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20 December 2001

Morris P. Hebert, Inc.
Post Office Box 3106
Houma, Louisiana 70361

Attention Mr. Brian Kendrick

Gentlemen:

Geotechnical Investigation
State of Louisiana
LDNR/CRD Brown Marsh Small Dredge Project
Lafourche Parish, Louisiana
Eustis Engineering Project No. 17149

Transmitted are three (two bound and one unbound) copies of our engineering report covering a geotechnical investigation for the subject project.

Thank you for asking us to perform these services.

Yours very truly,

EUSTIS ENGINEERING COMPANY, INC.

THOMAS H. STREMLAU, P.E.

SRS:ejg/ken

STATE OF LOUISIANA
THOMAS H. STREMLAU
REG. NO. 16248
REGISTERED
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

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GEOTECHNICAL INVESTIGATION

STATE OF LOUISIANA

LDNR/CRD BROWN MARSH SMALL DREDGE PROJECT

LAFOURCHE PARISH, LOUISIANA

EUSTIS ENGINEERING PROJECT NO. 17149

FOR
MORRIS P. HEBERT, INC.
HOUMA, LOUISIANA

By
Eustis Engineering Company, Inc.
Metairie, Louisiana

20 DECEMBER 2001

GEOTECHNICAL INVESTIGATION

STATE OF LOUISIANA

LDNR/CRD BROWN MARSH SMALL DREDGE PROJECT

LAFOURCHE PARISH, LOUISIANA

EUSTIS ENGINEERING PROJECT NO. 17149

INTRODUCTION

1. This report contains the results of a geotechnical investigation performed for the LDNR/CRD Brown Marsh Small Dredge Project in Lafourche, Louisiana. The investigation was performed in general accordance with Eustis Engineering Company, Inc.'s proposal dated 25 April 2001 and our revised proposal dated 4 October 2001. The work was performed for Morris P. Hebert, Inc., at the request of Mr. Brian Kendrick.

2. This report has been prepared in accordance with generally accepted geotechnical engineering practice for the exclusive use of Morris P. Hebert for specific application to the subject site. In the event of any changes in the nature, design, or location of the proposed dredging, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report are modified and verified in writing. Should these data be used by anyone other than Morris P. Hebert, they should contact Eustis Engineering for interpretation of data and to secure other information which may be pertinent to this project.

3. The analyses and recommendations contained in this report are based in part on data obtained from the soil borings. The nature and extent of variations in subsoil conditions between and away from the boring locations may not become evident

until construction. If variations then appear, it will be necessary to reevaluate the recommendations contained in this report.

4. Recommendations and conclusions contained in this report are to some degree subjective and should be used for design purposes only. This report should not be included in the contract plans and specifications. However, the results of the soil borings and laboratory tests contained in the Appendix of this report may be included in the plans and specifications.

SCOPE

5. The scope of this geotechnical investigation included the drilling of undisturbed soil test borings and performance of soil mechanics laboratory tests on samples obtained from the borings. Our scope also included preparation of an engineering report. This report includes a boring location plan, individual boring logs, a summary of the laboratory test data, a discussion of the subsoil conditions, and an estimate of the amount of shrinkage due to dewatering of the dredged material.

SOIL BORINGS

6. Fifteen undisturbed soil test borings were drilled during the period of 22 through 25 October 2001 at the locations shown on Figure 1. The borings were located in the field by a representative of Morris P. Hebert.

7. The marsh borings, Borings 9 through 16, were each drilled to a depth of 10 feet below the existing ground surface, and the water borings, Borings 1 through 7, were each drilled to a depth of 15 feet below the mudline. Another water boring was to be drilled in the northern portion of the project in Bayou Lafourche, but was omitted at the direction of Morris P. Hebert. A generalized subsoil profile is shown on Figure

2, and detailed descriptive logs of the borings are shown in both tabular and graphical form in the Appendix.

8. The borings were made using hand equipment consisting of a 2-in. diameter piston sampler or 3-in. diameter Shelby tubes pushed by hand. Undisturbed samples of the subsoils were obtained at close intervals or changes in strata using the described samplers. The samples were immediately extruded from the sampling barrel, inspected, and visually classified by Eustis Engineering's soil technician. Representative samples were placed in moisture proof containers and sealed for preservation.

LABORATORY TESTS

9. Soil mechanics laboratory tests consisting of natural water content, unit weight, and unconfined compression shear (UC) were performed on undisturbed samples obtained from the borings. In addition, Atterberg liquid and plastic limits were performed on selected representative samples to aid in classification of the subsoils and to give an indication of their relative compressibility. The test establishing the percent passing a No. 200 sieve was also performed on selected cohesionless soils to aid in their classification. The results of the laboratory tests are tabulated on the boring logs.

10. Grain size analyses were performed on representative samples of cohesionless soils to determine their particle distribution (PD) curve. The results of these analyses are shown on separate sheets in the Appendix following the boring logs.

11. In addition, organic content tests were performed on selected samples obtained from the borings. The results of these tests are used to determine the amount of organic matter in the samples. The results of the organic content tests are shown on the boring logs.

DESCRIPTION OF SUBSOIL CONDITIONS

Stratigraphy

12. Water Borings. Approximately 3.5 to 7.5 feet of water was encountered at the boring locations in the bayou. Reference to the logs of Borings 1 through 7 shows the soils in these areas are predominantly very soft to medium stiff gray clay (CH) and silty clay (CL) soils for the entire boring depths of 15 feet below the mudline. These deposits are interspersed by layers of very loose to loose gray clayey sand (SC), very soft to medium stiff gray sandy clay (CL), and loose gray sandy silt (ML) which occur in most of the water borings.

13. Marsh Borings. Reference to the logs of Borings 9 through 13 and 16 shows that the near surface soils in these areas are comprised of organic material. These soils consist mainly of very soft to soft gray and brown clay (CH), organic clay (OH), and humus (Pt) from the ground surface to depths ranging from 2 to 6 feet. Beneath these predominantly organic deposits and beginning at the ground surface in the remaining borings, the marsh borings encountered very soft to medium stiff gray clay (CH) and silty clay (CL). These deposits are interspersed in Borings 9, 10, and 13 by layers of very loose to loose gray silty sand (SM) and sand (SP) and soft gray sandy clay (CL).

Ground Water

14. The borings for this project were drilled in either standing water or in the marsh, where the water is at the ground surface. The area is subject to tidal variations that may be a hydraulic consideration in your design.

ENGINEERING ANALYSES

Consolidation and Shrinkage of Dredge Material

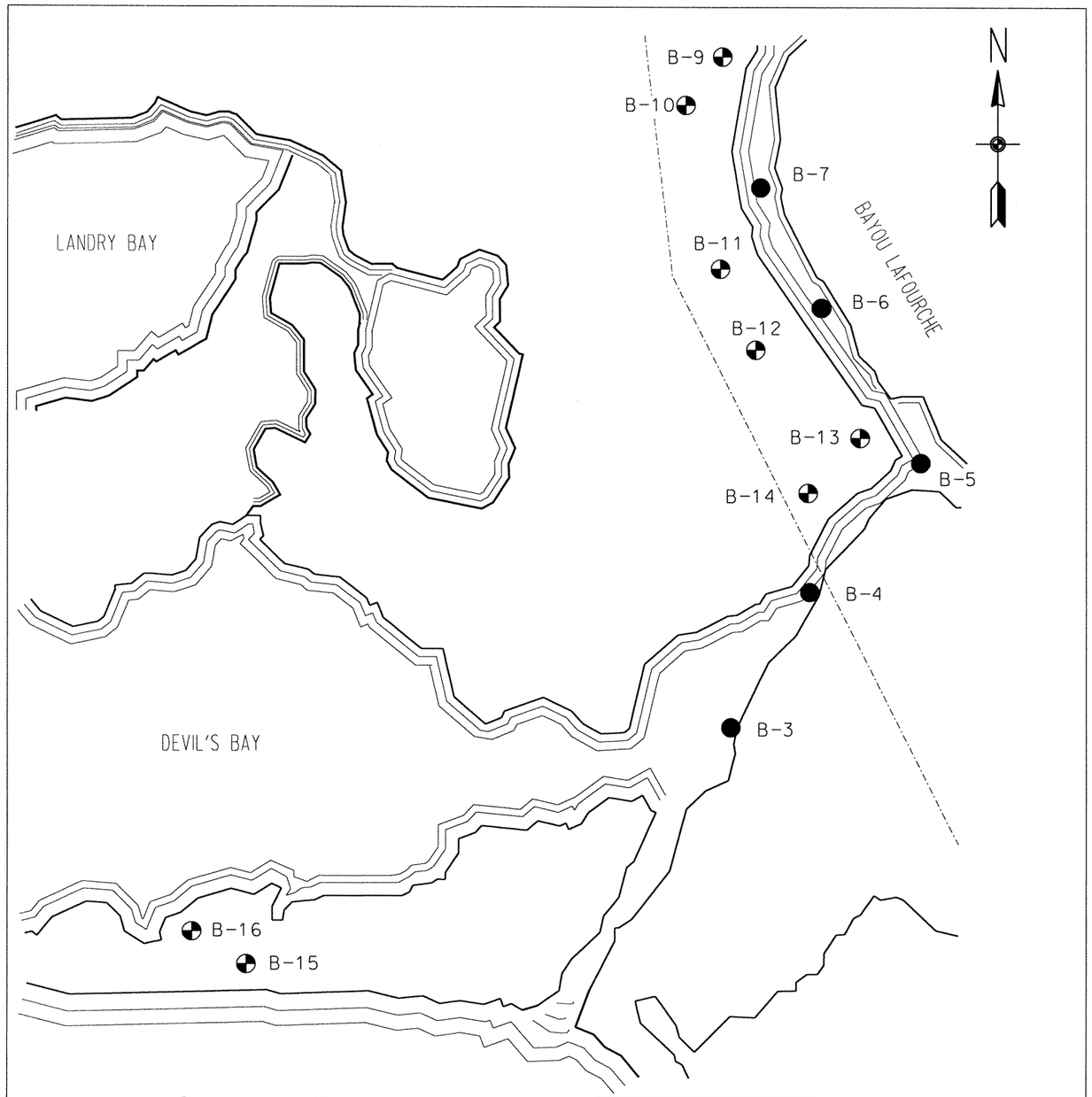
15. It is our understanding that up to 12 inches of material dredged from the canal may be placed in the areas of the marsh borings. We estimate consolidation settlement of foundation soils to vary between 4 and 6 inches.

16. Due to the organic nature of the soils, materials dredged from the canal will also experience settlement in the form of shrinkage due to dewatering of the materials above the water surface. We have also assumed the proposed dredging will be no deeper than 10 feet below the mudline. Atterberg limits and moisture content tests conducted on samples obtained above the 10-ft depth were used for our evaluation. On the basis of these assumptions, we have estimated the shrinkage that may occur subsequent to placement of the dredged material.

17. Our shrinkage estimates are generally based on the guidelines contained in U.S. Army Corps of Engineers' publication EM1110-2-5027, dated 30 September 1987. Based on our analyses, we estimate approximately 5 to 7 inches of settlement will occur as a result of shrinkage. This estimate assumes static conditions and 12 inches of dredged material will remain unsubmerged when placed on the marsh. Ongoing consolidation and submergence will reduce the value given above and that value should be considered an "upper bound" estimate. Our evaluation of shrinkage and settlement indicates dredge materials placed on the bank will subside essentially to existing marsh level.

Other Considerations

18. Eustis Engineering has not performed slope stability analyses to evaluate placement of materials within the proximity of the bank. Eustis Engineering is available to perform slope stability analyses should you require them.



DENOTES LAND BORINGS

DENOTES WATER BORINGS

BORINGS DRILLED: 22 THROUGH 25 OCTOBER 2001

NOT TO SCALE

EUSTIS ENGINEERING COMPANY, INC.

GEOTECHNICAL ENGINEERS

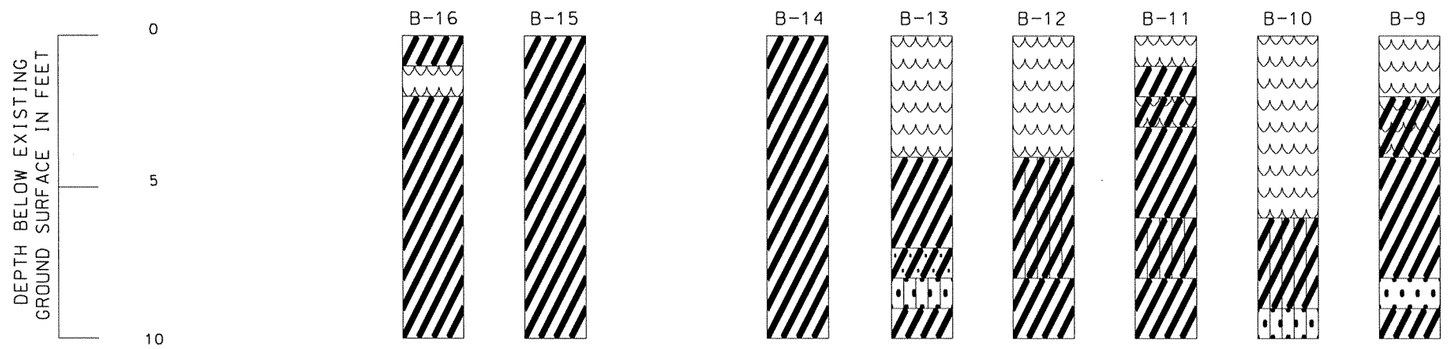
3011 28TH STREET METAIRIE, LOUISIANA

LOCATION OF BORINGS

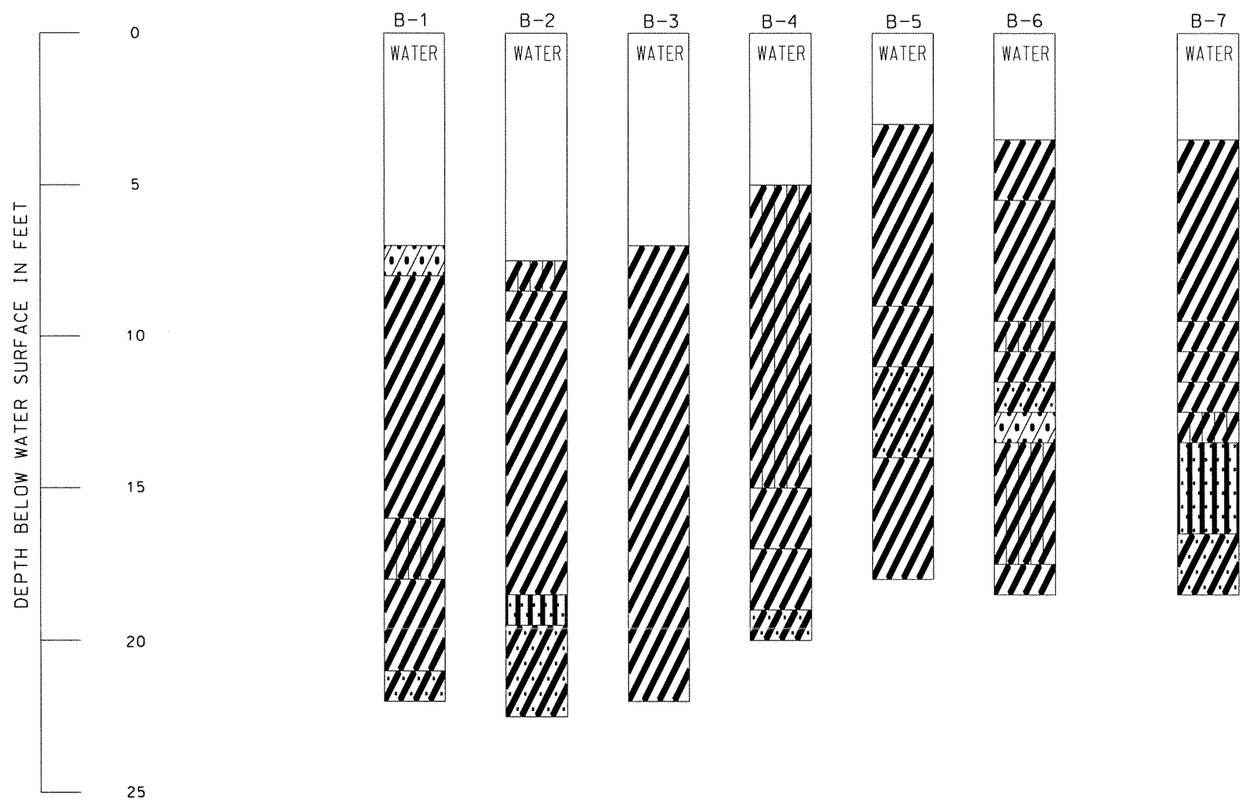
STATE OF LOUISIANA
LDNR/CRD BROWN MARSH
SMALL DREDGE PROJECT
LAFOURCHE, LOUISIANA

DRAWN BY: D. LAFONT	PLOT DATE: 7 NOV. 2001	CADD FILE: FIGURE 1.DGN
CHECKED BY: S.R.S.	JOB NO. 17149	FIGURE 1

MARSH BORINGS



WATER BORINGS



NOTES: 1) A LEGEND OF THE SYMBOLS USED ON THIS FIGURE IS INCLUDED AS A SEPERATE SHEET IN THE APPENDIX.
2) MORE DETAILED DESCRIPTIONS OF THE BORINGS ARE PROVIDED ON THE BORING LOGS IN THE APPENDIX.

EUSTIS ENGINEERING COMPANY, INC.
GEOTECHNICAL ENGINEERS
3011 28TH STREET METAIRIE, LOUISIANA

SUBSOIL PROFILE

STATE OF LOUISIANA
LDNR/CRD BROWN MARSH
SMALL DRAINAGE PROJECT
LAFOURCHE PARISH, LOUISIANA

DRAWN BY: D. LAFONT	PLOT DATE: 10 DEC. 01	CADD FILE: FIGURE 2.DGN
CHECKED BY: S. SIMON	JOB NO.: 17149	FIGURE 2

APPENDIX

LEGEND AND NOTES FOR LOG OF BORING AND TEST RESULTS

PP	Pocket penetrometer resistance in tons per square foot
TV	Torvane shear strength in tons per square foot
SPT	Standard Penetration Test. Number of blows of a 140-lb. hammer dropped 30 inches required to drive 2-in O.D., 1.4-in. I.D. sampler a distance of one foot into the soil, after first seating it 6 inches
SPLR	Type of Sampling — Shelby, SPT, Auger, No Sample
SYMBOL	Clay, Silt, Sand, Humus — Predominant type shown heavy; Modifying type shown light
DENSITY	Unit weight in pounds per cubic foot
USC	Unified Soil Classification
TYPE	UC — Unconfined compression shear
	OB — Unconsolidated undrained triaxial compression shear on one specimen confined at the approximate overburden pressure
	UU — Unconsolidated undrained triaxial compression shear
	CU — Consolidated undrained triaxial compression shear
	DS — Direct shear
	CON — Consolidation
	PD — Particle size distribution
	k — Coefficient of permeability in centimeters per second
	SP — Swelling pressure in pounds per square foot
ϕ	Angle of internal friction in degrees
c	Cohesion in pounds per square foot

Other laboratory test results reported on separate figure

Ground Water Measurements — Initial — Final

GENERAL NOTES

(1) At the time the borings were made, ground water levels were measured below existing ground surface. These observations are shown on the boring logs. However, ground water levels may vary due to seasonal and other factors. If important to construction, the depth to ground water should be determined by those persons responsible for construction, immediately prior to beginning work.

(2) While the individual logs of borings are considered to be representative of subsurface conditions at their respective locations on the dates shown, it is not warranted that they are representative of subsurface conditions at other locations and times.

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

STATE OF LOUISIANA
LDNR/CRD BROWN MARSH SMALL DREDGE PROJECT
LAFOURCHE PARISH, LOUISIANA

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 17149 **Date Drilled:** 10/24/01 **Boring:** 1

Refer to "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
0					Loose dark gray clayey sand	SC	1	0-1	42						40	28	12		
					Very soft gray clay w/organic matter pockets, silty sand lenses, clayey sand layers, shell fragments, & roots	CH	2	1-2	73										ORG CONTENT = 7.21%
					w/silt pockets		3	2-3	66	60	100	UC	--	30	58	20	38		
							4	3-4											
5					w/sand pockets		5	4-5											
							6	5-6											
							7	6-7											
							8	7-8											
							9	8-9											
10					Very soft gray silty clay	CL	10	9-10	46						48	21	27		
							11	10-11											
					Medium stiff gray clay w/sand pockets	CH	12	11-12											
							13	12-13											
							14	13-14											
15					Medium stiff gray sandy clay	CL	15	14-15											
20																			
25																			

Comments: Water Depth = 7 Feet

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

STATE OF LOUISIANA
LDNR/CRD BROWN MARSH SMALL DREDGE PROJECT
LAFOURCHE PARISH, LOUISIANA

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 17149 **Date Drilled:** 10/24/01 **Boring:** 2

Refer to "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
0					Soft gray silty clay	CL	1	0-1	71						70	24	46		
					Very soft gray clay w/silt pockets	CH	2	1-2	70	58	99	UC	--	50					
							3	2-3											
							4	3-4											
5							5	4-5											
							6	5-6											
							7	6-7	72	57	97	UC	--	65	68	22	46		
							8	7-8											
							9	8-9											
10							10	9-10											
							11	10-11											
					Loose gray sandy silt	ML	12	11-12											PD
					Soft gray sandy clay w/sand layers	CL	13	12-13											-#200 = 84.6
							14	13-14											
15							15	14-15											
20																			
25																			

Comments: Water Depth = 7.5 Feet

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

STATE OF LOUISIANA
LDNR/CRD BROWN MARSH SMALL DREDGE PROJECT
LAFOURCHE PARISH, LOUISIANA

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 17149 **Date Drilled:** 10/24/01 **Boring:** 3

Refer to "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
0					Very soft gray clay	CH	1	0-1											
							2	1-2											
					w/silt pockets & lenses		3	2-3	94	48	93	UC	--	15	93	25	68		
							4	3-4											
5							5	4-5	94										
					w/silty clay layers		6	5-6											
							7	6-7											
					w/silty sand pockets & lenses		8	7-8	72	57	97	UC	--	95	70	22	48		
							9	8-9											
10							10	9-10											
							11	10-11											
							12	11-12											
							13	12-13											
							14	13-14											
					w/sand layers		15	14-15											
15																			
20																			
25																			

Comments: Water Depth = 7 Feet

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

STATE OF LOUISIANA
LDNR/CRD BROWN MARSH SMALL DREDGE PROJECT
LAFOURCHE PARISH, LOUISIANA

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 17149 **Date Drilled:** 10/25/01 **Boring:** 4 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
0					Very soft gray silty clay w/organic matter & silt lenses	CL	1	0-1	42										ORG CONTENT = 5.42%
							2	1-2											
							3	2-3	43						38	20	18		
							4	3-4											
							5	4-5											
5							6	5-6	38						40	21	19		
							7	6-7											
							8	7-8											
							9	8-9											
							10	9-10											
10					Soft gray clay	CH	11	10-11											
							12	11-12											
					Medium stiff gray clay w/sand layers	CH	13	12-13											
							14	13-14											
					Soft gray sandy clay w/sand layers	CL	15	14-15											
15																			
20																			
25																			

Comments: Water Depth = 5 Feet

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

STATE OF LOUISIANA
LDNR/CRD BROWN MARSH SMALL DREDGE PROJECT
LAFOURCHE PARISH, LOUISIANA

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 17149 **Date Drilled:** 10/25/01 **Boring:** 5

Refer to "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
0					Soft gray clay w/organic matter	CH	1	0-1											
					w/silt pockets		2	1-2	59	63	101	UC	--	155	74	24	50		
							3	2-3											
							4	3-4											
5					w/wood, silt pockets, concretions, & organic matter		5	4-5	73						93	26	67		
							6	5-6											
					Very soft gray clay w/silty sand lenses & pockets	CH	7	6-7	61	63	101	UC	--	105	66	20	46		
							8	7-8											
					Very soft gray sandy clay w/sand layers	CL	9	8-9	43										-200 = 64.3%
10							10	9-10											
							11	10-11											
					Soft gray clay w/clayey sand lenses	CH	12	11-12											
							13	12-13											
							14	13-14											
15							15	14-15											
20																			
25																			

Comments: Water Depth = 3 Feet

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

STATE OF LOUISIANA
LDNR/CRD BROWN MARSH SMALL DREDGE PROJECT
LAFOURCHE PARISH, LOUISIANA

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 17149 **Date Drilled:** 10/25/01 **Boring:** 6 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
0					Medium stiff gray clay w/organic matter & silt pockets	CH	1	0-1	80										ORG CONTENT = 7.95%
							2	1-2											
					Very soft gray clay w/silt pockets, organic matter, & wood w/sand layers	CH	3	2-3	110	41	87	UC	--	45	118	27	91		
							4	3-4											
							5	4-5											
5					Medium stiff gray silty clay	CL	6	5-6	41						46	19	27		
					Soft gray clay	CH	7	6-7											
					Soft gray sandy clay w/sand layers	CL	8	7-8	42						27	17	10		
					Soft gray clay w/sand layers	CH	9	8-9											
					Very loose gray clayey sand	SC	10	9-10											SIEVE
10					Soft gray silty clay w/silty sand lenses	CL	11	10-11											
							12	11-12	67										
							13	12-13											
							14	13-14											
					Medium stiff gray clay w/sand pockets	CH	15	14-15											
15																			
20																			
25																			

Comments: Water Depth = 3.5 Feet

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

STATE OF LOUISIANA
LDNR/CRD BROWN MARSH SMALL DREDGE PROJECT
LAFOURCHE PARISH, LOUISIANA

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 17149 **Date Drilled:** 10/25/01 **Boring:** 7

Refer to "Legends & Notes"

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
0					Soft gray clay	CH	1	0-1	67	57	95	UC	--	80	89	24	65		
							2	1-2											
							3	2-3											
					w/wood		4	3-4											
5					w/silt pockets & organic matter		5	4-5	102	44	89	UC	--	120	114	28	86		
							6	5-6											
					Medium stiff gray clay w/organic matter & silt pockets	CH	7	6-7	116										ORG CONTENT = 11.53%
					Very soft gray clay w/silt pockets, organic matter, & wood	CH	8	7-8	97	45	89	UC	--	75	77	28	49		
					Soft gray clay w/sand layers	CH	9	8-9											
10					Soft gray silty clay w/alternating sandy silt lenses & clay layers	CL	10	9-10	41										-200 = 98.6%
					Loose gray sandy silt	ML	11	10-11											
							12	11-12											SIEVE
							13	12-13											
					Soft gray sandy clay w/sand lenses	CL	14	13-14											
15							15	14-15											
20																			
25																			

Comments: Water Depth = 3.5 Feet

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

STATE OF LOUISIANA
LDNR/CRD BROWN MARSH SMALL DREDGE PROJECT
LAFOURCHE PARISH, LOUISIANA

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 17149 **Date Drilled:** 10/23/01 **Boring:** 9 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
0					Very soft gray & brown humus w/clay layers	Pt	1	0-1	243										
					w/organic clay layers		2	1-2	270	19	71	UC	--	55	263	43	220		ORGANIC CONTENT = 12.0
					Very soft gray organic clay w/humus	OH	3	2-3											
							4	3-4	123	39	87	UC	--	15	112	28	84		
5					Soft gray clay	CH	5	4-5											
							6	5-6											
							7	6-7											
							8	7-8											
					Very loose gray fine sand w/silt	SP-SM	9	8-9											PD
10					Soft gray clay w/sand layers	CH	10	9-10											
15																			
20																			
25																			

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

STATE OF LOUISIANA
LDNR/CRD BROWN MARSH SMALL DREDGE PROJECT
LAFOURCHE PARISH, LOUISIANA

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 17149 **Date Drilled:** 10/23/01 **Boring:** 10 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
0					Very soft brown humus	Pt	1	0-1	724										
							2	1-2	729										
							3	2-3	609										ORGANIC CONTENT = 52.3
							4	3-4	261										
							5	4-5											
5							6	5-6	261	20	70	UC	--	20	279	53	226		
					Very soft gray silty clay w/clayey sand layers	CL	7	6-7											
							8	7-8											
							9	8-9											
					Very loose gray silty sand	SM	10	9-10											PD
10																			
15																			
20																			
25																			

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

STATE OF LOUISIANA
LDNR/CRD BROWN MARSH SMALL DREDGE PROJECT
LAFOURCHE PARISH, LOUISIANA

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 17149 **Date Drilled:** 10/23/01 **Boring:** 11 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
0					Soft brown humus w/organic clay layers	Pt	1	0-1	296										ORGANIC CONTENT = 10.8
					Soft brown clay	CH	2	1-2											
					Soft gray organic clay	OH	3	2-3	170										
					Very soft gray clay	CH	4	3-4											
					w/silt pockets & organic matter		5	4-5	104	44	90	UC	--	25	106	22	84		
5					w/organic matter		6	5-6											
					Soft gray silty clay w/organic matter	CL	7	6-7	52										
					w/sand lenses		8	7-8											
					Medium stiff gray clay w/sand lenses	CH	9	8-9											
							10	9-10											
10																			
15																			
20																			
25																			

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

STATE OF LOUISIANA
LDNR/CRD BROWN MARSH SMALL DREDGE PROJECT
LAFOURCHE PARISH, LOUISIANA

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 17149 **Date Drilled:** 10/23/01 **Boring:** 12 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
0					Very soft brown humus	Pt	1	0-1	933										
							2	1-2	326										ORGANIC CONTENT = 29.0
							3	2-3	353						330	72	258		
							4	3-4	357										
					Soft gray silty clay w/sand pockets w/sand layers	CL	5	4-5											
5							6	5-6											
							7	6-7											
							8	7-8											
					Medium stiff gray clay w/sand layers	CH	9	8-9											
							10	9-10											
10																			
15																			
20																			
25																			

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

STATE OF LOUISIANA
LDNR/CRD BROWN MARSH SMALL DREDGE PROJECT
LAFOURCHE PARISH, LOUISIANA

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 17149 **Date Drilled:** 10/23/01 **Boring:** 13 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
0					Very soft brown humus	Pt	1	0-1	763										
							2	1-2	265	18	70	UC	--	35					
							3	2-3	206	25	75	UC	--	30					ORGANIC CONTENT = 28.3
							4	3-4	601										
					Very soft gray clay w/silty sand lenses & organic matter	CH	5	4-5	80	53	96	UC	--	40	64	20	44		
5							6	5-6											
					w/clayey sand layers		7	6-7											
					Soft gray sandy clay w/sand layers	CL	8	7-8											
					Loose gray silty sand	SM	9	8-9											PD
					Medium stiff gray clay w/sand layers	CH	10	9-10											
10																			
15																			
20																			
25																			

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

STATE OF LOUISIANA
LDNR/CRD BROWN MARSH SMALL DREDGE PROJECT
LAFOURCHE PARISH, LOUISIANA

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 17149 **Date Drilled:** 10/23/01 **Boring:** 14 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
0					Very soft gray clay w/organic matter, roots, & silt pockets	CH	1	0-1	115										
					w/organic matter		2	1-2	110	41	86	UC	--	50	126	33	93		
					w/clayey silt lenses		3	2-3											
					w/organic matter		4	3-4	117	39	85	UC	--	75					
							5	4-5											
5					w/silt pockets & lenses & organic matter		6	5-6	71										
					w/sand lenses		7	6-7											
					w/sandy silt pockets & lenses		8	7-8	78	55	97	UC	--	70					
					w/sand lenses		9	8-9											
10							10	9-10											
15																			
20																			
25																			

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

STATE OF LOUISIANA
LDNR/CRD BROWN MARSH SMALL DREDGE PROJECT
LAFOURCHE PARISH, LOUISIANA

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 17149 **Date Drilled:** 10/22/01 **Boring:** 15 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
0					Soft gray clay w/roots, silt pockets, & organic matter	CH	1	0-1	96										
							2	1-2											
					w/silt pockets, concretions, & roots		3	2-3	49	71	106	UC	--	200	67	21	46		
							4	3-4											
							5	4-5											
5					w/silt pockets, concretions, & trace of organic matter		6	5-6	51	69	104	UC	--	140	67	22	45		
							7	6-7											
							8	7-8											
							9	8-9											
10							10	9-10											
15																			
20																			
25																			

Comments:

EUSTIS ENGINEERING COMPANY, INC.

LOG OF BORING AND TEST RESULTS

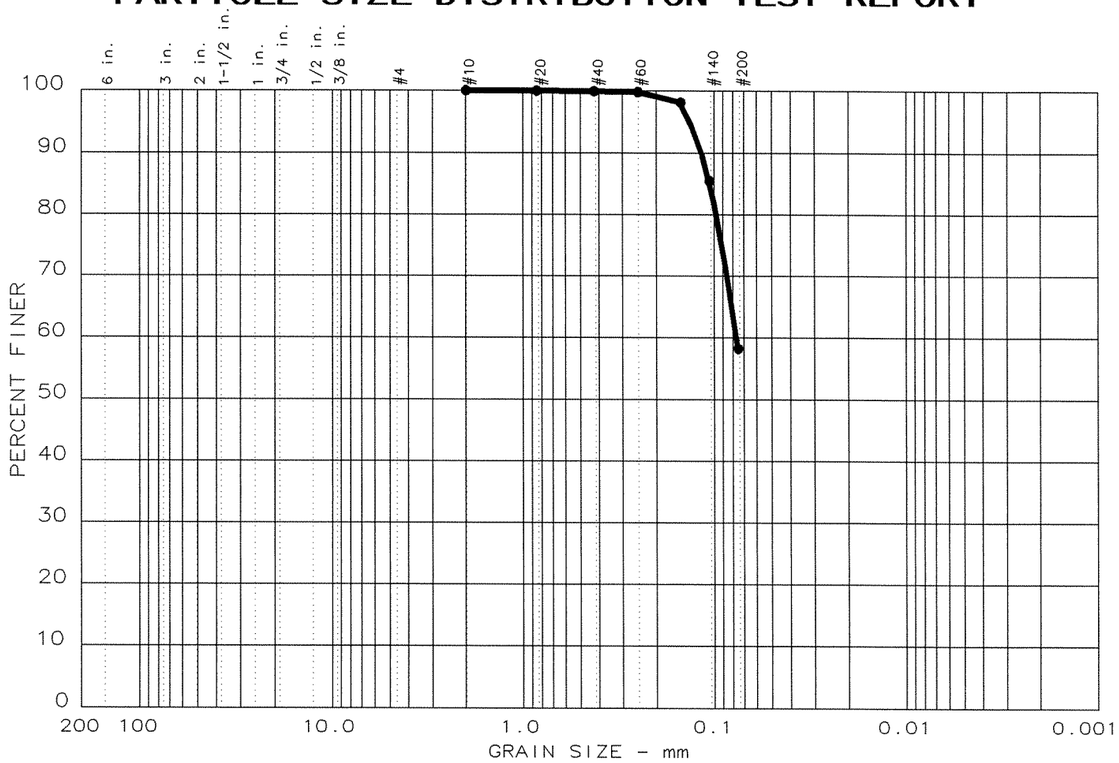
STATE OF LOUISIANA
LDNR/CRD BROWN MARSH SMALL DREDGE PROJECT
LAFOURCHE PARISH, LOUISIANA

Ground Elev.: **Datum:** **Gr. Water Depth:** See Text **Job No.:** 17149 **Date Drilled:** 10/22/01 **Boring:** 16 **Refer to "Legends & Notes"**

Scale In Feet	PP	SPT	SPLR	Symbol	Visual Classification	USC	Sample Number	Depth In Feet	Water Content Percent	Density Dry	Density Wet	Shear Tests Type	Shear Tests ø	Shear Tests C	Atterberg Limits LL	Atterberg Limits PL	Atterberg Limits PI		Other Tests
0					Soft gray clay w/wood, roots, humus, & silt pockets	CH	1	0-1	66						64	18	46		
					Very soft brown humus w/clay layers	Pt	2	1-2	260										ORGANIC CONTENT = 12.8
					Soft gray clay	CH	3	2-3											
							4	3-4	56	66	103	UC	--	195	66	22	44		
5							5	4-5											
							6	5-6											
							7	6-7											
							8	7-8											
					w/silt lenses & silty sand lenses		9	8-9	65	60	99	UC	--	110					
10					w/sand layers		10	9-10											
15																			
20																			
25																			

Comments:

PARTICLE SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
●	4	0.0	0.0	41.7	58.3		ML		

SIEVE inches size	PERCENT FINER ●		
	GRAIN SIZE		
D_{60}	0.08		
D_{30}			
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ●		
10	100.0		
20	100.0		
40	99.9		
60	99.8		
100	98.1		
140	85.5		
200	58.3		

Sample information:
● Boring 2,Sample 12
Loose gray SANDY SILT

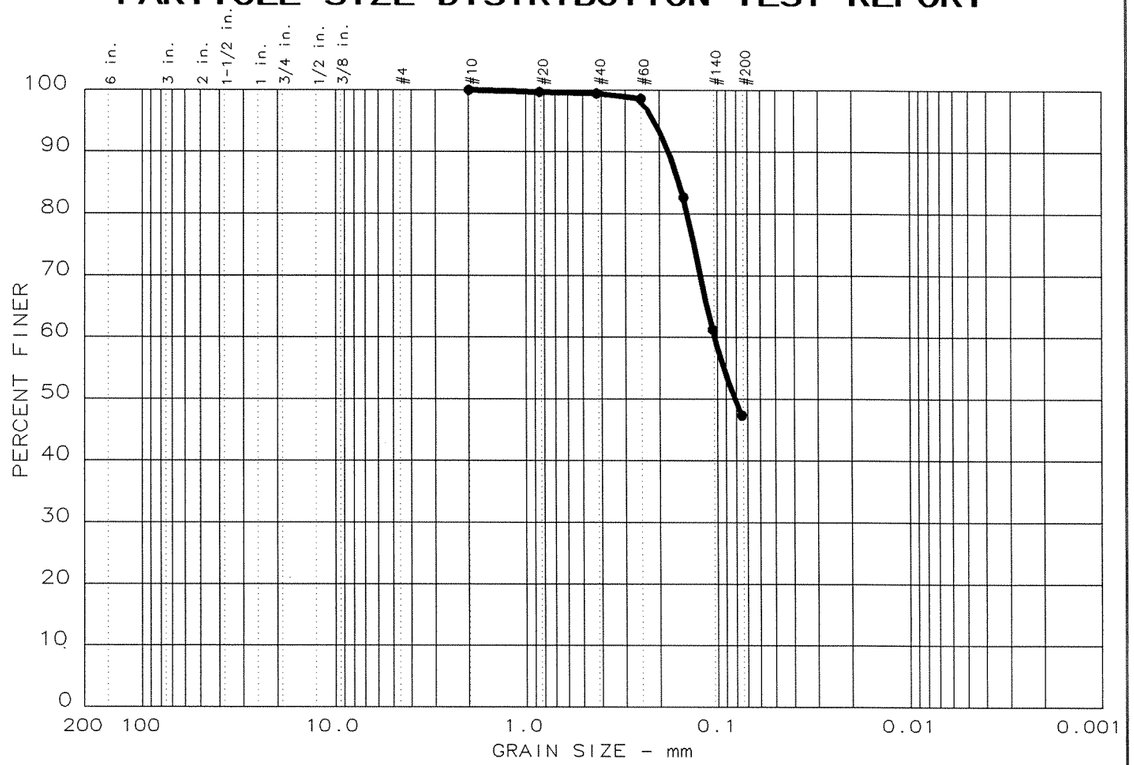
Remarks:
Sample depth 11.0'-12.0'

Eustis Engineering Company, Inc.

Project No.: 17149
Project: Brown Marsh

Date: 11-12-01 Data Sheet No. ——

PARTICLE SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
●	5	0.0	0.0	52.7	47.3		SC		

SIEVE inches size	PERCENT FINER ●		
GRAIN SIZE			
D_{60}	0.10		
D_{30}			
D_{10}			
COEFFICIENTS			
C_c			
C_u			

SIEVE number size	PERCENT FINER ●		
10	100.0		
20	99.7		
40	99.4		
60	98.6		
100	82.7		
140	61.3		
200	47.3		

Sample information:

● Boring 6, Sample 10
Very Loose gray CLAYEY SAND

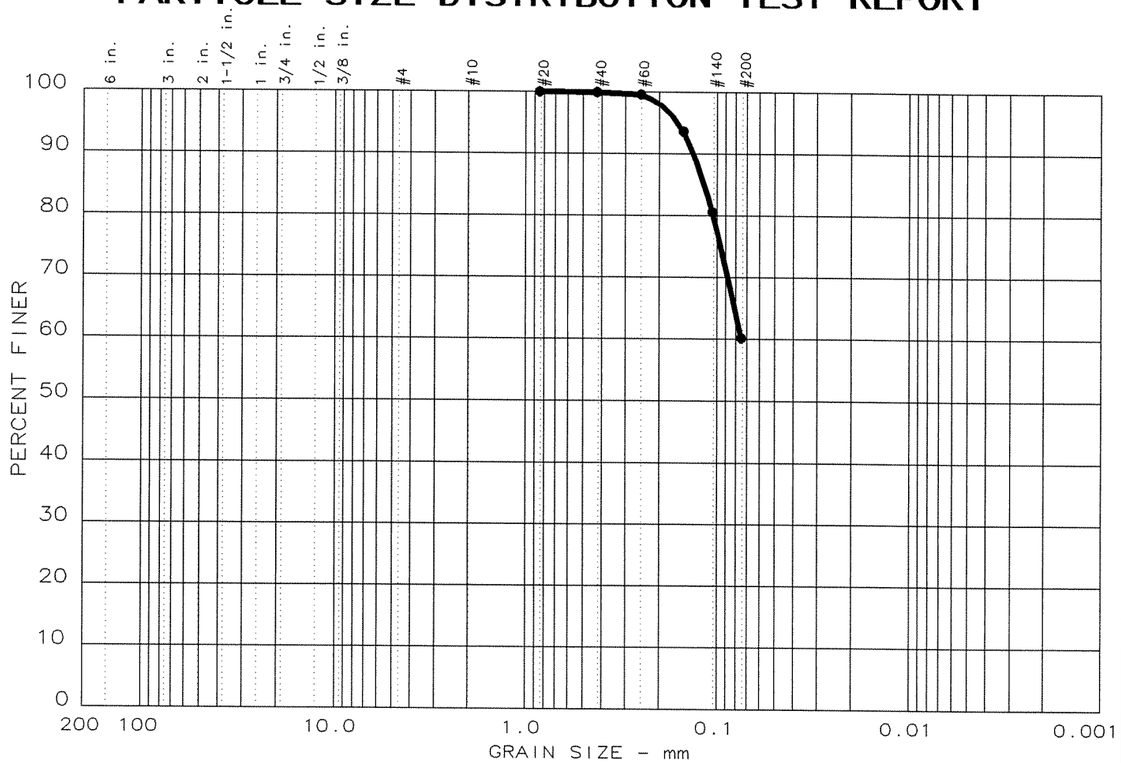
Remarks:
Sample depth 9.0'-10.0'

Eustis Engineering Company, Inc.

Project No.: 17149
Project: Brown Marsh

Date: 11-12-01 Data Sheet No. ——

PARTICLE SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
●	6	0.0	0.0	39.8	60.2		ML		

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

SIEVE number size	PERCENT FINER ●		
20	100.0		
40	99.9		
60	99.6		
100	93.6		
140	80.6		
200	60.2		

Sample information:

● Boring 7, Sample 12
Loose gray SANDY SILT

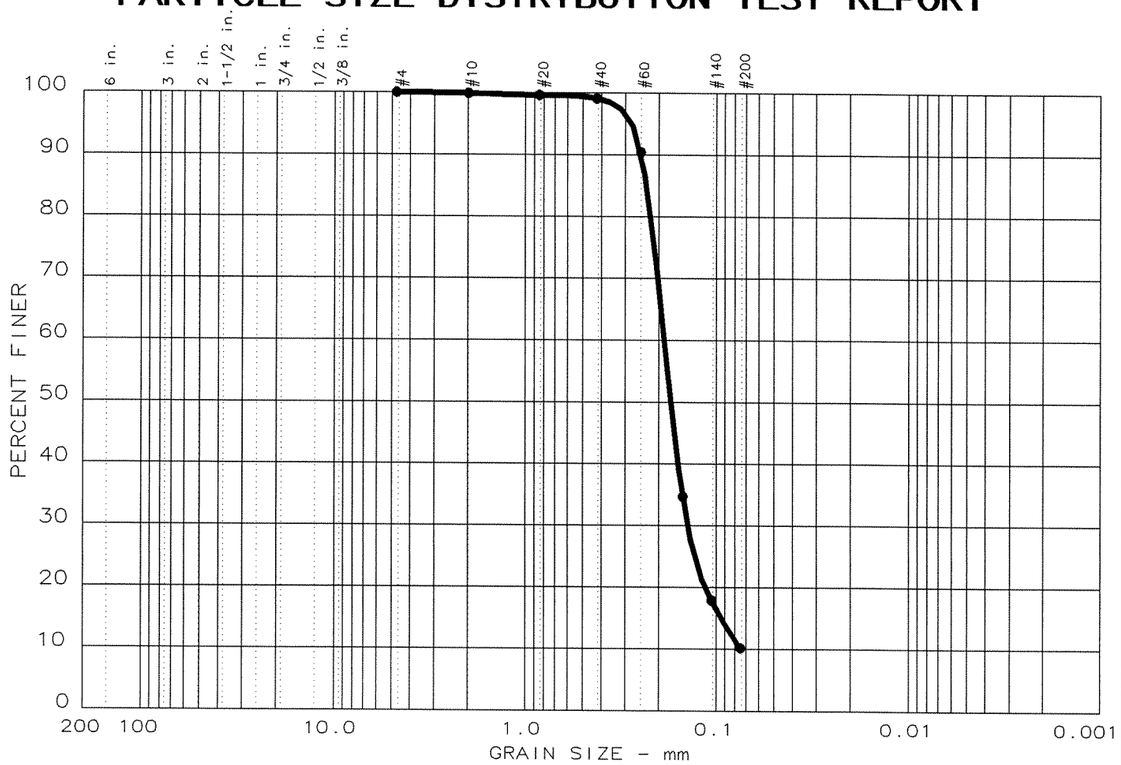
Remarks:
Sample depth 11.0'-12.0'

Eustis Engineering Company, Inc.

Project No.: 17149
Project: Brown Marsh

Date: 11-12-01 Data Sheet No. ——

PARTICLE SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
●	7	0.0	0.0	89.8	10.2		SP-SM		

SIEVE inches size	PERCENT FINER ●		
	GRAIN SIZE		
D_{60}	0.19		
D_{30}	0.14		
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ●		
4	100.0		
10	99.8		
20	99.6		
40	99.1		
60	90.4		
100	34.7		
140	17.9		
200	10.2		

Sample information:

● Boring 9, Sample 9
Very Loose gray FINE SAND w/ silt

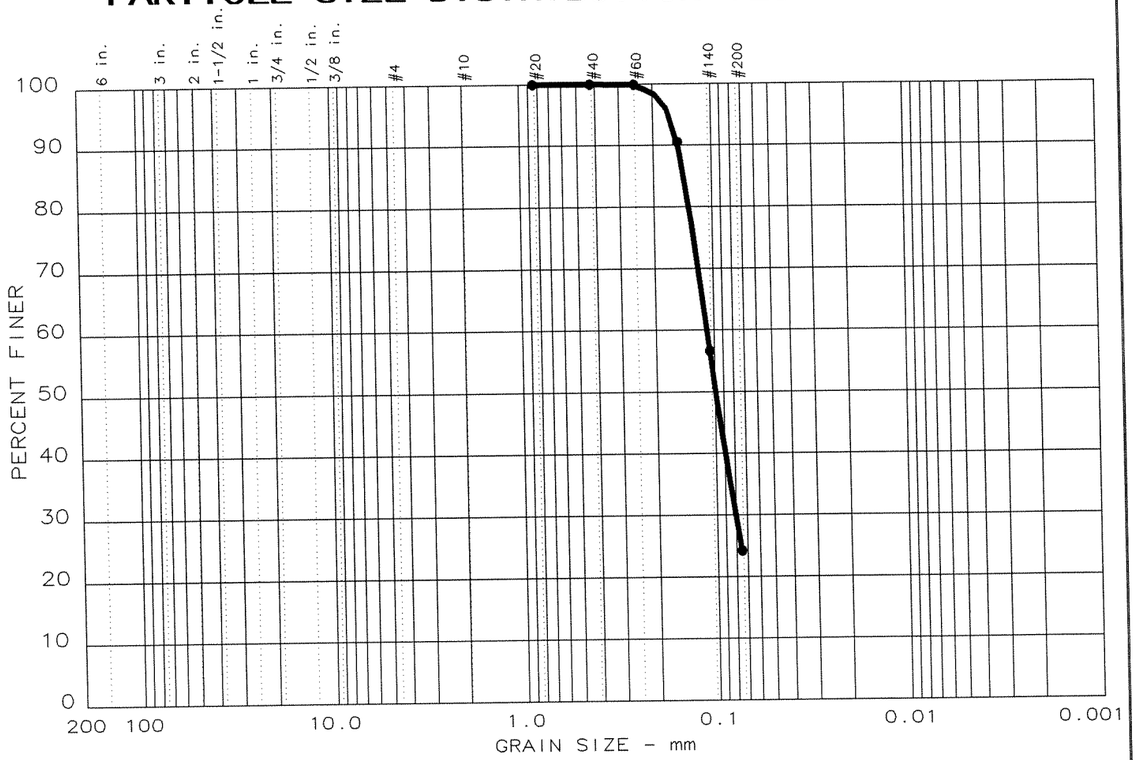
Remarks:
Sample depth 8.0'-9.0'

Eustis Engineering Company, Inc.

Project No.: 17149
Project: Brown Marsh

Date: 11-12-01 Data Sheet No. ——

PARTICLE SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
●	8	0.0	0.0	75.8	24.2		SM		

SIEVE inches size	PERCENT FINER ●		
	GRAIN SIZE		
D_{60}	0.11		
D_{30}	0.08		
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ●		
20	100.0		
40	100.0		
60	99.9		
100	90.5		
140	56.6		
200	24.2		

Sample information:

● Boring 10, Sample 10
Very Loose gray SILTY SAND

Remarks:
Sample depth 9.0'-10.0'

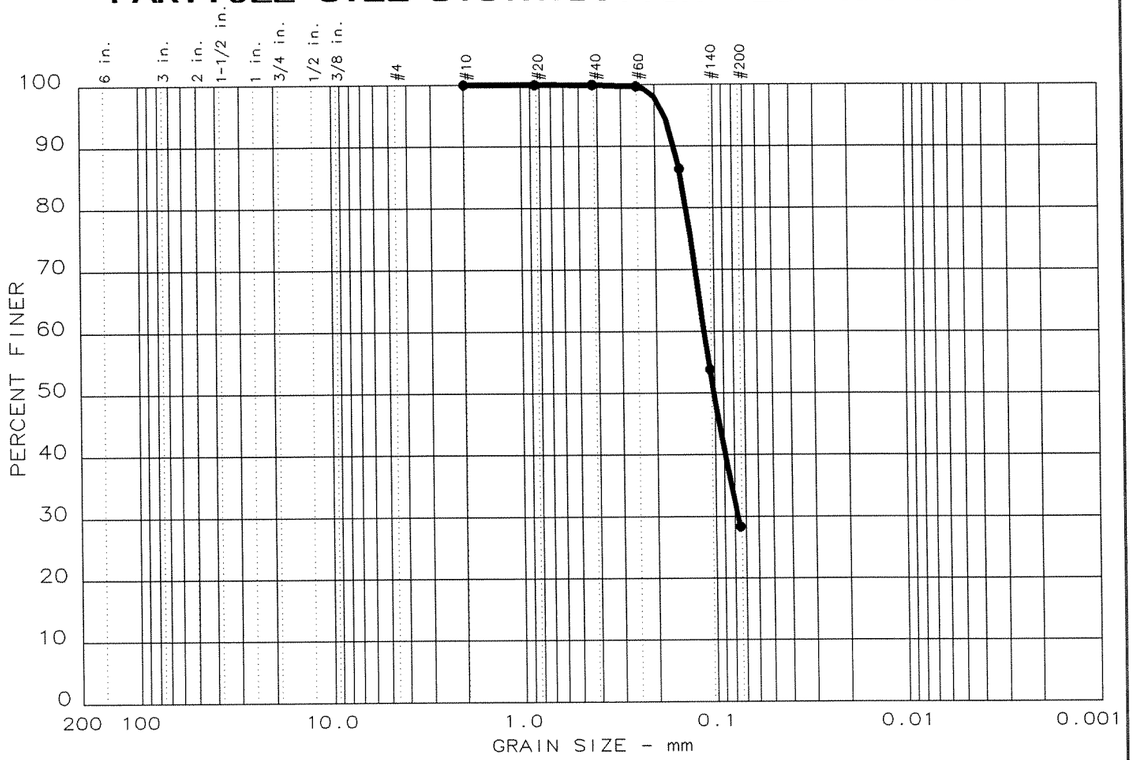
Eustis Engineering Company, Inc.

Project No.: 17149
Project: Brown Marsh

Date: 11-12-01

Data Sheet No. ——

PARTICLE SIZE DISTRIBUTION TEST REPORT



	Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	LL	PI
●	9	0.0	0.0	71.6	28.4		SM		

SIEVE inches size	PERCENT FINER ●		
	GRAIN SIZE		
D_{60}	0.11		
D_{30}	0.08		
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ●		
10	100.0		
20	100.0		
40	99.9		
60	99.7		
100	86.3		
140	53.8		
200	28.4		

Sample information:
● Boring 13, Sample 9
Loose gray SILTY SAND

Remarks:
Sample depth 8.0'-9.0'

Eustis Engineering Company, Inc.

Project No.: 17149
Project: Brown Marsh

Date: 11-12-01 Data Sheet No. ——