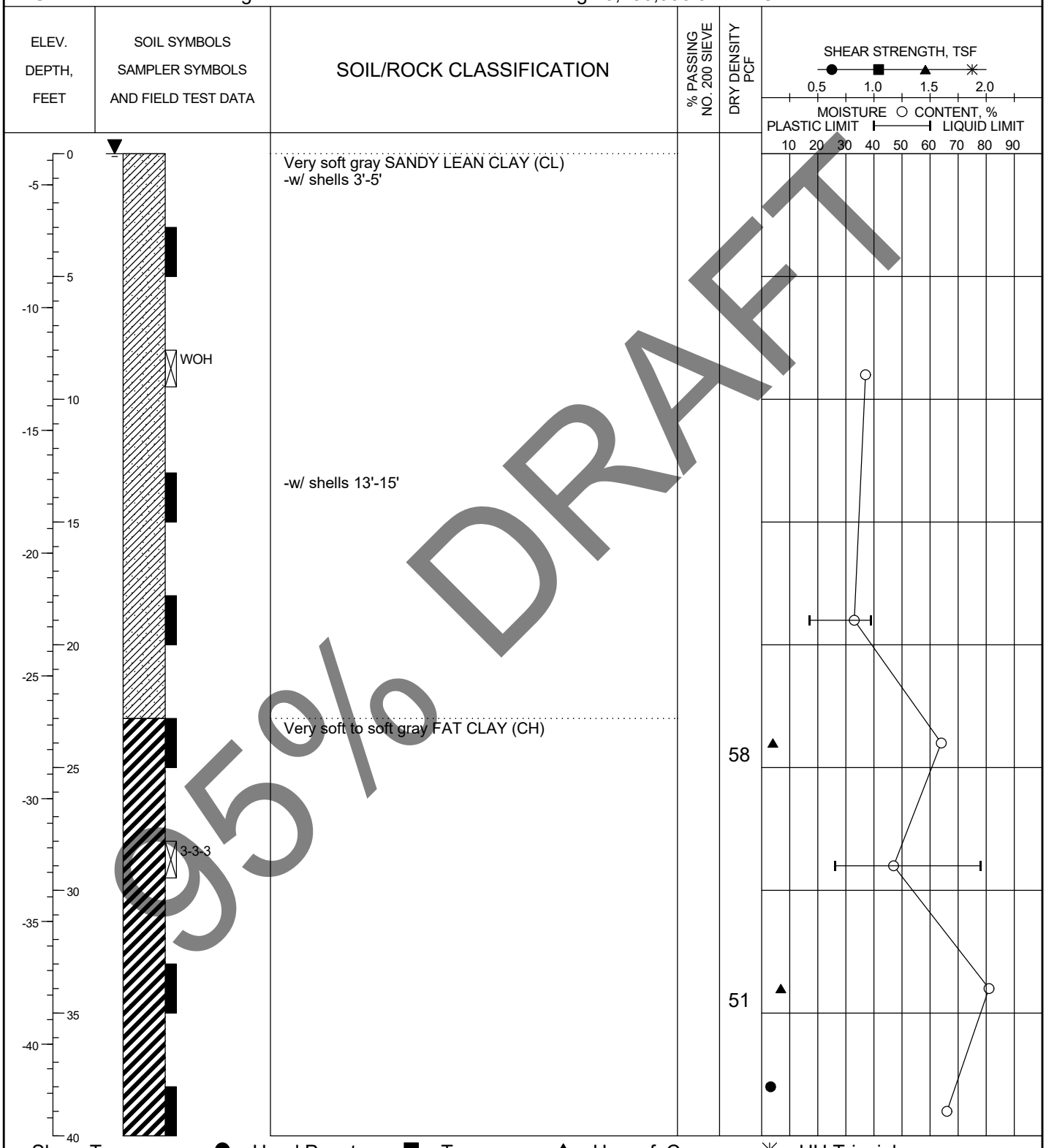
Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-11b

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson Marsh Cells 7,8 & 9 | Project No.: HG0915780
Boring No.: ATK-B-12 (Depth of Water = 9 feet) | Date: 7/20/2009 | Elevation: -3.73 feet
Groundwater during drilling: 0 feet | Northing: 13,800,703.3 | Station: --
Groundwater after drilling: --- | Easting: 3,256,996.9 | Offset: --



Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

95% DRAFT

PLATE A-12

HVJ ASSOCIATES

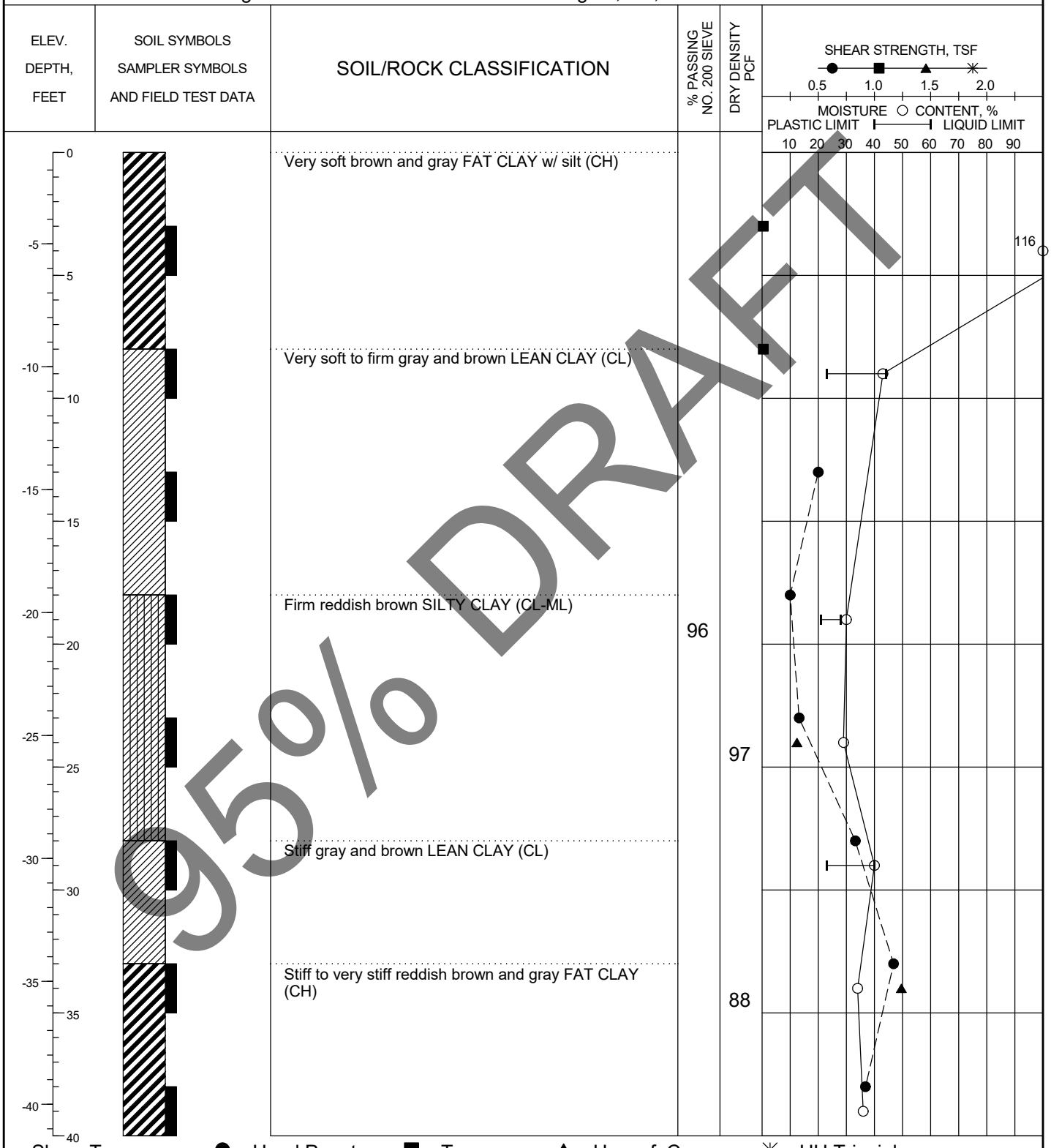
LOG OF BORING

Project: Atkinson Island Cell 10 | Project No.: HG0915781

Boring No.: BR-1 (Depth of water = 3.6 feet) | Date: 9/21/2009 | Elevation: -1.29 feet

Groundwater during drilling: --- | Northing: 13,794,955.7 | Station: --

Groundwater after drilling: --- | Easting: 3,259,202.4 | Offset: --



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-13

LOG OF SOIL BORING HG-09-15781.GPJ HVJ.GDT 11/12/09

HVJ ASSOCIATES

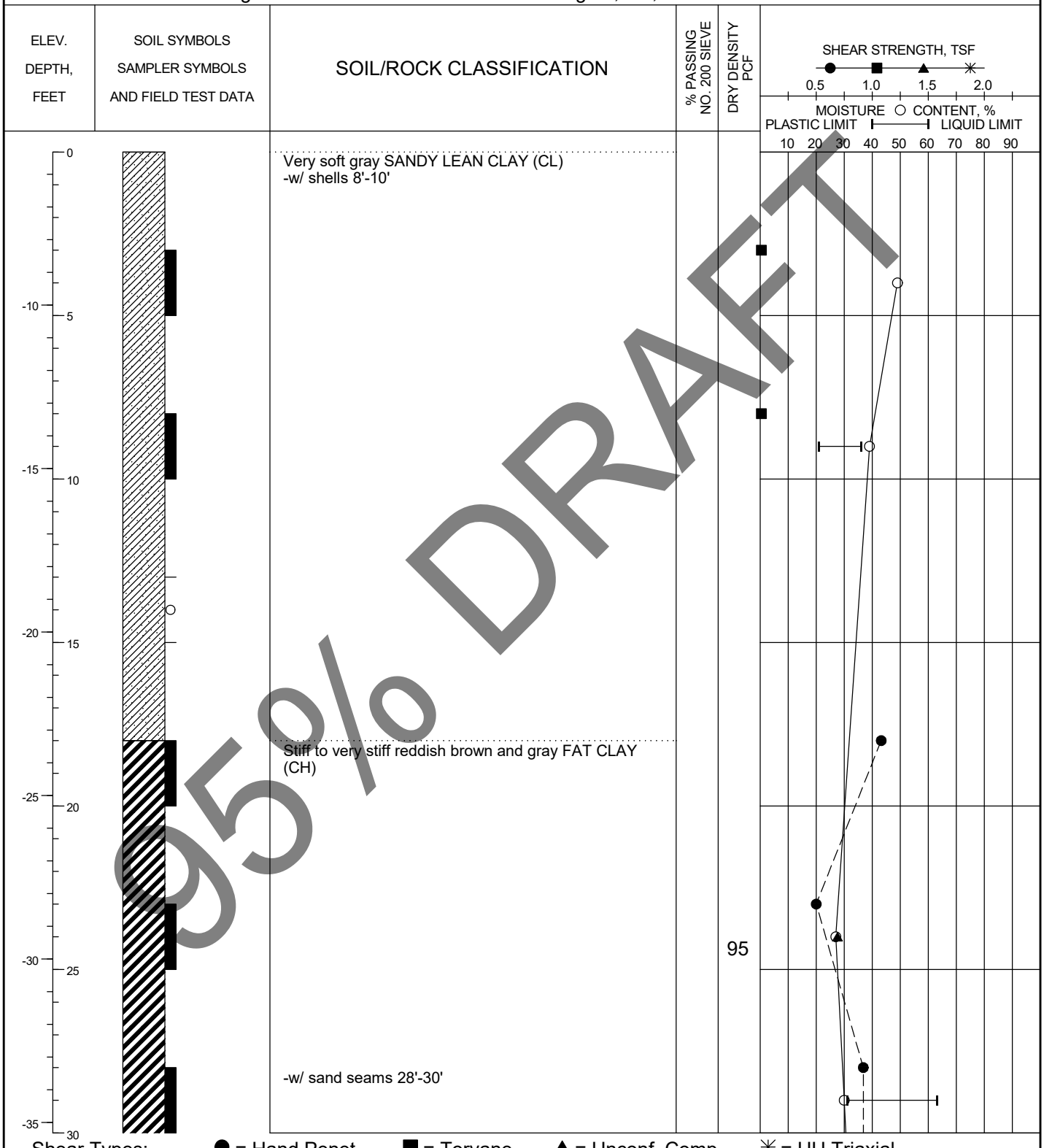
LOG OF BORING

Project: Atkinson Island Cell 10 | Project No.: HG0915781

Boring No.: BR-2 (Depth of water = 8.2 feet) | Date: 9/21/2009 | Elevation: -5.32 feet

Groundwater during drilling: --- | Northing: 13,795,289.6 | Station: --

Groundwater after drilling: --- | Easting: 3,260,102.2 | Offset: --



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-14a

LOG OF SOIL BORING HG-09-15781.GPJ HVJ.GDT 11/12/09

HVJ ASSOCIATES

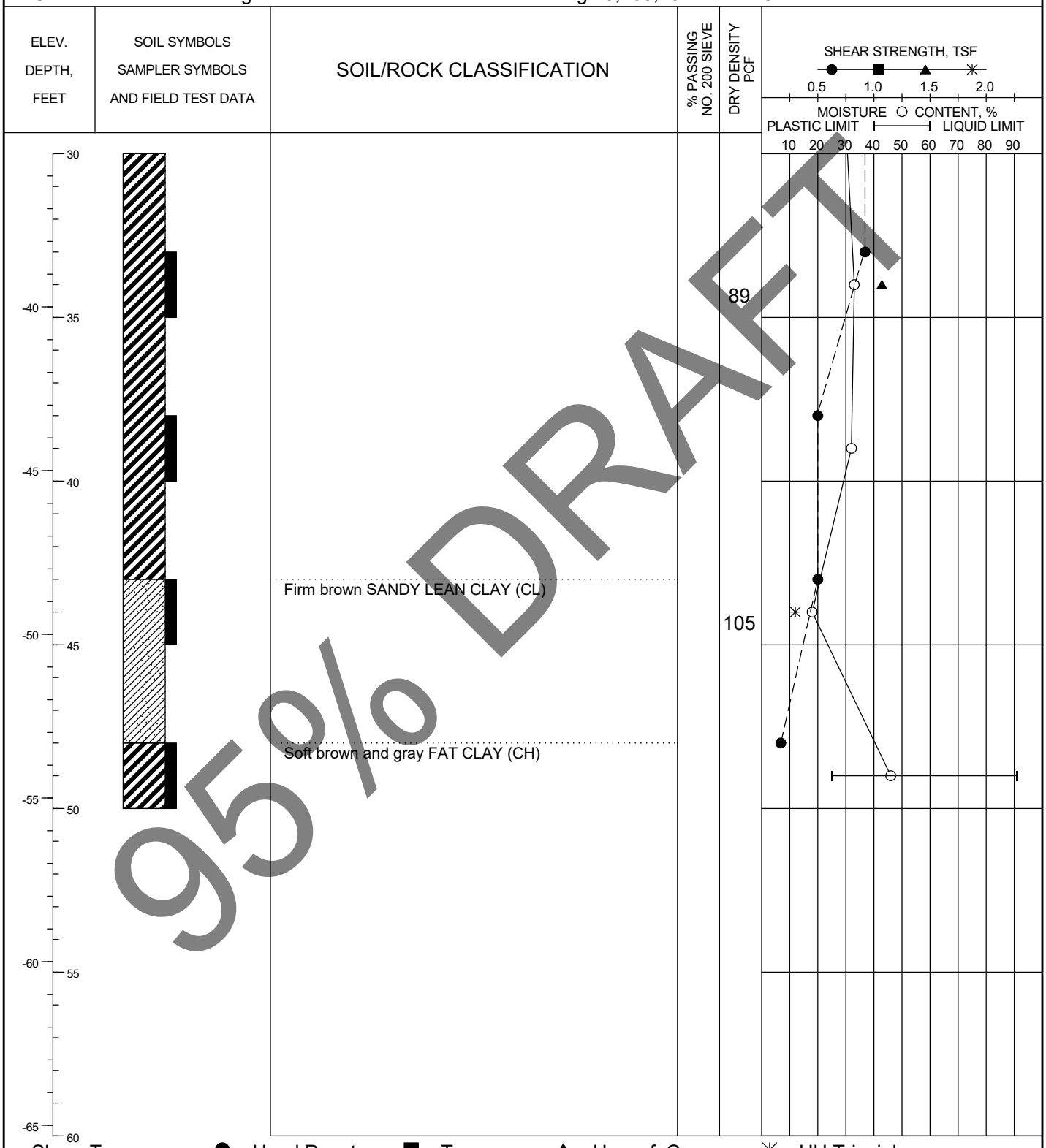
LOG OF BORING

Project: Atkinson Island Cell 10 | Project No.: HG0915781

Boring No.: BR-2 (Depth of water = 8.2 feet) | Date: 9/21/2009 | Elevation: -5.32 feet

Groundwater during drilling: --- | Northing: 13,795,289.6 | Station: --

Groundwater after drilling: --- | Easting: 3,260,102.2 | Offset: --



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-14b

HVJ ASSOCIATES

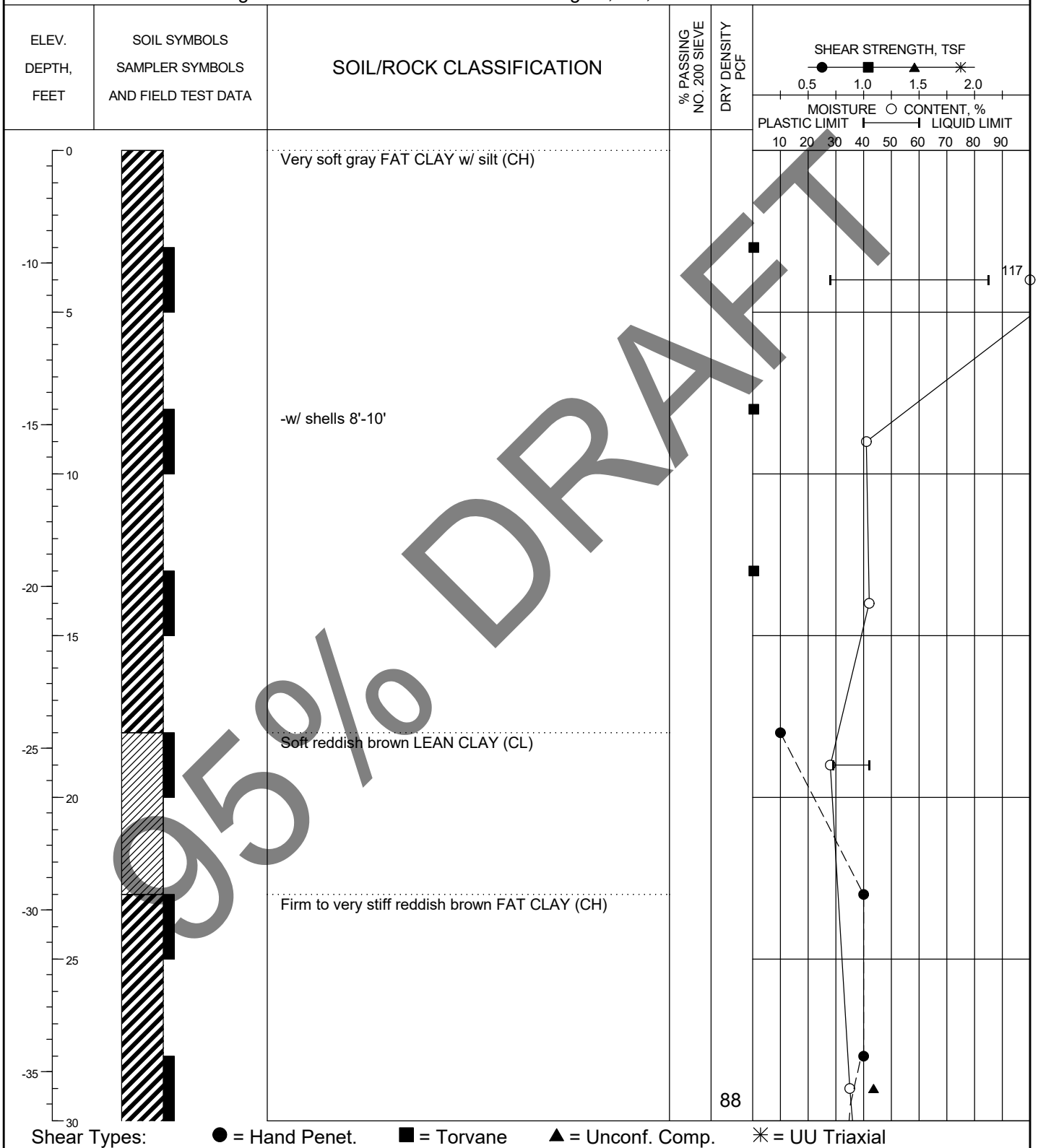
LOG OF BORING

Project: Atkinson Island Cell 10 | Project No.: HG0915781

Boring No.: BR-3 (Depth of water = 8.8 feet) | Date: 9/21/2009 | Elevation: -6.52 feet

Groundwater during drilling: --- | Northing: 13,796,291.1 | Station: --

Groundwater after drilling: --- | Easting: 3,261,397.4 | Offset: --



Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

95% DRAFT

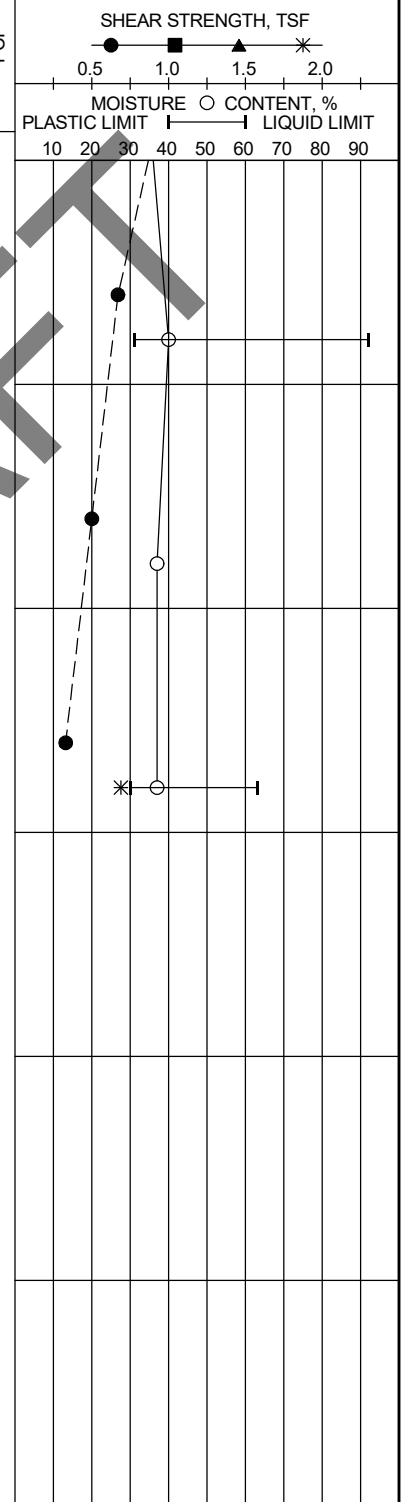
PLATE A-15a

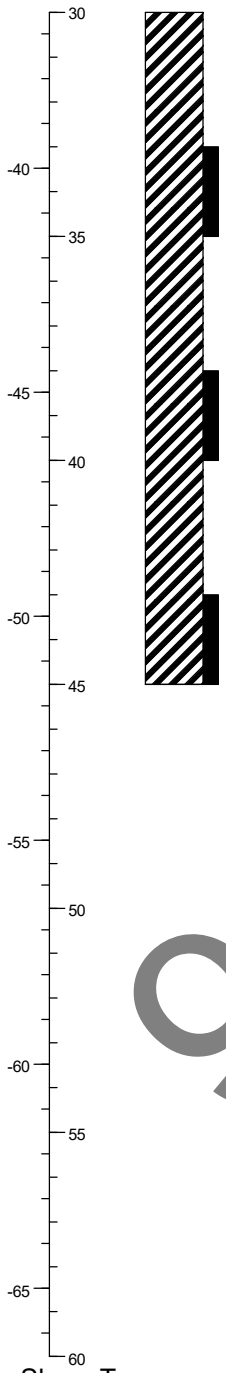
HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson Island Cell 10 | Project No.: HG0915781
Boring No.: BR-3 (Depth of water = 8.8 feet) | Date: 9/21/2009 | Elevation: -6.52 feet
Groundwater during drilling: --- | Northing: 13,796,291.1 | Station: --
Groundwater after drilling: --- | Easting: 3,261,397.4 | Offset: --

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF
				85





Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

95% DRAFT

PLATE A-15b

LOG OF SOIL BORING HG-09-15781.GPJ HVJ.GDT 11/12/09

HVJ ASSOCIATES

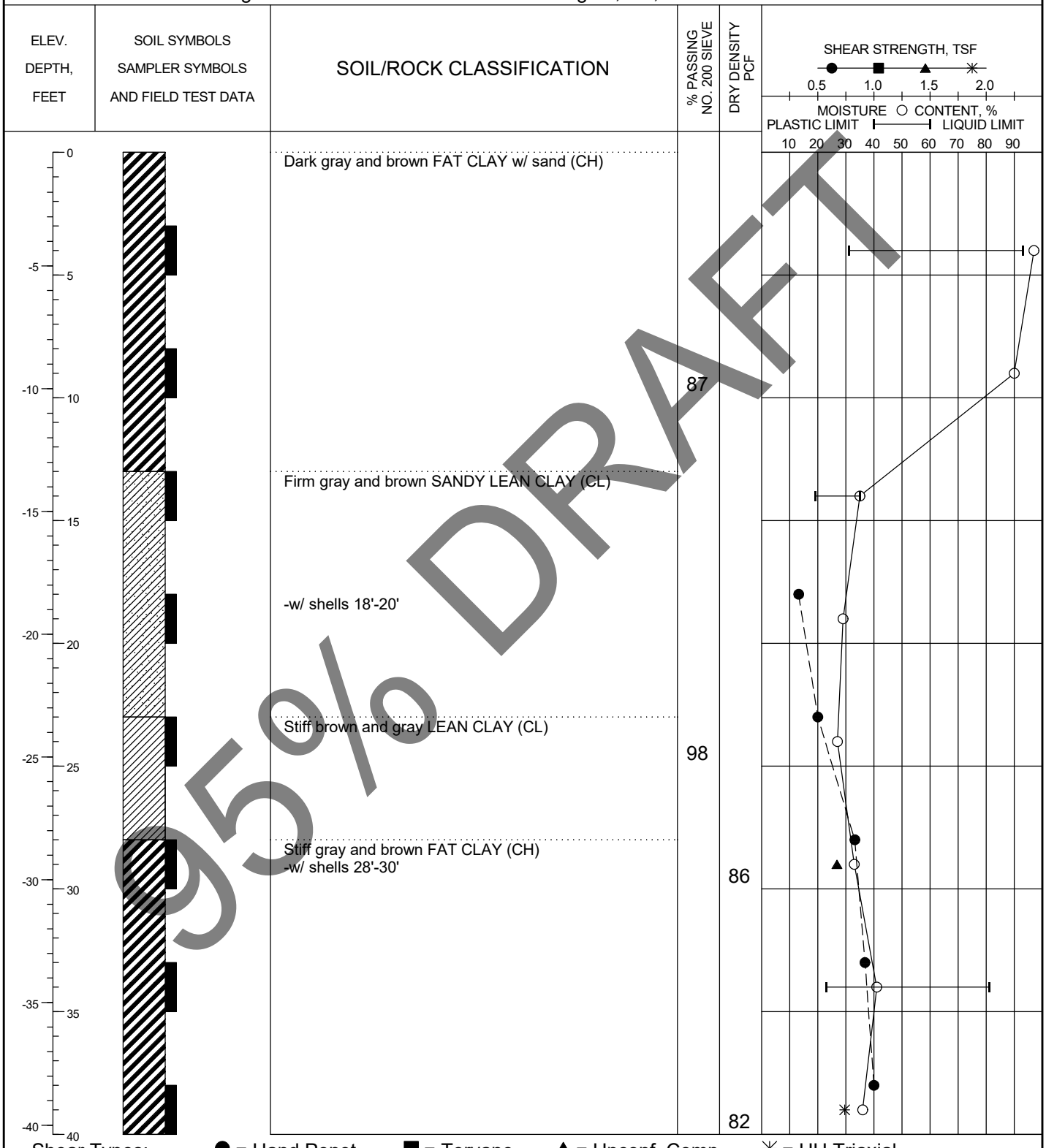
LOG OF BORING

Project: Atkinson Island Cell 10 | Project No.: HG0915781

Boring No.: BR-4 (Depth of water = 3 feet) | Date: 9/25/2009 | Elevation: -0.37 feet

Groundwater during drilling: --- | Northing: 13,795,889.7 | Station: --

Groundwater after drilling: --- | Easting: 3,258,863.6 | Offset: --



Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

95% DRAFT

PLATE A-16

HVJ ASSOCIATES

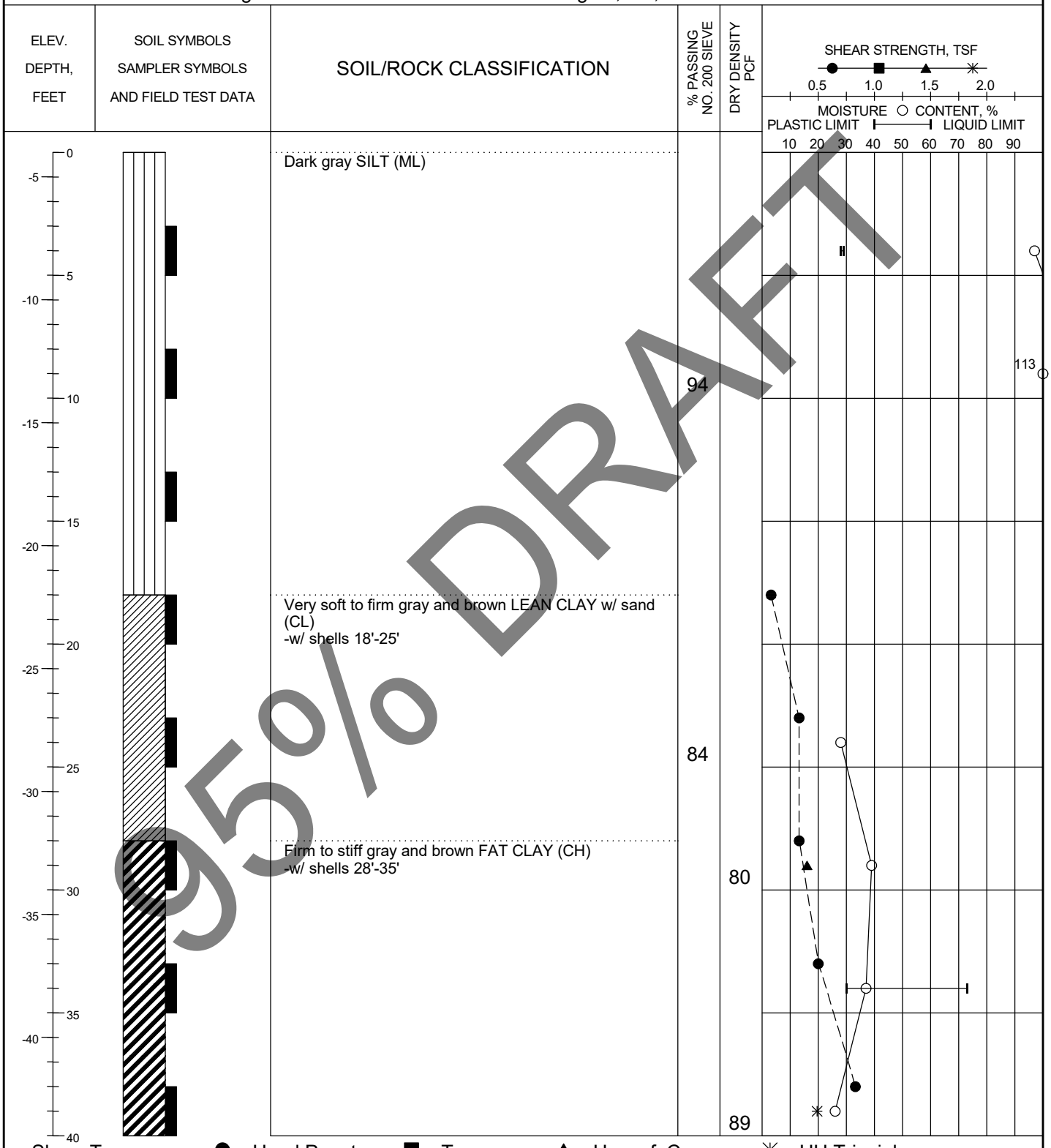
LOG OF BORING

Project: Atkinson Island Cell 10 | Project No.: HG0915781

Boring No.: BR-5 (Depth of water = 7 feet) | Date: 9/24/2009 | Elevation: -4.01 feet

Groundwater during drilling: --- | Northing: 13,798,187.9 | Station: --

Groundwater after drilling: --- | Easting: 3,257,944.9 | Offset: --



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-17

LOG OF SOIL BORING HG-09-15781.GPJ HVJ.GDT 11/12/09

HVJ ASSOCIATES

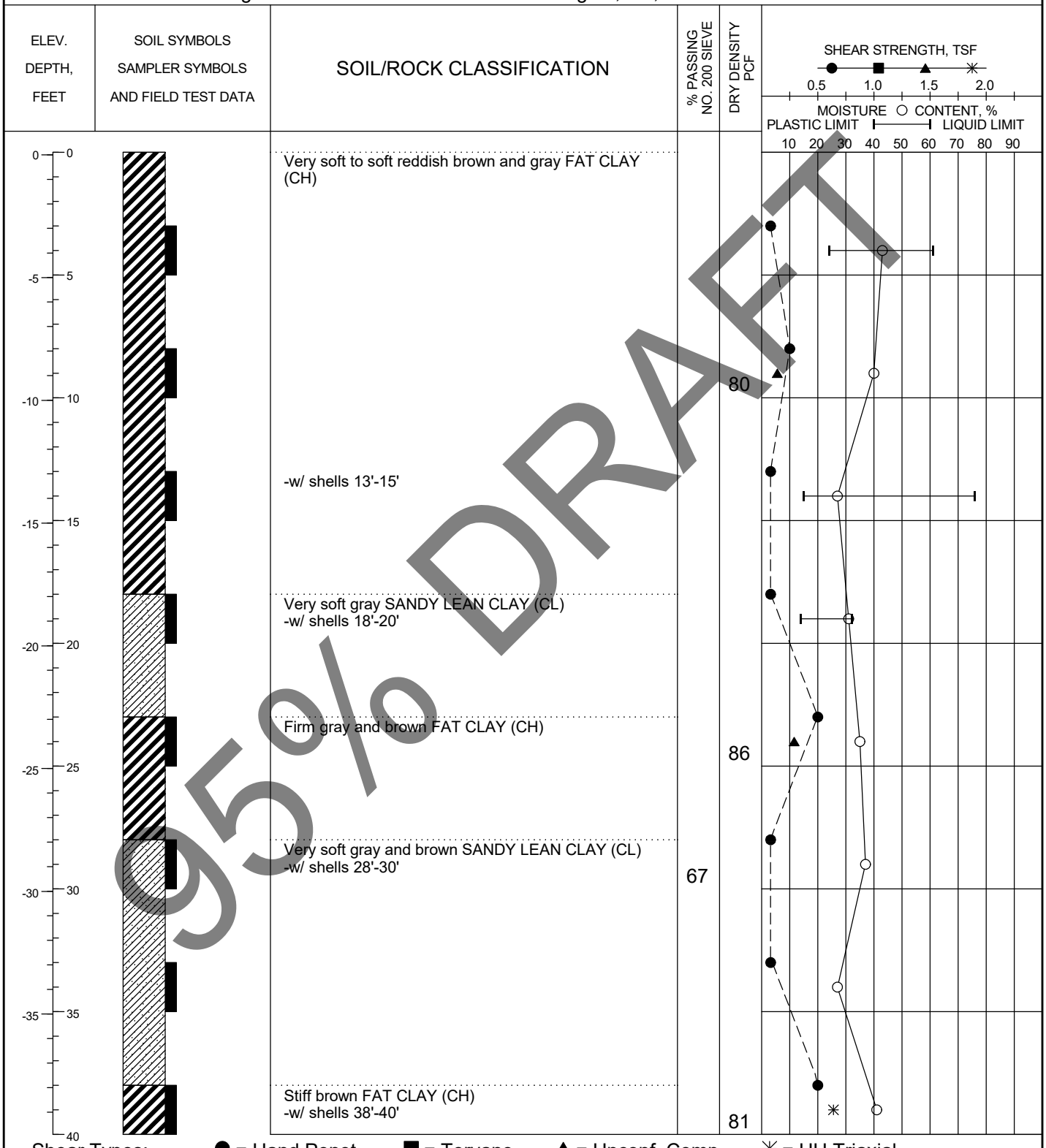
LOG OF BORING

Project: Atkinson Island Cell 10 | Project No.: HG0915781

Boring No.: BR-6 (Depth of water = 2.5 feet) | Date: 9/24/2009 | Elevation: 0.10 feet

Groundwater during drilling: --- | Northing: 13,798,667.6 | Station: --

Groundwater after drilling: --- | Easting: 3,256,372.4 | Offset: --



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-18

LOG OF SOIL BORING HG-09-15781.GPJ HVJ.GDT 11/12/09

HVJ ASSOCIATES

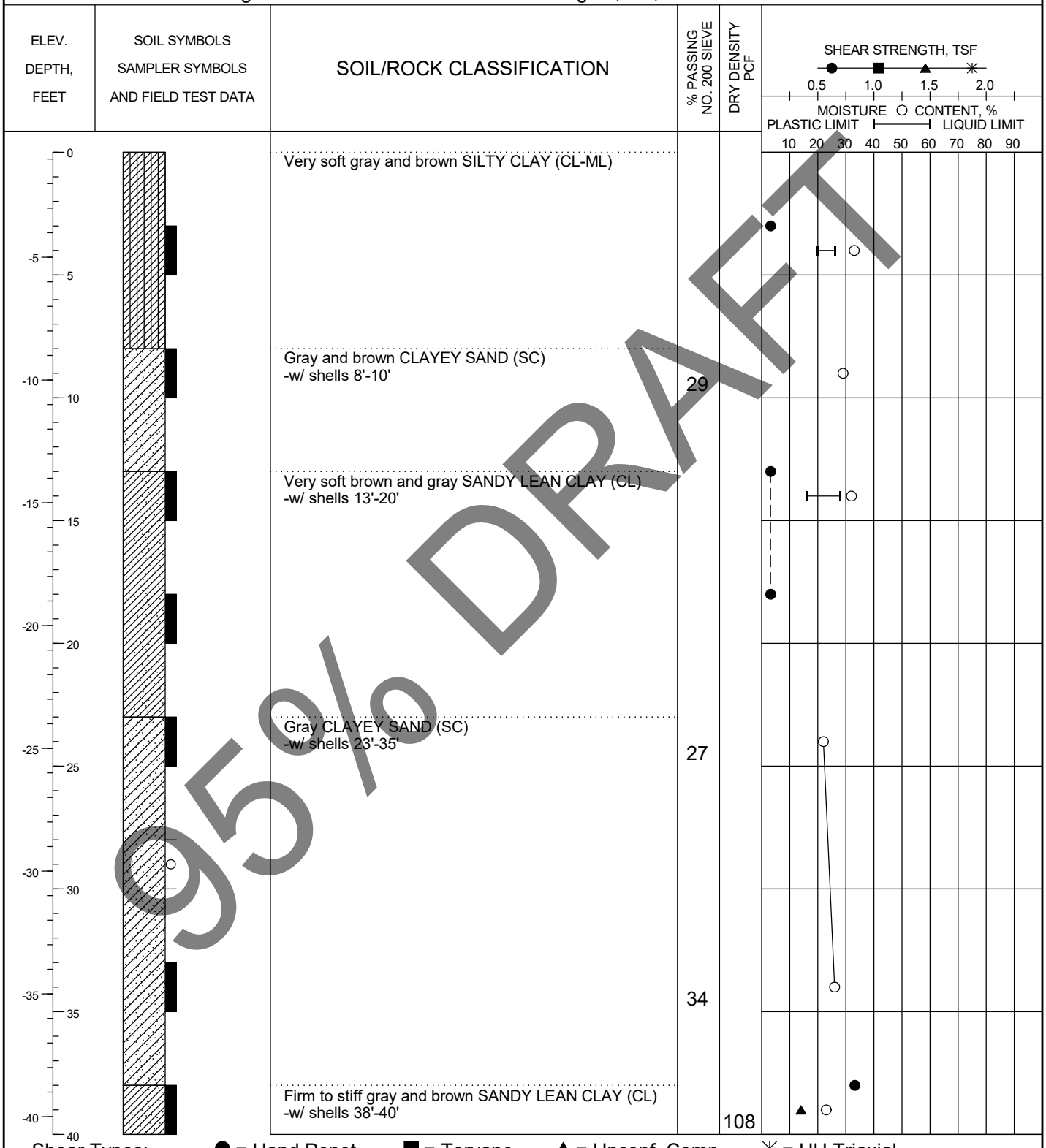
LOG OF BORING

Project: Atkinson Island Cell 10 | Project No.: HG0915781

Boring No.: BR-7 (Depth of water = 2.67 feet) | Date: 9/24/2009 | Elevation: -0.72 feet

Groundwater during drilling: --- | Northing: 13,800,528.0 | Station: --

Groundwater after drilling: --- | Easting: 3,255,906.9 | Offset: --



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-19

LOG OF SOIL BORING HG-09-15781.GPJ HVJ.GDT 11/12/09

HVJ ASSOCIATES

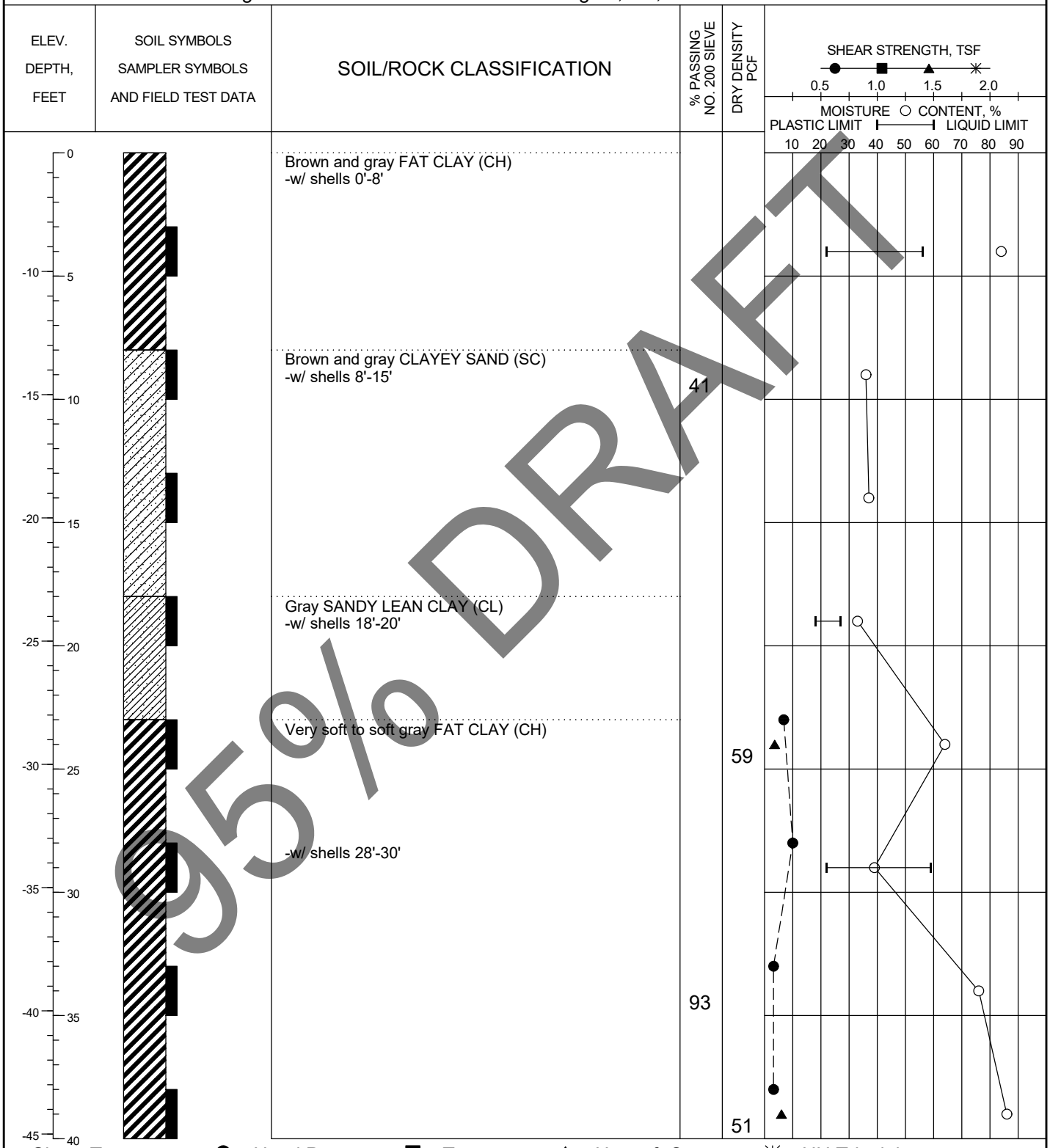
LOG OF BORING

Project: Atkinson Island Cell 10 | Project No.: HG0915781

Boring No.: BR-8 (Depth of water = 9 feet) | Date: 9/26/2009 | Elevation: -5.19 feet

Groundwater during drilling: --- | Northing: 13,798,071.9 | Station: --

Groundwater after drilling: --- | Easting: 3,259,051.8 | Offset: --



Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

95% DRAFT

PLATE A-20

HVJ ASSOCIATES

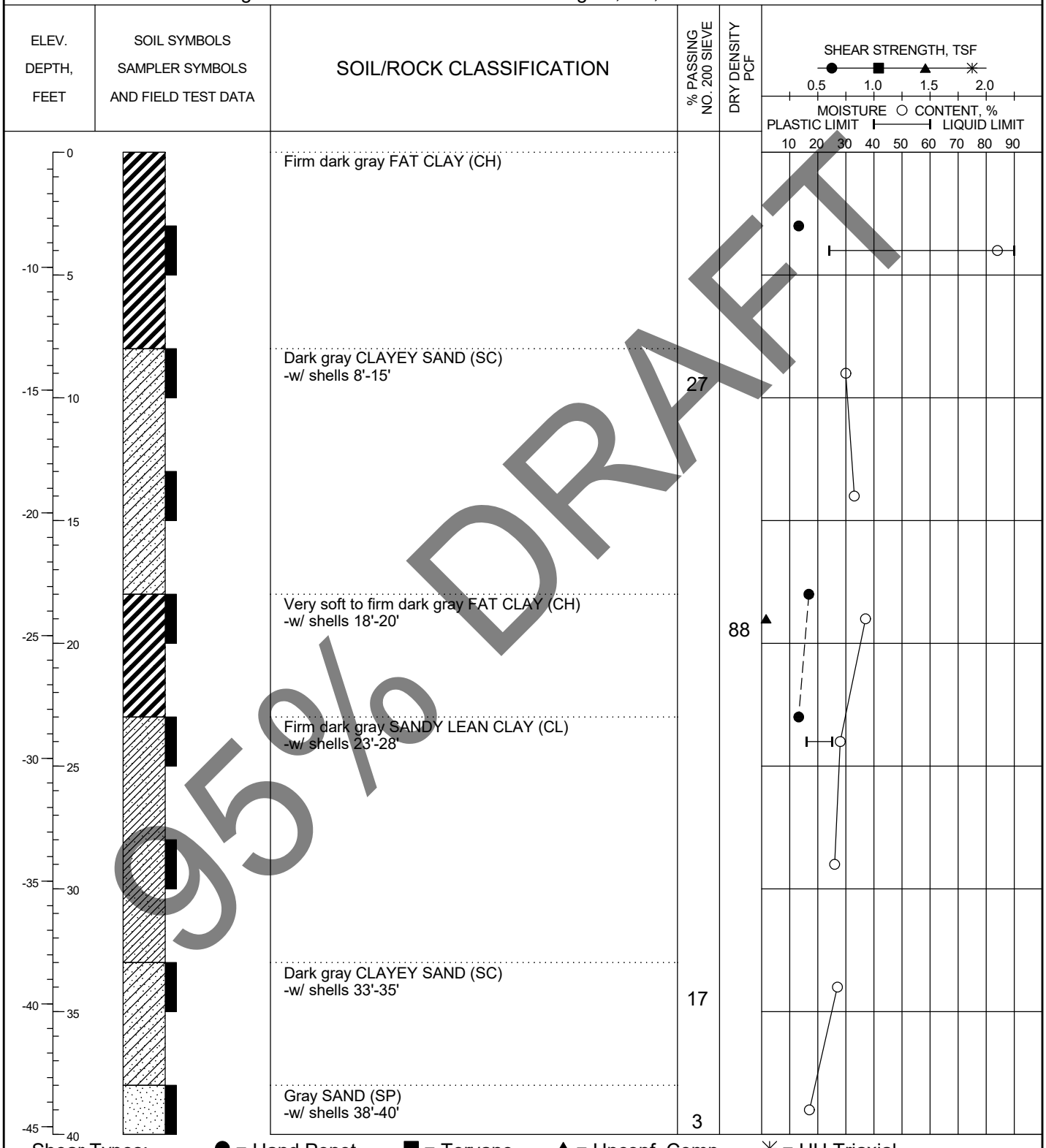
LOG OF BORING

Project: Atkinson Island Cell 10 | Project No.: HG0915781

Boring No.: BR-9 (Depth of water = 8.5 feet) | Date: 9/25/2009 | Elevation: -5.31 feet

Groundwater during drilling: --- | Northing: 13,799,535.2 | Station: --

Groundwater after drilling: --- | Easting: 3,258,750.9 | Offset: --



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

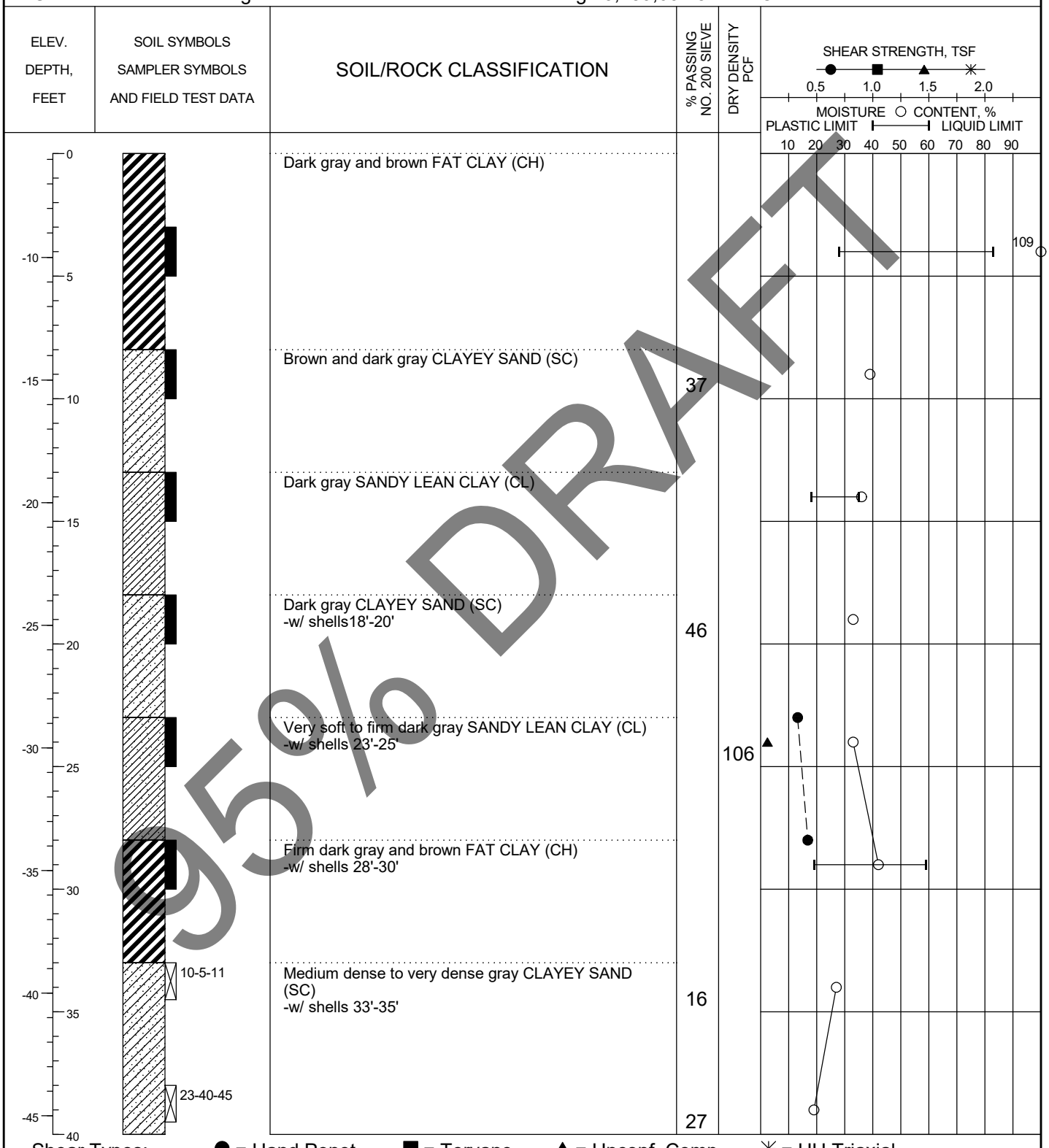
PLATE A-21

LOG OF SOIL BORING HG-09-15781.GPJ HVJ.GDT 11/12/09

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson Island Cell 10 | Project No.: HG0915781
Boring No.: BR-10 (Depth of water = 9.5 feet) | Date: 9/25/2009 | Elevation: -5.76 feet
Groundwater during drilling: --- | Northing: 13,799,364.7 | Station: --
Groundwater after drilling: --- | Easting: 3,259,637.8 | Offset: --



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-22

LOG OF SOIL BORING HG-09-15781.GPJ HVJ.GDT 11/12/09

HVJ ASSOCIATES

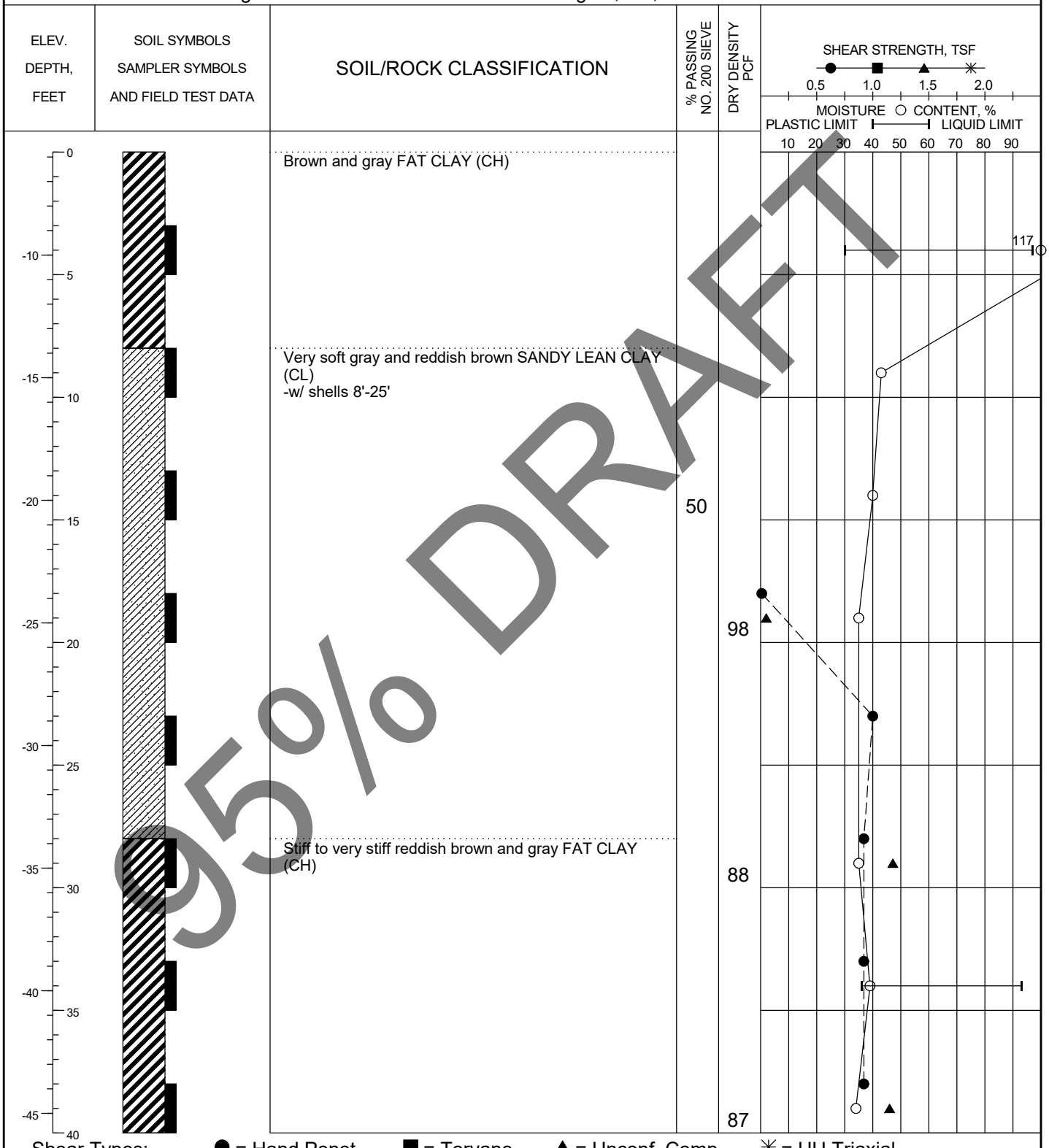
LOG OF BORING

Project: Atkinson Island Cell 10 | Project No.: HG0915781

Boring No.: BR-11 (Depth of water = 9.17 feet) | Date: 9/26/2009 | Elevation: -5.80 feet

Groundwater during drilling: --- | Northing: 13,797,055.9 | Station: --

Groundwater after drilling: --- | Easting: 3,259,983.3 | Offset: --



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

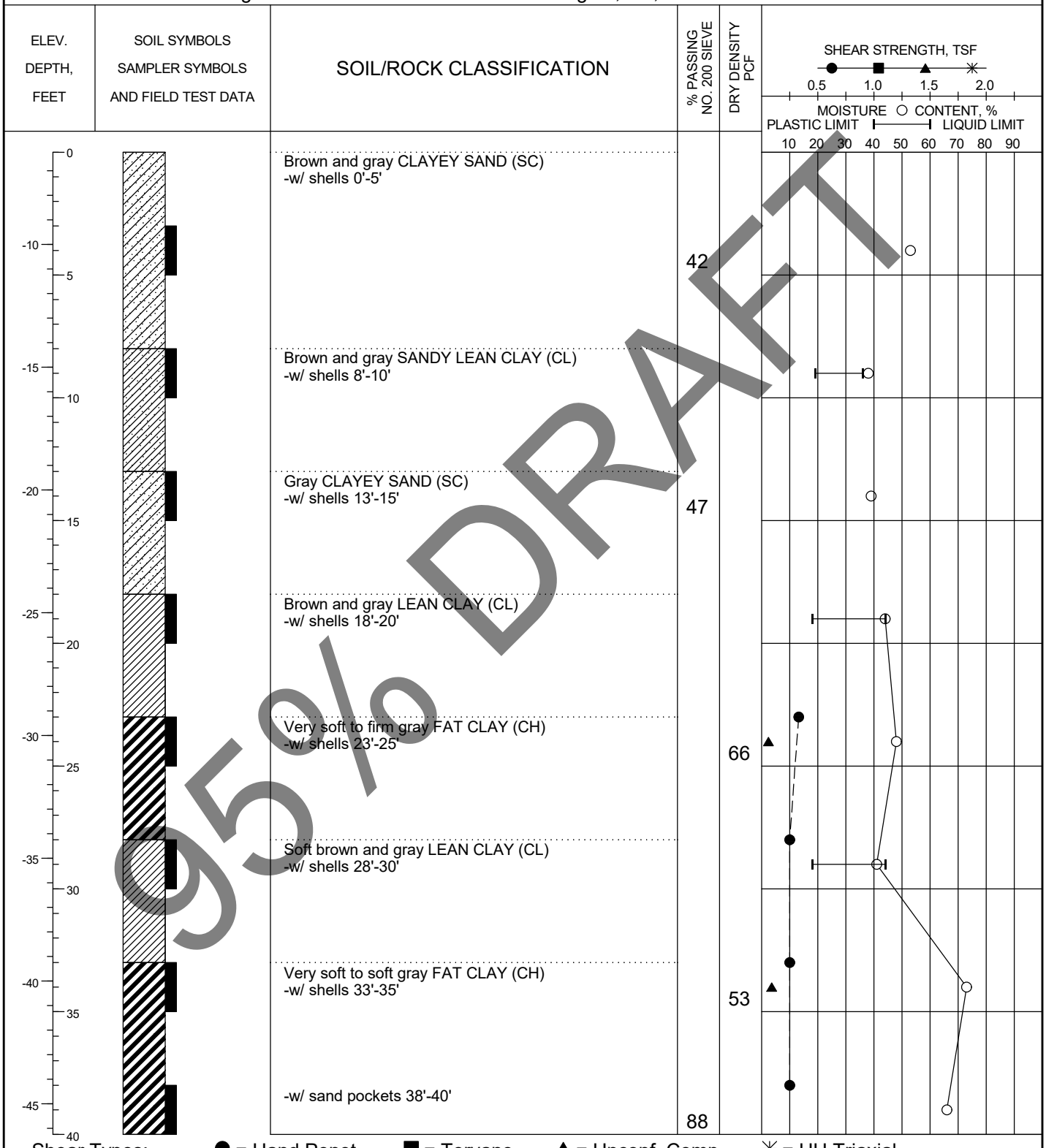
PLATE A-23

LOG OF SOIL BORING HG-09-15781.GPJ HVJ.GDT 11/12/09

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson Island Cell 10 | Project No.: HG0915781
Boring No.: BR-12 (Depth of water = 9.5 feet) | Date: 9/25/2009 | Elevation: -6.25 feet
Groundwater during drilling: --- | Northing: 13,797,662.5 | Station: --
Groundwater after drilling: --- | Easting: 3,260,842.8 | Offset: --



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-24

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson M789 & 10
Project No.: HG0915782
Boring No.: CC-1
Date: 12/10/2009
Elevation: 2.3 feet
Groundwater during drilling: ---
Northing: 13,800,310.2
Station: --
Groundwater after drilling: ---
Easting: 3,255,166.2
Offset: --

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF
0		Brownish gray CLAYEY SAND (SC)	21	
-5		-w/ shells 3'-6'	44	
-10			41	

SHEAR STRENGTH, TSF
0.5 1.0 1.5 2.0
MOISTURE ○ CONTENT, %
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 50 60 70 80 90

0 5 10 15 20 25 30 35

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-1

LOG OF SOIL BORING HG-09-15782-2.GPJ HVJ.GDT 1/5/10

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson M789 & 10
Project No.: HG0915782
Boring No.: CC-2
Date: 12/3/2009
Elevation: 3.2 feet
Groundwater during drilling: ---
Northing: 13,799,992.0
Station: --
Groundwater after drilling: ---
Easting: 3,254,735.8
Offset: --

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF
0		Dark grayish brown CLAYEY SAND (SC) -w/ gravel 0'-3'	19	
-5		-w/ shells 6'-9'	47	

SHEAR STRENGTH, TSF
0.5 1.0 1.5 2.0
MOISTURE ○ CONTENT, %
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 50 60 70 80 90

0 5 -5 10 -10 15 -15 20 -20 25 -25 30 -30 35

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-2

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson M789 & 10
Project No.: HG0915782
Boring No.: CC-3
Date: 12/10/2009
Elevation: 2.12 feet
Groundwater during drilling: ---
Northing: 13,799,805.4
Station: --
Groundwater after drilling: ---
Easting: 3,255,183.7
Offset: --

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF
0		Brownish dark gray CLAYEY SAND (SC) -w/ shells 0'-3'	37	
-5		Grayish brown SANDY LEAN CLAY (CL) -w/ shells 3'-6'	53	
-10			50	

SHEAR STRENGTH, TSF
0.5 1.0 1.5 2.0
MOISTURE ○ CONTENT, %
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 50 60 70 80 90

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-3

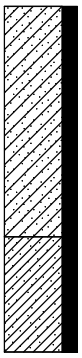
HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson M789 & 10
Project No.: HG0915782
Boring No.: CC-4
Date: 12/3/2009
Elevation: 1.93 feet
Groundwater during drilling: ---
Northing: 13,799,588.3
Station: --
Groundwater after drilling: ---
Easting: 3,254,749.8
Offset: --

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF
0		Brownish dark gray CLAYEY SAND (SC) -w/ shells 0'-6'	21	
-5		Brownish dark gray SANDY LEAN CLAY (CL)	46	
			59	

SHEAR STRENGTH, TSF
● 0.5 ■ 1.0 ▲ 1.5 ✳ 2.0
MOISTURE ○ CONTENT, %
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 50 60 70 80 90



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-4

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson M789 & 10
Project No.: HG0915782
Boring No.: CC-5
Date: 12/9/2009
Elevation: 4.09 feet
Groundwater during drilling: ---
Northing: 13,798,887.7
Station: --
Groundwater after drilling: ---
Easting: 3,254,950.6
Offset: --

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF
0 / 5		Grayish brown CLAYEY SAND (SC) -w/ shells 0'-6'	27 46	

SHEAR STRENGTH, TSF
0.5 1.0 1.5 2.0
MOISTURE ○ CONTENT, %
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 50 60 70 80 90

0 5 10 15 20 25 30 35
0 -5 -10 -15 -20 -25 -30

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-5

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson M789 & 10
Project No.: HG0915782
Boring No.: CC-6
Date: 12/10/2009
Elevation: 2.44 feet
Groundwater during drilling: ---
Northing: 13,798,805.1
Station: --
Groundwater after drilling: ---
Easting: 3,255,483.3
Offset: --

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF
0		Dark grayish brown SANDY LEAN CLAY (CL) -w/ shells 0'-6'	60	
-5			59	
-10			68	

SHEAR STRENGTH, TSF
0.5 1.0 1.5 2.0
MOISTURE ○ CONTENT, %
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 50 60 70 80 90

0 5 -5 10 -10 15 -15 20 -20 25 -25 30 -30 35

95% DRAFT

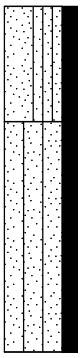
Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-6

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson M789 & 10
Project No.: HG0915782
Boring No.: CC-7
Date: 12/3/2009
Elevation: 5.75 feet
Groundwater during drilling: ---
Northing: 13,798,679.7
Station: --
Groundwater after drilling: ---
Easting: 3,254,781.2
Offset: --

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF
0		Dark grayish brown SAND W/ SILT (SP-SM)	7	
5		Darky grayish brown SILTY SAND (SM) -w/ shells 3'-9'	21	
0			25	
-5				
-10				
-15				
-20				
-25				

SHEAR STRENGTH, TSF
● 0.5 ■ 1.0 ▲ 1.5 ✳ 2.0

MOISTURE ○ CONTENT, %
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 50 60 70 80 90

95% DRAFT

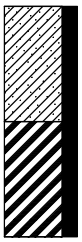
Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-7

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson M789 & 10
Project No.: HG0915782
Boring No.: SF-4
Date: 11/18/2009
Elevation: 3.66 feet
Groundwater during drilling: ---
Northing: 13,802,521.8
Station: --
Groundwater after drilling: ---
Easting: 3,254,824.7
Offset: --

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF
0		Light brown SANDY LEAN CLAY (CL)	63	
0		Reddish brown FAT CLAY W/ SAND (CH)	74	

SHEAR STRENGTH, TSF
0.5 1.0 1.5 2.0
MOISTURE ○ CONTENT, %
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 50 60 70 80 90

0 5 -5 10 -10 15 -15 20 -20 25 -25 30 -30 35

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-8

LOG OF SOIL BORING HG-09-15782-2.GPJ HVJ.GDT 1/5/10

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson M789 & 10 | Project No.: HG0915782
Boring No.: SF-5 | Date: 11/18/2009 | Elevation: 5.22 feet
Groundwater during drilling: --- | Northing: 13,803,023.5 | Station: --
Groundwater after drilling: --- | Easting: 3,254,719.0 | Offset: --

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF
5 — 0		Light brown SAND W/ SILT (SP-SM)	6	
0 — 5		Light brown FAT CLAY W/ SAND (CH)	76	
-5 — 10				
-10 — 15				
-15 — 20				
-20 — 25				
-25 — 30				

SHEAR STRENGTH, TSF
● 0.5 ■ 1.0 ▲ 1.5 ✳ 2.0
MOISTURE ○ CONTENT, %
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 50 60 70 80 90

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

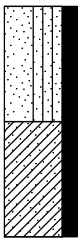
PLATE A-9

HVJ ASSOCIATES

LOG OF SOIL BORING HG-09-15782-2.GPJ HVJ.GDT 1/5/10

LOG OF BORING

Project: Atkinson M789 & 10
Project No.: HG0915782
Boring No.: SF-6
Date: 11/18/2009
Elevation: 4.67 feet
Groundwater during drilling: ---
Northing: 13,803,522.1
Station: --
Groundwater after drilling: ---
Easting: 3,254,525.2
Offset: --

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF	SHEAR STRENGTH, TSF (0.5 1.0 1.5 2.0) / MOISTURE ○ CONTENT, % PLASTIC LIMIT — LIQUID LIMIT (10 20 30 40 50 60 70 80 90)
0 / 0		Light brown SAND W/ SILT (SP-SM)	8		○
0 / 5		Brownish gray SANDY LEAN CLAY (CL)	54		○ — ○
-5 / 10					
-10 / 15					
-15 / 20					
-20 / 25					
-25 / 30					
-30 / 35					

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-10

LOG OF SOIL BORING HG-09-15782-2.GPJ HVJ.GDT 1/5/10

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson M789 & 10
Project No.: HG0915782
Boring No.: SF-7
Date: 11/18/2009
Elevation: 4.36 feet
Groundwater during drilling: ---
Northing: 13,804,023.8
Station: --
Groundwater after drilling: ---
Easting: 3,254,419.5
Offset: --

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF	SHEAR STRENGTH, TSF / MOISTURE CONTENT, %
0 / 0		Brownish gray CLAYEY SAND (SC)	16		
-5 / 5			43		
-10 / 10					
-15 / 15					
-20 / 20					
-25 / 25					
-30 / 30					
35					

SHEAR STRENGTH, TSF
0.5 1.0 1.5 2.0
MOISTURE ○ CONTENT, %
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 50 60 70 80 90

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-11

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson M789 & 10
Project No.: HG0915782
Boring No.: SF-8
Date: 12/10/2009
Elevation: 5.8 feet
Groundwater during drilling: ---
Northing: 13,801,120.8
Station: --
Groundwater after drilling: ---
Easting: 3,255,226.4
Offset: --

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF
0		Brown SANDY LEAN CLAY (CL) -w/ shells 0'-3'	58	
5		Dark brown CLAYEY SAND (SC) -w/ shells 3'-6'	36	
0		Dark brown SANDY LEAN CLAY (CL)	61	
-5				
-10				
-15				
-20				
-25				

SHEAR STRENGTH, TSF
● 0.5 ■ 1.0 ▲ 1.5 ✳ 2.0
MOISTURE ○ CONTENT, %
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 50 60 70 80 90

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-12

HVJ ASSOCIATES

LOG OF SOIL BORING HG-09-15782-2.GPJ HVJ.GDT 1/5/10

LOG OF BORING

Project: Atkinson M789 & 10
Project No.: HG0915782
Boring No.: SF-8B
Date: 11/18/2009
Elevation: 3.67 feet
Groundwater during drilling: ---
Northing: 13,804,522.4
Station: --
Groundwater after drilling: ---
Easting: 3,254,225.7
Offset: --

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF	SHEAR STRENGTH, TSF / MOISTURE CONTENT, %
0		Brownish gray CLAYEY SAND (SC)	27		
-5		Reddish brown FAT CLAY W/ SAND (CH)	83		

SHEAR STRENGTH, TSF: 0.5, 1.0, 1.5, 2.0
MOISTURE CONTENT, %: PLASTIC LIMIT — LIQUID LIMIT; 10 20 30 40 50 60 70 80 90

95% DRAFT

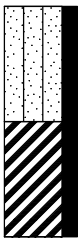
Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-13

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson M789 & 10
Project No.: HG0915782
Boring No.: SF-9
Date: 11/18/2009
Elevation: 3.13 feet
Groundwater during drilling: ---
Northing: 13,805,024.1
Station: --
Groundwater after drilling: ---
Easting: 3,254,120.0
Offset: --

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF	SHEAR STRENGTH, TSF / MOISTURE CONTENT, %
0		Grayish brown SILTY SAND (SM)	44		
0		Reddish brown FAT CLAY W/ SAND (CH)	80		
-5					
-10					
-15					
-20					
-25					
-30					

SHEAR STRENGTH, TSF
0.5 1.0 1.5 2.0
MOISTURE ○ CONTENT, %
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 50 60 70 80 90

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-14

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson M789 & 10 | Project No.: HG0915782

Boring No.: SF-9A | Date: 12/10/2009 | Elevation: 3.98 feet

Groundwater during drilling: --- | Northing: 13,801,723.4 | Station: --

Groundwater after drilling: --- | Easting: 3,255,117.2 | Offset: --

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF
0		Dark brown SANDY LEAN CLAY (CL)	61	
-5		Light grayish brown FAT CLAY W/ SAND (CH)	53	
			86	

SHEAR STRENGTH, TSF

● 0.5 ■ 1.0 ▲ 1.5 ✳ 2.0

MOISTURE ○ CONTENT, %

PLASTIC LIMIT — LIQUID LIMIT

10 20 30 40 50 60 70 80 90

0 5 -5 10 -10 15 -15 20 -20 25 -25 30 -30 35

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-15

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson M789 & 10
Project No.: HG0915782
Boring No.: SF-10
Date: 11/18/2009
Elevation: 1.47 feet
Groundwater during drilling: ---
Northing: 13,805,140.3
Station: --
Groundwater after drilling: ---
Easting: 3,254,557.4
Offset: --

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF	SHEAR STRENGTH, TSF / MOISTURE CONTENT, %
0		Brownish gray CLAYEY SAND (SC)	32		
-5			36		

SHEAR STRENGTH, TSF: 0.5 1.0 1.5 2.0
MOISTURE CONTENT, %: PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 50 60 70 80 90

0 5 -5 10 -10 15 -15 20 -20 25 -25 30 -30 35

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-16

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson M789 & 10
Project No.: HG0915782
Boring No.: SF-11
Date: 11/18/2009
Elevation: 2.02 feet
Groundwater during drilling: ---
Northing: 13,804,641.7
Station: --
Groundwater after drilling: ---
Easting: 3,254,751.3
Offset: --

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF
0		Dark gray CLAYEY SAND (SC)	22	
-5			44	

SHEAR STRENGTH, TSF
0.5 1.0 1.5 2.0
MOISTURE ○ CONTENT, %
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 50 60 70 80 90

0 5 -5 10 -10 15 -15 20 -20 25 -25 30 -30 35

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-17

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson M789 & 10
Project No.: HG0915782
Boring No.: SF-12
Date: 11/18/2009
Elevation: 2.68 feet
Groundwater during drilling: ---
Northing: 13,804,240.9
Station: --
Groundwater after drilling: ---
Easting: 3,254,853.4
Offset: --

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF
0		Gray CLAYEY SAND (SC)	14	
-5		Dark gray LEAN CLAY W/ SAND (CL)	71	

SHEAR STRENGTH, TSF
0.5 1.0 1.5 2.0
MOISTURE ○ CONTENT, %
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 50 60 70 80 90

0 5 -5 10 -10 15 -15 20 -20 25 -25 30 -30 35

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-18

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson M789 & 10
Project No.: HG0915782
Boring No.: SF-13
Date: 11/18/2009
Elevation: 3.11 feet
Groundwater during drilling: ---
Northing: 13,803,136.6
Station: --
Groundwater after drilling: ---
Easting: 3,255,068.3
Offset: --

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF
0		Light brown CLAYEY SAND (SC)	15	
-5		Dark gray SAND W/ SILT (SP-SM)	6	

SHEAR STRENGTH, TSF
0.5 1.0 1.5 2.0
MOISTURE ○ CONTENT, %
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 50 60 70 80 90

0 5 -5 10 -10 15 -15 20 -20 25 -25 30 -30 35

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

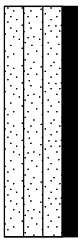
PLATE A-19

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson M789 & 10
Project No.: HG0915782
Boring No.: SF-19
Date: 11/18/2009
Elevation: 1.38 feet
Groundwater during drilling: ---
Northing: 13,803,751.5
Station: --
Groundwater after drilling: ---
Easting: 3,255,311.8
Offset: --

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF	SHEAR STRENGTH, TSF (0.5 1.0 1.5 2.0) / MOISTURE ○ CONTENT, % PLASTIC LIMIT — LIQUID LIMIT (10 20 30 40 50 60 70 80 90)
0		Grayish brown SILTY SAND (SM)	25		
-5			43		



95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-20

LOG OF SOIL BORING HG-09-15782-2.GPJ HVJ.GDT 1/5/10

HVJ ASSOCIATES

LOG OF BORING

Project: Atkinson M789 & 10
Project No.: HG0915782
Boring No.: SF-20
Date: 11/18/2009
Elevation: 1.17 feet
Groundwater during drilling: ---
Northing: 13,804,253.2
Station: --
Groundwater after drilling: ---
Easting: 3,255,206.2
Offset: --

ELEV. DEPTH, FEET	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	SOIL/ROCK CLASSIFICATION	% PASSING NO. 200 SIEVE	DRY DENSITY PCF
0		Gray SILTY SAND (SM)	22	
-5		Dark gray SANDY LEAN CLAY (CL)	59	

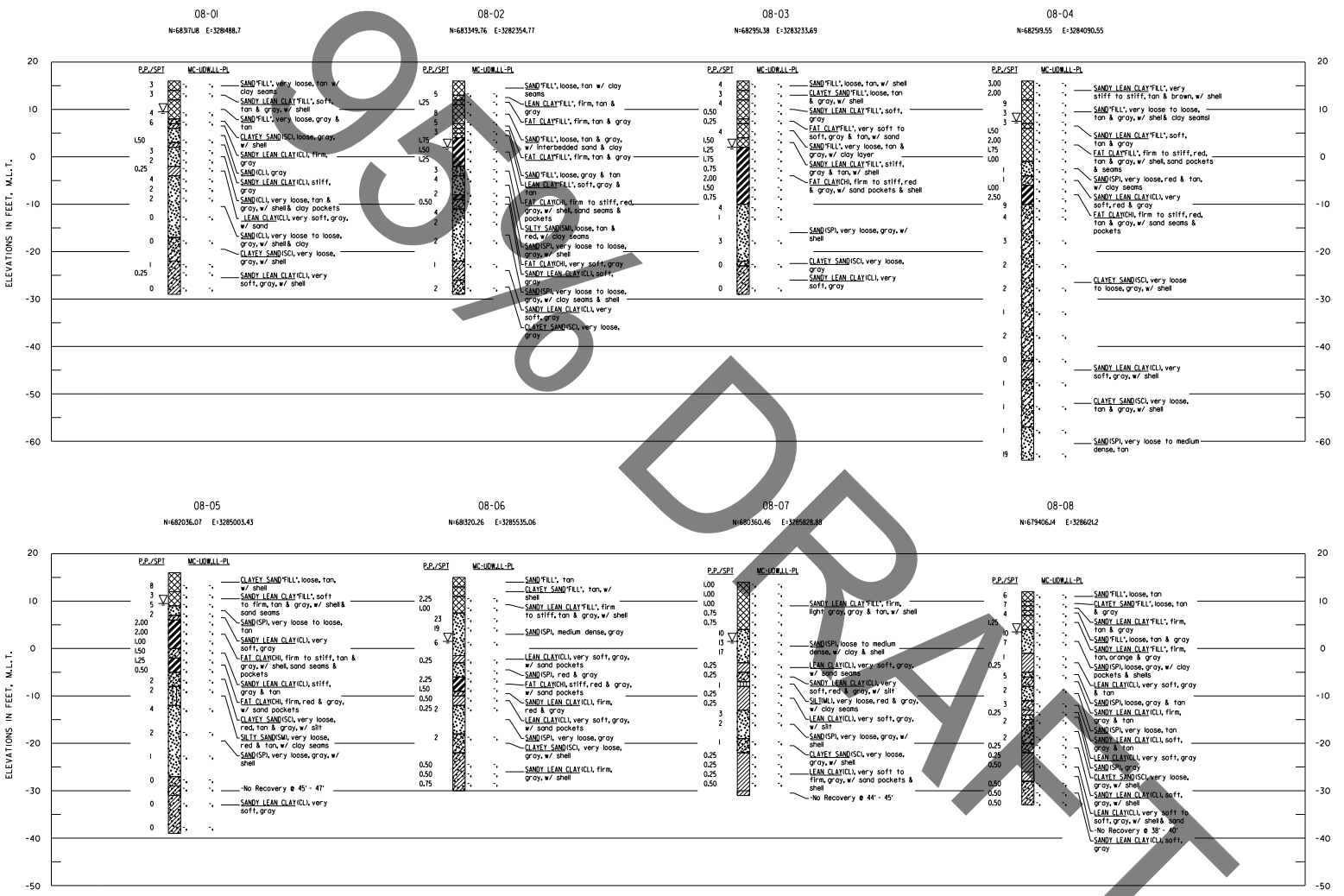
SHEAR STRENGTH, TSF
0.5 1.0 1.5 2.0
MOISTURE ○ CONTENT, %
PLASTIC LIMIT — LIQUID LIMIT
10 20 30 40 50 60 70 80 90

95% DRAFT

Shear Types: ● = Hand Penet. ■ = Torvane ▲ = Unconf. Comp. ✳ = UU Triaxial

PLATE A-21

HVJ ASSOCIATES



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Galveston District

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Checked by:	X	Approval Recommended	
Submitted by: LORI A. THOMAS, P.E. Project Manager, Levees Section		Approved by: PETE G. PEREZ, P.E. Chief, Engineering and Construction Division	

U.S. ARMY ENGINEER DISTRICT, GALVESTON
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DISTRICT COMMANDER

HOUSTON-GALVESTON NAVIGATION CHANNEL, TEXAS
LEVEE CONSTRUCTION
PLACEMENT AREA NOS. 14 AND 15

BORING LOGS PLACEMENT AREA NO. 15

Drawing No.:
F-1
Sheet 29 of 41

SOLICITATION NO.
W912HY-
08-B-00

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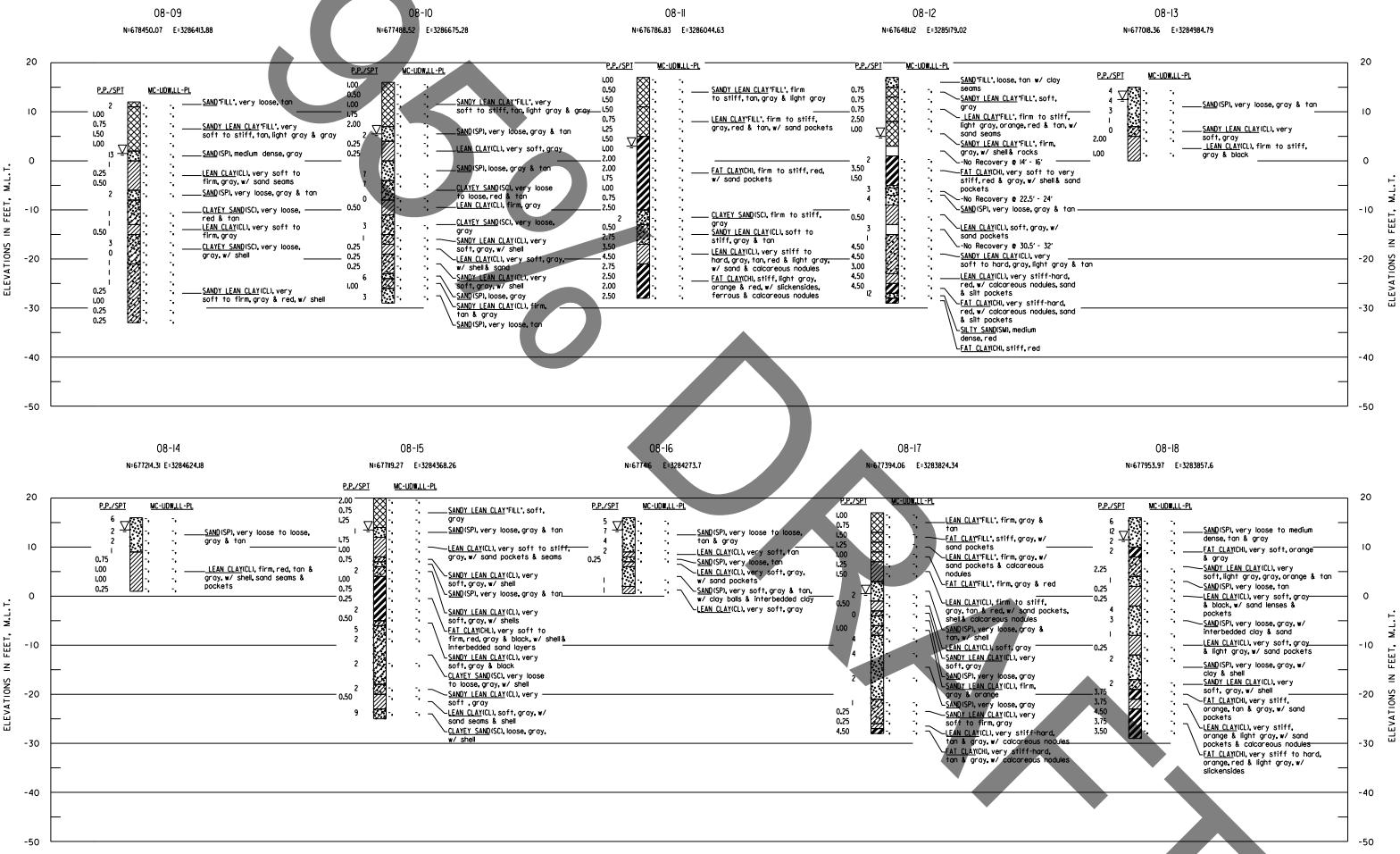

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Chief, Engineering Branch
Approved by: PETE G. PEREZ, P.E.
Chief, Engineering and Construction Division

Date: JULY 2008
Scale: AS SHOWN
Approval Recommended: HARRISON T. SUTCLIFFE, P.E.
Chief, Engineering Branch

HOUSTON-GALVESTON NAVIGATION CHANNEL, TEXAS
LEVEE CONSTRUCTION
PLACEMENT AREA NOS. 14 AND 15

BORING LOGS
PLACEMENT AREA NO. 15

Drawing No.:
F-2
Sheet 30 of 41

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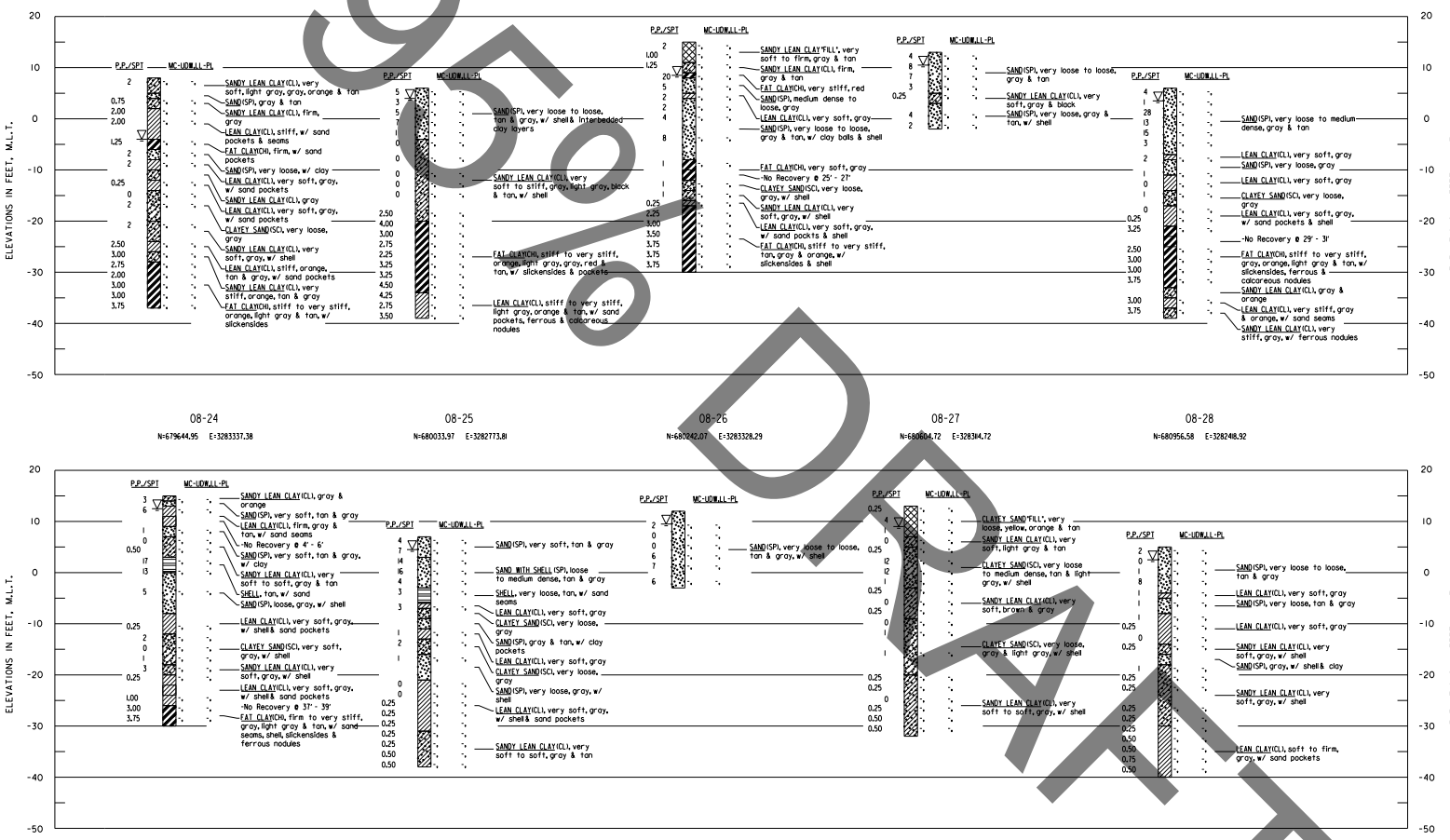

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Submitted by: LORI K. THOMAS, P.E., Chief, Geotech. & Structural Section
Approved by: PETE G. PEREZ, P.E., Chief, Engineering and Construction Division
Date: JULY 2008
Scale: AS SHOWN
Approval Recommended: HARRISON T. SUTCLIFFE, P.E., Chief, Engineering Branch

HOUSTON-GALVESTON NAVIGATION CHANNEL, TEXAS
LEVEE CONSTRUCTION
PLACEMENT AREA NOS. 14 AND 15

BORING LOGS
PLACEMENT AREA NO. 15

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F-3
Sheet 31 of 41
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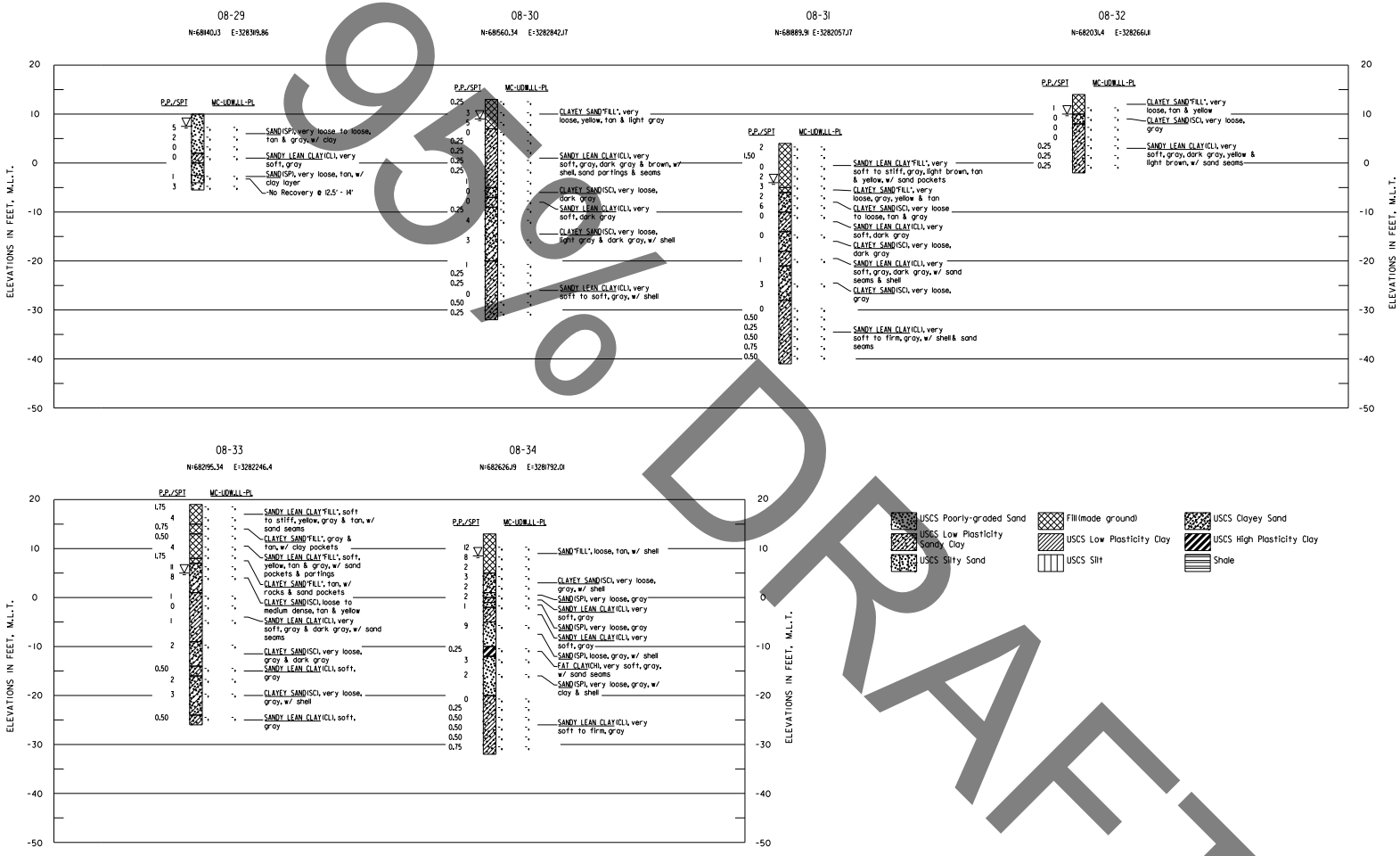

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Approved by: PETE G. PEREZ, P.E. Chief, Engineering and Construction Division			

HOUSTON-GALVESTON NAVIGATION CHANNEL, TEXAS
LEVEE CONSTRUCTION
PLACEMENT AREA NOS. 14 AND 15

BORING LOGS
PLACEMENT AREA NO. 15

Drawing No.:
F-4
Sheet 32 of 41

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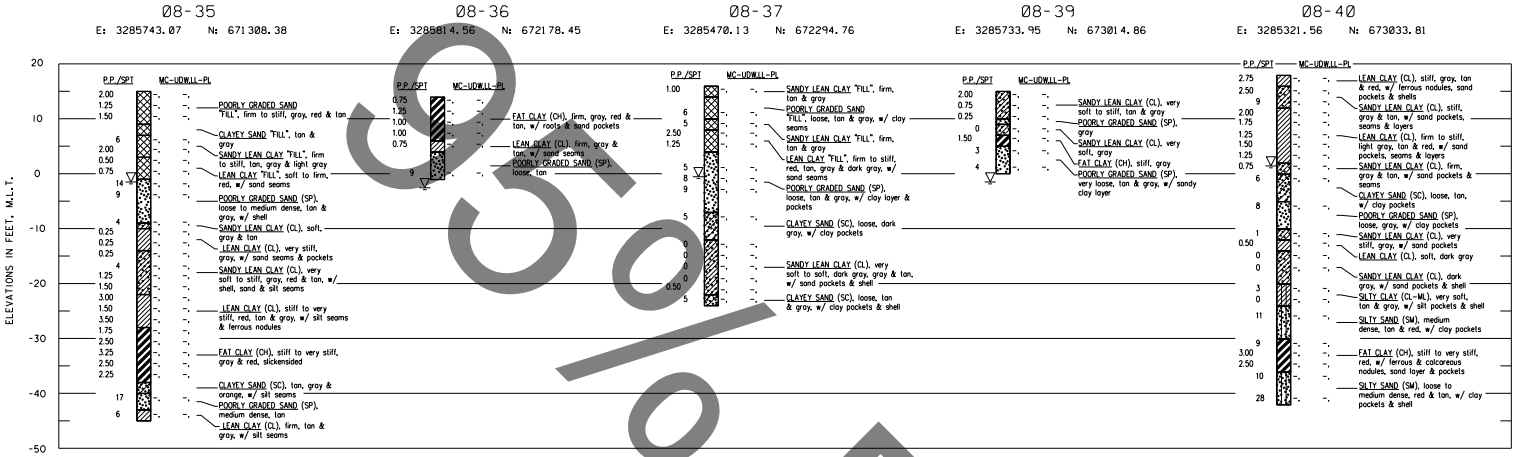

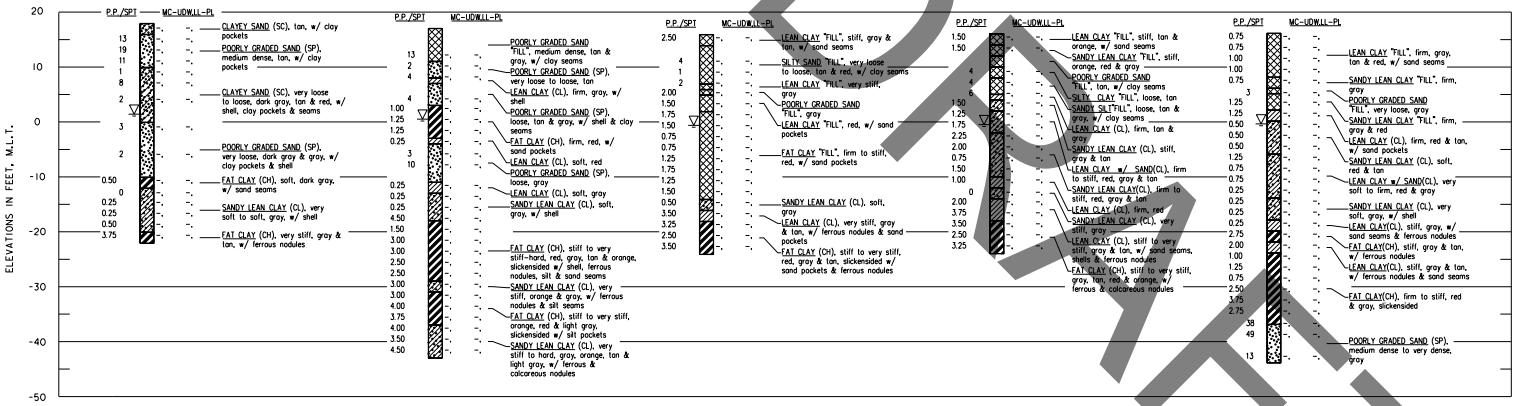

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Checked by:	X	Submitted by: LEAH L. THOMAS, P.E. Chief, Hydraulic Engineering Section	Approved/Recommended MARSON T. LATTUCA, P.E. Chief, Engineering and Construction Division
Approved by:		PETE G. PEREZ, P.E. Chief, Engineering and Construction Division	

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HOUSTON-GALVESTON NAVIGATION CHANNEL, TEXAS
LEVEE CONSTRUCTION
PLACEMENT AREA NOS. 14 AND 15

BORING LOGS
PLACEMENT AREA NO. 14

Drawing No.:
F-5
Sheet 33 of 41

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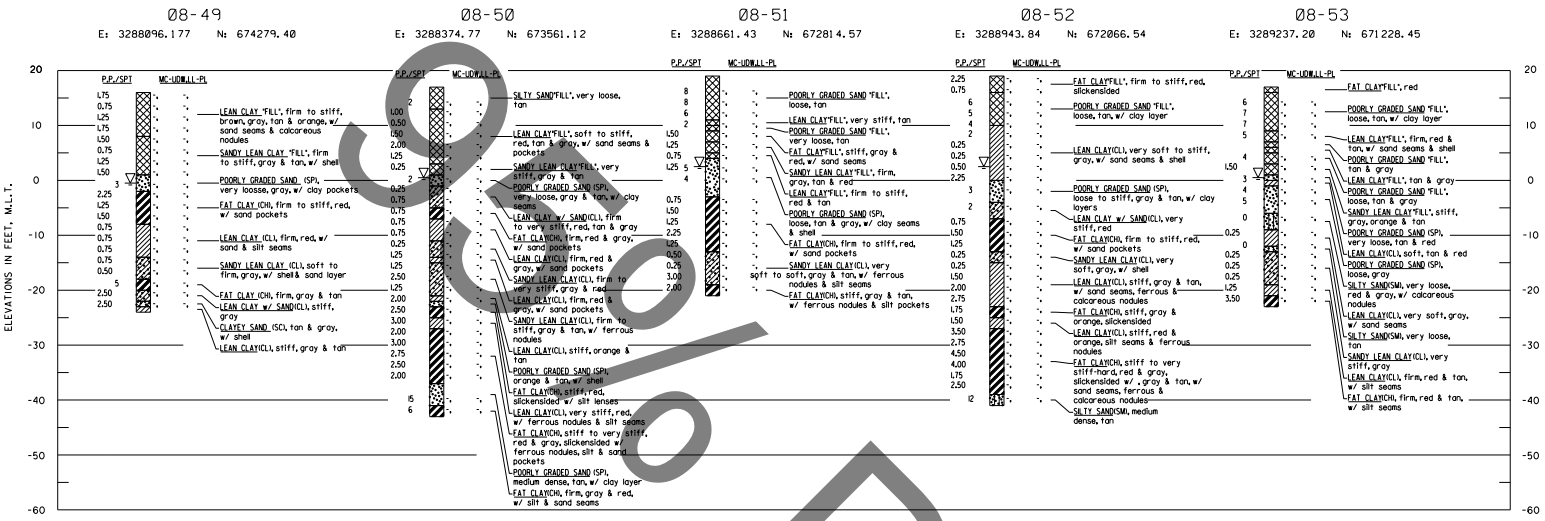

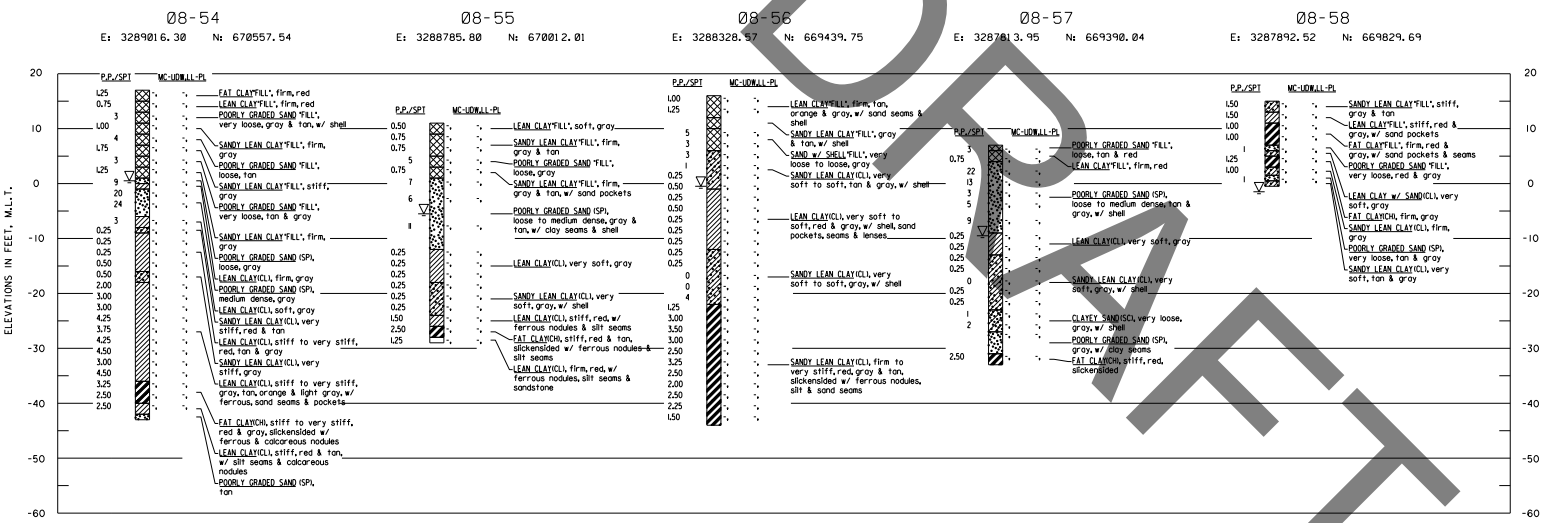

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Submitted by: LORI K. THOMAS, P.E. Chief, Geotech & Structural Section			
Approved by: PETE G. PEREZ, P.E. Chief, Engineering and Construction Division			

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HOUSTON-GALVESTON NAVIGATION CHANNEL, TEXAS
LEVEE CONSTRUCTION
PLACEMENT AREA NOS. 14 AND 15

BORING LOGS
PLACEMENT AREA NO. 14

Drawing No.:
F-6
Sheet 34 of 41

File No. HSC 401-516

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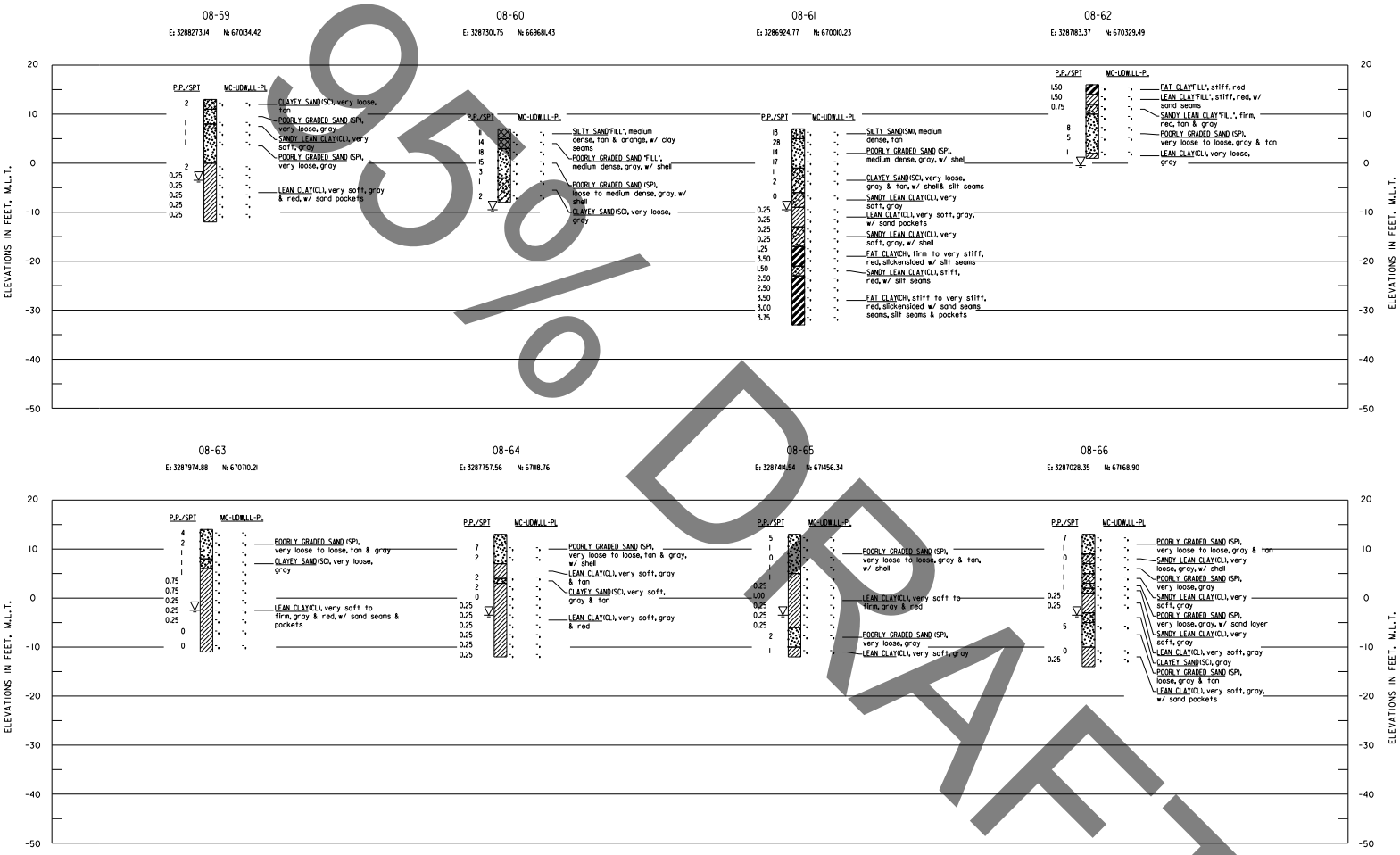

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DAVID C. WESTON, Col., C.E.,
DISTRICT COMMANDER

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Designed by: X
Checked by: X
Submitted by: LORI K. THOMAS, P.E. Chief, Geotech & Structural Section
Approved by: PETE G. PEREZ, P.E. Chief, Engineering and Construction Division
Date: JULY 2008
Scale: AS SHOWN
Approval Recommended: HARRISON T. SUTCLIFFE, P.E. Chief, Engineering Branch

HOUSTON-GALVESTON NAVIGATION CHANNEL, TEXAS
LEVEE CONSTRUCTION
PLACEMENT AREA NOS. 14 AND 15

BORING LOGS
PLACEMENT AREA NO. 14

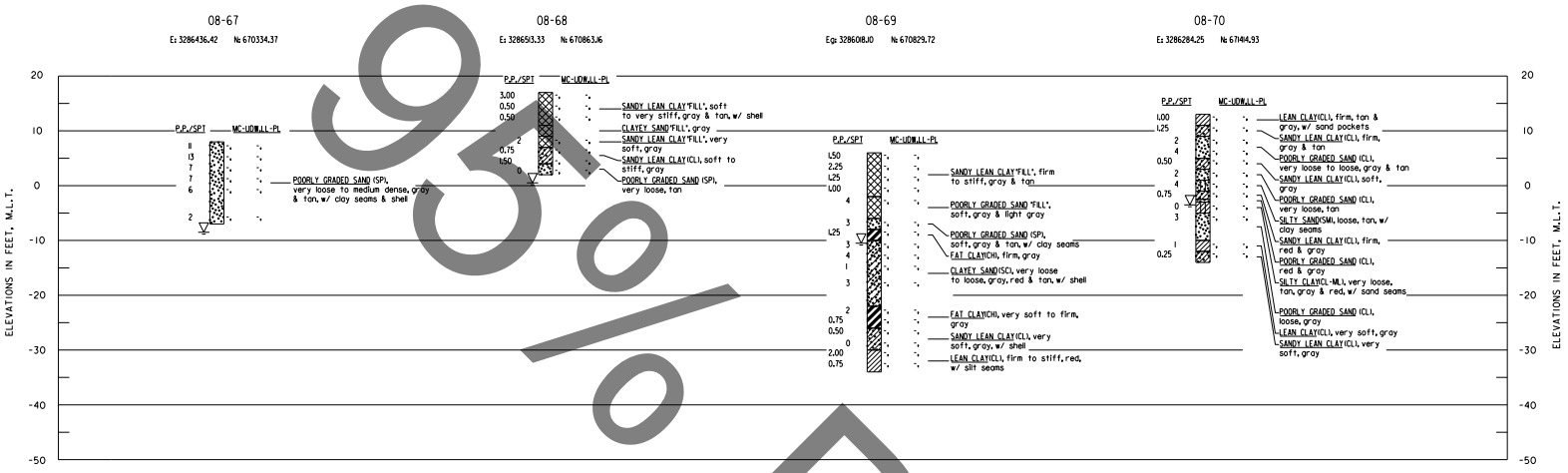
Drawing No.:
F-7
Sheet 35 of 41

File No. HSC 401-516

File:$FILE$

SOLICITATION NO.
W912HY-
08-B-00

7/15/2008 7:18:10 AM w:\cadd\projects\hsc\401-516 pa 14 15\drawings\F07 PA-14.dgn



NOTES:

1. SOILS HAVE BEEN CLASSIFIED IN ACCORDANCE WITH ASTM 2487-06 "CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES (UNIFIED SOILS CLASSIFICATION SYSTEM". CONSISTENCY OF SOILS SUCH AS SOFT, MEDIUM, HARD, LOOSE, DENSE, ETC., ARE RELATIVE TERMS BASED ON ESTIMATED UNDISTURBED SHEAR STRENGTH OF THE MATERIAL AS DETERMINED BY VISUAL CLASSIFICATION POCKET PENETROMETER TESTS AND PENETRATION RESISTANCE DURING SAMPLING.
2. FIGURES TO THE RIGHT OF BORING LOGS ARE WATER CONTENTS IN PERCENT OF THE DRY WEIGHT, DRY DENSITY, LIQUID LIMIT, PLASTIC LIMIT, AND BAR LINEAR SHRINKAGE. (MC-UDW),(LL-PL),(B.L.S.)* FIGURES TO THE LEFT OF BORING LOGS ARE BLOWS PER FOOT OF PENETRATION FROM STANDARD PENETRATION TESTING.
3. BORINGS WERE DRILLED USING WET ROTARY DRILLING TECHNIQUES AND UNDISTURBED SAMPLES WERE RECOVERED WITH A 3-INCH DIAMETER THIN WALL SAMPLER WHERE COHESIVE MATERIALS WERE ENCOUNTERED. WHERE COHESIONLESS MATERIALS WERE ENCOUNTERED, DISTURBED SAMPLES WERE TAKEN WITH A SPLIT SPOON SAMPLER DURING PERFORMANCE OF STANDARD PENETRATION TESTING.
4. ELEVATIONS OF THE TOP OF BORINGS ARE APPROXIMATE.
5. WATER SURFACE LEVELS SHOWN ON BORING LOGS WERE DETERMINED AT THE TIME OF DRILLING.

LEGEND:

- Fill (made ground)
- USCS Low Plasticity Clay
- USCS Low Plasticity Silty Clay
- USCS Poorly-graded Sand
- USCS High Plasticity Clay
- USCS Silty Sand
- USCS Low Plasticity Sandy Clay
- USCS Clayey Sand

95% DRAFT

SOLICITATION NO. W912HY-08-B-00

US Army Corps of Engineers
Galveston District

Rev.	Description	Date	By

DATE: $DATE$ TIME: $TIME$ BY: $USER$

Drawn by:	X	Date: JULY 2008	Rev. No.:
Designed by:	X	Scale: AS SHOWN	
Checked by:	X	Approval Recommended	
Submitted by: LEAH L. THOMAS, P.E. Project Manager, Real Estate		Approval Recommended MARSON T. LATTUCA, P.E. Chief, Real Estate Division	
Approved by: PETE G. PEREZ, P.E. Chief, Engineering and Construction Division			

U.S. ARMY ENGINEER DISTRICT, GALVESTON CORPS OF ENGINEERS GALVESTON, TEXAS

PREPARED UNDER THE DIRECTION OF DAVID C. WESTON, COL., C.E. DISTRICT COMMANDER

HOUSTON-GALVESTON NAVIGATION CHANNEL, TEXAS LEVEE CONSTRUCTION PLACEMENT AREA NOS. 14 AND 15

BORING LOGS PLACEMENT AREA NO. 14

Drawing No.: F-8

Sheet 36 of 41

File No. HSC 401-516

Files: $FILES$

U.S. ARMY CORPS OF ENGINEERS
GEOTECHNICAL BORING DATA

PROJECT NAME Houston. Galveston Navigation Channel

LOG OF BORING NO. 93-B2

LOCATION/STATION Marsh Site 15

DATE/TIME STARTED 9-25-94
DATE/TIME COMPLETED 9-25-94

TIDE ELEVATION 2' MLT DATUM, TIME ____ LOCATION LT. BKN.# Morgan Pt.

WATER DEPTH 12-5(deck) = 7'

DEPTH FROM WATER SURFACE
BOTTOM OF BORING 45'

WEATHER Sunny

DRILL RIG MANUFACTURE
MODEL NO. Mayhew 200

DRILLER Jakie Smith
LOGGER H. Jaffri

DRILLER'S/LOGGER'S COMMENTS

95% DRAFT

pc_wp12_coe_log.r

U.S. ARMY CORPS OF ENGINEERS

BORING NO. 93-152 DATE: BEGIN 9-25-94 PAGE 1 / 9
JOB NO. 946783.2 COMPLETE 9-25-94 Thin Walled Tube
PROJECT Houston Galveston Channel ☐ 3" ☐ 6"
LOCATION 1
ELEVATION OF HOLE -5' MLT (Mudline)
MANUFACTURER'S DESIGNATION OF DRILL RIG
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling
WEATHER Sunny
DRILLER Jackie Smith LOGGER Hasnain Jaffri

12'
5' deck
7' water
2' tide

Casing 25ft

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
0	J	1	0/0	D'Gry	clay	very soft		
		2	0/0	Dark Gry				
		3	0/0	D. Gray	clay	very soft		
5		4	0/0.08	Dark Gray	clay	very soft	Sandy	
		5	0/0.08	Dark Gray	clay	very soft	Sandy	w/shell
		6	0/0.12	Dark Gray	clay	very soft	Sandy	w/shell
10		7	0/0.08	Dark Gray	clay	very soft	Sandy	w/shell
		8	0/0.08	Dark Gray	clay	very soft	Sandy	
15		9	0/0	Gray	clay	very soft		
		10	0/0.08	Gray	clay	very soft		
		11	0/0	Gray	clay	V. soft		
20		12	0/0	Gray	clay	very soft		
		13	0/0	Gray	clay	V. soft		
25		14	0/0.12	Gray	clay	V. soft		
		15	0/0.12	Gray	clay	V. soft		
		16	0.25/0.12	Gray	clay	Soft		
30		17	0.25/0.12	Gray	clay	Soft		w/organic
		18	0.5	L gry	clay	medium stiff		w/organic
35		19	0.5	L gray	clay	medium stiff		w/organic

95% DRAFT

U.S. ARMY CORPS OF ENGINEERS

BORING NO. 93-152 DATE: BEGIN 9-25-94 PAGE 2 / 2
JOB NO. 94G783.2 COMPLETE 9-25-94 Thin Walled Tube
PROJECT Houston Galveston Channel ☒ 3" ☐ 6"
LOCATION
ELEVATION OF HOLE
MANUFACTURER'S DESIGNATION OF DRILL RIG
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling
WEATHER Sunny
DRILLER Jacklin Smith LOGGER Hassan Salti

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
35								
SWD Depth		20	0.75	light gray	clay	medium stiff		
		21	0.75	light gray	clay	medium stiff		Silty bottom 1' sand layer
40								
45								
50								
55								
60								
65								
70								

95% DRAFT

Project: ...n-Galveston navigation channel

SUMM... OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-152

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
1	0 -1.5	0.00		Gray,Clay,Very soft,Sandy	C L	43.1											
2	1.5 - 2	0.00		Gray,Clay,Very soft,Sandy	C L	39.7											
3	2 - 4	0.00		Gray,Clay,Very soft,Sandy	C L	29.0											
4	4 - 6	0.00		Gray,Clay,Very soft,Sandy	C L	28.3											
5	6 - 8	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	28.7	90.9	117.0									
6	8 - 10	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	23.5											
7	10 - 12	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	32.2											
8	12 -14	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	31.2											
9	14 - 16	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	31.7											
10	16 - 18	0.00		Gray,Clay,Very soft Q-TEST See SWD report 16250	~~C H~~ CL	35.1	85		40	12							
11	18 - 20	0.00		Gray,Clay,Very soft CONSOL See SWD report 16250	~~C H~~ CL	34	87		39	14							
12	20 - 22	0.00		Gray,Clay,Very soft See SWD report 16250	~~C H~~ CL												
13	22 - 24	0.00		Gray,Clay,Very soft,Sandy	C L	31.7											
14	24 - 26	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	33.5	89.1	118.9	40.0	17.0	100.0	99.8	97.8	77.0	65.5		0.17
15	26 - 28	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	34.8											
16	28 - 30	0.25		Gray,Clay,Soft,w/sand pockets	C H	43.7											
17	30 -32	0.50		Gray,Clay,Medium stiff,w/organic material	C H	68.3											
18	32 - 34	0.50		Gray,Clay,Medium stiff,Sandy	C L	26.3	96.7	122.2	45.0	20.0	100.0	100.0	99.8	91.6	82.7		0.83
19	34 - 36	0.50		Light gray,Clay,Medium stiff,w/organic material See SWD report 16250 CONSOL	~~C H~~ CL	26.4	96		49	15							
20	36 - 38	0.75		Light gray,Clay,Medium stiff,w/organic material See SWD report 16250	~~C H~~ CL												

95% DRAFT

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classifcation, M c : Moisture Content
q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe
* : Material retained are shell fragments

Project: n-Galveston navigation channel

SUMMARY OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-152

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
21	38 - 40	0.75		Gray,Clay,Medium stiff	C H	21.2											

95% DRAFT

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classifcation, M c : Moisture Content

q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe

* : Material retained are shell fragments

U.S. ARMY CORPS OF ENGINEERS
GEOTECHNICAL BORING DATA

PROJECT NAME HOUSTON GALVESTON NAVIGATION CHANNEL

LOG OF BORING NO. 93-152A

LOCATION/STATION STA. MARSH SITE 75 L

DATE/TIME STARTED 9.26.94 7:40
DATE/TIME COMPLETED .94 :

TIDE ELEVATION 2.5 MLT DATUM, TIME 6:05 LOCATION LT. BKN.# PIER a MORGAN POI.

WATER DEPTH 11 - 3 (DECK) = 8

DEPTH FROM WATER SURFACE
BOTTOM OF BORING 45.5'

WEATHER SUNNY & CLEAR

DRILL RIG MANUFACTURE
MODEL NO. MAYHEW 200

DRILLER JACKIE SMITH
LOGGER JOHN A. GENTRY

DRILLER'S/LOGGER'S COMMENTS

95% DRAFT

pc.wp12.coe.log.r

U.S. ARMY CORPS OF ENGINEERS

BORING NO. 93-1521 DATE: BEGIN 9.26 94 PAGE 2 13
JOB NO. 94G783.2 COMPLETE 9.26 94 Thin Walled Tube
PROJECT HOUSTON GALVESTON NAVIGATION CHANNEL ☒ 3" ☐ 6"
LOCATION STA. MARSH SITE 15
ELEVATION OF HOLE - S.S MLT MUDLINE
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 200
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling
WEATHER SUNNY & CLEAR
DRILLER JACKIE SMITH LOGGER JOHN A CENTRY

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
0	X	1	WOH	GRAY	SAND	VERY LOOSE	SILTY	FINE 0 - 16' SET 3FT of 4" STEEL CASE
5	X	2	WOH	GRAY	SAND	VERY LOOSE	SILTY	-W/SHELL FRAGMENTS 4'-15'
10	X	3	WOH	GRAY	SAND	VERY LOOSE	SILTY	
15	X	4	WOH	GRAY	SAND	VERY LOOSE	SILTY	-W/CLAY LAYERS 16-15'
0.3		5	0/0.06	GRAY	CLAY	VERY SOFT	SANDY	VERY 16.5-36.5 -W/SAND STRM 16.5-36
0.3	20	6	0/0.06	GRAY	CLAY	VERY SOFT	SANDY	
0.4		7	0/0.05	GRAY	CLAY	VERY SOFT	SANDY	
0.2		8	0/0.04	GRAY	CLAY	VERY SOFT	SANDY	
0.2	25 CONCRETE	9	0/0.04	GRAY	CLAY	VERY SOFT	SANDY	
0.3	SAND AFF	10	0/0.06	GRAY	CLAY	VERY SOFT	SANDY	
0.3	30	11	0/0.06	GRAY	CLAY	VERY SOFT	SANDY	
0.2		12	0/0.04	GRAY	CLAY	VERY SOFT	SANDY	
0.2		13	0/0.04	GRAY	CLAY	VERY SOFT	SANDY	
0.2	35	14	0/0.04	GRAY	CLAY	VERY SOFT	SANDY	WOH WEIGHT OF HAMM

95% DRAFT

U.S. ARMY CORPS OF ENGINEERS

BORING NO. 93-152A DATE: BEGIN 9 26 94 PAGE 3 13
JOB NO. 94G783.3 COMPLETE 9.26.94 Thin Walled Tube
PROJECT HOUSTON GALVESTON NAVIGATION CHANNEL ■ 3" ☐ 6"
LOCATION STA. MARSH 377K 15
ELEVATION OF HOLE - 5.5 MLT MUDLINE
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 200
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling
WEATHER SUNNY & CLEAR
DRILLER JACKIE SMITH LOGGER JOHN AGENTRY

TO RANGE ROC

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
35								VERY SL. SANDY - W/ SAND SEAMS 36.5-
6.2		15	0 / 0.04	GRAY	CLAY	VERY SOFT	SANDY	
0.2		16	0 / 0.04	GRAY	CLAY	VERY SOFT	SANDY	- W/ SAND LAYERS 38'-40'
40								
45								
50								
55								
60								
65								
70								

95% DRAFT

Project: ...on-Galveston navigation channel

SUMM OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-152A

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
1	0 - 1.5		W.O.H	Gray,Sand,Very loose,Silty,w/shell fragments	S M												
2	5 - 6.5		W.O.H	Gray,Sand,Very loose,Silty,w/shell&shell fragments	S M						99.6*	98.9*	98.4*	82.3	20.8		
3	10 -11.5		1/W.O.H	Gray,Sand,Very loose,Silty,w/shell fragments	S M												
4	15-16.5		W.O.H	Gray,Sand,Very loose,Silty,w/shell fragments	S M												
5	16.5-18.5	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	27.3											
6	18.5-20.5	0.00		Gray,Clay,Very soft,Sandy,w/sand seams @ See SWD report 16250	C L	33.3	90		41	14							
7	20.5-22.5	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	26.2	89.0	116.3	36.0	16.0	99.7*	99.2*	97.6*	81.2	65.4		0.18
8	22.5-24.5	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	26.2											
9	24.5-26.5	0.00		Gray,Clay,Very soft,Sandy,w/sand seams CONSOL See SWD report 16250	C L	23.9	101		34	13							
10	26.5-28.5	0.00		Gray,Clay,Very soft,Sandy,w/sand seams See SWD report 16250	C L												
11	28.5-30.5	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	42.0	77.8	110.5	43.0	20.0	100.0	99.8	99.1	77.7	64.4		0.16
12	30.5-32.5	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	43.2											
13	32.5-34.5	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	40.3											
14	34.5-36.5	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	32.3											
15	36.5-38.5	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	31.4											
16	38.5-40	0.00		Gray,Clay,Very soft,Sandy,w/sand pockets& shell fragments	C L	24.0											

95% DRAFT

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classifcation, M c : Moisture Content
q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe
* : Material retained are shell fragments

U.S. ARMY CORPS OF ENGINEERS
GEOTECHNICAL BORING DATA

PROJECT NAME HOUSTON GALVESTON NAVIGATION CHANNEL

LOG OF BORING NO. 93-152 P

LOCATION/STATION STA. MARSH SITE 15 L

DATE/TIME STARTED 9-26-94 9:55
DATE/TIME COMPLETED 9-26-94 11:20

TIDE ELEVATION 2.5 MLT DATUM, TIME 9:35 LOCATION LT. BKN.# PIER 0 MORGAN POIN

WATER DEPTH 14-4 (DECK) =10

DEPTH FROM WATER SURFACE BOTTOM OF BORING 62.5

WEATHER SUNNY & CLEAR

DRILL RIG MANUFACTURE MODEL NO. MAYHEW 200

DRILLER JACKIE SMITH
LOGGER JOHN A. GENTRY

DRILLER'S/LOGGER'S COMMENTS

95% DRAFT

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U.S. ARMY CORPS OF ENGINEERS

BORING NO. 93-1520 DATE: BEGIN 9.26 94 PAGE 2 13
JOB NO. 94G783.3 COMPLETE 9.26 94 Thin Walled Tube
PROJECT HOUSTON GALVESTON NAVIGATION CHANNEL ☐ 3" ☐ 6"
LOCATION STA. MARSH SITE 15
ELEVATION OF HOLE -7.5 MLT MUDLINE
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 200
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drillin
WEATHER SUNNY/CLEAR
DRILLER JACKIE SMITH LOGGER JOHN A GENTRY

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
0	X	1	WOH	GRAY	SAND	VERY LOOSE	SILTY	FINE 0'-2.5' -W/SHELL FRAGMENTS 0-18'
5	X	2	WOH	GRAY	SAND	VERY LOOSE	SILTY	(SET 41 OF 4" STEEL CASING)
10	X	3	WOH	GRAY	SAND	VERY LOOSE	SILTY	
15	X	4	2 2 3	GRAY	SAND	LOOSE	SILTY	
20	X	5	1 3 5	GRAY	SAND	LOOSE	SILTY	
25	X	6	1 4 5	GRAY	SAND	LOOSE		COARSE 25-
30	X	7	7 12 14	GRAY	SAND	MEDIUM DENSE		
35	X	8	9 10 24	Gray	Sand	Dense		*WEIGHT OF HAMMER

95% DRAFT

U.S. ARMY CORPS OF ENGINEERS

BORING NO. 93-1528 DATE: BEGIN 9-26 94 PAGE 3 1 3
JOB NO. 946783.3 COMPLETE 9-26 94 Thin Walled Tube
PROJECT HOUSTON GALVESTON NAVIGATION CHANNEL ☑ 3" ☐ 6"
LOCATION STA. MARSH 5776 15
ELEVATION OF HOLE -7.5 MLT MUD LINE
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 200
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling
WEATHER SUNNY & CLEAR
DRILLER JACKIE SMITH LOGGER JOHN AGENTRY

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
35	X	8	9 19 24	GRAY	SAND	DENSE		COARSE 35 - 52.5
40	X	9	24 50/3"	GRAY	SAND	VERY DENSE		W/ GRAVEL 40'-52.5
45	X	10	15 42 50/2"	GRAY	SAND	VERY DENSE		
50	X	11	23 50/4"	GRAY	SAND	VERY DENSE		
	X	12	26 50/3"	GRAY	SAND	VERY DENSE		
55								
60								
65								
70								

95% DRAFT

Project: , on-Galveston navigation channel

SUMM OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-152B

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
1	0 - 1.5		W.O.H	Gray,Sand,Very loose,Silty,w/shell fragments	S M												
2	5 -6.5		W.O.H	Gray,Sand,Very loose,Silty,w/shell fragments	S M						100.0	99.9	94.9	63.8	29.0		
3	10 -11.5		W.O.H	Gray,Sand,Very loose,Silty,w/shell fragments	S M												
4	15 -16.5		5	Gray,Sand,loose,Silty,w/shell fragments	S M												
5	20 -21.5		8	Gray,Sand,loose,Silty,w/shell fragments	S M												
6	25-26.5		9	Gray,Sand,Loose,Silty,w/shell fragments	SP-SM						100.0	100.0	96.0	74.6	11.5		
7	30-31.5		26	Gray,Sand,Medium dense,Silty,w/shell fragments	S M												
8	35-36.5		~~49~~ 50/4"	Gray,Sand,Dense,Silty,w/shell fragments	S M												
9	40-41.5		50/3"	Gray,Sand,Very dense,Silty,w/shell fragments	S M												
10	45-46.5		42/50-2"	Gray,Sand,Very dense,Silty,w/shell fragments	S M												
11	49.5-51		50/4"	Gray,Sand,Very dense,Silty,w/shell fragments	S M												
12	51-52.5		50/3"	Gray,Sand,Very dense,Silty,w/shell fragments	S M												

95% DRAFT

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classifcation, M c : Moisture Content

q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe

* : Material retained are shell fragments

U.S. ARMY CORPS OF ENGINEERS
GEOTECHNICAL BORING DATA

PROJECT NAME HOUSTON GALVESTON NAVIGATION CHANNEL

LOG OF BORING NO. 93-158

LOCATION/STATION STA. MARSH STK 15 - L

DATE/TIME STARTED 9-27-94 10:00
DATE/TIME COMPLETED 9-27-94 11:50

TIDE ELEVATION 3 MLT DATUM, TIME 9:00 LOCATION LT. BKN.# PIER 0 MORGANS POINT

WATER DEPTH 12 - 5 (DECK) = 7

DEPTH FROM WATER SURFACE
BOTTOM OF BORING 48.5

WEATHER SUNNY CLEAR HOT

DRILL RIG MANUFACTURE
MODEL NO. MAYHEW 200

DRILLER JACK SMITH
LOGGER JOHN A. GENTRY

DRILLER'S/LOGGER'S COMMENTS

95% DRAFT

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U.S. ARMY CORPS OF ENGINEERS

BORING NO. 93-158 DATE: BEGIN 9-27-94 PAGE 213
JOB NO. 94G783.3 COMPLETE 9-27-94 Thin Walled Tube
PROJECT HOUSTON GALVESTON NAVIGATION CHANNEL ■ 3" □ 6"
LOCATION STA. MARSHSITE N
ELEVATION OF HOLE -4ML7 MUD LINE
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 200
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drillin
WEATHER SUNNY CLEAR 4H67
DRILLER JACKIE SMITH LOGGER JOHN A GENTRY

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
TORVANE ROC								
0	J	1	0	GRAY	CLAY	VERY SOFT		BROWN 0'-2' SET 33ft OF 4" STEEL CASING
	J	2	•	GRAY	SAND	VERY LOOSE	SILTY	FINE 2'-24'
5	X	3	WOP	GRAY	SAND	VERY LOOSE	SILTY	-W/SHELL FRAGMENTS
10	X	4	WOH	GRAY	SAND	VERY LOOSE	SILTY	
15	X	5	2 2 1	GRAY	SAND	VERY LOOSE	SILTY	
20	X	6	1 1	GRAY	SAND	VERY LOOSE	SILTY	
25	X	7	WOH	GRAY	CLAY	VERY SOFT		-W/SAND SEAMS 24'-25'
0.2		8	0 / 0.04	GRAY	CLAY	VERY SOFT		-W/SHELL FRAGMENTS 24'-35.5'
0.2		9	0 / 0.04	GRAY	CLAY	VERY SOFT		
0.2	30 CONTINUED	10	0 / 0.04	GRAY	CLAY	VERY SOFT		
0.1		11	0 / 0.02	GRAY	CLAY	VERY SOFT		
0.2	35	12	0 / 0.04	GRAY	CLAY	VERY SOFT		WOP WEIGHT OF PIPE WOH WEIGHT OF HAMMER

95% DRAFT

U.S. ARMY CORPS OF ENGINEERS

BORING NO. 93-93158 DATE: BEGIN 9-27-94 PAGE 3 of 3
JOB NO. 946783.3 COMPLETE 9-27 94 Thin Walled Tube
PROJECT HOUSTON GALVESTON NAVIGATION CHANNEL ■ 3" □ 6"
LOCATION STA. MARINSITE 15
ELEVATION OF HOLE -4 MLT MUD LINE
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 200
GROUNDWATER: DEPTH _____ ft., ELEV. _____ ft., at end of Drilling
WEATHER SUNNY & CLEAR
DRILLER JACKIE SMITH LOGGER JOHN AGENTRY

TO EVANS ROC

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
35								
		13	0 / 0.04	GRAY	CLAY	VERY SOFT		-W/SAND SEAMS 35-S
0.2								
		14	0 / 0.04	GRAY	CLAY	VERY SOFT		
0.2								
		15	0 / 0.06	GRAY	CLAY	VERY SOFT		
0.3								
40								
45								
50								
55								
60								
65								
70								

95% DRAFT

GEOTEST ENGINEERING, INC.

Project: .on-Galveston navigation channel

SUMM. OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-158

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
1	0 - 2	0.00		Gray,Clay,Very soft,w/hydrocarbon	C H	62.8											
2	2 - 4			Gray,Sand,Very loose,Silty,w/shell fragments	S M												
3	4 - 5.5		W.O.P	Gray,Sand,Very loose,Silty,w/shell fragments	S M						97.5*	96.8*	95.5*	74.6	27.0		
4	9 - 10.5		W.O.H	Gray,Sand,Very loose,Silty,w/shell fragments	S M												
5	14 -15.5		3	Gray,Sand,Very loose,Silty,w/shell fragments	S M												
6	19 -20.5		2	Gray,Sand,Very loose,Silty,w/shell fragments	S M												
7	24 -25.5	0.00	W.O.H	Gray,Clay,Very soft,Sandy	C L	35.6											
8	25.5-27.5	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	28.1	92.5	118.5	31.0	16.0	91.1*	90.9*	89.3*	69.8	57.0		0.12
9	27.5-29.5	0.00		Gray,Clay,Very soft,Sandy	C L	39.0											
10	29.5-31.5	0.00		Gray,Clay,Very soft,w/sand seams & shell fragments See SWD report 16250 CONSOL	C H	40.9	81		52	13							
11	31.5-33.5	0.00		Gray,Clay,Very soft,w/sand seams & shell fragments See SWD report 16250	C H												
12	33.5-35.5	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	34.8	85.5	115.2	48.0	21.0	98.2*	96.6*	89.4*	73.5	60.3		0.16
13	35.5-37.5	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments& sand pockets	C L	40.6											
14	37.5-39.5	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	39.9											
15	39.5-41.5	0.00		Gray,Clay,Very soft,Sandy,w/sand pockets& shell fragments	C L	47.1											

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classifcation, M c : Moisture Content
q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe

9516 DRAFT

U.S. ARMY CORPS OF ENGINEERS
GEOTECHNICAL BORING DATA

PROJECT NAME HOUSTON GALVESTON NAVIGATION CHANNEL

LOG OF BORING NO. 93-159

LOCATION/STATION STA. MARSH SITE 15

DATE/TIME STARTED 9-26-94 2:40
DATE/TIME COMPLETED 9-24-94 4:30

TIDE ELEVATION 2 MLT DATUM, TIME 2:30 LOCATION LT. BKN.# PIERCE MORGAN POINT

WATER DEPTH 12 - 4 (DECK) = 8

DEPTH FROM WATER SURFACE
BOTTOM OF BORING 47.5

WEATHER SUNNY CLEAR SHOT

DRILL RIG MANUFACTURE
MODEL NO. MAYHEW 200

DRILLER JACKIE SMITH
LOGGER JOHN A. GENTRY

DRILLER'S/LOGGER'S COMMENTS

95% DRAFT

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U.S. ARMY CORPS OF ENGINEERS

BORING NO. 93-159 DATE: BEGIN 9-26-94 PAGE 213
JOB NO. 94G783.3 COMPLETE 9-26-94 Thin Walled Tube ☒ 3" ☐ 6"
PROJECT HOUSTON GALVESTON NAVIGATION CHANNELS
LOCATION STA. MARSH SZ76 LS
ELEVATION OF HOLE -6 MLT MUDLINE
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 200
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drillin
WEATHER SUNNY CLEAR & HOT
DRILLER JACKIE SMITH LOGGER JOHN A. CENTER

3-5

TORVANE RDG.

0.1

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
0								
	3	1	0	GRAY	CLAY	VERY SOFT		SAMPLE SLIP OUT WHILE PULLING ↓ BROWN 1.2 PIPE
	3	2	0 / 0.02	GRAY	CLAY	VERY SOFT		SET 23 FT. OF 4" STEEL CASING SAMPLER BALG WHILE EXTRACTING
5	X	3	WOP	GRAY	SAND	VERY LOOSE	SILTY	FINE 4'-19' -W/ CLAY SEAMS 4'-19' -W/SHELL 4'-19'
10	X	4	WOH	GRAY	SAND	VERY LOOSE	SILTY	
15	X	5	WOH	GRAY	SAND	VERY LOOSE	SILTY	
20	X	6	WOH	GRAY	CLAY	VERY SOFT		-W/SAND SEAMS 19'-36' -W/SHELL 19.-36.5
		7	0 / 0.06	GRAY	CLAY	VERY SOFT		
		8	0 / 0.04	GRAY	CLAY	VERY SOFT		
25		9	0 / 0.10	GRAY	CLAY	VERY SOFT		
		10	0 / 0.06	GRAY	CLAY	VERY SOFT		
		11	0 / 0.06	GRAY	CLAY	VERY SOFT		
30		12	0 / 0.10	GRAY	CLAY	VERY SOFT		
		13	0 / 0.06	GRAY	CLAY	VERY SOFT		
35		14	0 / 0.04	GRAY	CLAY	VERY SOFT		*WEIGHT OF HAMMER

0.2 0.5 0.3 0.3 0.5 0.3 0.3

90% DRAFT

U.S. ARMY CORPS OF ENGINEERS

BORING NO. 93-154 DATE: BEGIN 9-26 94 PAGE 3 13
JOB NO. 94G783.3 COMPLETE 9-26 94 Thin Walled Tube
PROJECT HOUSTON GALVESTON NAVIGATION CHANNEL ☒ 3" ☐ 6"
LOCATION STA. MARSHSITE N5
ELEVATION OF HOLE -6 MLT MUDLINE
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 20.0
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling
WEATHER SUNNY CLEAR+HOT
DRILLER JACKIE SMITH LOGGER JOHN AGENTRY

TORVANE COC

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
35								
			0					-W/SAND SEAMS 36.5-39
		15	0.6	GRAY	CLAY	VERY SOFT		-W/SHELL 36.5-39
		16	0	GRAY	CLAY	VERY SOFT		-W/SAND LAYER 39-39.5
40								
45								
50								
55								
60								
65								
70								

95% DRAFT

Project: ɔn-Galveston navigation channel

SUMI OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-159

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
1	0 - 2	0.00		Gray,Clay,Very soft,w/hydrocarbon & shell fragments	C H	87.4											
2	2 - 4	0.00		Gray,Clay,Very soft,w/hydrocarbon & shell fragments	C H	67.2											
3	4 - 5.5		W.O.P	Gray,Sand,Very loose,Silty,w/shell fragments	S M						98.3*	98.0*	97.4*	89.5	45.6		
4	9 -10.5		W.O.H	Gray,Sand,Very loose,Silty,w/shell fragments	S M												
5	14 -15.5		W.O.H	Gray,Sand,Very loose,Silty,w/shell fragments	S M												
6	19 -20.5	0.00	W.O.H	Gray,Clay,Very soft,w/sand seams & shell fragments	C H	42.0											
7	20.5-22.5	0.00		Gray,Clay,Very soft,w/sand seam & shell fragments	C H	38.0											
8	22.5-24.5	0.00		Gray,Clay,Very soft,w/shell fragments	C H	45.0											
9	24.5-26.5	0.00		Gray,Clay,Very soft,w/shell fragments and sand seams	C H	41.9	79.1	112.2	51.0	19.0	100.0	100.0	98.2	91.1	86.6		.16
10	26.5-28.5	0.00		Gray,Clay,Very soft,w/shell fragments	C H	47.9											
11	28.5-30.5	0.00		Gray,Clay,Very soft,w/shell fragments	C H	56.0											
12	30.5-32.5	0.00		Gray,Clay,Very soft,w/shell fragments	C H	54.5											
13	32.5-34.5	0.00		Gray,Clay,Very soft,w/shell fragments	C H	47.0											
14	34.5-36.5	0.00		Gray,Clay,Very soft,w/shell fragments	C H	57.2											
15	36.5-38.5	0.00		Gray,Clay,Very soft,w/shell fragments	C H	57.1											
16	38-.5-39.	0.00		Gray,Clay,Very soft,w/shell fragments	C H	57.7											

95% DRAFT

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classifcation, M c : Moisture Content
q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe

U.S. ARMY CORPS OF ENGINEERS
GEOTECHNICAL BORING DATA

PROJECT NAME HOUSTON GALVESTON NAVIGATION CHANNEL

LOG OF BORING NO. 93-160

LOCATION/STATION STA. MARSH SITE 1-5

DATE/TIME STARTED 9-26-94 12:10
DATE/TIME COMPLETED 9-26-94 2:25

TIDE ELEVATION 2 MLT DATUM, TIME 12:00 LOCATION LT. BKN.# PIER N MORGAN POINT

WATER DEPTH 14 - 4 (DECK) = 10

DEPTH FROM WATER SURFACE
BOTTOM OF BORING 62

WEATHER SUNNY CLEAR & HOT

DRILL RIG MANUFACTURE
MODEL NO. MAYHEW 200

DRILLER JACKIE SMITH
LOGGER JOHN A. GENTRY

DRILLER'S/LOGGER'S COMMENTS

95% DRAFT

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U.S. ARMY CORPS OF ENGINEERS

BORING NO. 93-160 DATE: BEGIN 9-26-94 PAGE 2 13
JOB NO. 94G783.3 COMPLETE 9-26-94 Thin Walled Tube
PROJECT HOUSTON GALVESTON NAVIGATION CHANNEL ■ 3" □ 6"
LOCATION STA. MARSH SITE 15
ELEVATION OF HOLE -8 MLT MUD LINE
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 200
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drillin
WEATHER SUNNY CLEAR 1707
DRILLER JACKIE SMITH LOGGER JOHN A GENTRY

TORVANE ROC	DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE / SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
	0	X	1	WOP	GRAY	CLAY	VERY SOFT		PUSH SHELBY TUBE NO RECOVER + BROWN 8'-10S
0.1			2	0/0.02	BROWN	CLAY	VERY SOFT		SET 23 FT OF 4" STEEL CASI
0.1	5		3	0/0.02	BROWN	CLAY	VERY SOFT		*JAR SAMPLES
0.1			4	0/0.02	GRAY	CLAY	VERY SOFT		SAMPLE BULK WHILE EX-STRUDING @ 3.5-5.5 + 5.5-7.5
0.1			5	0/0.02	GRAY	CLAY	VERY SOFT		-W/ SAND SEAMEAS 7.5-2
0.1	10		6	0/0.02	GRAY	CLAY	VERY SOFT		W/ SHELL 7.5-29.5
0.2			7	0/0.04	GRAY	CLAY	VERY SOFT		
0.2	15		8	0/0.04	GRAY	CLAY	VERY SOFT		
0.2	Q		9	0/0.04	GRAY	CLAY	VERY SOFT		
0.2			10	0/0.02	GRAY	CLAY	VERY SOFT		
0.2	20 consol		11	0/0.04	GRAY	CLAY	VERY SOFT		
0.2	2wo dup		12	0/0.04	GRAY	CLAY	VERY SOFT		
0.4	25		13	0/0.08	GRAY	CLAY	VERY SOFT		
0.4	Q		14	0/0.08	GRAY	GRAY	VERY SOFT		
0.5			15	0/0.10	GRAY	CLAY	VERY SOFT		
0.4	30		16	0/0.08	GRAY	CLAY	VERY SOFT		
0.3			17	0/0.06	GRAY	CLAY	VERY SOFT		
0.5	35		18	0/0.10	GRAY	CLAY	VERY SOFT		

90% DRAFT

GEOTEST ENGINEERING, INC.

U.S. ARMY CORPS OF ENGINEERS

BORING NO. 93-160 DATE: BEGIN 9-26-94 PAGE 3 13
JOB NO. 94G783.3 COMPLETE 9-26-94 Thin Walled Tube
PROJECT HOUSTON GALVESTON NAVIGATION CHANNEL ☒ 3" ☐ 6"
LOCATION STA. MARSH SITE 1S
ELEVATION OF HOLE -B MLT MUD LINE
MANUFACTURER'S DESIGNATION OF DRILL RIG MAYHEW 200
GROUNDWATER: DEPTH ____ ft., ELEV. ____ ft., at end of Drilling
WEATHER SUNNY CLEAR 4407
DRILLER JACKIE SMITH LOGGER JOHN AGENTRY

DEPTH, FEET	SAMPLE	SAMPLE NO.	PEN./TORVANE SPT.-BLOW COUNT	COLOR	MATERIAL TYPE	CONSISTENCY	SECONDARY CONSTITUENTS	STRUCTURAL FEATURES AND COMMENTS
35	X	19	3 4 7	GRAY	SAND	MEDIUM DENSE	SILTY	FINE 36.5-41 INTERCANZES 36.5-42'
40	X	20	5 4 8	GRAY	SAND	MEDIUM DENSE	SILTY	
45	X	21	4 24 33	GRAY	SAND	VERY DENSE	SILTY	COARSE 45-52
50	X	22	15 32 47	GRAY	SAND	VERY DENSE	SILTY	
55								
60								
65								
70								

95% DRAFT

Project: .n-Galveston navigation channel

SUMM JF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-160

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
1	0 - 1.5	0.00	W.O.P	Brown,Clay,Very soft,w/hydrocarbon	C H	77.9											
2	1.5 -3.5	0.00		Brown,Clay,Very soft,w/hydrocarbon	C H	49.3											
3	3.5 - 5.5	0.00		Brown,Clay,Very soft,w/hydrocarbon	C H	80.6											
4	5.5 - 7.5	0.00		Gray,Clay,Very soft	C H	45.5											
5	7.5 - 9.5	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	24.1											
6	9.5 -11.5	0.00		Gray,Clay,Very soft,Sandy	C L	30.7											
7	11.5-13.5	0.00		Gray,Clay,Very soft,Sandy	C L	34.3											
8	13.5-15.5	0.00		Gray,Clay,Very soft,Sandy	C L	40.7	78.4	110.3	45.0	19.0	99.3*	99.0*	98.7*	94.1	78.4		0.13
9	15.5-17.5	0.00		Gray,Clay,Very soft,w/sand seams&shell fragments See SWD report 16250 Q-TEST	~~C H~~ CL	37.1	86		38	11							
10	17.5-19.5	0.00		Gray,Clay,Very soft,w/shell fragments	C H	39.3											
11	19.5-21.5	0.00		Gray,Clay,Very soft,w/sand seams&shell fragments See SWD report 16250 CONSOL	~~C H~~ CL	41.2	80		49	15							
12	21.5-23.5	0.00		Gray,Clay,Very soft,w/sand seams&shell fragments See SWD report 16250	C H												
13	23.5-25.5	0.00		Gray,Clay,Very soft,Sandy,w/shell fragments	C L	47.7	70.6	104.2	44.0	18.0	100.0	99.8*	98.6*	93.9	75.7		0.22
14	25.5-27.5	0.00		Gray,Clay,Very soft,w/sand seams&shell fragments See SWD report 16252 Q-test	~~C H~~ CL	45.6	73		42	13							
15	27.5-29.5	0.00		Gray,Clay,Very soft,w/sand seams	C H	43.4											
16	29.5-31.5	0.00		Gray,Clay,Very soft,w/sand seams	C H	55.3	65.7	102.0	62.0	25.0	100.0	99.7	96.0	95.0	93.1		0.17
17	31.5-33.5	0.00		Gray,Clay,Very soft,w/sand seams	C H	56.2											
18	33.5-35.5	0.00		Gray,Clay,Very soft,w/organic material	C H	82.4											
19	35.5-37		13	Gray,Sand,Medium dense,Silty	S M												
20	40.5-42		14	Gray,Sand,Medium dense,Silty	S M												

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classifcation, M c : Moisture Content
q u : Uncogined Compressive Strength, W O H : Weight of hammer, W O P : Weight of Pipe

95% DRAFT

Project: ...on-Galveston navigation channel

SUMM... OF LABORATORY TEST RESULTS

Contract No. DACW64-94-C-0040

Boring No. 93-160

S #	Depth (ft)	P P (tsf)	SPT Blows per Foot	Visual Classification	U S C	Mc (%)	Dry Unit Wt (pcf)	Wet Unit Wt (pcf)	L L (%)	PL (%)	Mechanical Analysis % Passing					Torvane Shear Strength (tsf)	q u (tsf)
											#4	#10	#40	#100	#200		
21	45.5-47		57	Gray,Sand,Very dense,Silty	S M												
22	50.5-41		79	Gray,Sand,Very dense,Silty	S M												

S # : Sample Number, P P : Pocket Penetrometer Reading, U S C : Unified Soil Classifcation, M c : Moisture Content

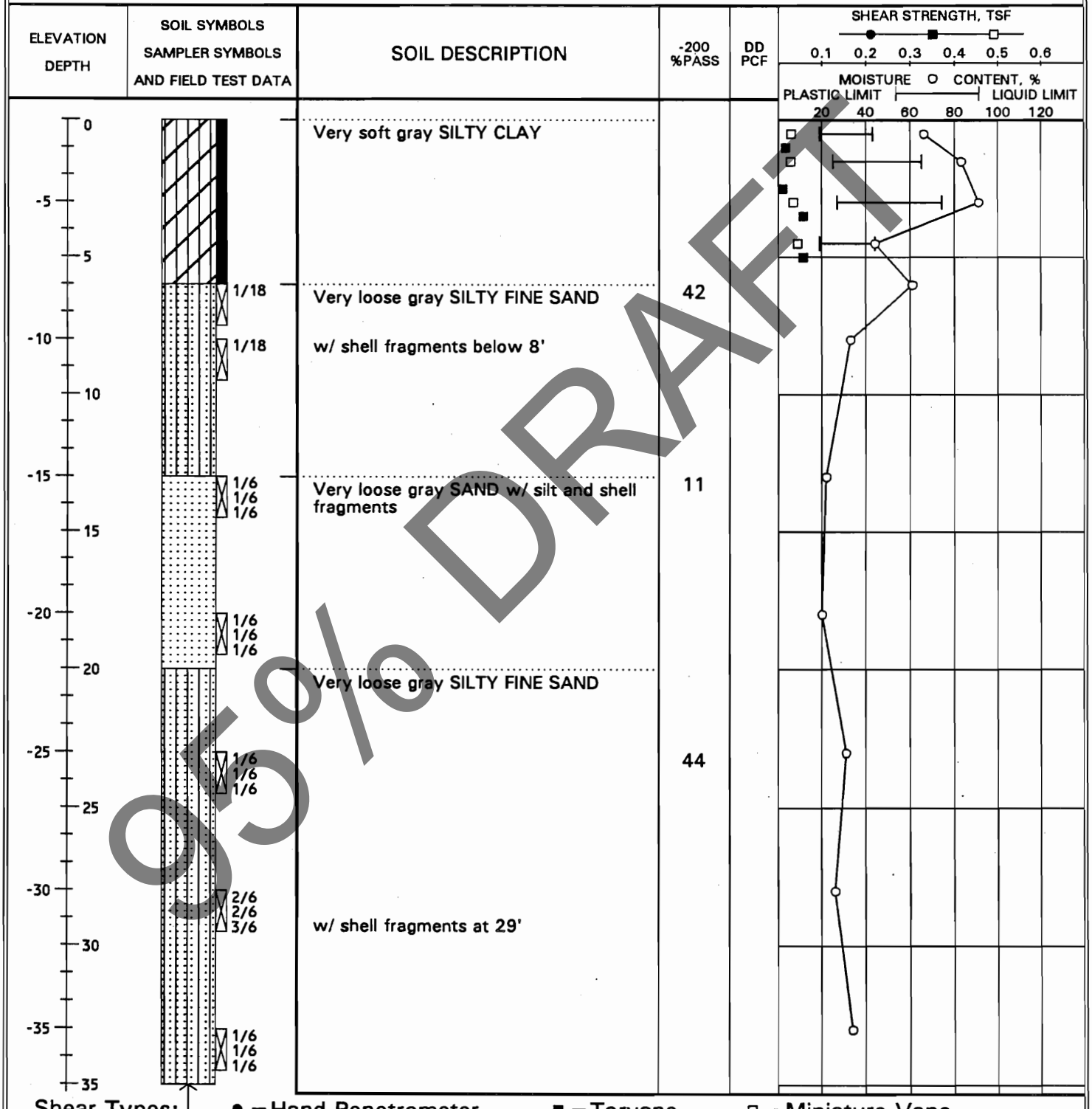
...ive Strength W Q H : Weight of hammer, W O P : Weight of Pipe

95% DRAFT

LOG OF SOIL BORING
Boring No. NA7

Project Name: Marsh Demonstration Project
Date: November 15, 1992
Water Depth: 4 feet
Northing: 682,686 feet

Project No. 92-217G4
Sea Floor Elevation: -2 feet
Time of Measurement: 9:59 AM
Easting: 3,285,638 feet



95% DRAFT

Shear Types: • = Hand Penetrometer ■ = Torvane □ = Miniature Vane

See Plate 2 for boring location.

Plate 9

Appendix C – Coast Chart No. 204 Galveston Bay, Texas

95% DRAFT

PORT HOUSTON
THE INTERNATIONAL PORT OF TEXAS

Turner Collie & Braden Inc.
GAHAGAN & BRYANT ASSOCIATES, INC
5444 WESTHEIMER ROAD, SUITE 400
HOUSTON, TEXAS 77056
TBPE NO. F-10788

Project 11

Houston Ship Channel Expansion Channel Improvement Project

Coast Chart No. 204 Galveston Bay, Texas

95% DRAFT

PORT HOUSTON℠
THE INTERNATIONAL PORT OF TEXAS

December 9, 2020

95% PRELIMINARY

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW AND IS NOT INTENDED TO BE USED FOR CONSTRUCTION, BIDDING, OR PERMITTING PURPOSES.

ENGINEER: ASHLEY P. JUDITH
LICENSE NO: TX# 112988
DATE: DECEMBER 09, 2020

ENGINEER: CHESTER HEDDERMAN
LICENSE NO: TX# 100209
DATE: DECEMBER 09, 2020

Turner Collie & Braden, Inc.
JOINT VENTURE - PORT DEVELOPMENT AND ENVIRONMENTAL SERVICES
Gahagan & Bryant Associates, Inc.

TREASURY DEPARTMENT

COAST CHART No. 204

GALVESTON BAY

TEXAS

Scale 1:80,000

(Polyconic Projection)

Published at Washington, D.C.
January 1916
BY THE U.S. COAST AND GEODETIC SURVEY
O.H. Tittmann, Superintendent

(Date of first publication 1900.)

TIDES

The planes of reference is Mean Daily Low Water	Galveston Bay Entrance	Galveston Bay Entrance Texas City	Christmas Bluff
Tropic High Water (interval)	4h 58m	4h 54m	5h 10m
Tropic Low Water (interval)	5 04 s	5 07 s	5 23 s
Tropic High Water (height)	1.4 ft.	1.2 ft.	0.4 ft.
Tropic Low Water (height)	0.1 -	-0.2 -	0.1 -
Mean Daily High Water (height)	1.1 -	1.1 -	0.4 -
Mean Daily Low Water (height)	0.0 -	0.0 -	0.0 -

Tropic tides occur when the moon is near either tropic, that is, furthest north or south of the equator. The tropic intervals (intervals are marked h m) When marked s the interval is to be added to the time of the moon's upper transit for the place when the moon is in north declination, and to the lower transit for south declination. When marked) for a given declination reverse the (minus) and the s.

Both the times and heights of the tides are greatly modified by the winds, the effects of which are often greater than the mail tide.

The predicted time and height of the tide can be obtained from the TIDE TABLES published annually by the United States Coast and Geodetic Survey.

LIFE SAVING STATIONS

Life Saving Stations are designated thus ⊕ L.S.S.

LIGHTS

(The visibility of Lights is given for an elevation of 15 feet above the level of the sea.)

Name	Latitude	Longitude West from Greenwich	Character	Intensity Int. Flashes	Color of Structure	Height above Ground	Visibility nautical miles	Fog Signal
Bolivar Point	29° 22' 19"	94° 45' 40"	Fixed White		White	117 ft.	16	
Red Fixed	29° 20' 18"	94° 46' 09"	18 Fl. 0	Dark Sec.	White	46 -	12½	
Galveston Shoal	29° 21' 3½	94° 50' 22"	15 Fl. 0	Dark Sec.	Black	52 -		
Red Fish Bar Cut			Fixed White		White	19 -	11½	Bell
Light Vessel Galveston Bar			Fixed Red		Green	45 -	12½	Bell

BUOYS

Red Buoys to be left in entering, on Starboard hand.
Black Buoys to be left, in entering, on Port hand.
Black and Red horizontal stripes...Danger Buoy.
Black and White perpendicular stripes...Channel Buoy.
C. & G. or S. signifies Can, Nun or Spar.

TIDE BALL

A time ball is designed daily (Sundays excepted) from the Levy building, Galveston, at eleven A.M. of the 105th meridian. 5h 21m 00s Greenwich time.

STORM WARNING DISPLAY

Storm warning displays are made by the U.S Weather Bureau at Galveston, cor. of Center and Mechanic Streets.

SOUNDINGS

The soundings are expressed in fathoms except on the dotted sections and inside the Coast line where they are given in feet

ABBREVIATIONS

Materials in Capitals	Colors in Shades (see each letter)	Other Qualities (see each letter)
M - Pre-Shell	bu - blue	brd - hard, broad
S. - Sand		crs - coarse
Sh. - Shells		fn - fine
		stk - stocky

Projection and triangulation executed ..... between 1846 and 1847
Topography executed ..... between 1880 and 1887
Hydrography executed ..... between 1864 and 1906
Astronomical observations ..... in 1846
Magnetic observations ..... between 1846 and 1906
Corrected from surveys by the Corps of Engineers, U.S.A. ..... to Sept. 1907

Statute Miles
Nautical Miles
Kilometers

Lines Dividing the High Seas from Inland Waters

Galveston Harbor ..... (Points outer end of N. Jetty to Bolivar Lighthouse, thence N.W. by W. ½ W. Westerly (mag.) to shore

DRAFT
96 to

from the Image Archives of the Historical Map & Chart Collection
Office of Coast Survey/National Ocean Service/NOAA

Appendix D – NOAA Chart 11327

95% DRAFT

PORT HOUSTON
THE INTERNATIONAL PORT OF TEXAS

Turner Collie & Braden Inc.
GAHAGAN & BRYANT ASSOCIATES, INC
5444 WESTHEIMER ROAD, SUITE 400
HOUSTON, TEXAS 77056
TBPE NO. F-10788

Project 11

Houston Ship Channel Expansion Channel Improvement Project

NOAA Chart 11327

95% DRAFT

PORT HOUSTON℠
THE INTERNATIONAL PORT OF TEXAS

December 9, 2020

95% PRELIMINARY

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW AND IS NOT INTENDED TO BE USED FOR CONSTRUCTION, BIDDING, OR PERMITTING PURPOSES.

ENGINEER: ASHLEY P. JUDITH
LICENSE NO: TX# 112988
DATE: DECEMBER 09, 2020

ENGINEER: CHESTER HEDDERMAN
LICENSE NO: TX# 100209
DATE: DECEMBER 09, 2020

Turner Collie & Braden, Inc.
JOINT VENTURE - PORT DEVELOPMENT AND ENVIRONMENTAL SERVICES
Gahagan & Bryant Associates, Inc.

NOAA encourages users to submit inquiries, discrepancies or comments about this chart at http://www.nauticalcharts.noaa.gov/staff/contact.htm.

SCALE 1:25,000
Nautical Miles 1 ½ 0 1
Yards 1000 500 0 1000 2000
Meters 1000 500 0 1000 2000

Formerly C&GS 519, 1st Ed., Jan 1966 KAPP 88

SOUNDINGS IN FEET

11327

01' 95°00'W 59' 58' 57' 56' 55' 54' 53' 52' 94°50'W 51' 49'

29°40' 39' 38' 37' 36' 35' 34' 33' 32' 31' 30' 29°25'N

CONTINUED ON CHART 11328 (NW) CONTINUED ON CHART 11326 (NE) CONTINUED ON CHART 11326 (E) CONTINUED ON CHART 11326 (SE) JOINS CHART 11324 (S) CONTINUED ON CHART 11326 (SW) CONTINUED ON CHART 11326 (W)

La Porte · Bayridge Park · Bay Shore Park · Sylvan Beach · Little Cedar Bayou · Bayside Terrace · Shoreacres · Red Bluff · El Jardin del Mar · Surf Oaks · Todville · Seabrook · Kemah · Clear C. · Bayview · Clifton Beach · Baycliff · Humble Camp · Galveston County Industrial Water Reservoir · Moses Lake · San Leon · Dickinson Bayou · Camp Allen · Beach City · Marsh · Mesquite Knot · Houston Pt · Fisher Shoals (Shoalins to 1 fect reported 1978) · Dow Reef · Sunkhead Reef · Red Fish Island · Red Fish Island Shoal · Dollar Reef · Dollar Pt · Shell Bank · Red Fish Bar · ATKINSON ISLAND · BEACON '76 TO LOWER END MORGANS POINT CUT · BAYPORT SHIP CHANNEL · SOUTH BOAT CUT · RED FISH LIGHT 1 TO BEACON 76 (TURN) · BOLIVAR ROADS TO RED FISH LIGHT 1 · TRINITY BAY · UPPER GALVESTON BAY · DICKINSON BAY · GALVESTON BAY

Obstructions Gas and Oil Well Structures (see note)

Platforms PA · Platform PA · Pile PA · Piles PA · Subm pile PA · Subm piles PA · Subm pipe PA · Subm platform (ruins) PA · Subm platforms (ruins) PA · Subm dols PA · Dols PA · Pipe PA · Pipes PA · Marker PA · Sign PA · Obstn PA · Well PA · Stake PA · Stakes PA · Subm stake PA · Subm stakes PA · Pile rep PA · Platform rep PA · Subm piles rep PA · Subm pipe rep PA · Platforms rep PA · Masts PA · Ruins PA · Wks PA · Tanks · Tower · Towers · Church · Tank · Water Tower · Radio Tower · Windmill · Boat Barrier · Pipeline Area · Spoil Area · Disposal Area · Foul Area · Anch · Prohibited Anch · Restricted Area · Seaplane Area · Cable Area · Fish Haven (auth min 7 ft) · Oyster Beds, numerous private markers, use caution when transiting this area · Shell Bank · Shoal · Rock · Grs · Marsh · Mangrove · Snag · Wreck · Mast PA · Exposed Pipeline PA · Submerged Pipeline PA · Submerged Cable PA · Submerged Cable Area · Submerged Pipeline Area · Submerged Cable and Pipeline Area · Submerged Pipeline and Cable Area · Submerged Pipeline and Cable PA · Submerged Cable and Pipeline PA · Submerged Pipeline and Cable Area · Submerged Cable and Pipeline Area · Submerged Pipeline and Cable PA · Submerged Cable and Pipeline PA

F RWG 162ft Priv DIRECTIONAL (see note) · Fl R 2.5s 17ft 5M "67" Ra Ref · Fl G 2.5s 17ft 4M "65" Ra Ref · Fl G 6s 17ft 4M "66" Ra Ref · Iso 6s 65ft · Fl R 2.5s 17ft 4M "82" Ra Ref · Fl G 2.5s 17ft 4M "81" Ra Ref · Fl R 4s 17ft 4M "84" · Fl G 4s 17ft 4M "83" · Fl R 4s 17ft 3M "78" · Fl R 2.5s 17ft 4M "76" Ra Ref · Fl R 2.5s 17ft 4M "74" Ra Ref · Fl R 2.5s 17ft 4M "72" Ra Ref · Fl G 2.5s 17ft 4M "71" Ra Ref · Fl R 4s 17ft 3M "74" Ra Ref · Fl G 4s 17ft 3M "73" Ra Ref · Fl R 2.5s 17ft 4M "70" Ra Ref · Fl (2) G 6s 17ft 4M "69" Ra Ref · Fl G 2.5s 17ft 4M "67" Ra Ref · Fl R 2.5s 17ft 3M "68" Ra Ref · Fl R 6s 17ft 4M "66" Ra Ref · Fl G 6s 17ft 4M "65" · Fl R 4s 17ft 4M "64" Ra Ref · Fl G 4s 17ft 3M "63" · Fl R 6s 17ft 4M "62" Ra Ref · Fl G 4s 17ft 4M "61" Ra Ref · Fl R 2.5s 17ft 4M "60" Ra Ref · Fl (2) G 6s 17ft 4M "59" Ra Ref · Fl R 2.5s 17ft 4M "58" Ra Ref · Fl G 2.5s 17ft 4M "57" Ra Ref · Fl R 2.5s 17ft 3M "54" Ra Ref · Fl G 4s 17ft 4M "55" Ra Ref · Fl R 4s 17ft 4M "56" Ra Ref · Fl G 4s 17ft 3M "51" Ra Ref · Fl R 2.5s 17ft 3M "52" Ra Ref · Fl G 2.5s 17ft 3M "53" Ra Ref · Fl R 4s 17ft 3M "50" Ra Ref · Fl G 4s 17ft 4M "49" Ra Ref · Fl R 2.5s 17ft 4M "48" Ra Ref · Fl G 2.5s 17ft 4M "47" Ra Ref · Fl R 6s 17ft 4M "46" Ra Ref · Fl G 6s 17ft 4M "45" Ra Ref · Fl R 4s 17ft 4M "44" Ra Ref · Fl G 4s 17ft 4M "43" Ra Ref · Fl R 2.5s 17ft 3M "42" Ra Ref · Fl G 2.5s 17ft 4M "41" Ra Ref · Fl (2) R 6s 17ft 3M "40" Ra Ref · Fl (2) G 6s 17ft 4M "39" Ra Ref · Fl R 2.5s 17ft 3M "38" Ra Ref · Fl G 2.5s 17ft 4M "37" Ra Ref · Fl G 4s 17ft 4M "35A" Ra Ref · Fl R 6s 17ft 4M "36" Ra Ref · Fl G 6s 17ft 4M "35" Ra Ref · Fl R 2.5s 17ft 4M "34" Ra Ref · Fl G 2.5s 17ft 3M "11" Ra Ref · Fl R 6s 17ft 4M "48" · Fl G 6s 65ft · Fl R 2.5s 10ft Priv · Fl G 2.5s 10ft "11" Priv · Fl G 6s 17ft 4M "85" Ra Ref · Fl R 6s 17ft 4M "86" Ra Ref · Fl R 2.5s 17ft 4M "2" · Fl R 2.5s 17ft 4M "3" · Fl R 2.5s 17ft 4M "4" · Fl R 2.5s 17ft 4M "5" Ra Ref · Fl R 4s 17ft 4M "6" · Fl G 4s 17ft 4M "7" · Fl G 6s 17ft 4M "8" Ra Ref · Fl G 6s 17ft 4M "9" Ra Ref · Fl R 6s 17ft 4M "10" Ra Ref · Fl G 4s 17ft 4M "11" Ra Ref · Fl R 6s 17ft 4M "12" Ra Ref · Fl R 4s 17ft 3M "13" Ra Ref · Fl R 6s 17ft 4M "14" Ra Ref · Fl G 6s 17ft 4M "15" Ra Ref · Fl R 6s 17ft 4M "16" Ra Ref · Fl G 6s 17ft 4M "17" Ra Ref · Fl R 6s 17ft 4M "18" Ra Ref · Fl G 6s 17ft 4M "19" Ra Ref · Fl R 6s 17ft 4M "20" Ra Ref · Fl G 6s 17ft 4M "21" Ra Ref · Fl R 6s 17ft 4M "22" Ra Ref · Fl G 6s 17ft 4M "23" Ra Ref · Fl R 6s 17ft 4M "24" Ra Ref · Fl G 6s 17ft 4M "25" Ra Ref · Fl R 6s 17ft 4M "26" Ra Ref · Fl G 6s 17ft 4M "27" Ra Ref · Fl R 6s 17ft 4M "28" Ra Ref · Fl G 6s 17ft 4M "29" Ra Ref · Fl R 6s 17ft 4M "30" Ra Ref · Fl G 6s 17ft 4M "31" Ra Ref · Fl R 6s 17ft 4M "32" Ra Ref · Fl G 6s 17ft 4M "33" Ra Ref · Fl R 6s 17ft 4M "34" Ra Ref · Fl G 6s 17ft 4M "35" Ra Ref · Fl R 6s 17ft 4M "36" Ra Ref · Fl G 6s 17ft 4M "37" Ra Ref · Fl R 6s 17ft 4M "38" Ra Ref · Fl G 6s 17ft 4M "39" Ra Ref · Fl R 6s 17ft 4M "40" Ra Ref · Fl G 6s 17ft 4M "41" Ra Ref · Fl R 6s 17ft 4M "42" Ra Ref · Fl G 6s 17ft 4M "43" Ra Ref · Fl R 6s 17ft 4M "44" Ra Ref · Fl G 6s 17ft 4M "45" Ra Ref · Fl R 6s 17ft 4M "46" Ra Ref · Fl G 6s 17ft 4M "47" Ra Ref · Fl R 6s 17ft 4M "48" Ra Ref · Fl G 6s 17ft 4M "49" Ra Ref · Fl R 6s 17ft 4M "50" Ra Ref · Fl G 6s 17ft 4M "51" Ra Ref · Fl R 6s 17ft 4M "52" Ra Ref · Fl G 6s 17ft 4M "53" Ra Ref · Fl R 6s 17ft 4M "54" Ra Ref · Fl G 6s 17ft 4M "55" Ra Ref · Fl R 6s 17ft 4M "56" Ra Ref · Fl G 6s 17ft 4M "57" Ra Ref · Fl R 6s 17ft 4M "58" Ra Ref · Fl G 6s 17ft 4M "59" Ra Ref · Fl R 6s 17ft 4M "60" Ra Ref · Fl G 6s 17ft 4M "61" Ra Ref · Fl R 6s 17ft 4M "62" Ra Ref · Fl G 6s 17ft 4M "63" Ra Ref · Fl R 6s 17ft 4M "64" Ra Ref · Fl G 6s 17ft 4M "65" · Fl R 6s 17ft 4M "66" Ra Ref · Fl G 6s 17ft 4M "67" Ra Ref · Fl R 6s 17ft 4M "68" Ra Ref · Fl G 6s 17ft 4M "69" Ra Ref · Fl (2) R 6s 17ft 4M "70" Ra Ref · Fl R 2.5s 17ft 4M "72" Ra Ref · Fl G 2.5s 17ft 4M "71" Ra Ref · Fl R 2.5s 17ft 3M "74" Ra Ref · Fl G 4s 17ft 3M "73" Ra Ref · Fl R 2.5s 17ft 3M "76" Ra Ref · Fl G 2.5s 17ft 4M "75" Ra Ref · Fl R 2.5s 17ft 4M "76" Ra Ref · Fl R 4s 17ft 3M "78" · Fl G 2.5s 17ft 4M "81" Ra Ref · Fl R 2.5s 17ft 4M "82" Ra Ref · Fl R 4s 17ft 4M "84" · Fl G 4s 17ft 4M "83" · Fl G 6s 17ft 4M "85" Ra Ref · Fl R 6s 17ft 4M "86" Ra Ref · Fl G 2.5s 17ft 4M "1" · Fl G 2.5s 17ft 4M "2" · Fl R 2.5s 17ft 4M "3" · Fl R 2.5s 17ft 4M "4" · Fl R 2.5s 17ft 4M "5" Ra Ref · Fl R 4s 17ft 4M "6" · Fl G 4s 17ft 4M "7" · Fl G 6s 17ft 4M "8" Ra Ref · Fl G 6s 17ft 4M "9" Ra Ref · Fl R 6s 17ft 4M "10" Ra Ref · Fl G 6