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FINAL Report of Geotechnical Engineering Investigation

Sheboygan Harbor Airport Project

Contract No. W911XK-10-D-0004-0004

Sheboygan Falls, Sheboygan County, Wisconsin

TesTech File No: MI051G

Prepared for:

US Army Corps of Engineers

Detroit District

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December 9, 2011

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US Army Corps of Engineers
Detroit District
477 Michigan Avenue
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Attention: Ms. Tina P. Kowitz

Re: FINAL Report of Geotechnical Engineering Investigation
Sheboygan Harbor Airport Project, Contract No. W911XK-10-D-0004-0004,
Sheboygan Falls, Sheboygan County, Wisconsin
TesTech File Number: MI051G

Dear Ms. Kowitz:

TesTech, Inc. is pleased to submit the findings of the geotechnical engineering investigation conducted for the Sheboygan Harbor Airport project, (Contract No. W911XK-10-D-0004-0004) located in Sheboygan Falls, Sheboygan County, Wisconsin. We are pleased to transmit herewith two (2) hardcopies of our final report.

This report, prepared in accordance with the US Army Corps of Engineers, Detroit District Geotechnical Investigation Scope of Work Requirements, describes the exploratory procedures, field and laboratory testing, and presents our geotechnical analyses for the project. The appendices contain a site location map, logs of test borings, and laboratory test results. Representative soil samples obtained during the course of this exploration will be held at this office for a period of three (3) months and will then be discarded unless otherwise notified.

We appreciate the opportunity to offer these services. If you have any questions regarding this report or if we may be of further assistance to you, please contact our office at 937-435-3200.

Respectfully yours,
TesTech, Inc.

Monica M. Oakes, P.E.
Geotechnical Engineer

Jonathan J. Pickering, P.E.
Senior Geotechnical Engineer

Travis C. Burr, P.E.
Director of Operations

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1.1 AUTHORIZATION

TesTech, Inc. was contracted by the US Army Corps of Engineers (USACE) Detroit District under Contract Number W911XK-10-D-0004-0004 to perform geotechnical investigations for the proposed Sheboygan Harbor Airport project. The notice to proceed for the Sheboygan Harbor Airport project geotechnical investigation was issued by the Contracting Division of the Detroit District on September 20, 2011.

1.2 PURPOSE OF INVESTIGATION

The purpose of the geotechnical investigation was to investigate the suitability of a proposed Dredged Material Disposal Site.

The investigation included literature search, site exploration, field and laboratory testing, and a report of the materials and conditions encountered at the site.

This report presents the field and laboratory testing procedures, subsurface conditions at the boring locations, soil boring logs and the laboratory test results including our geotechnical analysis for the Sheboygan Harbor Airport project.

Assessment of site environmental conditions, including the detection of pollutants in the soil or groundwater, and environmental testing was beyond the scope of this exploration. However, had any contaminated soils been encountered or any peculiar odors detected, the client would have been notified for immediate action.

The geotechnical exploration for the project was conducted in accordance with the US Army Corps of Engineers, Detroit District Geotechnical Investigation Scope of Work Requirements.

2.0 General Information

2.1 PROJECT LOCATION

The Sheboygan Harbor Airport project is located at the Sheboygan County Memorial Airport in Sheboygan Falls, Sheboygan County, Wisconsin. The project is an agricultural area west of runways 13 and 3. Much of the project area is covered with grass and crops.

A site location map of the project site is included in Appendix A.

2.2 REGIONAL BEDROCK GEOLOGY

Bedrock was not encountered during our field investigations for the proposed project site.

The bedrock units, which underlie Sheboygan County, range in age from Precambian at depth, to Silurian at the surface. The oldest are impermeable crystalline rock of Precambian age at depths that average more than 1,500 feet below the land surface.

Silurian dolomite, often referred to as Niagara, is the uppermost bedrock in Sheboygan County and reaches thicknesses up to 580 feet. Rocks underlying the Niagara dolomite are not visible in the county. Below Niagara dolomite is a shale formation known as Maquoketa. It reaches a maximum thickness of 405 feet. The Maquoketa Shale overlies a dolomite formation, termed Platteveille-Galena, which is approximately 500 feet in thickness. This rock formation, in turn, overlies Cambrian sandstones, which are 450 feet thick. All of these sedimentary rock formations overlie Precambian igneous rocks.

3.0 Subsurface Exploration

The geotechnical field exploration was conducted by **TesTech, Inc.** from October 20 to October 29, 2011. The field investigations program consisted of the drilling of sixteen (16) soil borings designated as SA-11-01 through SA-11-16.

Table 3.1 Boring Depths, Coordinates & Surface Elevations

Sheboygan Harbor Airport (Fieldwork Completed By TesTech, Inc.)						
Boring No.	**Depth (ft)**	**Northing (Y) (NAD83)**	**Easting (X) (NAD83)**	**Elevation (NAVD88)**	**Date Drilled**	**Borehole Status**
SA-11-01	49.0	652960	2533682	749.0	10/27/11	*Backfilled
SA-11-02	49.0	652683	2533584	742.8	10/28/11	*Backfilled
SA-11-03	49.0	652683	2533959	746.4	10/27/11	*Backfilled
SA-11-04	49.0	652859	2533803	747.9	10/28/11	*Backfilled
SA-11-05	49.0	652525	2534264	745.0	10/27/11	*Backfilled
SA-11-06	49.0	652412	2534093	751.8	10/29/11	*Backfilled
SA-11-07	49.0	652289	2533802	742.3	10/29/11	*Backfilled
SA-11-08	49.0	652345	2534470	744.3	10/26/11	*Backfilled
SA-11-09	49.0	652241	2534275	748.8	10/26/11	*Backfilled
SA-11-10	49.0	652109	2534471	744.6	10/25/11	*Backfilled
SA-11-11	49.0	651878	2534651	741.2	10/25/11	*Backfilled
SA-11-12	49.0	651901	2534290	748.0	10/26/11	*Backfilled
SA-11-13	49.0	651481	2534482	746.8	10/23/11	*Backfilled
SA-11-14	49.0	651315	2534210	747.9	10/22/11	*Backfilled
SA-11-15	49.0	651087	2534235	745.2	10/22/11	*Backfilled
SA-11-16	49.0	650783	2533944	738.8	10/20/11	*Backfilled

*Backfilled with cement/bentonite grout

The soil borings were conducted utilizing split spoon sampling techniques per ASTM D 1586 using conventional hollow stem augers powered by an All Terrain Vehicle (ATV) drill rig (CME 550X). The soil borings were drilled to 49.0 feet below the existing ground surface.

Split spoon sampling techniques, per ASTM D 1586, utilizing a split spoon sampler were conducted at 2.5-foot intervals to boring termination. Split spoon samples were started immediately at the ground surface.

Split spoon sampling and penetration procedures were performed by driving a standard 1-3/8-inch inside diameter, 2-inch outside diameter split spoon sampler with a 140-lb. automatic hammer falling through a height of 30 inches. The number of hammer blows required to drive the sampler 6 inches was recorded for a total of 18 inches. The penetration resistance value (N-value) is the summation of the last two 6-inch increments. The N-values are recorded on the boring logs. The results of the Standard Penetration Tests (SPT) indicate the relative density of

cohesionless soils and comparative consistency of the cohesive soils, and are used as an index to derive soil parameters from various empirical correlations.

Fourteen (14) Shelby tube samples were successfully retrieved from borings SA-11-01 through SA-11-12 between approximate depths of 2.5 and 22.0 feet.

Groundwater readings were taken at all of the borings and the groundwater level measurements are provided on the attached individual boring logs. The soil borings were subsequently backfilled completion of drilling and/or measurement of groundwater levels.

The borings were tremie backfilled within cement/bentonite grout from the bottom of the bore hole to within 2 feet of the existing ground. From two feet to the surface the bore hole was backfilled with cuttings to allow for re-vegetation.

Boring frequency, location, spacing and depth for the field investigations were assigned by the USACE prior to the fieldwork. The actual locations of borings were staked on-site by the **TesTech** survey crew. The boring locations are shown on the Boring Location Plans in Appendix A. The actual surface elevations, northing and easting coordinates of individual borings are presented in North American Datum 1983 (NAD83) as the horizontal coordinate system and in International Great Lakes Datum 1985 (IGLD85) based North American Vertical Datum 1988 (NAVD88) as the vertical coordinate system.

The subsurface exploration for the project was conducted in accordance with the US Army Corps of Engineers, Detroit District Geotechnical Investigation Scope of Work Requirements.

4.0 Evaluation of Subsurface Conditions

The subsoil conditions at the project site were explored by drilling a total of sixteen (16) soil borings. Generalized descriptions of the materials encountered in the borings are given below, in no specific order. More detailed descriptions of the soils are provided in the Individual Logs of Test Borings provided in Appendix B. It should be noted that the stratification lines shown on the soil boring logs do not represent exact geological planes but approximate transitions between soil types. In-situ stratum changes could occur gradually, abruptly or at slightly different depths.

4.1 SUBSURFACE CONDITIONS

Sparse grass was observed growing from the clay soils located at the ground surface. The surface and subsurface soils consisted of clay. Bedrock was not encountered. Photographs of representative soil samples are provided in Appendix B.

Clay

Reddish brown red clay soils were encountered in all of the soil borings at approximate depths between the ground surface (0.0) and 49.0 feet below the existing ground surface. SPT blow counts (N values) in the clay ranged from 6 blows per foot (bpf) to sampler refusal indicating a medium stiff to hard consistency. Sampler refusal is defined as over 50 blow counts for less than 6 inches of sampler penetration. Unconfined compressive strength estimates based on pocket penetrometer testing ranged from 0.50 to 4.5 tons per square foot (tsf). The clay was classified as CL under the Unified Soil Classification System (USCS).

Silty Clay

Reddish brown silty clay soil was encountered in boring SA-11-02 between 9.5 and 12.0 feet below the existing ground surface. N values in the silty clay was 15 bpf indicating a stiff consistency. The silty clay was classified as CL-ML under the USCS.

4.2 GROUNDWATER CONDITIONS

Groundwater was encountered and/or measured in fourteen (14) borings, SA-11-03 through SA-11-16, at approximate depths varying from 7.0 to 44.5 feet below the existing ground surface during drilling and after the completion of the drilling operations and removal of augers. Details of the groundwater conditions as observed and measured are provided in Table 4.1 and on the borings logs in Appendix B.

The groundwater conditions observed, or lack thereof, reflect the conditions at the time of our exploration only. Fluctuations of the groundwater table should be expected to occur both seasonally and annually due to variations in rainfall, evaporation, transpiration, construction activities, and other site-specific factors. Contractors should be prepared to control surface water and groundwater during construction at all times at a minimum with a sump and pump system.

Table 4.1 Groundwater Depths

Boring	Groundwater Level (ft)		
	During Drilling	At Completion	24 Hour
SA-11-01		None	None
SA-11-02		None	None
SA-11-03		41.1	30.0
SA-11-04		None	None
SA-11-05		None	16.8
SA-11-06		None	13.0
SA-11-07		None	32.0
SA-11-08		44.5	21.0
SA-11-09		39.8	None
SA-11-10		29.4	16.5
SA-11-11		None	36.0
SA-11-12		9.5	12.5
SA-11-13		12.0	7.0
SA-11-14	30.0	21.0	8.4
SA-11-15	42.5	None	37.8
SA-11-16		None	35.5

5.0 Engineering Properties

The soil samples obtained during the drilling operations were sealed in glass jars to prevent moisture loss and labeled. The soil samples were then transported to the **TesTech** Corps-validated laboratory for visual classification by the Geotechnical Engineer, in accordance with the ASTM D 2487 Classification System, and laboratory testing. The testing items and related ASTM standards are listed in Table 5.1. The visually classified soils were modified, if required, based on the laboratory soil classification test results.

Table 5.1 Laboratory Test Items and Related ASTM Standards

Test Items	Standard Name
Soil Classifications	ASTM D 2487 & D 2488
Particle Size Analysis	ASTM D 422
Atterberg Limits	ASTM D 4318
Unconfined Compressive Strength	ASTM D 2166
Standard Proctor Compaction	ASTM D 698
Modified Proctor Compaction	ASTM D 1557
Hydraulic Conductivity	ASTM D 5084
Soil Density	ASTM D 7263
Moisture Content	ASTM D 2216

The laboratory test results are provided in the tables on the following pages and are also included in Appendix C.

5.1 SOIL CLASSIFICATION TESTS

Thirty-four (34) sieve tests for particle size analysis and fifity-four (54) Atterberg Limits tests were performed on representative split-spoon samples. The results for these tests are shown in Table 5.2 and Table 5.3.

5.2 UNCONFINED COMPRESSIVE TESTS

Eight (8) Shelby tube samples from multiple borings at various depths were tested for unconfined compressive strength, in-situ dry density and the natural moisture content. The results are shown in Table 5.4.

5.3 COMPACTION TESTS

Four (4) bulk samples of subgrade materials obtained from surface and near surface soils were tested for Standard Proctor and Modifed Proctor values. Tables 5.5 and 5.6 below summarize the test results for the Standard and Modified Proctor Tests.

Table 5.2 Particle Size Analysis Results

Boring No.	Depth (ft)	% Gravel	% Sand	% Silt	% Clay	USCS
SA-11-01	2.5 – 4.0	4.2	17.8	35.6	42.4	CL
SA-11-01	18.0 – 20.0	3.0	16.9	33.7	46.4	CL
SA-11-02	10.0 – 11.5	3.0	21.3	56.5	19.1	CL-ML
SA-11-02	15.0 – 17.0	1.3	16.9	31.8	50.0	CL
SA-11-03	0.0 – 10.0	1.4	18.9	32.1	47.6	CL
SA-11-03	10.0 – 12.0	1.4	19.3	33.8	45.5	CL
SA-11-04	15.0 – 16.5	2.3	17.8	33.2	46.7	CL
SA-11-04	20.0 – 22.0	3.5	17.8	31.5	47.2	CL
SA-11-05	25.0 – 26.5	5.3	22.5	28.6	43.6	CL
SA-11-05	27.5 – 29.0	3.1	33.3	36.3	27.3	CL
SA-11-06	15.0 – 16.5	4.9	21.4	33.2	40.5	CL
SA-11-06	18.0 – 20.0	16.3	15.9	27.6	40.2	CL
SA-11-07	5.0 – 7.0	0.0	7.8	46.4	45.8	CL
SA-11-07	32.5 – 34.0	2.9	16.3	35.2	45.6	CL
SA-11-08	8.0 – 10.0	1.7	18.6	34.8	44.9	CL
SA-11-08	30.0 – 31.5	2.1	16.3	30.7	50.9	CL
SA-11-09	0.0 – 10.0	0.9	22.0	38.8	38.3	CL
SA-11-09	5.0 – 7.0	0.0	5.0	42.8	52.2	CL
SA-11-09	22.5 – 24.0	3.0	18.7	30.8	47.5	CL
SA-11-10	2.5 – 4.0	0.1	43.8	28.2	27.9	CL
SA-11-10	10.0 – 12.0	4.6	20.3	32.9	42.2	CL
SA-11-10	35.0 – 36.5	3.7	14.9	29.0	52.4	CL
SA-11-11	12.5 – 14.0	1.3	19.6	35.2	43.9	CL
SA-11-11	37.5 – 39.0	1.3	14.0	30.9	53.8	CL
SA-11-12	10.0 – 12.0	7.0	39.5	32.7	20.8	CL
SA-11-12	47.5 – 49.0	0.4	12.5	31.4	55.7	CL
SA-11-13	2.5 – 4.0	0.8	21.1	36.4	41.7	CL
SA-11-13	40.0 – 41.5	1.2	17.0	30.5	51.3	CL
SA-11-14	5.0 – 6.5	0.3	18.8	34.5	46.4	CL
SA-11-14	42.5 – 44.0	3.7	14.0	31.0	51.3	CL
SA-11-15	20.0 – 21.5	2.5	17.4	35.6	44.5	CL
SA-11-15	45.0 – 46.5	2.2	14.8	28.6	54.4	CL
SA-11-16	7.5 – 9.0	2.9	16.7	33.7	46.7	CL
SA-11-16	22.5 – 24.0	3.5	14.3	31.9	50.3	CL

Table 5.3 Atterberg Limits Test Results

Boring No.	Depth (ft)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)
SA-11-01	2.5 – 4.0	40	15	25
SA-11-01	5.0 – 6.5	36	13	23
SA-11-01	18.0 – 20.0	35	12	23
SA-11-01	40.0 – 41.5	42	14	28
SA-11-02	2.5 – 4.0	37	14	23
SA-11-02	10.0 – 11.5	18	13	5
SA-11-02	15.0 – 17.0	34	12	22
SA-11-02	25.0 – 26.5	37	12	25
SA-11-03	0.0 – 10.0	34	11	23
SA-11-03	10.0 – 12.0	35	13	22
SA-11-03	12.5 – 14.0	25	11	14
SA-11-03	27.5 – 29.0	33	11	22
SA-11-04	2.5 – 4.0	38	14	24
SA-11-04	15.0 – 16.5	34	13	21
SA-11-04	20.0 – 22.0	34	13	21
SA-11-04	45.0 – 46.5	42	14	28
SA-11-05	2.5 – 4.0	20	10	10
SA-11-05	12.5 – 14.0	26	12	14
SA-11-05	25.0 – 26.5	34	13	21
SA-11-05	27.5 – 29.0	18	10	8
SA-11-06	15.0 – 16.5	31	12	19
SA-11-06	18.0 – 20.0	34	12	22
SA-11-06	25.0 – 26.5	14	11	3
SA-11-06	30.0 – 31.5	41	13	28
SA-11-07	5.0 – 7.0	31	14	17
SA-11-07	22.5 – 24.0	36	12	24
SA-11-07	32.5 – 34.0	35	13	22
SA-11-07	42.5 – 44.0	39	13	26
SA-11-08	5.0 – 6.5	34	12	22
SA-11-08	8.0 – 10.0	34	13	21
SA-11-08	15.0 – 16.5	34	11	23
SA-11-08	30.0 – 31.5	37	14	23
SA-11-09	0.0 – 10.0	29	11	18
SA-11-09	5.0 – 7.0	33	16	17

SA-11-09	7.5 – 9.0	20	10	10
SA-11-09	17.5 – 19.0	28	11	17
SA-11-09	22.5 – 24.0	37	11	26
SA-11-10	2.5 – 4.0	28	13	15
SA-11-10	10.0 – 12.0	29	11	18
SA-11-10	20.0 – 21.5	32	12	20
SA-11-10	35.0 – 36.5	37	14	23
SA-11-10	42.5 – 44.0	42	14	28
SA-11-11	2.5 – 4.0	NV	NP	NP
SA-11-11	12.5 – 14.0	31	12	19
SA-11-11	35.0 – 36.5	39	13	26
SA-11-11	37.5 – 39.0	39	15	24
SA-11-12	10.0 – 12.0	18	10	8
SA-11-12	15.0 – 16.5	23	11	12
SA-11-12	32.5 – 34.0	39	12	27
SA-11-12	47.5 – 49.0	41	15	26
SA-11-13	2.5 – 4.0	32	14	18
SA-11-13	17.5 – 19.0	21	11	10
SA-11-13	37.5 – 39.0	39	13	26
SA-11-13	40.0 – 41.5	38	13	25
SA-11-14	5.0 – 6.5	34	14	20
SA-11-14	20.0 – 21.5	32	12	20
SA-11-14	42.5 – 44.0	40	14	26
SA-11-14	47.5 – 49.0	41	14	27
SA-11-15	7.5 – 9.0	34	13	21
SA-11-15	20.0 – 21.5	32	11	21
SA-11-15	27.5 – 29.0	36	12	24
SA-11-15	45.0 – 46.5	40	14	26
SA-11-16	7.5 – 9.0	34	13	21
SA-11-16	10.0 – 11.5	34	11	24
SA-11-16	22.5 – 24.0	40	14	26
SA-11-16	37.5 – 39.0	40	12	28

*NV = No Value and NP = Non-Plastic

Table 5.4 Unconfined Compression Results for Cohesive Soils

Boring No.	Depth (ft)	Dry Density (pcf)	Moisture Content (%)	Saturation (%)	S_u (psi)
SA-11-01	18.0 – 20.0	115.3	17.3	99.8	14.27
SA-11-02	15.0 – 17.0	115.2	17.2	98.5	17.32
SA-11-03	10.0 – 12.0	114.8	15.6	88.7	9.83
SA-11-04	20.0 – 22.0	134.3	17.3	97.4	8.47
SA-11-06	18.0 – 20.0	116.8	16.0	95.7	15.68
SA-11-07	5.0 – 7.0	111.8	18.2	95.3	11.74
SA-11-08	8.0 – 10.0	114.6	17.0	95.9	18.51
SA-11-12	10.0 – 12.0	131.0	10.7	98.6	13.26

Table 5.5 Standard Proctor Results for Bulk Samples

Sample No.	Depth (ft)	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
SA-11-03	8.0 – 12.0	116.4	10.5
SA-11-08	10.0 – 15.0	115.7	11.4

Table 5.6 Modified Proctor Results for Bulk Samples

Sample No.	Depth (ft)	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
SA-11-02	0.0 – 10.0	127.5	8.7
SA-11-09	18.0 – 25.0	132.4	7.8

5.4 HYDRAULIC CONDUCTIVITY TESTS

Four (4) tests Shelby tube samples were tested for permeability. The results are shown in Table 5.7 below.

Table 5.7 Hydraulic Conductivity Results

Boring No.	Depth (ft)	Dry Density (pcf)	Final Water Content (%)	Permeability (cm/s)
SA-11-06	18.0 – 20.0	115.0	17.5	$5.8x10^{-8}$
SA-11-08	8.0 – 10.0	114.8	16.1	$1.3x10^{-7}$
SA-11-09	5.0 – 7.0	122.0	16.7	$8.3x10^{-8}$
SA-11-10	10.0 – 12.0	122.6	17.0	$9.3x10^{-8}$

5.5 DRY DENSITY TESTS

Sixteen (16) split spoon samples were tested for dry density (unit weight). The test results are provided in Table 5.8.

Table 5.8 Dry Density Results

Boring Number	Depth (ft)	Moisture Content* (%)	Dry Density (pcf)
SA-11-01	40.0 – 41.5	17.4	113.3
SA-11-02	25.0 – 26.5	17.7	112.6
SA-11-03	12.5 -14.0	13.2	124.6
SA-11-04	2.5 – 4.0	15.0	116.9
SA-11-05	2.5 – 4.0	9.8	132.9
SA-11-06	30.0 – 31.5	17.4	116.1
SA-11-07	42.5 – 44.0	17.2	113.7
SA-11-08	15.0 – 16.5	16.7	118.4
SA-11-09	7.5 – 9.0	8.6	134.4
SA-11-10	20.0 – 21.5	15.5	118.1
SA-11-11	35.0 – 35.5	17.3	115.6
SA-11-12	32.5 – 34.0	18.2	113.9
SA-11-13	17.5 – 19.0	12.4	128.9
SA-11-14	47.5 – 49.0	17.4	115.2
SA-11-15	7.5 – 9.0	15.2	117.7
SA-11-16	37.5 – 39.0	16.8	107.0

*As Recieved

5.6 SUMMARY OF ENGINEERING PROPERTIES

The soil located at the project size is relatively consistent at all boring locations and from the surface elevation to the maximum boring termination depth, 49.0 feet. Therefore, only one major soil type exists at the project size. Table 5.9 below summaries the engineering properties of the clay soil.

Table 5.9 Engineering Properties of Site Soil

			Upper Value	Lower Value	Average
Soil Type				**CL**	
Atterberg Limits		Liquid Limit (%)	**42**	**14**	**34**
		Plastic Limit (%)	**14**	**11**	**13**
		Plasticity Index (%)	**28**	**3**	**21**
Undrained Shear Strength, Su (psi)			**18.5**	**8.5**	**13.6**
Proctor Compaction	Standard	Maximum Dry Density (pcf)	**116.4**	**115.7**	**116.0**
		Optimum Moisture Content (%)	**10.5**	**11.4**	**11.0**
	Modified	Maximum Dry Density (pcf)	**132.4**	**127.5**	**130.0**
		Optimum Moisture Content (%)	**7.8**	**8.7**	**8.3**
Hydraulic Conductivity		Permeability (cm/s)	**$1.3x10^{-7}$**	**$5.8x10^{-8}$**	**$9.1x10^{-8}$**
Dry Density (pcf)			**134.4**	**107.0**	**118.7**

6.0 Limitations of Liability

Discussions presented in this report are based upon the available soil information, currently accepted engineering principles, and available information provided by the Detroit District Corps of Engineers. **TesTech** should be notified of any revisions to the scope of this project so that these revisions may be evaluated against the known subsurface conditions. Should it be necessary to revise the discussions outlined in this report, **TesTech** will submit a written report to address any necessary changes to the discussions. No other warranties, expressed or implied, are made.

The soils encountered in the borings varied between boring locations. Other discontinuities in soil types and geology may exist, including abrupt strata changes and soil strength variations. The extent of these variations may not be fully determined from the borings or site reconnaissance. Additional variations may not become apparent until mass excavation commences.

Assessment of site environmental conditions, including the detection of pollutants in the soil or groundwater, and environmental testing was beyond the scope of this exploration.

7.0 Appendices

APPENDICES:

A. Site Location Map
Boring Location Plans

B. Logs of Test Borings
Soil Profiles
Soil Photographs
Field Classification System for Soil Exploration

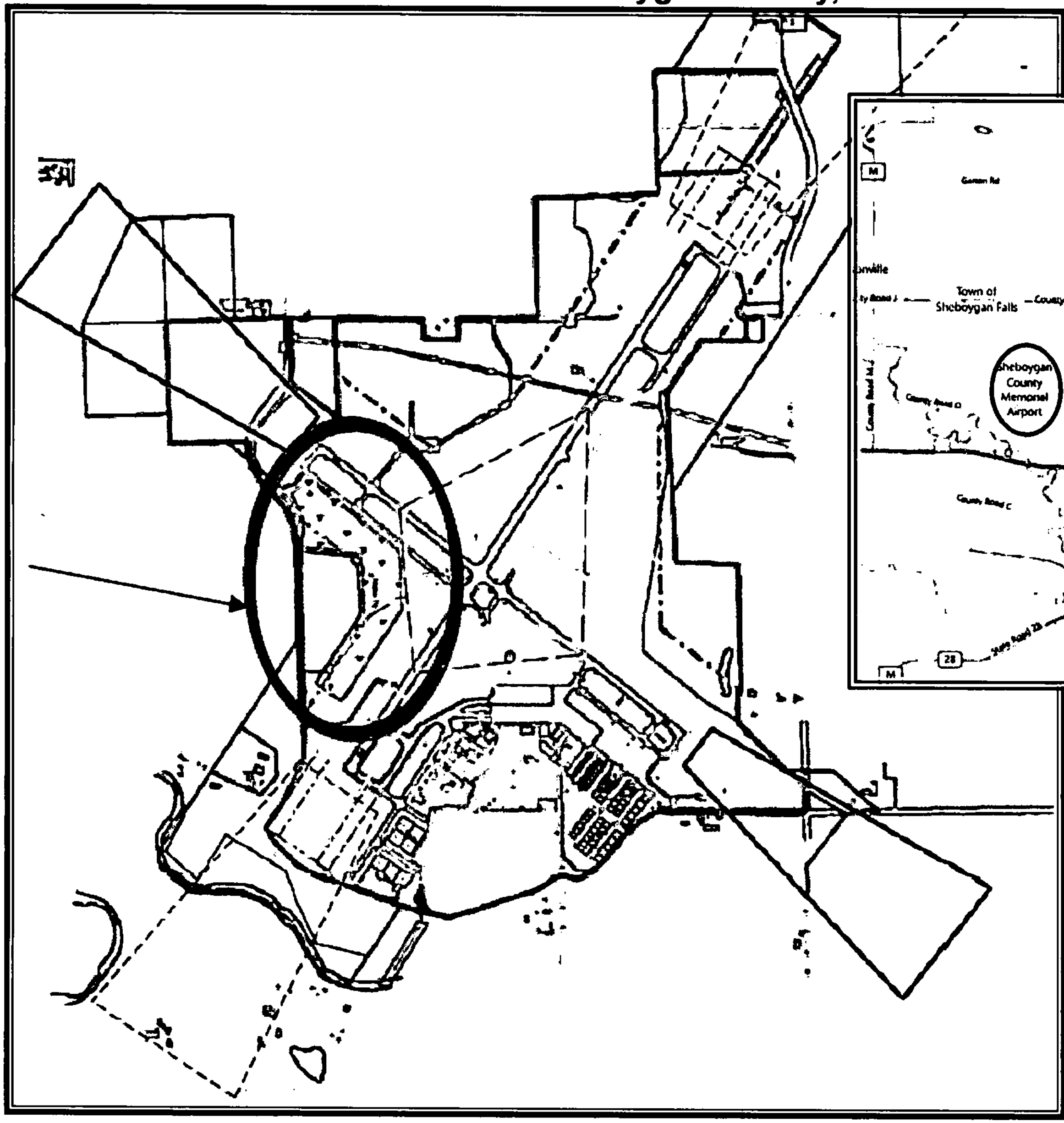
C. Laboratory Test Results
Sieve Analysis and Classification
Unconfined Compressive Strength
Proctor Compaction
Hydraulic Conductivity
Soil Density
Moisture Content

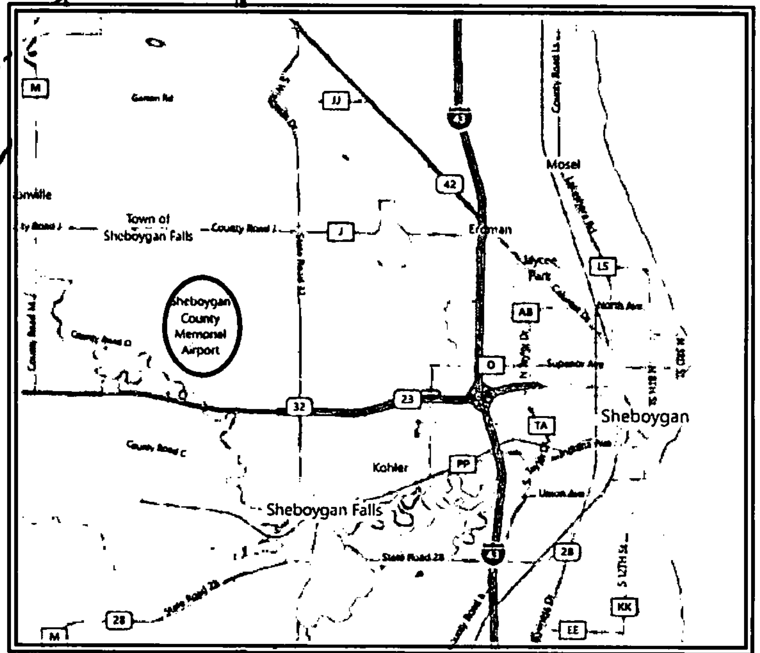
D. Field Data
Field Logs of Test Borings

APPENDIX A

Site Location Map
Boring Location Plan

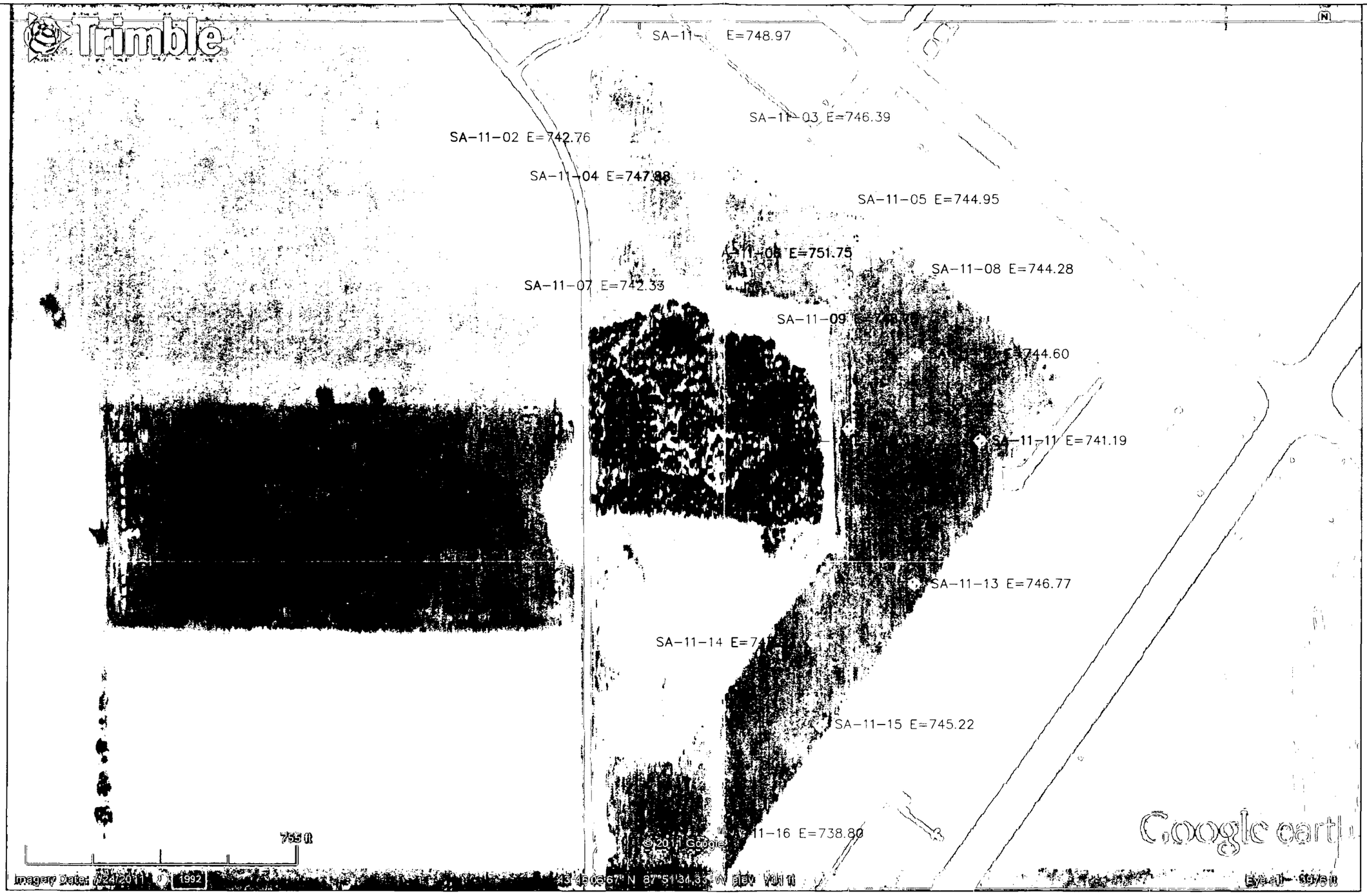
Project Site
Sheboygan Harbor Airport
Sheboygan County, Wisconsin





The project area is located within the red oval.

N



VERTICAL DATUM = NAVD88 USING GEOID09

160 0 160 320

GRAPHIC SCALE (IN FEET)
1 inch = 160 ft.

BY	DATE	DESCRIPTION

SHEBOYGAN FALLS, WISCONSIN

SCALE: 1" = 160'

DATE: DECEMBER 8, 2011

DESIGN N/A
DRAWN CTT
CHKED MMO

TES TECH
8164 EXECUTIVE COURT
LANSING, MICHIGAN 48917
OFFICE (517) 622-1002
FAX (517) 627-6392

JOB NO. M1051

SHEET NO.

OF

APPENDIX B

Logs of Test Borings
Soil Profiles
Soil Photographs
Field Classification System for Soil Exploration

DRILLING LOG

DIVISION: Detroit

INSTALLATION:

SHEET 1 OF 2 SHEETS

1. PROJECT: Sheboygan Harbor Airport	10. SIZE AND TYPE OF BIT: 4.25" ID HSA, SS and ST
2. LOCATION (Coordinates or Station): Sheboygan Falls, WI N 652,960.0 E 2,533,682.0	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): NAVD88, MSL
3. DRILLING AGENCY: TesTech, Inc.	12. MANUFACTURER'S DESIGNATION OF DRILL: ATV CME 550X
4. HOLE NO. (As shown on drawing title and file number): SA-11-01	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 19 / UNDISTURBED 1
5. NAME OF DRILLER: Messer	14. TOTAL NUMBER CORE BOXES: 0
6. DIRECTION OF HOLE: ☐ VERTICAL ☐ INCLINED --- DEG. FROM VERT.	15. ELEVATION GROUND WATER:
7. THICKNESS OF OVERBURDEN: 49.0	16. DATE HOLE: STARTED 10/27/2011 / COMPLETED 10/27/2011
8. DEPTH DRILLED INTO ROCK: 0.0	17. ELEVATION TOP OF HOLE: +749.0
9. TOTAL DEPTH OF HOLE: 49.0	18. TOTAL CORE RECOVERY FOR BORING: 0 %
	19. GEOLOGIST: King

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) (g)
+749.0	0.0		CLAY, stiff, moist, some topsoil, some rock fragments, little sand, dark reddish brown (CL)	56	SS-1 0.0 1.5	6-6-8, N = 14 Pen.: 4.5 tsf
+747.0	2.0		CLAY, stiff to very stiff, moist, little sand, reddish brown (CL)	94	SS-2 2.5 4.0	5-9-10, N = 19 Pen.: 4.5 tsf
				100	SS-3 5.0 6.5	6-9-8, N = 17 Pen.: 4.5 tsf
				100	SS-4 7.5 9.0	6-12-14, N = 26 Pen.: 4.5 tsf
				100	SS-5 10.0 11.5	7-11-14, N = 25 Pen.: 4.5 tsf
				100	SS-6 12.5 14.0	5-7-10, N = 17 Pen.: 3.0 tsf
				0	SS-7 15.0 16.5	Sample Obtained from Cuttings
				100	ST 18.0 20.0	
				100	SS-9 20.0 21.5	4-6-7, N = 13 Pen.: 2.0 tsf
				56	SS-10 22.5 24.0	4-5-8, N = 13 Pen.: 0.5 tsf

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 749.0 | **Hole No. SA-11-01**

PROJECT: Sheboygan Harbor Airport | INSTALLATION | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV-ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
			CLAY, stiff to very stiff, moist, little sand, reddish brown (CL) *(continued)*	100	SS-11 25.0 26.5	5-7-8, N = 15 Pen.: 2.5 tsf
				44	SS-12 27.5 29.0	4-6-10, N = 16 Pen.: 2.5 tsf
				100	SS-13 30.0 31.5	7-9-9, N = 18 Pen.: 2.5 tsf
				100	SS-14 32.5 34.0	4-5-7, N = 12 Pen.: 3.0 tsf
				100	SS-15 35.0 36.5	4-5-7, N = 12 Pen.: 2.5 tsf
				100	SS-16 37.5 39.0	4-5-8, N = 13 Pen.: 2.0 tsf
				100	SS-17 40.0 41.5	5-5-10, N = 15 Pen.: 3.5 tsf
				100	SS-18 42.5 44.0	4-7-8, N = 15 Pen.: 2.5 tsf
				100	SS-19 45.0 46.5	5-7-9, N = 16 Pen.: 3.0 tsf
+700.0	49.0			100	SS-20 47.5 49.0	4-8-11, N = 19 Pen.: 3.0 tsf

DRILLING LOG

DIVISION: Detroit

INSTALLATION:

SHEET 1 OF 2 SHEETS

1. PROJECT: Sheboygan Harbor Airport
2. LOCATION (Coordinates or Station): Sheboygan Falls, WI N 652,683.0 E 2,533,584.0
3. DRILLING AGENCY: TesTech, Inc.
4. HOLE NO. *(As shown on drawing title and file number)*: SA-11-02
5. NAME OF DRILLER: Messer
6. DIRECTION OF HOLE: ☐ VERTICAL ☐ INCLINED ---- DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: 49.0
8. DEPTH DRILLED INTO ROCK: 0.0
9. TOTAL DEPTH OF HOLE: 49.0
10. SIZE AND TYPE OF BIT: 4.25" ID HSA, SS and ST
11. DATUM FOR ELEVATION SHOWN *(TBM or MSL)*: NAVD88, MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: ATV CME 550X
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 19 UNDISTURBED 1
14. TOTAL NUMBER CORE BOXES: 0
15. ELEVATION GROUND WATER:
16. DATE HOLE: STARTED 10/28/2011 COMPLETED 10/28/2011
17. ELEVATION TOP OF HOLE: +742.8
18. TOTAL CORE RECOVERY FOR BORING: 0 %
19. GEOLOGIST: King

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS *(Drilling time, water loss, depth weathering, etc., if significant)* g
+742.8	0.0		CLAY, medium stiff to very stiff, moist, little sand, reddish brown (CL)	89	SS-1 0.0 1.5	3-4-4, N = 8 Pen.: 3.5 tsf
				100	SS-2 2.5 4.0	3-6-8, N = 14 Pen.: 4.0 tsf
				100	SS-3 5.0 6.5	4-7-9, N = 16 Pen.: 4.5 tsf
				100	SS-4 7.5 9.0	4-8-9, N = 17 Pen.: 3.5 tsf
+733.3	9.5		SILTY CLAY, stiff, moist, little sand, reddish brown (CL-ML)	100	SS-5 10.0 11.5	4-7-8, N = 15 Pen.: 2.0 tsf
+730.8	12.0		CLAY, medium stiff to hard, moist, little sand, reddish brown (CL)	67	SS-6 12.5 14.0	11-15-8, N = 23 Pen.: 2.0 tsf
				92	ST 15.0 17.0	
				33	SS-8 17.5 19.0	4-6-7, N = 13 Pen.: 1.5 tsf
				22	SS-9 20.0 21.5	7-10-11, N = 21 Pen.: 1.0 tsf
					SS-10 22.5 24.0	5-7-9, N = 16 Pen.: 1.0 tsf

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 742.8 | **Hole No. SA-11-02**

PROJECT: Sheboygan Harbor Airport | INSTALLATION: | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
			CLAY, medium stiff to hard, moist, little sand, reddish brown (CL) *(continued)*	100	SS-11 25.0 26.5	3-3-6, N = 9 Pen.: 2.0 tsf
				100	SS-12 27.5 29.0	5-5-6, N = 11 Pen.: 2.5 tsf
				100	SS-13 30.0 31.5	3-4-6, N = 10 Pen.: 2.5 tsf
				100	SS-14 32.5 34.0	4-6-7, N = 17 Pen.: 2.5 tsf
				100	SS-15 35.0 36.5	4-6-7, N = 13 Pen.: 3.0 tsf
				100	SS-16 37.5 39.0	5-7-9, N = 16 Pen.: 3.5 tsf
				100	SS-17 40.0 41.5	4-6-9, N = 15 Pen.: 3.5 tsf
				100	SS-18 42.5 44.0	5-8-9, N = 17 Pen.: 3.0 tsf
				100	SS-19 45.0 46.5	4-7-10, N = 17 Pen.: 3.25 tsf
+693.8	49.0			100	SS-20 47.5 49.0	4-6-9, N = 15 Pen.: 3.25 tsf

Hole No. SA-11-03

DRILLING LOG	DIVISION: Detroit	INSTALLATION	SHEET 1 OF 2 SHEETS

1. PROJECT: Sheboygan Harbor Airport	10. SIZE AND TYPE OF BIT: 4.25" ID HSA, SS and ST
2. LOCATION (Coordinates or Station): Sheboygan Falls, WI N 652,747.0 E 2,533,959.0	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): NAVD88, MSL
3. DRILLING AGENCY: TesTech, Inc.	12. MANUFACTURER'S DESIGNATION OF DRILL: ATV CME 550X
4. HOLE NO. (As shown on drawing title and file number): SA-11-03	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 18, UNDISTURBED 2
5. NAME OF DRILLER: Messer	14. TOTAL NUMBER CORE BOXES: 0
6. DIRECTION OF HOLE: ☐ VERTICAL ☐ INCLINED ___ DEG. FROM VERT.	15. ELEVATION GROUND WATER: 716.4
7. THICKNESS OF OVERBURDEN: 49.0	16. DATE HOLE: STARTED 10/27/2011, COMPLETED 10/27/2011
8. DEPTH DRILLED INTO ROCK: 0.0	17. ELEVATION TOP OF HOLE: +746.4
9. TOTAL DEPTH OF HOLE: 49.0	18. TOTAL CORE RECOVERY FOR BORING: 0 %
	19. GEOLOGIST: King

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
+746.4	0.0		CLAY, medium stiff to very stiff, moist, little sand, reddish brown (CL)	89	SS-1 0.0 1.5	5-6-8, N = 14 Pen.: 4.0 tsf
				100	SS-2 2.5 4.0	6-9-9, N = 18 Pen.: 4.0 tsf
				100	SS-3 5.0 6.5	5-7-8, N = 15 Pen.: 2.5 tsf
				0	ST 8.0 10.0	
				83	ST 10.0 12.0	
				100	SS-6 12.5 14.0	3-3-5, N = 8 Pen.: 1.0 tsf
				100	SS-7 15.0 16.5	6-4-6, N = 10 Pen.: 2.0 tsf
				100	SS-8 17.5 19.0	4-4-6, N = 10 Pen.: 1.5 tsf
				61	SS-9 20.0 21.5	10-10-5, N = 15 Pen.: 1.5 tsf
				100	SS-10 22.5 24.0	3-5-7, N = 8 Pen.: 2.5 tsf

DRILLING LOG (Cont Sheet)

ELEVATION TOP OF HOLE: 746.4

Hole No. SA-11-03

PROJECT: Sheboygan Harbor Airport

INSTALLATION:

SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
			CLAY, medium stiff to very stiff, moist, little sand, reddish brown (CL) *(continued)*	94	SS-11 25.0 26.5	5-6-8, N = 14
				56	SS-12 27.5 29.0	6-9-9, N = 18
				100	SS-13 30.0 31.5	5-7-8, N = 15 Pen.: 2.0 tsf
				78	SS-14 32.5 34.0	3-3-5, N = 8 Pen.: 0.5 tsf
				100	SS-15 35.0 36.5	6-4-6, N = 10 Pen.: 2.0 tsf
				100	SS-16 37.5 39.0	4-4-6, N = 10 Pen.: 2.0 tsf
				100	SS-17 40.0 41.5	3-6-8, N = 18 Pen.: 2.5 tsf
				100	SS-18 42.5 44.0	4-6-9, N = 15 Pen.: 3.0 tsf
				100	SS-19 45.0 46.5	4-8-9, N = 17 Pen.: 2.5 tsf
+699.4	47.0					
			CLAY, hard, moist, some rock fragments, little sand, reddish brown (CL)	100	SS-20 47.5 49.0	20-38-30, N = 68 Pen.: 1.0 tsf
+697.4	49.0					

Hole No. SA-11-04

DRILLING LOG	DIVISION: Detroit	INSTALLATION	SHEET 1 OF 2 SHEETS

1. PROJECT: Sheboygan Harbor Airport	10. SIZE AND TYPE OF BIT: 4.25" ID HSA, SS and ST
2. LOCATION (Coordinates or Station): Sheboygan Falls, WI N 652,585.9 E 2,533,803.0	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): NAVD88, MSL
3. DRILLING AGENCY: TesTech, Inc.	12. MANUFACTURER'S DESIGNATION OF DRILL: ATV CME 550X
4. HOLE NO. (As shown on drawing title and file number): SA-11-04	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 17 / UNDISTURBED 3
5. NAME OF DRILLER: Messer	14. TOTAL NUMBER CORE BOXES: 0
6. DIRECTION OF HOLE: ☐ VERTICAL ☐ INCLINED ___ DEG. FROM VERT.	15. ELEVATION GROUND WATER
7. THICKNESS OF OVERBURDEN: 49.0	16. DATE HOLE: STARTED 10/28/2011 / COMPLETED 10/28/2011
8. DEPTH DRILLED INTO ROCK: 0.0	17. ELEVATION TOP OF HOLE: +747.9
9. TOTAL DEPTH OF HOLE: 49.0	18. TOTAL CORE RECOVERY FOR BORING: 0 %
	19. GEOLOGIST: King

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
+747.9	0.0		CLAY, medium stiff to very stiff, moist, little sand, reddish brown (CL)	67	SS-1 0.0 1.5	2-3-4, N = 7 Pen.: 3.75 tsf
				100	SS-2 2.5 4.0	3-6-7, N = 13 Pen.: 4.5 tsf
				92	ST 5.0 7.0	
				100	SS-4 7.5 9.0	5-6-9, N = 15 Pen.: 4.5 tsf
				100	SS-5 10.0 11.5	4-5-6, N = 11 Pen.: 3.5 tsf
				100	SS-6 12.5 14.0	4-4-4, N = 8 Pen.: 2.0 tsf
				78	SS-7 15.0 16.5	6-5-6, N = 11 Pen.: 2.5 tsf
				46	ST 17.5 19.5	
				63	ST 20.0 22.0	
				11	SS-10 22.5 24.0	5-5-7, N = 12 Pen.: 0.5 tsf

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 747.9 | **Hole No. SA-11-04**

PROJECT: Sheboygan Harbor Airport | INSTALLATION: | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
			CLAY, medium stiff to very stiff, moist, little sand, reddish brown (CL) *(continued)*	89	SS-11 25.0 26.5	5-5-6, N = 11 Pen.: 2.5 tsf
				100	SS-12 27.5 29.0	5-7-7, N = 14 Pen.: 3.5 tsf
				100	SS-13 30.0 31.5	4-6-7, N = 13 Pen.: 3.0 tsf
				100	SS-14 32.5 34.0	5-6-8, N = 14 Pen.: 3.5 tsf
				100	SS-15 35.0 36.5	5-7-10, N = 17 Pen.: 3.25 tsf
				78	SS-16 37.5 39.0	3-5-8, N = 13 Pen.: 1.5 tsf
				67	SS-17 40.0 41.5	4-5-8, N = 13 Pen.: 3.0 tsf
				100	SS-18 42.5 44.0	4-6-8, N = 14 Pen.: 3.5 tsf
				100	SS-19 45.0 46.5	4-7-7, N = 14 Pen.: 3.5 tsf
+698.9	49.0			100	SS-20 47.5 49.0	6-7-8, N = 15 Pen.: 3.0 tsf

Hole No. SA-11-05

DRILLING LOG	DIVISION: Detroit	INSTALLATION	SHEET 1 OF 2 SHEETS

1. PROJECT: Sheboygan Harbor Airport	10. SIZE AND TYPE OF BIT: 4.25" ID HSA, SS and ST
2. LOCATION (Coordinates or Station): Sheboygan Falls, WI N 652,525.0 E 2,534,264.0	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): NAVD88, MSL
3. DRILLING AGENCY: TesTech, Inc.	12. MANUFACTURER'S DESIGNATION OF DRILL: ATV CME 550X
4. HOLE NO. (As shown on drawing title and file number): SA-11-05	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 19, UNDISTURBED 1
5. NAME OF DRILLER: Messer	14. TOTAL NUMBER CORE BOXES: 0
6. DIRECTION OF HOLE: ☐ VERTICAL ☐ INCLINED ---- DEG. FROM VERT.	15. ELEVATION GROUND WATER: 728.2
7. THICKNESS OF OVERBURDEN: 49.0	16. DATE HOLE: STARTED 10/27/2011, COMPLETED 10/27/2011
8. DEPTH DRILLED INTO ROCK: 0.0	17. ELEVATION TOP OF HOLE: +745.0
9. TOTAL DEPTH OF HOLE: 49.0	18. TOTAL CORE RECOVERY FOR BORING: 0 %
	19. GEOLOGIST: King

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
+745.0	0.0		CLAY, medium stiff to very stiff, moist, little sand, reddish brown (CL)	89	SS-1 0.0 1.5	6-7-7, N = 14 Pen.: 4.5 tsf
				78	SS-2 2.5 4.0	6-5-6, N = 11 Pen.: 3.5 tsf
				94	SS-3 5.0 6.5	5-6-7, N = 13 Pen.: 3.0 tsf
				89	SS-4 7.5 9.0	6-6-7, N = 13 Pen.: 0.5 tsf
				67	ST 10.0 12.0	
				28	SS-6 12.5 14.0	5-6-8, N = 14 Pen.: 3.5 tsf
				100	SS-7 15.0 16.5	3-4-5, N = 9 Pen.: 1.5 tsf
				100	SS-8 17.5 19.0	4-5-5, N = 10 Pen.: 1.0 tsf
				100	SS-9 20.0 21.5	2-3-5, N = 8 Pen.: 1.0 tsf
				100	SS-10 22.5 24.0	14-7-7, N = 14 Pen.: 3.0 tsf

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 745.0 | **Hole No. SA-11-05**

PROJECT: Sheboygan Harbor Airport | INSTALLATION: | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
			CLAY, medium stiff to very stiff, moist, little sand, reddish brown (CL) *(continued)*	100	SS-11 25.0 26.5	15-8-10, N = 18 Pen.: 2.0 tsf
+718.0	27.0					
			CLAY, stiff, moist, some sand, reddish brown (CL)	100	SS-12 27.5 29.0	4-6-8, N = 14 Pen.: 2.5 tsf
+716.0	29.0					
			CLAY, stiff to very stiff, moist, little sand, reddish brown (CL)			
				100	SS-13 30.0 31.5	4-7-8, N = 15 Pen.: 3.0 tsf
				100	SS-14 32.5 34.0	5-6-9, N = 15 Pen.: 4.0 tsf
				100	SS-15 35.0 36.5	5-8-10, N = 18 Pen.: 3.5 tsf
				100	SS-16 37.5 39.0	5-8-10, N = 18 Pen.: 3.5 tsf
				100	SS-17 40.0 41.5	6-7-8, N = 18 Pen.: 3.0 tsf
				100	SS-18 42.5 44.0	5-16-11, N = 27 Pen.: 3.0 tsf
				100	SS-19 45.0 46.5	6-9-11, N = 20 Pen.: 2.5 tsf
				100	SS-20 47.5 49.0	5-8-14, N = 22 Pen.: 2.5 tsf
+696.0	49.0					

Hole No. SA-11-06

DRILLING LOG	DIVISION: Detroit	INSTALLATION	SHEET 1 OF 2 SHEETS

1. PROJECT: Sheboygan Harbor Airport	10. SIZE AND TYPE OF BIT: 4.25" ID HSA, SS and ST
2. LOCATION (Coordinates or Station): Sheboygan Falls, WI N 652,412.0 E 2,534,093.0	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): NAVD88, MSL
3. DRILLING AGENCY: TesTech, Inc.	12. MANUFACTURER'S DESIGNATION OF DRILL: ATV CME 550X
4. HOLE NO. (As shown on drawing title and file number): SA-11-06	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 19, UNDISTURBED 1
5. NAME OF DRILLER: Messer	14. TOTAL NUMBER CORE BOXES: 0
6. DIRECTION OF HOLE: ☐ VERTICAL ☐ INCLINED --- DEG. FROM VERT.	15. ELEVATION GROUND WATER: 738.8
7. THICKNESS OF OVERBURDEN: 49.0	16. DATE HOLE: STARTED 10/29/2011, COMPLETED 10/29/2011
8. DEPTH DRILLED INTO ROCK: 0.0	17. ELEVATION TOP OF HOLE: +751.8
9. TOTAL DEPTH OF HOLE: 49.0	18. TOTAL CORE RECOVERY FOR BORING: 0 %
	19. GEOLOGIST: King

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) (g)
+751.8	0.0		CLAY, medium stiff, moist, little sand, reddish brown (CL)	50	SS-1 0.0 1.5	3-3-4, N = 7 Pen.: 3.5 tsf
+748.8	3.0		CLAY, medium stiff to very stiff, moist, little sand, little gravel, reddish brown (CL)	100	SS-2 2.5 4.0	7-7-9, N = 16 Pen.: 4.0 tsf
				100	SS-3 5.0 6.5	5-5-8, N = 15 Pen.: 4.5 tsf
				100	SS-4 7.5 9.0	5-6-7, N = 13 Pen.: 3.0 tsf
				0	SS-5 10.0 11.5	7-7-8, N = 15
				100	SS-6 12.5 14.0	5-5-5, N = 10 Pen.: 2.0 tsf
				100	SS-7 15.0 16.5	3-4-5, N = 9 Pen.: 2.0 tsf
				100	ST 18.0 20.0	
				100	SS-9 20.0 21.5	4-4-6, N = 10 Pen.: 3.0 tsf
+727.3	24.5			33	SS-10 22.5 24.0	5-8-12, N = 20

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 751.8 | **Hole No. SA-11-06**

PROJECT: Sheboygan Harbor Airport | INSTALLATION | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV-ERY e	BOX OR SAMPLE NO. f	REMARKS *(Drilling time, water loss, depth weathering, etc., if significant)* g
			CLAY, stiff to hard, moist, little sand, reddish brown (CL) *(continued)*	100	SS-11 25.0 26.5	4-8-9, N = 14 Pen.: 2.5 tsf 3" of SILTY SAND encountered at 26', tested for Atterberg Limits
				100	SS-12 27.5 29.0	7-7-7, N = 14 Pen.: 3.25 tsf
				100	SS-13 30.0 31.5	6-6-7, N = 13 Pen.: 2.5 tsf
				100	SS-14 32.5 34.0	7-8-9, N = 17 Pen.: 4.0 tsf
				100	SS-15 35.0 36.5	4-7-7, N = 14 Pen.: 4.5 tsf
				100	SS-16 37.5 39.0	3-6-8, N = 14 Pen.: 4.0 tsf
				100	SS-17 40.0 41.5	6-8-10, N = 18 Pen.: 4.0 tsf
				22	SS-18 42.5 44.0	16-20-21, N = 41 Pen.: 2.0 tsf
				100	SS-19 45.0 46.5	5-6-10, N = 16 Pen.: 3.0 tsf
+702.8	49.0			100	SS-20 47.5 49.0	5-7-8, N = 15 Pen.: 4.5 tsf

DRILLING LOG

DIVISION: Detroit

INSTALLATION:

SHEET 1 OF 2 SHEETS

1. PROJECT	Sheboygan Harbor Airport
2. LOCATION (Coordinates or Station)	Sheboygan Falls, WI N 652,289.0 E 2,533,802.0
3. DRILLING AGENCY	TesTech, Inc.
4. HOLE NO. *(As shown on drawing title and file number)*	SA-11-07
5. NAME OF DRILLER	Messer
6. DIRECTION OF HOLE	☐ VERTICAL ☐ INCLINED --- DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	49.0
8. DEPTH DRILLED INTO ROCK	0.0
9. TOTAL DEPTH OF HOLE	49.0
10. SIZE AND TYPE OF BIT	4.25" ID HSA, SS and ST
11. DATUM FOR ELEVATION SHOWN *(TBM or MSL)*	NAVD88, MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	ATV CME 550X
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	DISTURBED 19 / UNDISTURBED 1
14. TOTAL NUMBER CORE BOXES	0
15. ELEVATION GROUND WATER	710.3
16. DATE HOLE	STARTED 10/29/2011 / COMPLETED 10/29/2011
17. ELEVATION TOP OF HOLE	+742.3
18. TOTAL CORE RECOVERY FOR BORING	0 %
19. GEOLOGIST	King

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS *(Drilling time, water loss, depth weathering, etc., if significant)* g
+742.3	0.0		CLAY, medium stiff to stiff, moist, reddish brown (CL)	78	SS-1 0.0 1.5	3-3-3, N = 6 Pen.: 2.5 tsf
				100	SS-2 2.5 4.0	4-4-6, N = 10 Pen.: 2.75 tsf
				100	ST 5.0 7.0	
+735.3	7.0		CLAY, medium stiff to hard, moist, little sand, reddish brown (CL)	0	SS-4 7.5 9.0	4-6-6, N = 12
				67	SS-5 10.0 11.5	5-7-8, N = 15 Pen.: 2.0 tsf
				100	SS-6 12.5 14.0	5-7-7, N = 14 Pen.: 0.75 tsf
				100	SS-7 15.0 16.5	4-4-5, N = 9 Pen.: 2.5 tsf
				100	SS-8 17.5 19.0	3-5-8, N = 13 Pen.: 4.0 tsf
				67	SS-9 20.0 21.5	5-7-8, N = 15 Pen.: 3.5 tsf
				100	SS-10 22.5 24.0	4-6-9, N = 15 Pen.: 4.0 tsf

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 742.3 | **Hole No. SA-11-07**

PROJECT: Sheboygan Harbor Airport | INSTALLATION: | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV-ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
			CLAY, medium stiff to hard, moist, little sand, reddish brown (CL) *(continued)*	100	SS-11 25.0 26.5	6-6-9, N = 15 Pen.: 4.0 tsf
				50	SS-12 27.5 29.0	8-12-14, N = 26 Pen.: 1.0 tsf
				100	SS-13 30.0 31.5	4-7-7, N = 14 Pen.: 4.0 tsf
				56	SS-14 32.5 34.0	11-14-16, N = 30 Pen.: 1.5 tsf
				78	SS-15 35.0 36.5	6-8-10, N = 18 Pen.: 4.0 tsf
				100	SS-16 37.5 39.0	6-7-8, N = 15 Pen.: 3.5 tsf
				100	SS-17 40.0 41.5	7-7-7, N = 14 Pen.: 4.0 tsf
				100	SS-18 42.5 44.0	8-8-10, N = 18 Pen.: 4.25 tsf
				11	SS-19 45.0 46.5	11-20-24, N = 44 Pen.: 2.0 tsf
+693.3	49.0			100	SS-20 47.5 49.0	7-8-7, N = 15 Pen.: 4.25 tsf

Hole No. SA-11-08

DRILLING LOG	DIVISION: Detroit	INSTALLATION	SHEET 1 OF 2 SHEETS

1. PROJECT: Sheboygan Harbor Airport	10. SIZE AND TYPE OF BIT: 4.25" ID HSA, SS and ST
2. LOCATION (Coordinates or Station): Sheboygan Falls, WI N 652,377.9 E 2,534,470.0	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): NAVD88, MSL
3. DRILLING AGENCY: TesTech, Inc.	12. MANUFACTURER'S DESIGNATION OF DRILL: ATV CME 550X
4. HOLE NO. (As shown on drawing title and file number): SA-11-08	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 19, UNDISTURBED 1
5. NAME OF DRILLER: Messer	14. TOTAL NUMBER CORE BOXES: 0
6. DIRECTION OF HOLE: ☐ VERTICAL ☐ INCLINED ---- DEG. FROM VERT.	15. ELEVATION GROUND WATER: 723.3
7. THICKNESS OF OVERBURDEN: 49.0	16. DATE HOLE: STARTED 10/26/2011, COMPLETED 10/26/2011
8. DEPTH DRILLED INTO ROCK: 0.0	17. ELEVATION TOP OF HOLE: +744.3
9. TOTAL DEPTH OF HOLE: 49.0	18. TOTAL CORE RECOVERY FOR BORING: 0 %
	19. GEOLOGIST: King

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
+744.3	0.0		CLAY, medium stiff to hard, moist, little sand, reddish brown (CL)	78	SS-1 0.0 1.5	3-4-8, N = 12 Pen.: 3.0 tsf
				100	SS-2 2.5 4.0	5-6-8, N = 14 Pen.: 4.5 tsf
				100	SS-3 5.0 6.5	4-6-6, N = 12 Pen.: 2.5 tsf
				100	ST 8.0 10.0	
				100	SS-5 10.0 11.5	3-4-6, N = 10 Pen.: 1.0 tsf
				100	SS-6 12.5 14.0	3-3-4, N = 7 Pen.: 1.5 tsf
				100	SS-7 15.0 16.5	3-4-5, N = 9 Pen.: 1.5 tsf
				22	SS-8 17.5 19.0	3-5-6, N = 11
				100	SS-9 20.0 21.5	4-6-8, N = 14 Pen.: 2.5 tsf
				100	SS-10 22.5 24.0	4-6-7, N = 13 Pen.: 2.5 tsf

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 744.3 | **Hole No. SA-11-08**

PROJECT: Sheboygan Harbor Airport | INSTALLATION: | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV-ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
			CLAY, medium stiff to hard, moist, little sand, reddish brown (CL) *(continued)*	100	SS-11 25.0 26.5	3-5-6, N = 11 Pen.: 2.0 tsf
				100	SS-12 27.5 29.0	2-4-5, N = 9 Pen.: 2.5 tsf
				100	SS-13 30.0 31.5	6-6-8, N = 14 Pen.: 2.0 tsf
				22	SS-14 32.5 34.0	5-6-8, N = 14
				100	SS-15 35.0 36.5	8-7-8, N = 15 Pen.: 3.0 tsf
				94	SS-16 37.5 39.0	5-5-8, N = 13 Pen.: 2.5 tsf
				67	SS-17 40.0 41.5	5-7-11, N = 18 Pen.: 1.0 tsf
				100	SS-18 42.5 44.0	12-13-14, N = 27 Pen.: 1.0 tsf
				33	SS-19 45.0 46.5	11-17-14, N = 31 Pen.: 0.5 tsf
+695.3	49.0			100	SS-20 47.5 49.0	6-7-8, N = 15 Pen.: 2.5 tsf

DRILLING LOG

DIVISION: Detroit

INSTALLATION:

SHEET 1 OF 2 SHEETS

1. PROJECT: Sheboygan Harbor Airport	10. SIZE AND TYPE OF BIT: 4.25" ID HSA, SS and ST
2. LOCATION (Coordinates or Station): Sheboygan Falls, WI N 652,241.0 E 2,534,275.0	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): NAVD88, MSL
3. DRILLING AGENCY: TesTech, Inc.	12. MANUFACTURER'S DESIGNATION OF DRILL: ATV CME 550X
4. HOLE NO. (As shown on drawing title and file number): SA-11-09	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 19, UNDISTURBED 1
5. NAME OF DRILLER: Messer	14. TOTAL NUMBER CORE BOXES: 0
6. DIRECTION OF HOLE: ☐ VERTICAL ☐ INCLINED --- DEG. FROM VERT.	15. ELEVATION GROUND WATER: 709.0
7. THICKNESS OF OVERBURDEN: 49.0	16. DATE HOLE: STARTED 10/26/2011, COMPLETED 10/26/2011
8. DEPTH DRILLED INTO ROCK: 0.0	17. ELEVATION TOP OF HOLE: +748.8
9. TOTAL DEPTH OF HOLE: 49.0	18. TOTAL CORE RECOVERY FOR BORING: 0 %
	19. GEOLOGIST: King

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) (g)
+748.8	0.0		CLAY, medium stiff to very stiff, moist, little sand, reddish brown (CL)	94	SS-1 0.0 1.5	3-3-3, N = 6 Pen.: 2.5 tsf
				100	SS-2 2.5 4.0	5-7-10, N = 17 Pen.: 4.0 tsf
+744.3	4.5					
			CLAY, very stiff, moist, reddish brown (CL)	83	ST 5.0 7.0	
				94	SS-4 7.5 9.0	5-12-17, N = 29 Pen.: 4.0 tsf
+739.3	9.5					
			CLAY, stiff to very stiff, moist, little sand, reddish brown (CL)	94	SS-5 10.0 11.5	6-8-10, N = 18 Pen.: 3.5 tsf
				100	SS-6 12.5 14.0	5-6-10, N = 16 Pen.: 4.0 tsf
				100	SS-7 15.0 16.5	5-7-9, N = 16 Pen.: 4.0 tsf
				100	SS-8 17.5 19.0	7-11-11, N = 22 Pen.: 3.0 tsf
				100	SS-9 20.0 21.5	6-8-10, N = 18 Pen.: 4.0 tsf
				100	SS-10 22.5 24.0	4-7-10, N = 17 Pen.: 3.0 tsf

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 748.8 | **Hole No. SA-11-09**

PROJECT: Sheboygan Harbor Airport | INSTALLATION: | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
			CLAY, stiff to very stiff, moist, little sand, reddish brown (CL) *(continued)*	100	SS-11 25.0 26.5	5-7-12, N = 19 Pen.: 3.0 tsf
				100	SS-12 27.5 29.0	4-6-9, N = 15 Pen.: 3.5 tsf
				100	SS-13 30.0 31.5	4-6-8, N = 14 Pen.: 3.0 tsf
				100	SS-14 32.5 34.0	4-6-8, N = 14 Pen.: 2.5 tsf
				100	SS-15 35.0 36.5	3-5-8, N = 13 Pen.: 2.5 tsf
				100	SS-16 37.5 39.0	4-6-10, N = 16 Pen.: 2.0 tsf
				100	SS-17 40.0 41.5	4-6-10, N = 16 Pen.: 1.5 tsf
				100	SS-18 42.5 44.0	4-6-9, N = 15 Pen.: 3.0 tsf
				100	SS-19 45.0 46.5	3-4-7, N = 11 Pen.: 2.0 tsf
				100	SS-20 47.5 49.0	4-7-9, N = 16 Pen.: 2.0 tsf
+699.8	49.0					

Hole No. SA-11-10

DRILLING LOG	DIVISION: Detroit	INSTALLATION	SHEET 1 OF 2 SHEETS

1. PROJECT: Sheboygan Harbor Airport	10. SIZE AND TYPE OF BIT: 4.25" ID HSA, SS and ST
2. LOCATION (Coordinates or Station): Sheboygan Falls, WI N 652,109.0 E 2,534,471.0	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): NAVD88, MSL
3. DRILLING AGENCY: TesTech, Inc.	12. MANUFACTURER'S DESIGNATION OF DRILL: ATV CME 550X
4. HOLE NO. (As shown on drawing title and file number): SA-11-10	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 19 / UNDISTURBED 1
5. NAME OF DRILLER: Messer	14. TOTAL NUMBER CORE BOXES: 0
6. DIRECTION OF HOLE: ☐ VERTICAL ☐ INCLINED ___ DEG. FROM VERT.	15. ELEVATION GROUND WATER: 728.1
7. THICKNESS OF OVERBURDEN: 49.0	16. DATE HOLE: STARTED 10/25/2011 / COMPLETED 10/25/2011
8. DEPTH DRILLED INTO ROCK: 0.0	17. ELEVATION TOP OF HOLE: +744.6
9. TOTAL DEPTH OF HOLE: 49.0	18. TOTAL CORE RECOVERY FOR BORING: 0 %
	19. GEOLOGIST: King

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
+744.6	0.0		CLAY, medium stiff, moist, little sand, reddish brown (CL)	78	SS-1 0.0 1.5	2-3-3, N = 6
+742.6	2.0		CLAY, medium stiff to stiff, moist, and sand, reddish brown (CL)	94	SS-2 2.5 4.0	4-3-3, N = 6
				78	SS-3 5.0 6.5	4-6-7, N = 13 Pen.: 2.0 tsf
+737.6	7.0		CLAY, stiff to very stiff, moist, little sand, reddish brown (CL)	94	SS-4 7.5 9.0	6-6-8, N = 14 Pen.: 3.5 tsf
				100	ST 10.0 12.0	
				100	SS-6 12.5 14.0	3-6-9, N = 15 Pen.: 4.0 tsf
				100	SS-7 15.0 16.5	6-8-10, N = 18 Pen.: 3.5 tsf
				100	SS-8 17.5 19.0	4-4-7, N = 11 Pen.: 3.0 tsf
				100	SS-9 20.0 21.5	4-4-7, N = 11 Pen.: 2.5 tsf
				100	SS-10 22.5 24.0	3-6-8, N = 14

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 744.6 | **Hole No. SA-11-10**

PROJECT: Sheboygan Harbor Airport | INSTALLATION: | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV-ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
			CLAY, stiff to very stiff, moist, little sand, reddish brown (CL) *(continued)*	100	SS-11 25.0 26.5	3-5-8, N = 13 Pen.: 3.0 tsf
				100	SS-12 27.5 29.0	3-4-7, N = 11 Pen.: 3.5 tsf
				100	SS-13 30.0 31.5	7-10-10, N = 20 Pen.: 2.5 tsf
				56	SS-14 32.5 34.0	6-10-11, N = 21
				100	SS-15 35.0 36.5	4-7-10, N = 17 Pen.: 3.0 tsf
				89	SS-16 37.5 39.0	4-5-8, N = 13 Pen.: 2.5 tsf
				100	SS-17 40.0 41.5	7-8-9, N = 17 Pen.: 2.5 tsf
				100	SS-18 42.5 44.0	6-8-10, N = 18 Pen.: 2.5 tsf
				61	SS-19 45.0 46.5	4-8-11, N = 19 Pen.: 2.5 tsf
				100	SS-20 47.5 49.0	7-5-6, N = 11 Pen.: 1.5 tsf
+695.6	49.0					

Hole No. SA-11-11

DRILLING LOG	DIVISION Detroit	INSTALLATION	SHEET 1 OF 2 SHEETS

1. PROJECT	Sheboygan Harbor Airport
2. LOCATION (Coordinates or Station)	Sheboygan Falls, WI N 651,878.0 E 2,534,651.0
3. DRILLING AGENCY	TesTech, Inc.
4. HOLE NO. *(As shown on drawing title and file number)*	SA-11-11
5. NAME OF DRILLER	Messer
6. DIRECTION OF HOLE	☐ VERTICAL ☐ INCLINED --- DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	49.0
8. DEPTH DRILLED INTO ROCK	0.0
9. TOTAL DEPTH OF HOLE	49.0
10. SIZE AND TYPE OF BIT	4.25" ID HSA, SS and ST
11. DATUM FOR ELEVATION SHOWN *(TBM or MSL)*	NAVD88, MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	ATV CME 550X
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	DISTURBED 19 UNDISTURBED 1
14. TOTAL NUMBER CORE BOXES	0
15. ELEVATION GROUND WATER	705.2
16. DATE HOLE	STARTED 10/25/2011 COMPLETED 10/25/2011
17. ELEVATION TOP OF HOLE	+741.2
18. TOTAL CORE RECOVERY FOR BORING	0 %
19. GEOLOGIST	King

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS *(Drilling time, water loss, depth weathering, etc., if significant)* g
+741.2	0.0		CLAY, medium stiff to very stiff, moist, little sand, reddish brown (CL)	72	SS-1 0.0 1.5	3-4-5, N = 9 Pen.: 2.0 tsf
				89	SS-2 2.5 4.0	5-6-7, N = 13 Pen.: 0.5 tsf
				67	SS-3 5.0 6.5	9-9-10, N = 19 Pen.: 0.5 tsf
				94	SS-4 7.5 9.0	5-5-11, N = 16 Pen.: 2.5 tsf
				0	ST 10.0 12.0	
				94	SS-6 12.5 14.0	12-4-4, N = 8 Pen.: 1.5 tsf
+726.7	14.5		CLAY, medium stiff to very stiff, moist, reddish brown (CL)	100	SS-7 15.0 16.5	9-4-5, N = 9 Pen.: 1.0 tsf
				100	SS-8 17.5 19.0	9-4-5, N = 9 Pen.: 1.5 tsf
				78	SS-9 20.0 21.5	8-5-6, N = 11 Pen.: 1.5 tsf
				100	SS-10 22.5 24.0	5-5-7, N = 12 Pen.: 2.0 tsf

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 741.2 | **Hole No. SA-11-11**

PROJECT: Sheboygan Harbor Airport | INSTALLATION | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV-ERY e	BOX OR SAMPLE NO. f	REMARKS *(Drilling time, water loss, depth weathering, etc., if significant)* g
			CLAY, medium stiff to very stiff, moist, reddish brown (CL) *(continued)*	94	SS-11 25.0 26.5	18-7-7, N = 14 Pen.: 2.0 tsf
				78	SS-12 27.5 29.0	22-22-7, N = 29 Pen.: 3.0 tsf
				67	SS-13 30.0 31.5	20-11-9, N = 20 Pen.: 0.5 tsf
				100	SS-14 32.5 34.0	9-7-9, N = 16
				100	SS-15 35.0 36.5	5-8-12, N = 20 Pen.: 3.0 tsf
				100	SS-16 37.5 39.0	5-6-8, N = 14 Pen.: 2.0 tsf
				100	SS-17 40.0 41.5	4-6-8, N = 14 Pen.: 2.5 tsf
				100	SS-18 42.5 44.0	4-6-8, N = 14 Pen.: 2.5 tsf
				100	SS-19 45.0 46.5	6-7-9, N = 16 Pen.: 2.5 tsf
				100	SS-20 47.5 49.0	3-5-5, N = 10 Pen.: 1.5 tsf
+692.2	49.0					

DRILLING LOG

DIVISION: Detroit

INSTALLATION:

SHEET 1 OF 2 SHEETS

1. PROJECT: Sheboygan Harbor Airport	10. SIZE AND TYPE OF BIT: 4.25" ID HSA, SS and ST
2. LOCATION (Coordinates or Station): Sheboygan Falls, WI N 651,901.0 E 2,534,290.0	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): NAVD88, MSL
3. DRILLING AGENCY: TesTech, Inc.	12. MANUFACTURER'S DESIGNATION OF DRILL: ATV CME 550X
4. HOLE NO. (As shown on drawing title and file number): SA-11-12	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 19, UNDISTURBED 1
5. NAME OF DRILLER: Messer	14. TOTAL NUMBER CORE BOXES: 0
6. DIRECTION OF HOLE: ☐ VERTICAL ☐ INCLINED ___ DEG. FROM VERT.	15. ELEVATION GROUND WATER: 735.5
7. THICKNESS OF OVERBURDEN: 49.0	16. DATE HOLE: STARTED 10/26/2011, COMPLETED 10/26/2011
8. DEPTH DRILLED INTO ROCK: 0.0	17. ELEVATION TOP OF HOLE: +748.0
9. TOTAL DEPTH OF HOLE: 49.0	18. TOTAL CORE RECOVERY FOR BORING: 0 %
	19. GEOLOGIST: King

ELEVATION (a)	DEPTH (b)	LEGEND (c)	CLASSIFICATION OF MATERIALS (Description) (d)	% CORE RECOVERY (e)	BOX OR SAMPLE NO. (f)	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) (g)
+748.0	0.0		CLAY, stiff to very stiff, moist, little sand, reddish brown (CL)	78	SS-1 0.0 1.5	4-6-8, N = 14 Pen.: 4.0 tsf
				94	SS-2 2.5 4.0	5-6-7, N = 13 Pen.: 2.5 tsf
				100	SS-3 5.0 6.5	3-5-7, N = 12 Pen.: 2.5 tsf
				33	SS-4 7.5 9.0	10-11-8, N = 19 Pen.: 1.5 tsf
+738.5	9.5					
			CLAY, stiff, moist, and sand, reddish brown (CL)	75	ST 10.0 12.0	
				22	SS-6 12.5 14.0	4-4-6, N = 10 Pen.: 2.5 tsf
+733.5	14.5					
			CLAY, medium stiff to stiff, moist, little sand, reddish brown (CL)	100	SS-7 15.0 16.5	3-4-5, N = 9 Pen.: 2.5 tsf
				11	SS-8 17.5 19.0	5-7-7, N = 14
+728.5	19.5					
			CLAY, stiff to very stiff, moist, reddish brown (CL)	100	SS-9 20.0 21.5	5-6-6, N = 12 Pen.: 2.0 tsf
				100	SS-10 22.5 24.0	3-5-7, N = 12 Pen.: 1.5 tsf

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 748.0 | **Hole No. SA-11-12**

PROJECT: Sheboygan Harbor Airport | INSTALLATION | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
			CLAY, stiff to very stiff, moist, reddish brown (CL) *(continued)*	100	SS-11 25.0 26.5	4-6-8, N = 14 Pen.: 2.5 tsf
				100	SS-12 27.5 29.0	3-6-7, N = 13 Pen.: 2.0 tsf
				100	SS-13 30.0 31.5	4-5-7, N = 12 Pen.: 2.5 tsf
				100	SS-14 32.5 34.0	3-5-6, N = 11 Pen.: 2.5 tsf
				100	SS-15 35.0 36.5	4-5-8, N = 13 Pen.: 2.0 tsf
				78	SS-16 37.5 39.0	8-12-8, N = 20 Pen.: 1.0 tsf
				100	SS-17 40.0 41.5	5-6-9, N = 15 Pen.: 2.5 tsf
				100	SS-18 42.5 44.0	3-6-8, N = 14 Pen.: 2.5 tsf
				100	SS-19 45.0 46.5	3-6-8, N = 14 Pen.: 2.5 tsf
				100	SS-20 47.5 49.0	4-6-9, N = 15 Pen.: 3.0 tsf
+699.0	49.0					

DRILLING LOG

DIVISION: Detroit

INSTALLATION:

SHEET 1 OF 2 SHEETS

1. PROJECT	Sheboygan Harbor Airport
2. LOCATION (Coordinates or Station)	Sheboygan Falls, WI N 651,781.2 E 2,534,482.2
3. DRILLING AGENCY	TesTech, Inc.
4. HOLE NO. *(As shown on drawing title and file number)*	SA-11-13
5. NAME OF DRILLER	Messer
6. DIRECTION OF HOLE	☐ VERTICAL ☐ INCLINED ___ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	49.0
8. DEPTH DRILLED INTO ROCK	0.0
9. TOTAL DEPTH OF HOLE	49.0
10. SIZE AND TYPE OF BIT	4.25" ID HSA, SS
11. DATUM FOR ELEVATION SHOWN *(TBM or MSL)*	NAVD88, MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	ATV CME 550X
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	DISTURBED 20 / UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES	0
15. ELEVATION GROUND WATER	739.8
16. DATE HOLE	STARTED 10/23/2011 / COMPLETED 10/23/2011
17. ELEVATION TOP OF HOLE	+746.8
18. TOTAL CORE RECOVERY FOR BORING	0 %
19. GEOLOGIST	King

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
+746.8	0.0		CLAY, medium stiff to very stiff, moist, little sand, reddish brown (CL)	56	SS-1 0.0 1.5	4-4-5, N = 9 Pen.: 3.0 tsf
				100	SS-2 2.5 4.0	8-10-12, N = 22 Pen.: 4.0 tsf
				33	SS-3 5.0 6.5	6-6-8, N = 14 Pen.: 0.5 tsf
				100	SS-4 7.5 9.0	4-5-7, N = 12 Pen.: 2.0 tsf
				39	SS-5 10.0 11.5	16-8-7, N = 15 Pen.: 1.0 tsf
				22	SS-6 12.5 14.0	14-10-9, N = 19
				100	SS-7 15.0 16.5	4-6-6, N = 12 Pen.: 1.0 tsf
				100	SS-8 17.5 19.0	5-5-7, N = 12 Pen.: 2.0 tsf
				11	SS-9 20.0 21.5	9-10-12, N = 22
				100	SS-10 22.5 24.0	3-4-6, N = 10 Pen.: 1.5 tsf

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 746.8 | **Hole No. SA-11-13**

PROJECT: Sheboygan Harbor Airport | INSTALLATION | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOV-ERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
			CLAY, medium stiff to very stiff, moist, little sand, reddish brown (CL) *(continued)*	67	SS-11 25.0 26.5	7-7-8, N = 18 Pen.: 1.5 tsf
				100	SS-12 27.5 29.0	5-7-9, N = 16 Pen.: 2.5 tsf
				100	SS-13 30.0 31.5	7-5-8, N = 13 Pen.: 2.0 tsf
				100	SS-14 32.5 34.0	6-9-9, N = 18 Pen.: 3.5 tsf
				100	SS-15 35.0 36.5	5-6-10, N = 16 Pen.: 1.5 tsf
				100	SS-16 37.5 39.0	5-7-9, N = 16 Pen.: 2.5 tsf
				100	SS-17 40.0 41.5	9-10-14, N = 24 Pen.: 1.5 tsf
				100	SS-18 42.5 44.0	5-7-9, N = 16 Pen.: 2.5 tsf
				100	SS-19 45.0 46.5	6-6-8, N = 14 Pen.: 2.0 tsf
				100	SS-20 47.5 49.0	5-8-11, N = 19 Pen.: 3.0 tsf
+697.8	49.0					

Hole No. SA-11-14

DRILLING LOG	DIVISION Detroit	INSTALLATION	SHEET 1 OF 2 SHEETS

1. PROJECT Sheboygan Harbor Airport		10. SIZE AND TYPE OF BIT	4.25" ID HSA, SS
2. LOCATION (Coordinates or Station) Sheboygan Falls, WI N 651,315.0 E 2,534,210.4		11. DATUM FOR ELEVATION SHOWN (TBM or MSL)	NAVD88, MSL
3. DRILLING AGENCY TesTech, Inc.		12. MANUFACTURER'S DESIGNATION OF DRILL	ATV CME 550X
4. HOLE NO. (As shown on drawing title and file number)	SA-11-14	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	DISTURBED 20 / UNDISTURBED 0
5. NAME OF DRILLER Messer		14. TOTAL NUMBER CORE BOXES	0
6. DIRECTION OF HOLE ☐ VERTICAL ☐ INCLINED --- DEG. FROM VERT.		15. ELEVATION GROUND WATER	739.5
7. THICKNESS OF OVERBURDEN	49.0	16. DATE HOLE	STARTED 10/22/2011 / COMPLETED 10/22/2011
8. DEPTH DRILLED INTO ROCK	0.0	17. ELEVATION TOP OF HOLE	+747.9
9. TOTAL DEPTH OF HOLE	49.0	18. TOTAL CORE RECOVERY FOR BORING	0 %
		19. GEOLOGIST	King

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
+747.9	0.0		CLAY, medium stiff to very stiff, moist, little sand, reddish brown (CL)	78	SS-1 0.0 1.5	3-4-4, N = 8 Pen.: 3.0 tsf
				100	SS-2 2.5 4.0	6-10-11, N = 21 Pen.: 3.5 tsf
				89	SS-3 5.0 6.5	3-6-7, N = 13 Pen.: 3.5 tsf
				100	SS-4 7.5 9.0	5-6-9, N = 15 Pen.: 3.5 tsf
				100	SS-5 10.0 11.5	2-3-6, N = 9 Pen.: 2.5 tsf
				100	SS-6 12.5 14.0	2-5-5, N = 10 Pen.: 2.5 tsf
				100	SS-7 15.0 16.5	3-4-5, N = 9 Pen.: 2.0 tsf
				100	SS-8 17.5 19.0	3-4-5, N = 9 Pen.: 1.5 tsf
				100	SS-9 20.0 21.5	4-3-5, N = 8 Pen.: 1.0 tsf
				100	SS-10 22.5 24.0	4-4-7, N = 11 Pen.: 1.0 tsf

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 747.9 | **Hole No. SA-11-14**

PROJECT: Sheboygan Harbor Airport | INSTALLATION: | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
			CLAY, medium stiff to very stiff, moist, little sand, reddish brown (CL) *(continued)*	33	SS-11 25.0 26.5	3-5-7, N = 12 Pen.: 0.5 tsf
				100	SS-12 27.5 29.0	6-4-6, N = 10 Pen.: 2.0 tsf
				33	SS-13 30.0 31.5	7-10-11, N = 21 Pen.: 0.0 tsf
				100	SS-14 32.5 34.0	4-6-8, N = 18 Pen.: 2.5 tsf
				100	SS-15 35.0 36.5	5-7-7, N = 14 Pen.: 1.5 tsf
				100	SS-16 37.5 39.0	5-14-7, N = 21 Pen.: 1.5 tsf
				100	SS-17 40.0 41.5	4-5-7, N = 12 Pen.: 1.5 tsf
				100	SS-18 42.5 44.0	4-4-7, N = 11 Pen.: 2.0 tsf
				100	SS-19 45.0 46.5	4-6-7, N = 13 Pen.: 2.5 tsf
+698.9	49.0			100	SS-20 47.5 49.0	4-8-8, N = 16 Pen.: 2.0 tsf

Hole No. SA-11-15

DRILLING LOG	DIVISION Detroit	INSTALLATION	SHEET 1 OF 2 SHEETS

1. PROJECT	Sheboygan Harbor Airport
2. LOCATION (Coordinates or Station)	Sheboygan Falls, WI N 651,087.1 E 2,534,235.1
3. DRILLING AGENCY	TesTech, Inc.
4. HOLE NO. *(As shown on drawing title and file number)*	SA-11-15
5. NAME OF DRILLER	Messer
6. DIRECTION OF HOLE	☐ VERTICAL ☐ INCLINED --- DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN	49.0
8. DEPTH DRILLED INTO ROCK	0.0
9. TOTAL DEPTH OF HOLE	49.0
10. SIZE AND TYPE OF BIT	4.25" ID HSA, SS
11. DATUM FOR ELEVATION SHOWN *(TBM or MSL)*	NAVD88, MSL
12. MANUFACTURER'S DESIGNATION OF DRILL	ATV CME 550X
13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN	DISTURBED 20 / UNDISTURBED 0
14. TOTAL NUMBER CORE BOXES	0
15. ELEVATION GROUND WATER	707.4
16. DATE HOLE	STARTED 10/21/2011 / COMPLETED 10/21/2011
17. ELEVATION TOP OF HOLE	+745.2
18. TOTAL CORE RECOVERY FOR BORING	0 %
19. GEOLOGIST	King

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS *(Drilling time, water loss, depth weathering, etc., if significant)* g
+745.2	0.0		CLAY, medium stiff to very stiff, moist, little sand, reddish brown (CL)	100	SS-1 0.0 1.5	3-6-5, N = 11 Pen.: 3.5 tsf
				100	SS-2 2.5 4.0	6-9-10, N = 19 Pen.: 3.0 tsf
				89	SS-3 5.0 6.5	5-9-8, N = 17 Pen.: 3.5 tsf
				100	SS-4 7.5 9.0	4-7-9, N = 16 Pen.: 4.0 tsf
				100	SS-5 10.0 11.5	4-6-7, N = 13 Pen.: 3.0 tsf
				100	SS-6 12.5 14.0	4-3-5, N = 8 Pen.: 1.5 tsf
				100	SS-7 15.0 16.5	4-4-5, N = 9 Pen.: 1.5 tsf
				100	SS-8 17.5 19.0	8-7-9, N = 16 Pen.: 1.5 tsf
				100	SS-9 20.0 21.5	3-3-4, N = 7 Pen.: 1.5 tsf
				100	SS-10 22.5 24.0	3-4-6, N = 10 Pen.: 1.75 tsf

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 745.2 | **Hole No. SA-11-15**

PROJECT: Sheboygan Harbor Airport | INSTALLATION: | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
			CLAY, medium stiff to very stiff, moist, little sand, reddish brown (CL) *(continued)*	67	SS-11 25.0 26.5	9-9-9, N = 18 Pen.: 1.5 tsf
				100	SS-12 27.5 29.0	5-7-8, N = 15 Pen.: 2.0 tsf
				100	SS-13 30.0 31.5	5-6-7, N = 13 Pen.: 2.5 tsf
				100	SS-14 32.5 34.0	3-5-8, N = 12 Pen.: 2.0 tsf
				100	SS-15 35.0 36.5	3-5-6, N = 11 Pen.: 2.5 tsf
				100	SS-16 37.5 39.0	7-8-8, N = 16 Pen.: 2.5 tsf
				100	SS-17 40.0 41.5	5-7-8, N = 15 Pen.: 3.0 tsf
				11	SS-18 42.5 44.0	18-14-13, N = 27
				94	SS-19 45.0 46.5	5-9-7, N = 16 Pen.: 2.5 tsf
+696.2	49.0			94	SS-20 47.5 49.0	4-5-6, N = 11 Pen.: 2.5 tsf

DRILLING LOG

DIVISION: Detroit

INSTALLATION:

SHEET 1 OF 2 SHEETS

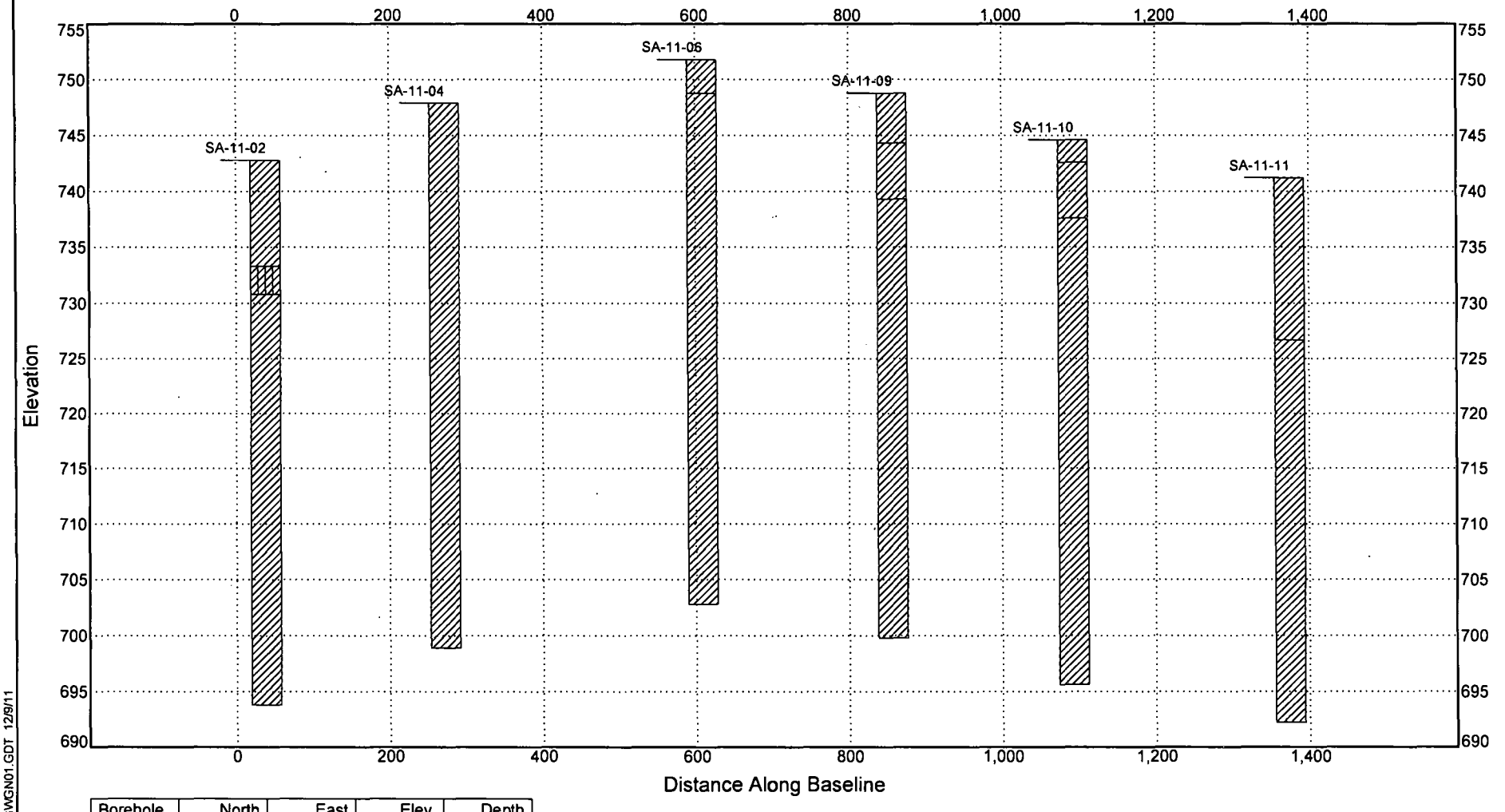
1. PROJECT: Sheboygan Harbor Airport	10. SIZE AND TYPE OF BIT: 4.25" ID HSA, SS
2. LOCATION (Coordinates or Station): Sheboygan Falls, WI N 650,783.2 E 2,533,943.9	11. DATUM FOR ELEVATION SHOWN (TBM or MSL): NAVD88, MSL
3. DRILLING AGENCY: TesTech, Inc.	12. MANUFACTURER'S DESIGNATION OF DRILL: ATV CME 550X
4. HOLE NO. (As shown on drawing title and file number): SA-11-16	13. TOTAL NO. OF OVERBURDEN SAMPLES TAKEN: DISTURBED 20, UNDISTURBED 0
5. NAME OF DRILLER: Messer	14. TOTAL NUMBER CORE BOXES: 0
6. DIRECTION OF HOLE: ☐ VERTICAL ☐ INCLINED ___ DEG. FROM VERT.	15. ELEVATION GROUND WATER: 703.3
7. THICKNESS OF OVERBURDEN: 49.0	16. DATE HOLE: STARTED 10/20/2011, COMPLETED 10/20/2011
8. DEPTH DRILLED INTO ROCK: 0.0	17. ELEVATION TOP OF HOLE: +738.8
9. TOTAL DEPTH OF HOLE: 49.0	18. TOTAL CORE RECOVERY FOR BORING: 0 %
	19. GEOLOGIST: King

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
+738.8	0.0		CLAY, medium stiff to hard, moist, little sand, reddish brown (CL)	89	SS-1 0.0 1.5	2-4-5, N = 9 Pen.: 3.5 tsf
				94	SS-2 2.5 4.0	5-9-12, N = 21 Pen.: 3.5 tsf
				100	SS-3 5.0 6.5	4-6-8, N = 14 Pen.: 4.0 tsf
				100	SS-4 7.5 9.0	6-7-9, N = 16 Pen.: 3.0 tsf
				100	SS-5 10.0 11.5	2-4-5, N = 9 Pen.: 2.5 tsf
				56	SS-6 12.5 14.0	3-8-7, N = 15 Pen.: 1.5 tsf
				100	SS-7 15.0 16.5	4-4-4, N = 8 Pen.: 2.0 tsf
				100	SS-8 17.5 19.0	3-6-7, N = 13 Pen.: 3.0 tsf
				100	SS-9 20.0 21.5	3-5-8, N = 13 Pen.: 3.0 tsf
				100	SS-10 22.5 24.0	5-6-10, N = 16 Pen.: 3.0 tsf

DRILLING LOG (Cont Sheet) | ELEVATION TOP OF HOLE 738.8 | **Hole No. SA-11-16**

PROJECT: Sheboygan Harbor Airport | INSTALLATION: | SHEET 2 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth weathering, etc., if significant) g
			CLAY, medium stiff to hard, moist, little sand, reddish brown (CL) *(continued)*	100	SS-11 25.0 26.5	5-7-9, N = 16 Pen.: 3.0 tsf
				100	SS-12 27.5 29.0	3-6-7, N = 13 Pen.: 3.0 tsf
				100	SS-13 30.0 31.5	6-7-8, N = 15 Pen.: 3.0 tsf
				56	SS-14 32.5 34.0	19-50/5", N = >50 Pen.: 1.5 tsf
				33	SS-15 35.0 36.5	9-50/5", N = >50 Pen.: 1.25 tsf
				33	SS-16 37.5 39.0	26-50/5", N = >50 Pen.: 1.0 tsf
				67	SS-17 40.0 41.5	42-27-10, N = 37 Pen.: 2.0 tsf
				89	SS-18 42.5 44.0	18-8-9, N = 17 Pen.: 2.0 tsf
				100	SS-19 45.0 46.5	3-7-9, N = 16 Pen.: 1.5 tsf
+689.8	49.0			67	SS-20 47.5 49.0	28-34-12, N = 46



Borehole	North	East	Elev.	Depth
SA-11-02	652683	2533584	742.8	49.0
SA-11-04	652586	2533803	747.9	49.0
SA-11-06	652412	2534093	751.8	49.0
SA-11-09	652241	2534275	748.8	49.0
SA-11-10	652109	2534471	744.6	49.0
SA-11-11	651878	2534651	741.2	49.0

DISTANCES:

Beginning	0
Ending	1400

VIEWING ANGLES (degrees):

Horizontal	0.0
Vertical	0.0

Position	North	East
Left, Front	652716	2533608
Right, Front	651883	2534734
Left, Back	652716	2533608
Right, Back	651883	2534734

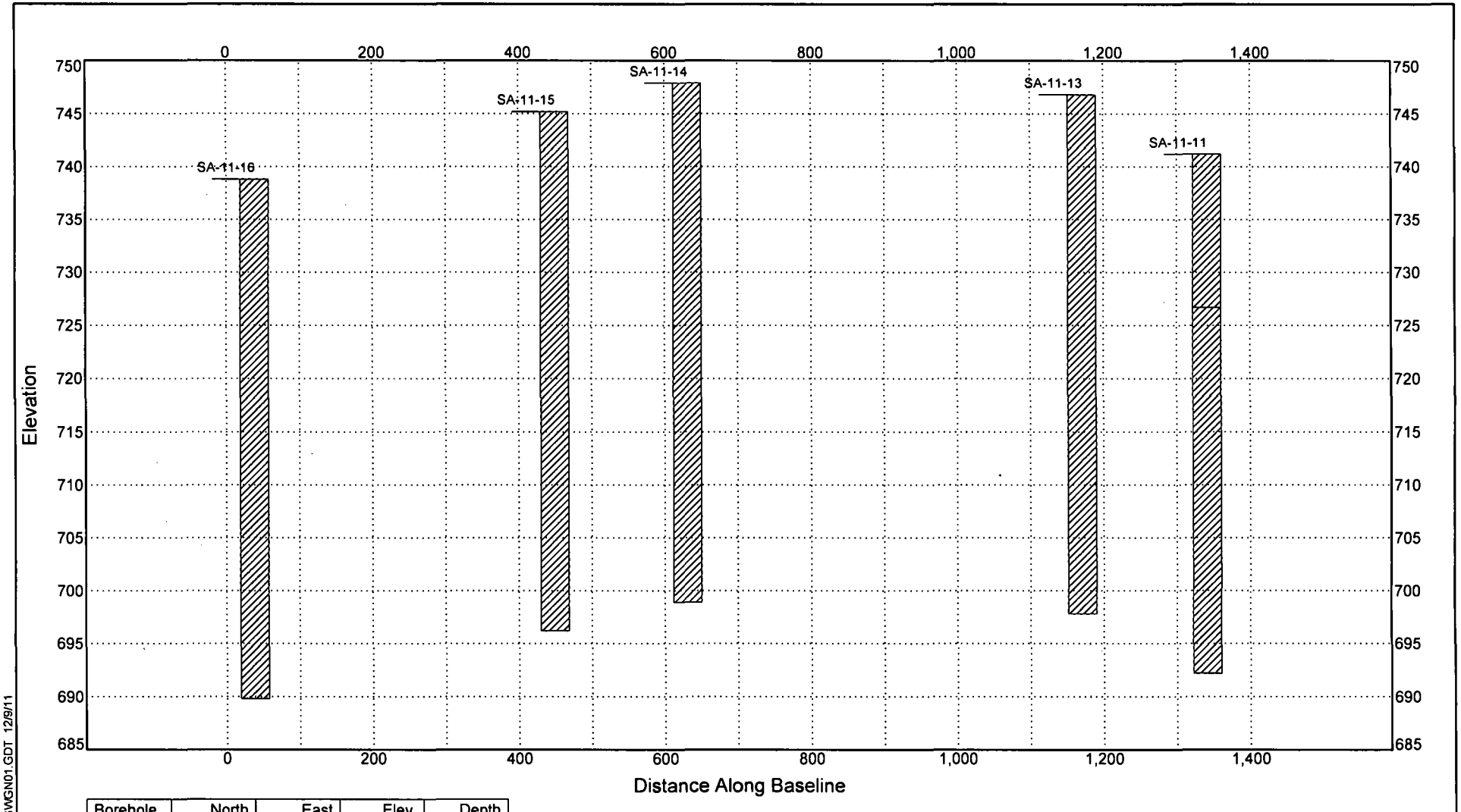
SUBSURFACE FENCE DIAGRAM SE to NW

Sheboygan Harbor Airport

Sheboygan Falls, WI

PROJECT #	DATE	PLATE
MI051G	Dec 11	1

FAGWGN01 MI051G SOIL PROFILES.GPJ FAGWGN01.GDT 12/9/11



Borehole	North	East	Elev.	Depth
SA-11-11	651878	2534651	741.2	49.0
SA-11-13	651781	2534482	746.8	49.0
SA-11-14	651315	2534210	747.9	49.0
SA-11-15	651087	2534235	745.2	49.0
SA-11-16	650783	2533944	738.8	49.0

DISTANCES:

Beginning	0
Ending	1400

VIEWING ANGLES (degrees):

Horizontal	0.0
Vertical	0.0

Position	North	East
Left, Front	650781	2533947
Right, Front	651977	2534675
Left, Back	650781	2533947
Right, Back	651977	2534675

SUBSURFACE FENCE DIAGRAM SW to NE

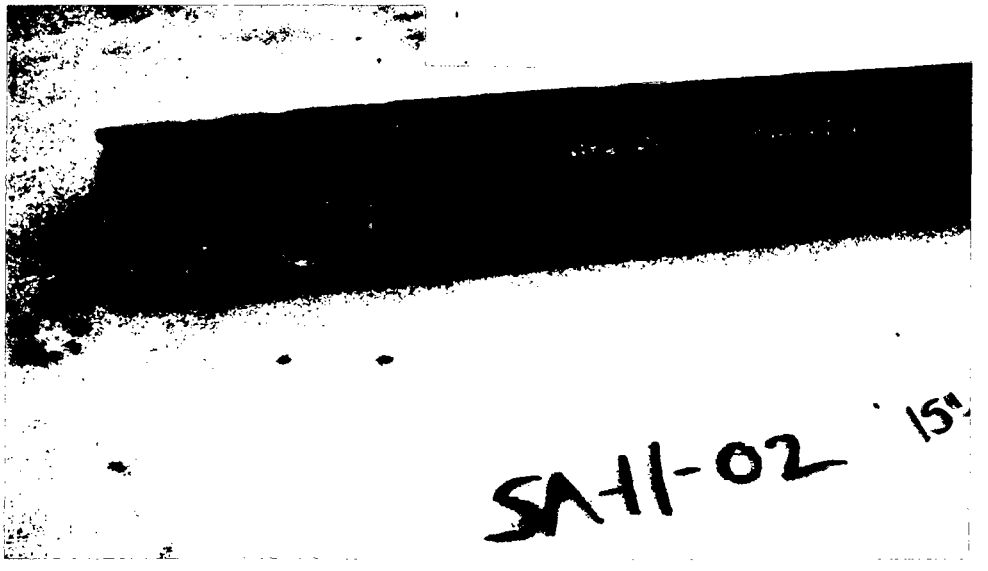
Sheboygan Harbor Airport

Sheboygan Falls, WI

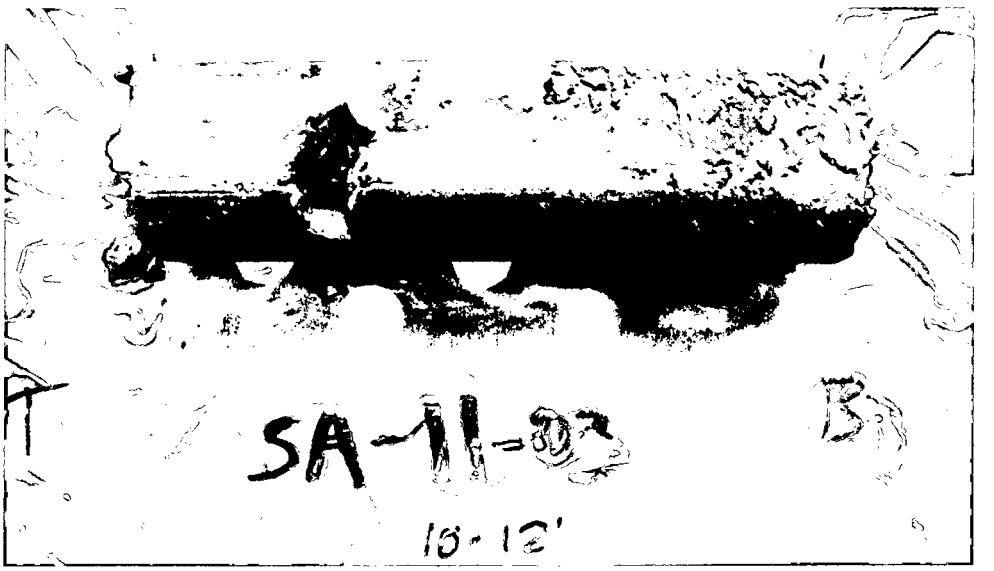
PROJECT #	DATE	PLATE
MI051G	Dec 11	1

FAGWGN01 MI051G SOIL PROFILES.GPJ FAGWGN01.GDT 12/9/11

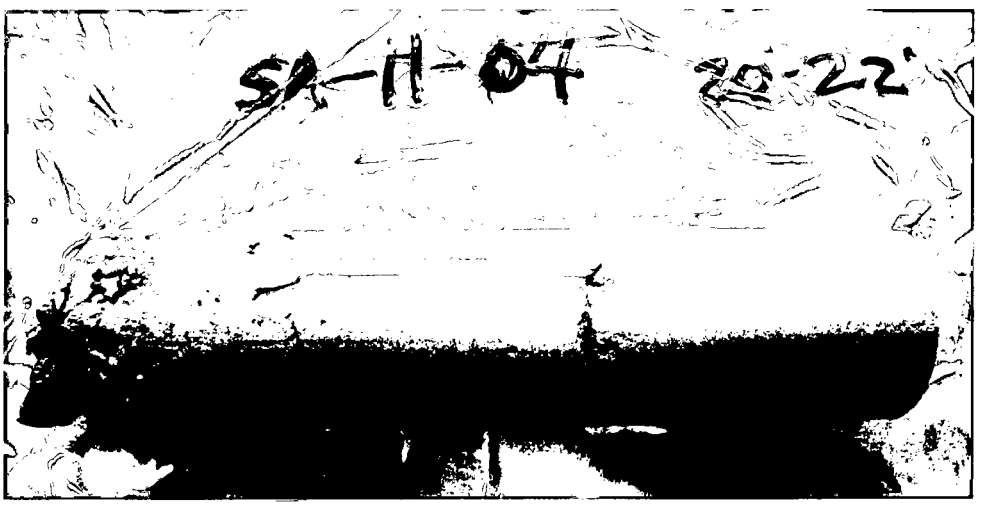
SA-11-01, 18' - 20'
CLAY, stiff to very stiff, moist, little sand, reddish brown (CL)



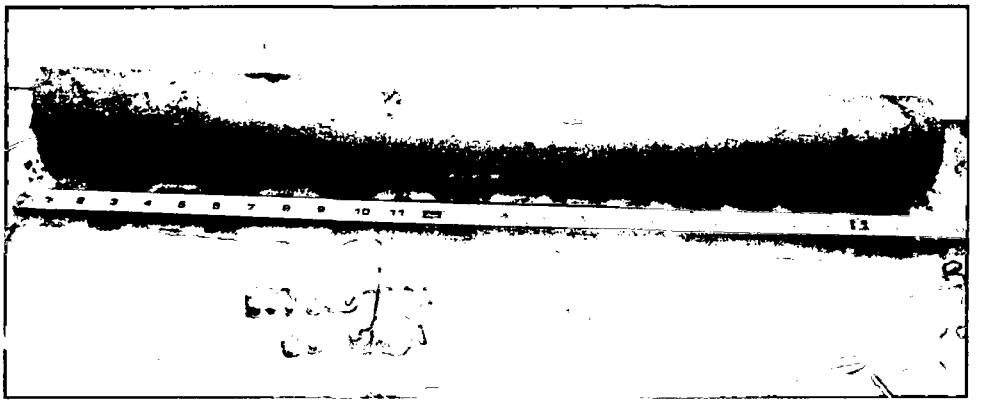
SA-11-02, 15' - 17'
CLAY, medium stiff to very stiff, moist, little sand, reddish brown (CL)



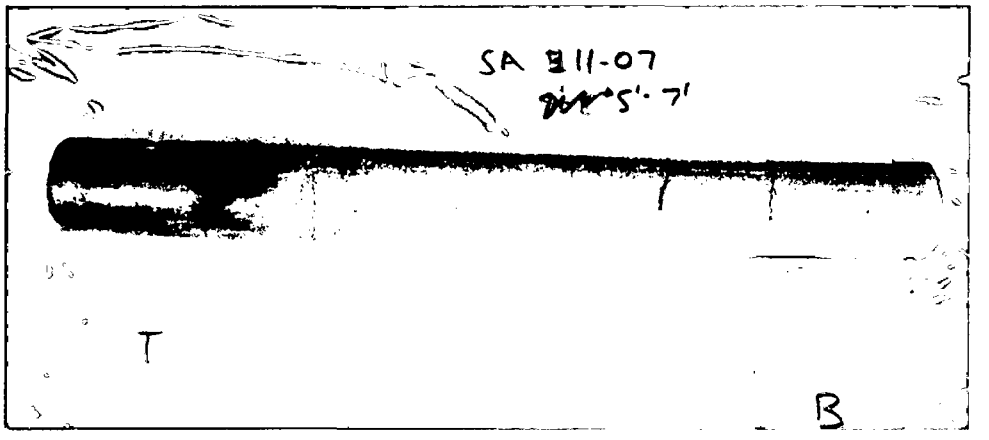
SA-11-03, 10' - 12'
CLAY, medium stiff to very stiff, moist, little sand, reddish brown (CL)



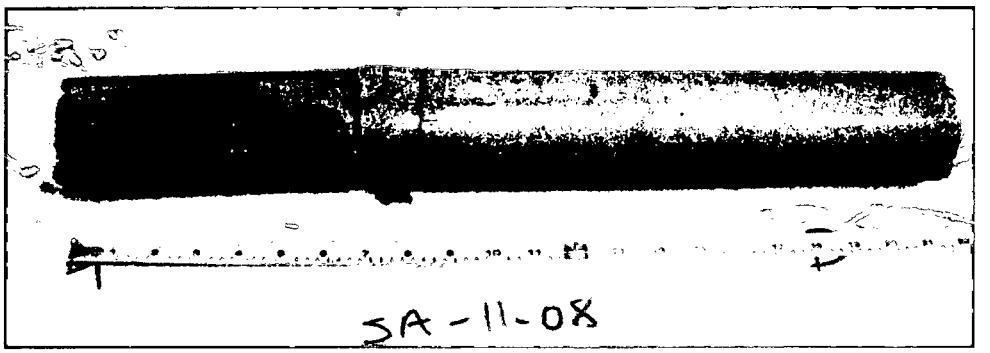
SA-11-04, 20' - 22'
CLAY, medium stiff to very stiff, moist, little sand, reddish brown (CL)



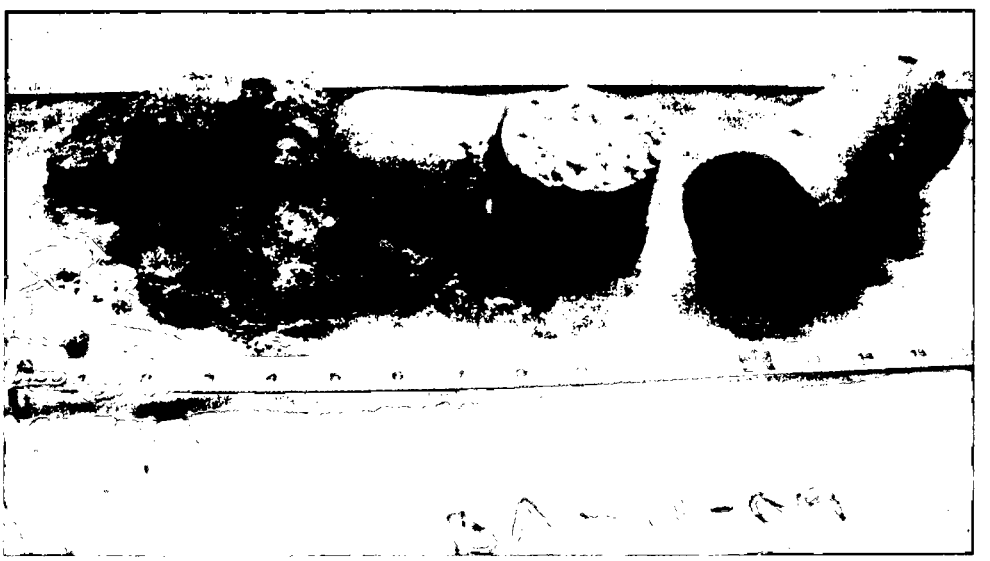
SA-11-06, 18' - 20'
CLAY, medium stiff to very stiff, moist, little sand, little gravel, reddish brown (CL)



SA-11-07, 5' - 7'
CLAY, medium stiff to stiff, moist, reddish brown (CL)

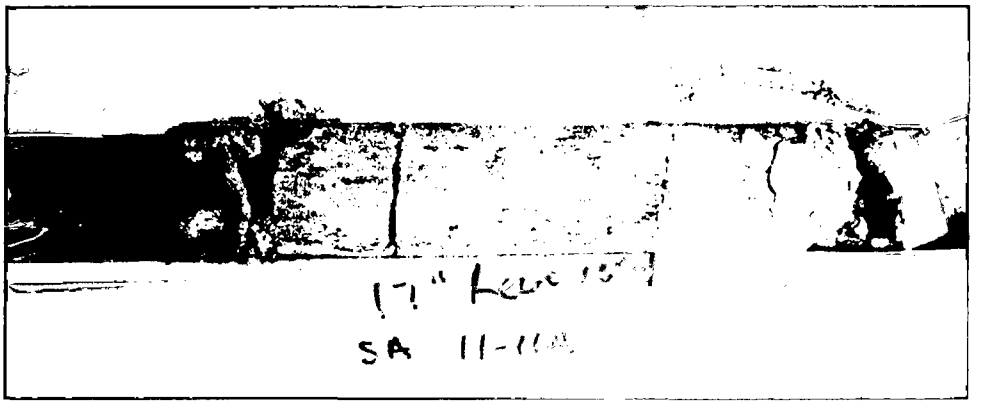


SA-11-08, 8' - 10'
CLAY, medium stiff to hard, moist, little sand, reddish brown (CL)



SA-11-09, 5' - 7'
CLAY, very stiff, moist, reddish brown (CL)

SA-11-10, 10' - 12'
CLAY, stiff to very stiff, moist, little sand, reddish brown (CL)



SA-11-11, 10' - 12'
CLAY, medium stiff to very stiff, moist, little sand, reddish brown (CL)

SA-11-12, 10' - 12'
CLAY, stiff to very stiff, moist, and sand, reddish brown (CL)

TESTECH, INC.
8534 YANKEE STREET
DAYTON, OHIO 45458
(937) 435-3200

Unified Soil Classification System

PARTICLE SIZE IDENTIFICATION

Description	Size
Boulders	· Diameter: 12 inches or larger
Cobbles	· Diameter: 3 to 12 inches
Gravel	· Coarse - 3/4 to 3 inches
	· Fine - 3/4 to No. 4
Sand	· Coarse - No. 10 to No. 4 (Diameter of pencil lead)
	· Medium - No. 40 to No. 10 (Diameter of broom straw)
	· Fine - No. 200 to No. 40 (Diameter of human hair)
Silt and Clay	· Passing No. 200 (Cannot see particles)

RELATIVE PROPORTIONS

Description	Percent by Weight (%)
Trace	0-5
Few	5-10
Little	10-20
Some	20-35
And	35-50

MOISTURE CONDITIONS

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

COHESIVE SOILS (Silt and Clay)

CONSISTENCY

Description	Blows/ft
Very Soft	2
Soft	3-5
Medium Stiff	6-9
Stiff	10-16
Very Stiff	17-30
Hard	>30

PLASTICITY

Degree of Plasticity	Plasticity Index
None	0-4
Slight	5-7
Medium	8-22
High to Very High	Over 22

COHESIONLESS SOIL (Sand, Gravel, and larger)
RELATIVE DENSITY

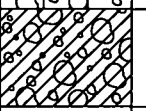
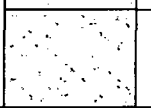
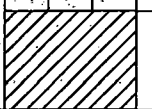
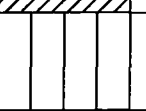
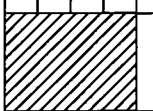
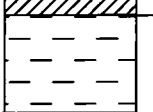
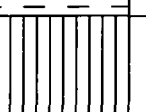
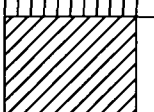
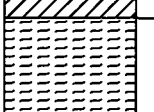
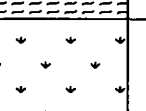
Description	Blows/ft
Very Loose	<4
Loose	4-10
Medium Dense	11-30
Dense	31-50
Very Dense	>50

Soil Classification on Boring Logs is made by visual inspection of samples (as per ASTM D 2487).

Strata Changes - In the column "Soil Descriptions" on the drill log, the horizontal lines represent strata changes. A solid line represents an actually observed change, a dashed line (–) represents an estimated change.

Ground Water - Observations were made at the times indicated. Porosity of soil strata, weather conditions, site topography, etc. may cause changes in the water levels indicated on the logs.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
	LESS THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FIND SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

APPENDIX C

Laboratory Test Results

Sieve Analysis and Classification
Unconfined Compressive Strength
Proctor Compaction
Hydraulic Conductivity
Soil Density
Moisture Content

Geotechnical Engineering
Materials Testing/Inspection
TESTECH
Professional Surveying and
Environmental Services

Putting Our Experience to Work for You!

Corporate Office,
8534 Yankee Street
Suite 2C
Dayton, Ohio 45458

2720 Airport Drive
Columbus, Ohio 43219

11505 Commonwealth Dr.
Louisville, Kentucky 40299

8164 Executive Court
Lansing, Michigan 48917

5769 Park Plaza Court
Indianapolis, Indiana 46220

LABORATORY REPORT

U.S. Army Corps of Engineers-Detroit District
477 Michigan Avenue, Room 700
Detroit, Michigan 48226

TT Project No. MI051G
TT Report No. 1034
Date November 29, 2011

Attn: Ms. Carlette Williams

RE: Laboratory Testing of Soil Samples from the Sheboygan Harbor Airport Interim Project, Sheboygan Falls, Wisconsin

On November 7, 2011, testing instructions were submitted to the laboratory for the above referenced project.

Testing was performed as specified by the client and in accordance with the following procedures:

ASTM D422, "Standard Test Method for Particle-Size Analysis of Soils"
ASTM D2487, "Standard Practice for Classifications of Soils for Engineering Purposes"
ASTM D4318, "Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils"
ASTM D698, "Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort"
ASTM D1557, "Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort"
ASTM D2166, "Standard Test Method for Unconfined Compressive Strength of Cohesive Soil"
ASTM D2216, "Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass"
ASTM D5084, "Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter"
ASTM D7263, "Standard Test Method for Laboratory Determination of Density (Unit Weight) of Soil Specimens"

Results are presented on the attached data sheets.

Should you have any questions, please contact us at 937-435-3200.

Respectfully submitted,
TesTech, Inc.

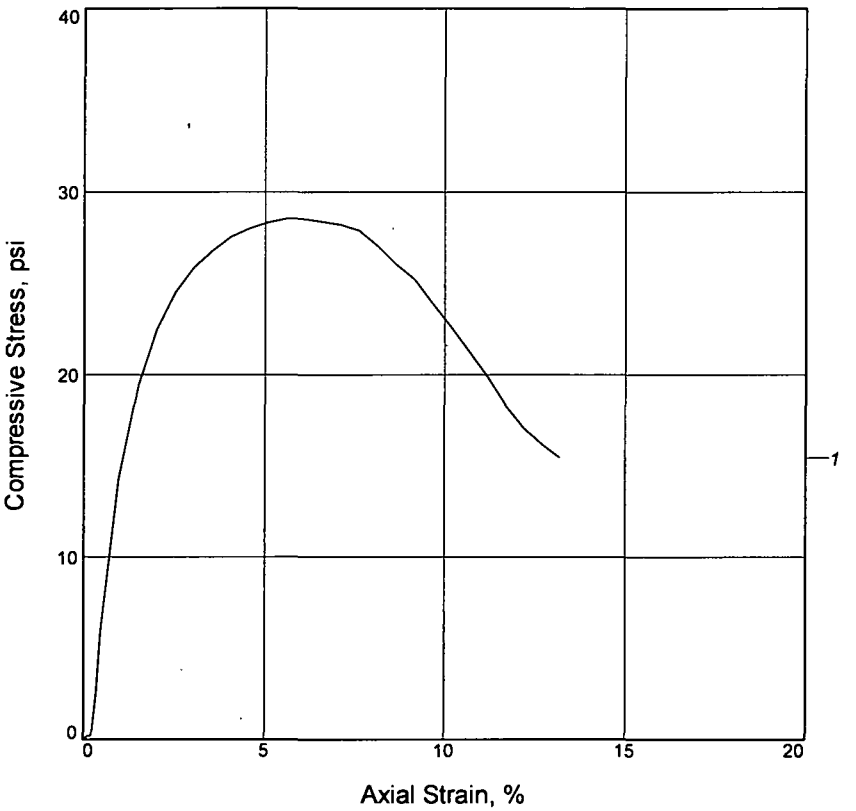
Sheila Sennet, CET #94321
Laboratory Operations

1-Carlette Williams
1-burr@testechinc.com
1-file

ASTM D5084, Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter

Boring:	SA-11-06	SA-11-08	SA-11-09	SA-11-10
Sample Type:	Shelby Tube	Shelby Tube	Shelby Tube	Shelby Tube
Tube Depth:	18.0'-20.0'	8.0'-10.0'	5.0'-7.0'	10.0'-12.0'
Liquid Limit:	34	34	33	29
Plastic Limit:	12	13	16	11
Plasticity Index:	22	21	17	18
UCSC:	CL	CL	CL	CL
Material Description:	red/brown gravelly lean Clay with sand	red/brown lean Clay with sand	red/brown lean Clay	red/brown lean Clay with sand
Test Specimen Depth, ft	19.3'-19.6'	9.0'-9.3'	6.0'-6.3'	11.5'-11.8'
Height, in	2.956	2.928	3.098	3.103
Diameter, in	2.856	2.871	2.868	2.854
Initial Mass, lb	1.471	1.458	1.610	1.603
Moisture Content (*i*), %	16.8	15.8	14.0	13.9
Moisture Content (*f*), %	17.5	16.1	16.7	17.0
Wet Density, pcf	134.3	133.0	139.1	139.6
Dry Density, pcf	115.0	114.8	122.0	122.6
Cell Pressure, psi	93	93	90	80
Back Pressure (*in*), psi	90	90	85	75
Back Pressure (*out*), psi	87	87	81	71
Permeability, cm/sec	**5.8×10^{-8}**	**1.3×10^{-7}**	**8.3×10^{-8}**	**9.3×10^{-8}**

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psi	28.54			
Undrained shear strength, psi	14.27			
Failure strain, %	6.1			
Strain rate, in./min.	0.06			
Water content, %	17.3			
Wet density, pcf	135.3			
Dry density, pcf	115.3			
Saturation, %	99.8			
Void ratio	0.4724			
Specimen diameter, in.	2.86			
Specimen height, in.	6.09			
Height/diameter ratio	2.13			

Description: red/brown lean CLAY with sand

LL = 35	**PL** = 12	**PI** = 23	**Assumed GS=** 2.72	**Type:** Undisturbed

Project No.: MI051G
Date Sampled: 11/17/11

Remarks:
Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 19.5'-20.0'
ASTM D2166 Unconfmed Compressive Strength
Figure _____

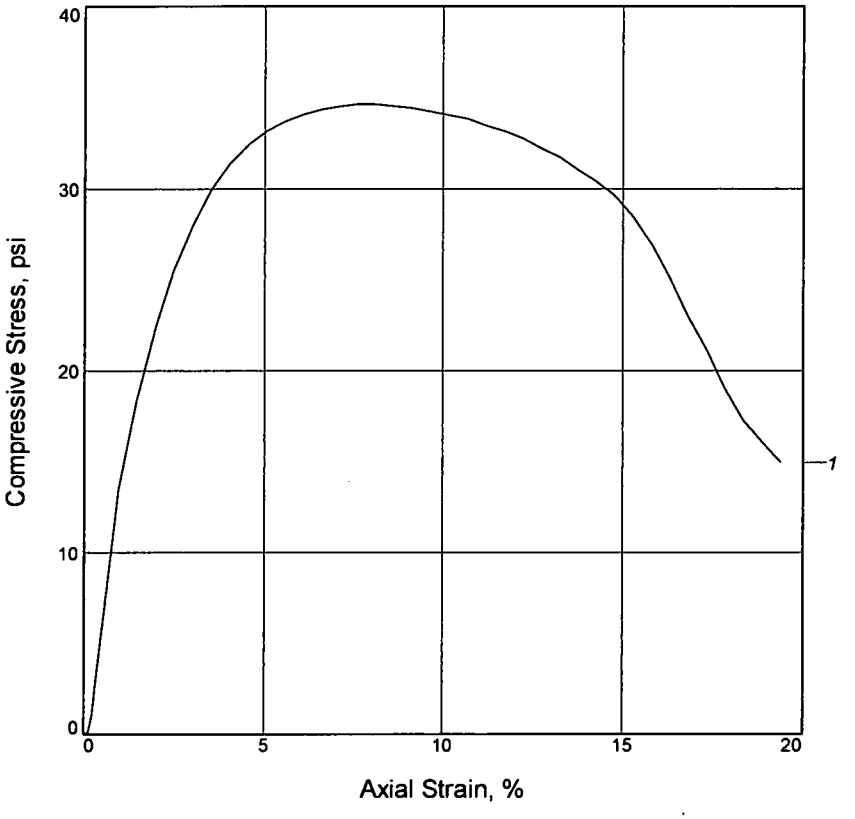
Client: U.S. Army Corps of Engineers - Detroit District

Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Location: SA-11-01, Shelby Tube
Sample Number: 1034 **Depth:** 18.0' - 20.0'

TESTECH

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psi	34.65			
Undrained shear strength, psi	17.32			
Failure strain, %	8.1			
Strain rate, in./min.	0.06			
Water content, %	17.2			
Wet density, pcf	135.0			
Dry density, pcf	115.2			
Saturation, %	98.5			
Void ratio	0.4740			
Specimen diameter, in.	2.87			
Specimen height, in.	6.08			
Height/diameter ratio	2.12			

Description: red/brown lean CLAY with sand

LL = 34	**PL** = 12	**PI** = 22	**Assumed GS=** 2.72	**Type:** Undisturbed

Project No.: MI051G
Date Sampled: 11/17/11

Remarks:
Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 15.7'-16.2'
ASTM D2166 Unconfined Compressive Strength
Figure _____

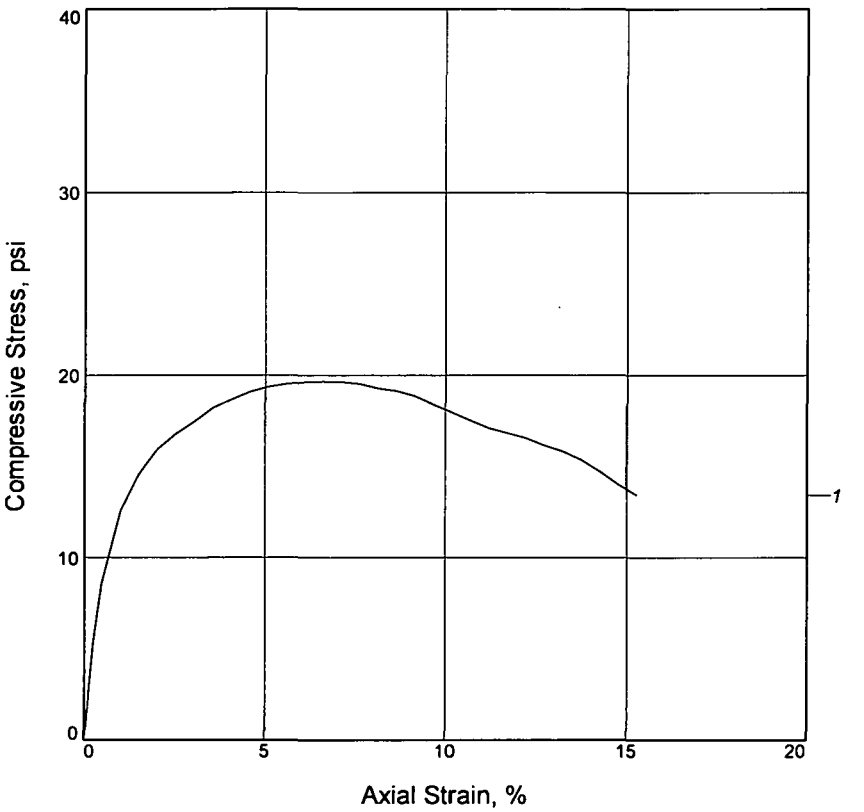
Client: U.S. Army Corps of Engineers - Detroit District

Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Location: SA-11-02, Shelby Tube
Sample Number: 1034 **Depth:** 15.0' - 17.0'

TESTECH

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psi	19.67			
Undrained shear strength, psi	9.83			
Failure strain, %	6.6			
Strain rate, in./min.	0.06			
Water content, %	15.6			
Wet density, pcf	132.7			
Dry density, pcf	114.8			
Saturation, %	88.7			
Void ratio	0.4790			
Specimen diameter, in.	2.85			
Specimen height, in.	6.07			
Height/diameter ratio	2.13			

Description: red/brown lean CLAY with sand

LL = 35	**PL** = 13	**PI** = 22	**Assumed GS=** 2.72	**Type:** Undisturbed

Project No.: MI051G
Date Sampled: 10/27/11

Remarks:
Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 10.3'-10.8'
ASTM D2166 Unconfined Compressive Strength
Figure _____

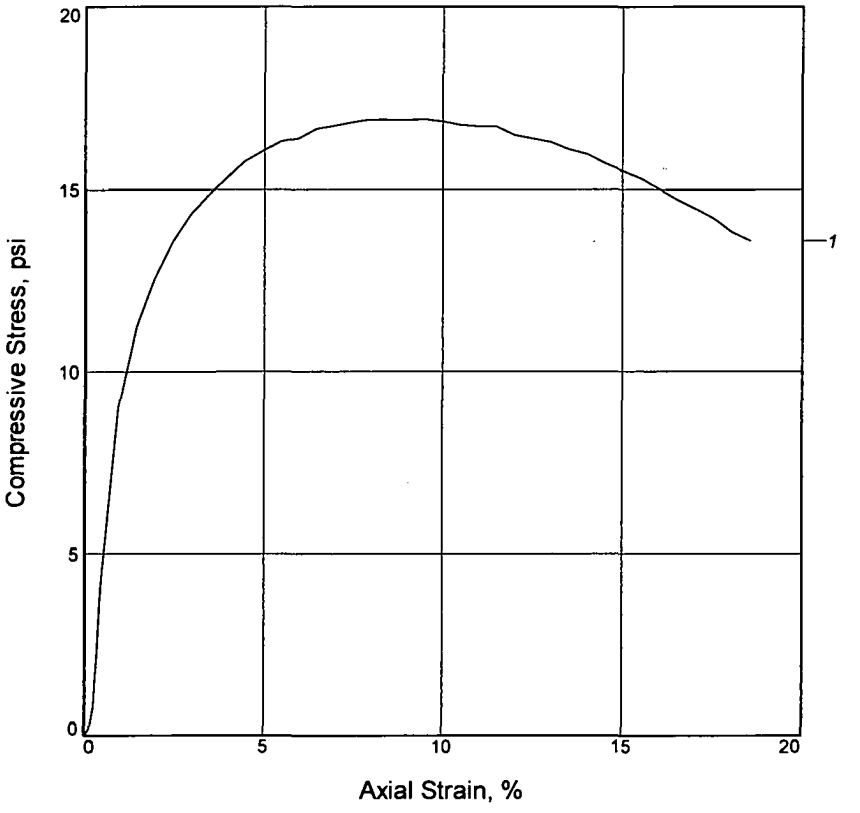
Client: U.S. Army Corps of Engineers - Detroit District

Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Location: SA-11-03, Shelby Tube
Sample Number: 1034 **Depth:** 10.0' - 12.0'

TESTECH

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psi	16.94			
Undrained shear strength, psi	8.47			
Failure strain, %	9.5			
Strain rate, in./min.	0.06			
Water content, %	17.3			
Wet density, pcf	134.3			
Dry density, pcf	114.5			
Saturation, %	97.4			
Void ratio	0.4826			
Specimen diameter, in.	2.86			
Specimen height, in.	5.96			
Height/diameter ratio	2.08			

Description: red/brown lean CLAY with sand

LL = 34	**PL** = 13	**PI** = 21	**Assumed GS=** 2.72	**Type:** Undisturbed

Project No.: MI051G
Date Sampled: 10/28/11

Remarks:
Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 20.5'-21.0'
ASTM D2166 Unconfined Compressive Strength
Figure _____

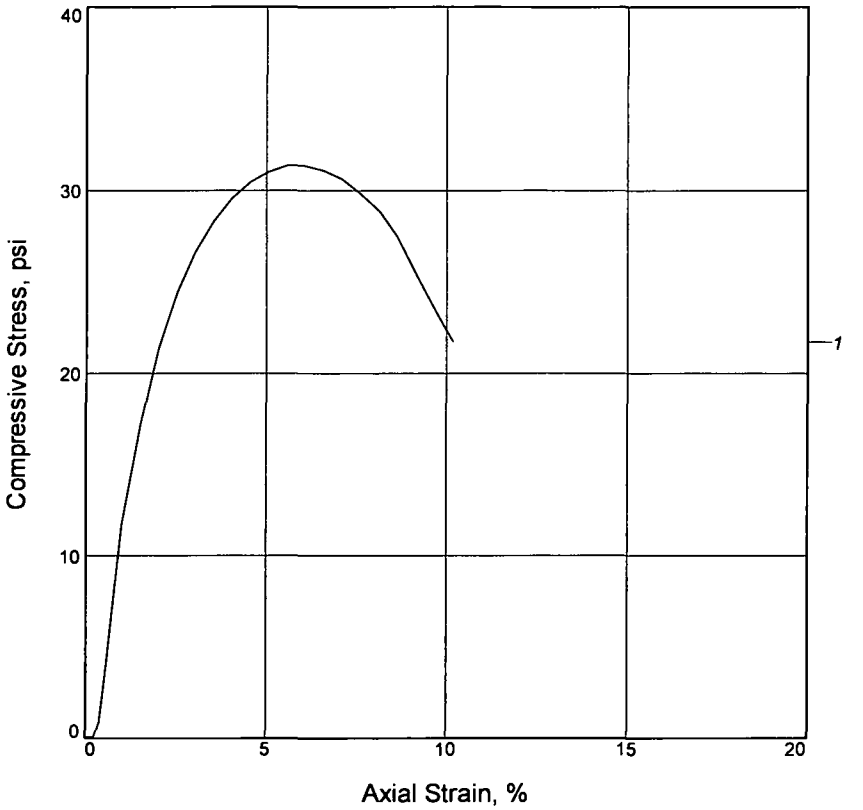
Client: U.S. Army Corps of Engineers - Detroit District

Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Location: SA-11-04, Shelby Tube
Sample Number: 1034 **Depth:** 20.0' - 22.0'

TESTECH

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psi	31.36			
Undrained shear strength, psi	15.68			
Failure strain, %	6.1			
Strain rate, in./min.	0.06			
Water content, %	16.0			
Wet density, pcf	135.5			
Dry density, pcf	116.8			
Saturation, %	95.7			
Void ratio	0.4535			
Specimen diameter, in.	2.87			
Specimen height, in.	6.08			
Height/diameter ratio	2.12			

Description: red/brown gravelly lean CLAY with sand

LL = 34	**PL** = 12	**PI** = 22	**Assumed GS=** 2.72	**Type:** Undisturbed

Project No.: MI051G
Date Sampled: 11/17/11

Remarks:
Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 18.8'-19.3'
ASTM D2166 Unconfined Compressive Strength
Figure _____

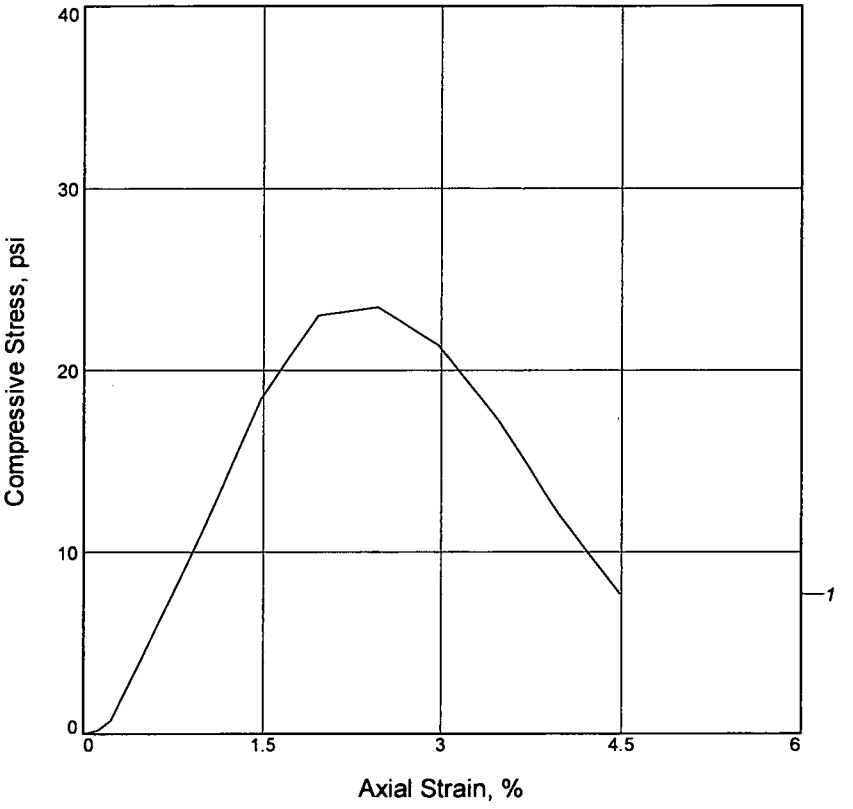
Client: U.S. Army Corps of Engineers - Detroit District

Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Location: SA-11-06, Shelby Tube
Sample Number: 1034 **Depth:** 18.0' - 20.0'

TESTECH

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psi	23.48			
Undrained shear strength, psi	11.74			
Failure strain, %	2.5			
Strain rate, in./min.	0.06			
Water content, %	18.2			
Wet density, pcf	132.1			
Dry density, pcf	111.8			
Saturation, %	95.3			
Void ratio	0.5192			
Specimen diameter, in.	2.88			
Specimen height, in.	5.75			
Height/diameter ratio	2.00			

Description: red/brown lean CLAY

LL = 31	**PL** = 14	**PI** = 17	**Assumed GS=** 2.72	**Type:** Undisturbed

Project No.: MI051G
Date Sampled: 11/17/11

Remarks:
Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 5.9'-6.4'
ASTM D2166 Unconfined Compressive Strength
Figure _____

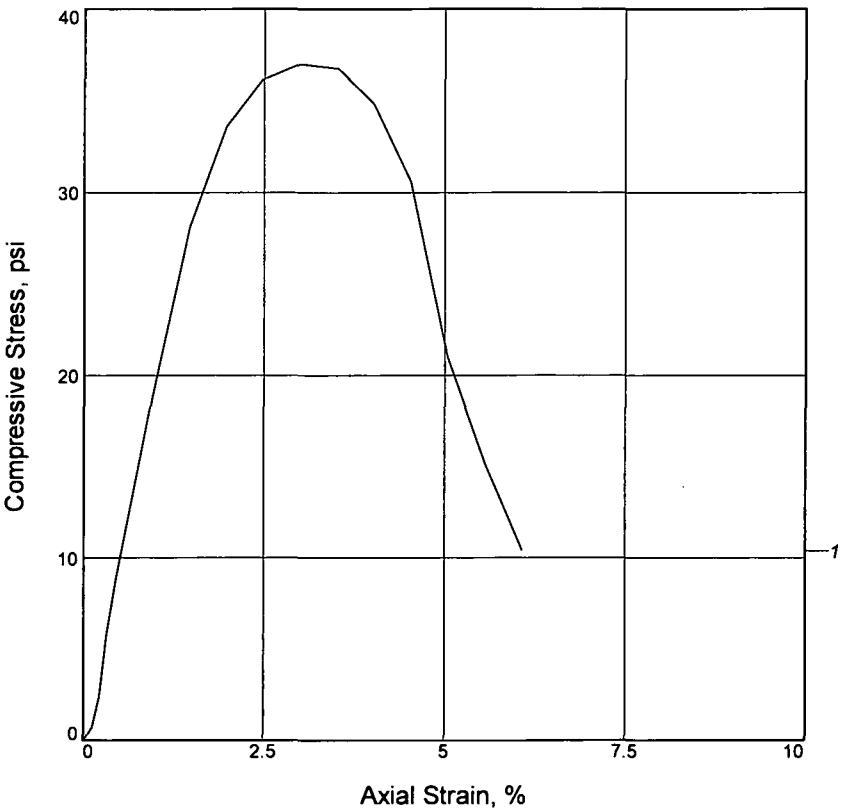
Client: U.S. Army Corps of Engineers - Detroit District

Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Location: SA-11-07, Shelby Tube
Sample Number: 1034 **Depth:** 5.0' - 7.0'

TESTECH

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psi	37.03			
Undrained shear strength, psi	18.51			
Failure strain, %	3.0			
Strain rate, in./min.	0.06			
Water content, %	17.0			
Wet density, pcf	134.0			
Dry density, pcf	114.6			
Saturation, %	95.9			
Void ratio	0.4823			
Specimen diameter, in.	2.87			
Specimen height, in.	6.08			
Height/diameter ratio	2.12			

Description: red/brown lean CLAY with sand

LL = 34	**PL** = 13	**PI** = 21	**Assumed GS=** 2.72	**Type:** Undisturbed

Project No.: MI051G
Date Sampled: 10/26/11

Remarks:
Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 9.3'-9.8'
ASTM D2166 Unconfined Compressive Strength
Figure _____

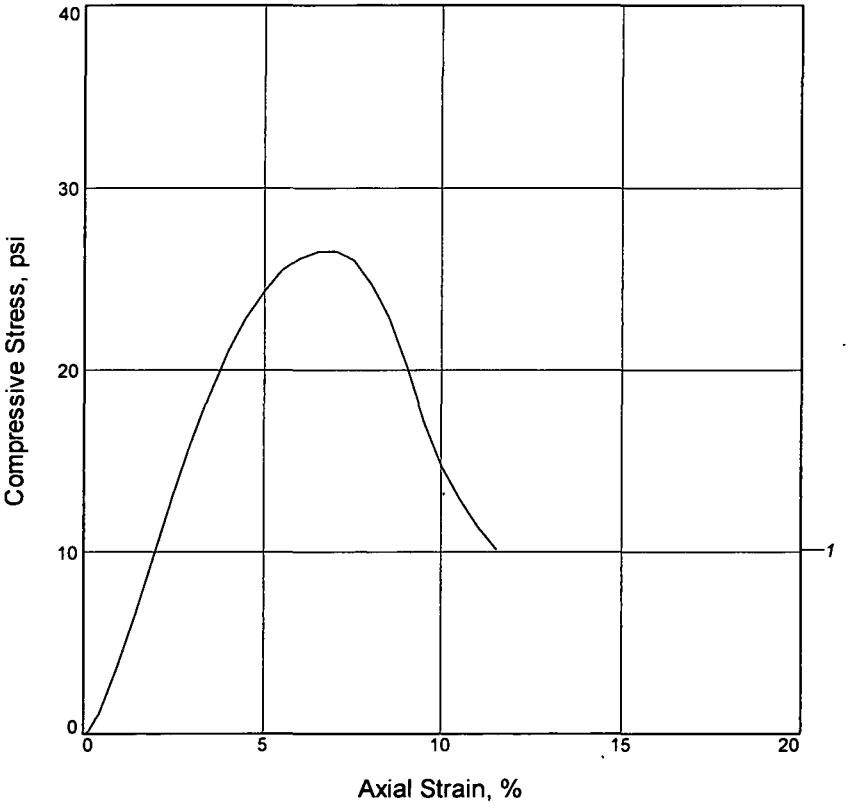
Client: U.S. Army Corps of Engineers - Detroit District

Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Location: SA-11-08, Shelby Tube
Sample Number: 1034 **Depth:** 8.0' - 10.0'

TESTECH

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, psi	26.53			
Undrained shear strength, psi	13.26			
Failure strain, %	7.0			
Strain rate, in./min.	0.06			
Water content, %	10.7			
Wet density, pcf	145.0			
Dry density, pcf	131.0			
Saturation, %	98.6			
Void ratio	0.2966			
Specimen diameter, in.	2.86			
Specimen height, in.	6.04			
Height/diameter ratio	2.11			

Description: gray/brown sandy lean CLAY

LL = 18	**PL** = 10	**PI** = 8	**Assumed GS=** 2.72	**Type:** Undistrubed

Project No.: MI051G
Date Sampled: 10/26/11

Remarks:
Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 10.8'-11.3'
ASTM D2166 Unconfined Compressive Strength
Figure _____

Client: U.S. Army Corps of Engineers - Detroit District

Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

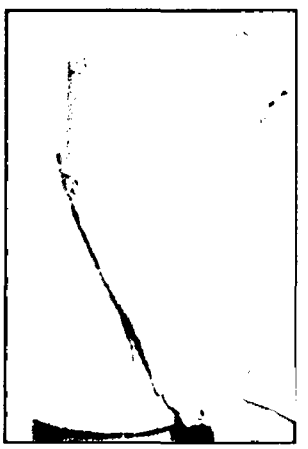
Location: SA-11-12, Shelby Tube
Sample Number: 1034 **Depth:** 10.0' - 12.0'

TESTECH

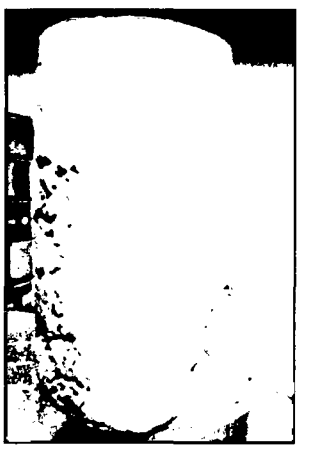
ASTM D2166 Unconfined Compressive Strength of Cohesive Soil

After Test

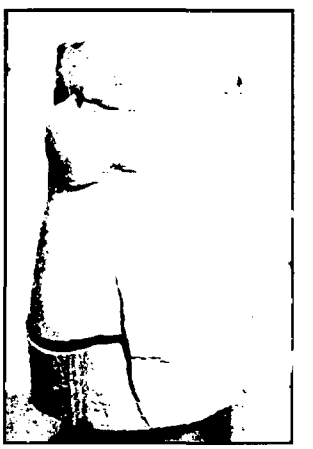
SA-11-01, ST 18'-20'



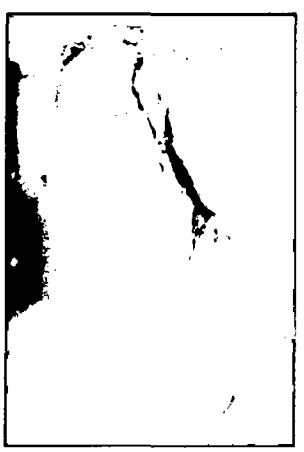
SA-11-02, ST 15'-17'



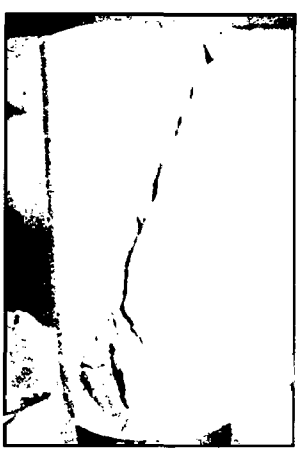
SA-11-03, ST 10'-12'



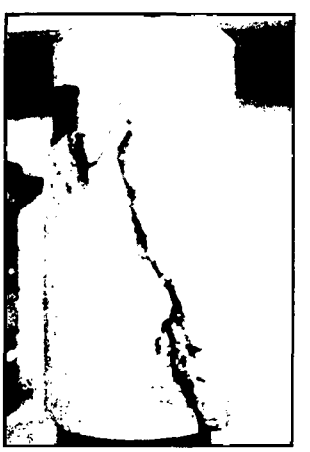
SA-11-04, ST 5'-7'



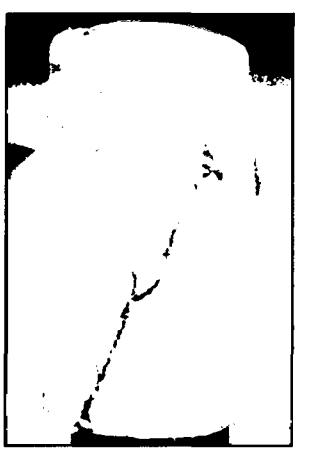
SA-11-06, ST 18'-20'



SA-11-07, ST 5'-7'



SA-11-08, ST 8'-10'



SA-11-12, ST 10'-12'

ASTM D7263 Laboratory Determination of Density (Unit Weight) of Soil Specimens, method B

Sample Type: Split-Spoon

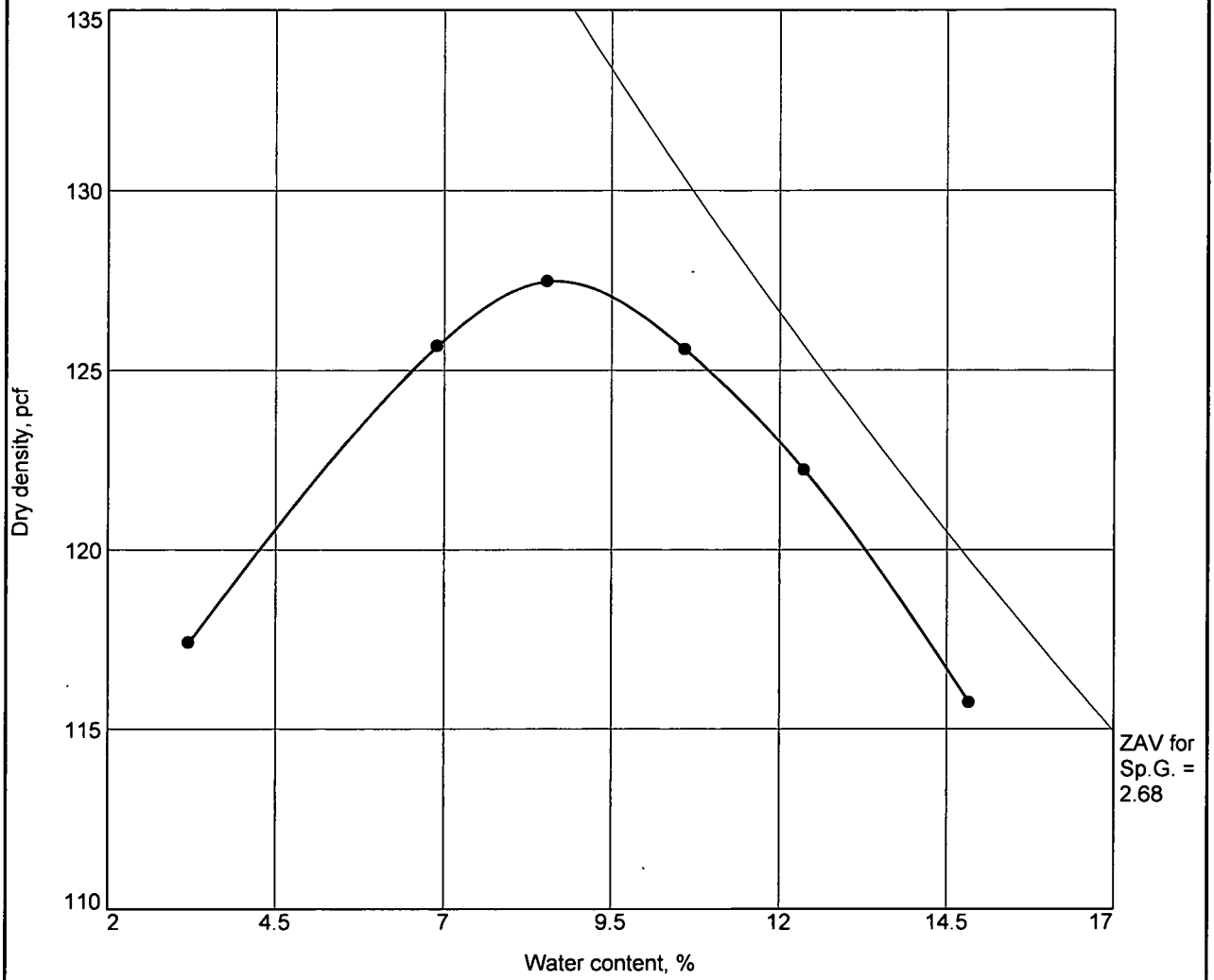
Boring:	SA-11-01	SA-11-02	SA-11-03	SA-11-04	SA-11-05	SA-11-06
Sample No.:	SS-17	SS-11	SS-6	SS-2	SS-2	SS-13
Depth:	40.0'-41.5'	25.0'-26.5'	12.5'-14.0'	2.5'-4.0'	2.5'-4.0'	30.0'-31.5'
Liquid Limit:	42	37	25	38	20	41
Plasticity Index:	28	25	14	24	10	28
Moisture Content, %	17.4	17.7	13.2	15.0	9.8	17.4
Wet Density, pcf	133.0	132.6	140.9	134.4	145.9	136.2
Dry Density, pcf	113.3	112.6	124.6	116.9	132.9	116.1

Boring:	SA-11-07	SA-11-08	SA-11-09	SA-11-10	SA-11-11
Sample No.:	SS-18	SS-7	SS-4	SS-9	SS-15
Depth:	42.5'-44.0'	15.0'-16.5'	7.5'-9.0'	20.0'-21.5'	35.0'-36.5'
Liquid Limit:	39	34	20	32	39
Plasticity Index:	26	23	10	20	26
Moisture Content, %	17.2	16.7	8.6	15.5	17.3
Wet Density, pcf	133.3	138.1	145.9	136.3	135.6
Dry Density, pcf	113.7	118.4	134.4	118.1	115.6

Boring:	SA-11-12	SA-11-13	SA-11-14	SA-11-15	SA-11-16
Sample No.:	SS-14	SS-8	SS-20	SS-4	SS-16
Depth:	32.5'-34.0'	17.5'-19.0'	47.5'-49.0'	7.5'-9.0'	37.5'-39.0'
Liquid Limit:	39	21	41	34	40
Plasticity Index:	27	10	27	21	28
Moisture Content, %	18.2	12.4	17.4	15.2	16.8
Wet Density, pcf	134.6	144.8	135.2	135.6	124.9
Dry Density, pcf	113.9	128.9	115.2	117.7	107.0

** Split spoon samples are disturbed*

COMPACTION TEST REPORT - ASTM D1557



Test specification: ASTM D 1557-07 Method B Modified
ASTM D 4718-87 Oversize Corr. Applied to Each Test Point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
0.0' - 10.0'							0.84	

ROCK CORRECTED TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 127.5 pcf Optimum moisture = 8.7 %	red/brown lean CLAY with sand (visual)

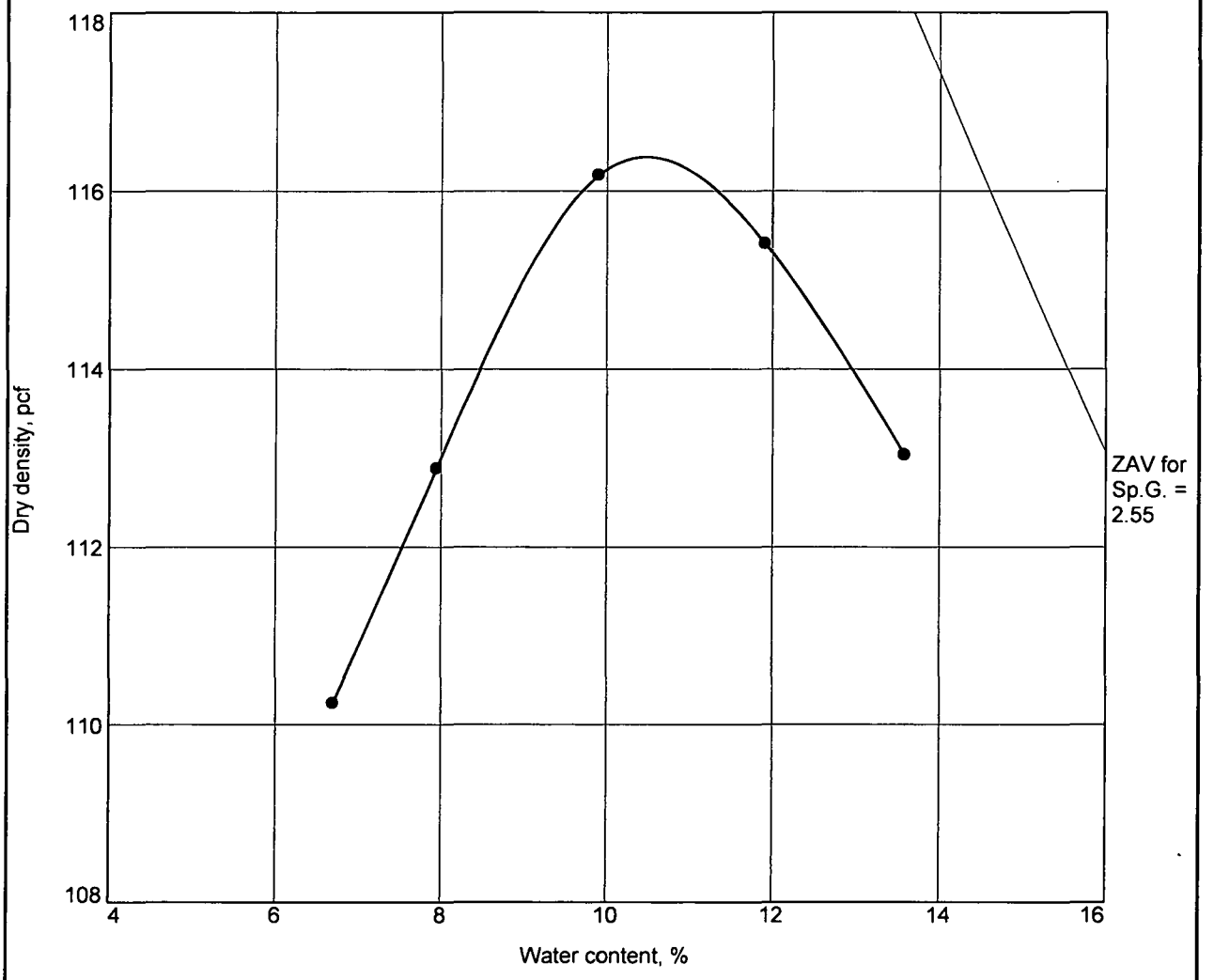
Project No. MI051G **Client:** U.S. Army Corps of Engineers - Detroit
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Date: 11/12/11
○ **Loc.:** SA-11-02, Bag Sample **Depth:** 0.0' - 10.0' **Sample No.:** 1034

TESTECH

Remarks:
Date of Instructions: 11/07/11
Lab No.: 1034

Figure

COMPACTION TEST REPORT - ASTM D698



Test specification: ASTM D 698-07 Method B Standard
ASTM D 4718-87 Oversize Corr. Applied to Each Test Point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
8.0' - 12.0'	CL	A-6(16)			34	23	0.9	79.7

ROCK CORRECTED TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 116.4 pcf Optimum moisture = 10.5 %	red/brown lean CLAY with sand

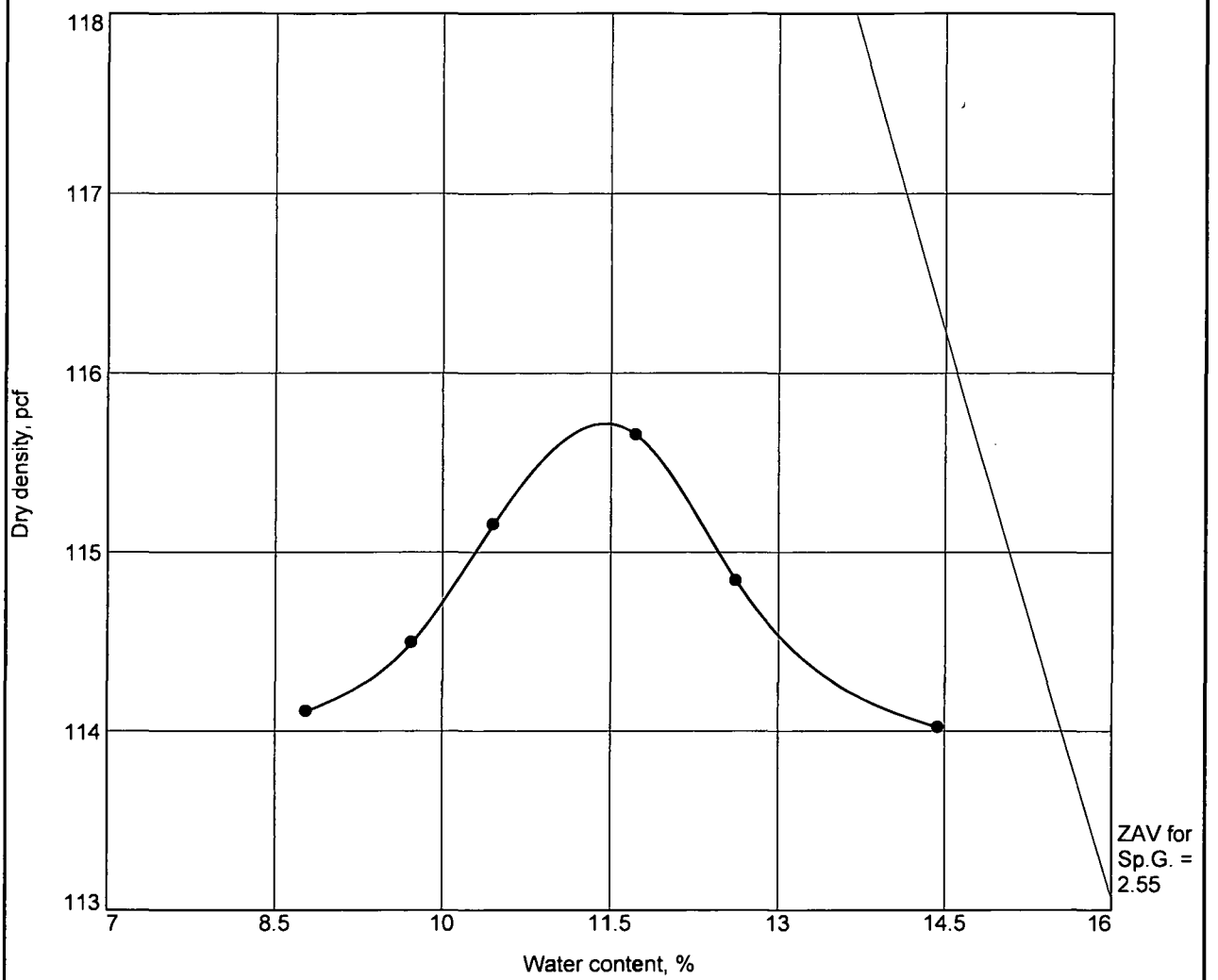
Project No. MI051G **Client:** U.S. Army Corps of Engineers - Detroit
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Date: 11/10/11
○ **Loc.:** SA-11-03, Bag Sample **Depth:** 8.0' - 12.0' **Sample No.:** 1034

TESTECH

Remarks:
Date of Instructions: 11/07/11
Lab No.: 1034

Figure

COMPACTION TEST REPORT - ASTM D698



Test specification: ASTM D 698-07 Method B Standard
ASTM D 4718-87 Oversize Corr. Applied to Each Test Point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
10.0' - 15.0'							0.46	

ROCK CORRECTED TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 115.7 pcf Optimum moisture = 11.4 %	red/brown lean CLAY with sand (visual)

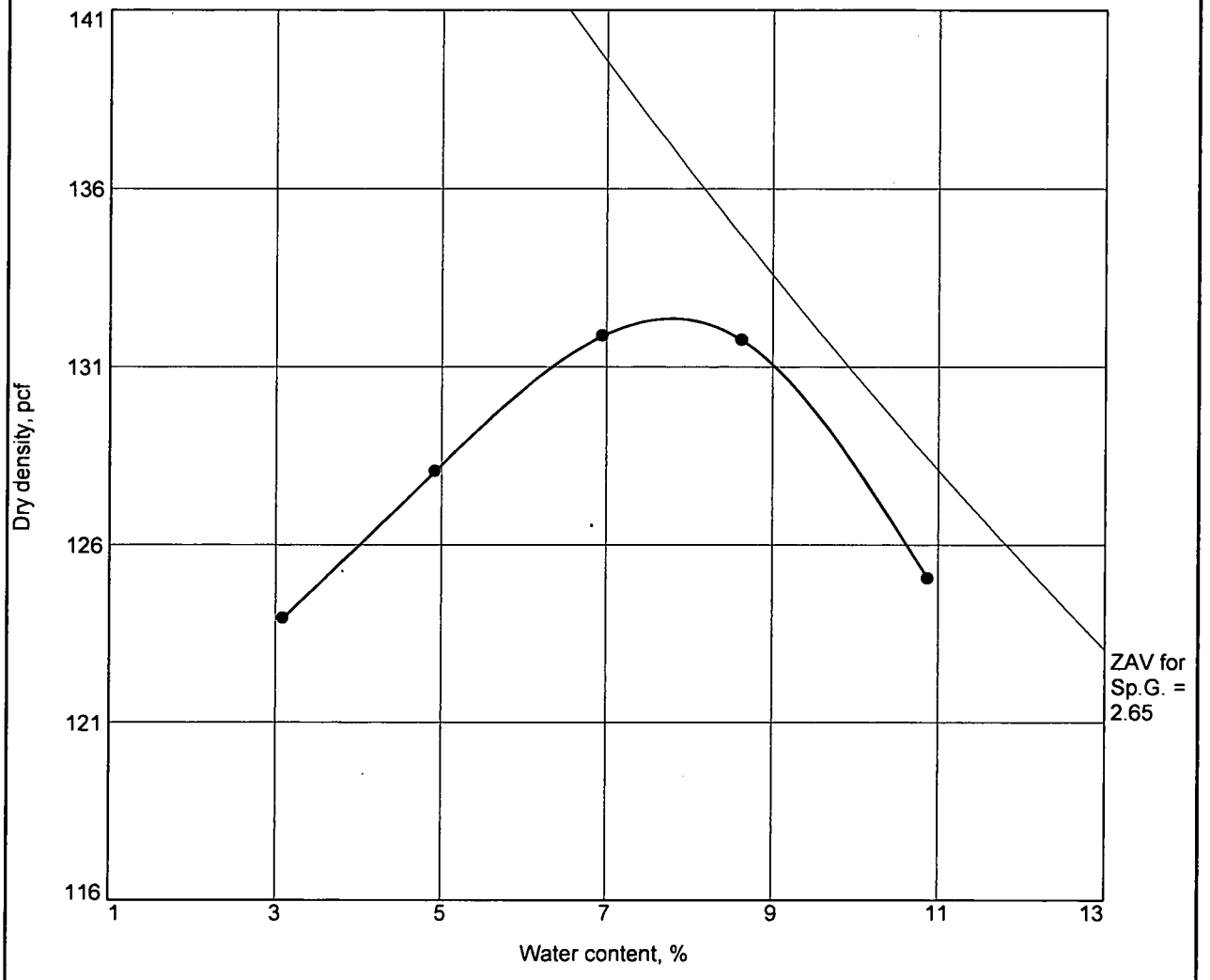
Project No. MI051G **Client:** U.S. Army Corps of Engineers - Detroit
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Date: 11/12/11
○ **Loc.:** SA-11-08, Bag Sample **Depth:** 10.0' - 15.0' **Sample No.:** 1034

TESTECH

Remarks:
Date of Instructions: 11/07/11
Lab No.: 1034

Figure

COMPACTION TEST REPORT - ASTM D1557



Test specification: ASTM D 1557-07 Method B Modified
ASTM D 4718-87 Oversize Corr. Applied to Each Test Point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
18.0' - 25.0'	CL	A-6(11)			29	18	0.4	77.1

ROCK CORRECTED TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 132.4 pcf Optimum moisture = 7.8 %	red/brown lean CLAY with sand

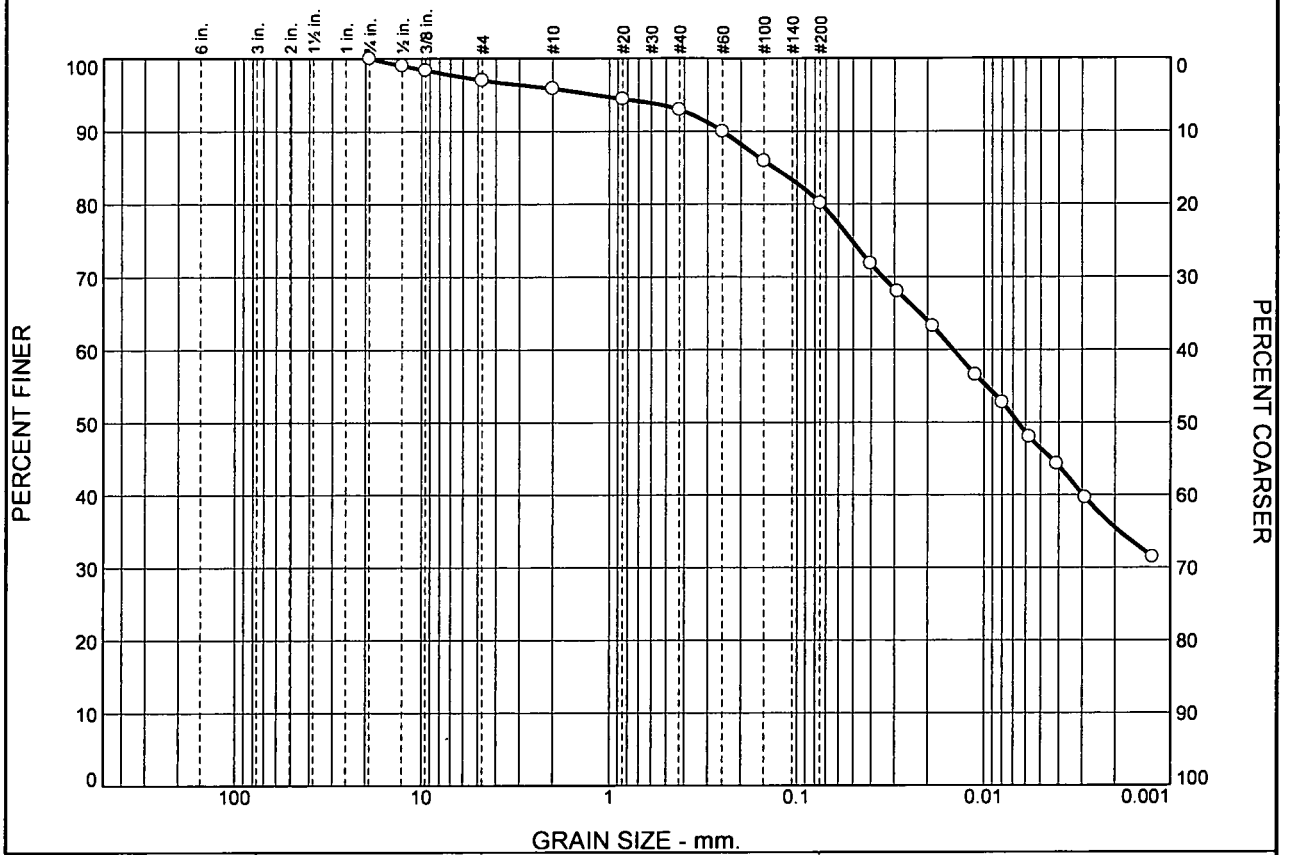
Project No. MI051G **Client:** U.S. Army Corps of Engineers - Detroit
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Date: 11/12/11
○ **Loc.:** SA-11-09, Bag Sample **Depth:** 18.0' - 25.0' **Sample No.:** 1034

TESTECH

Remarks:
Date of Instructions: 11/07/11
Lab No.: 1034

Figure

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.0	1.1	2.9	12.9	33.7	46.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75	100.0		
0.5	99.0		
0.375	98.4		
#4	97.0		
#10	95.9		
#20	94.4		
#40	93.0		
#60	90.0		
#100	85.9		
#200	80.1		

* (no specification provided)

Material Description

red/brown lean CLAY with sand

Atterberg Limits

PL= 12 LL= 35 PI= 23

Coefficients

D_{90}= 0.2506 D_{85}= 0.1326 D_{60}= 0.0146
D_{50}= 0.0066 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(16)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 19.5'-20.0'

Location: SA-11-01, Shelby Tube
Sample Number: 1034 **Depth:** 18.0' - 20.0' **Date:** 11/17/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-01, Shelby Tube
Depth: 18.0' - 20.0'
Sample Number: 1034
Material Description: red/brown lean CLAY with sand
Date: 11/17/11 **PL:** 12 **LL:** 35 **PI:** 23
USCS Classification: CL **AASHTO Classification:** A-6(16)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 19.5'-20.0'

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
622.63	14.59	0.00	0.75	0.00	100.0	0.0
			0.5	6.10	99.0	1.0
			0.375	9.93	98.4	1.6
			#4	18.23	97.0	3.0
			#10	25.18	95.9	4.1
50.74	0.00	0.00	#20	0.76	94.4	5.6
			#40	1.53	93.0	7.0
			#60	3.11	90.0	10.0
			#100	5.26	85.9	14.1
			#200	8.32	80.1	19.9

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 95.9
Weight of hydrometer sample =50.737
Hygroscopic moisture correction:
Moist weight and tare = 52.73
Dry weight and tare = 52.47
Tare weight = 28.18
Hygroscopic moisture = 1.0%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	22.9	42.0	37.6	0.0132	42.0	9.4	0.0404	71.9	28.1
2.00	22.9	40.0	35.6	0.0132	40.0	9.7	0.0291	68.0	32.0
5.00	22.9	37.5	33.1	0.0132	37.5	10.1	0.0188	63.3	36.7
15.00	22.9	34.0	29.6	0.0132	34.0	10.7	0.0111	56.6	43.4
30.00	22.9	32.0	27.6	0.0132	32.0	11.0	0.0080	52.8	47.2
60.00	23.0	29.5	25.2	0.0132	29.5	11.5	0.0057	48.0	52.0
120.00	23.2	27.5	23.2	0.0131	27.5	11.8	0.0041	44.3	55.7

Hydrometer Test Data (continued)

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
250.00	23.4	25.0	20.8	0.0131	25.0	12.2	0.0029	39.7	60.3
1440.00	22.3	21.0	16.5	0.0133	21.0	12.9	0.0013	31.5	68.5

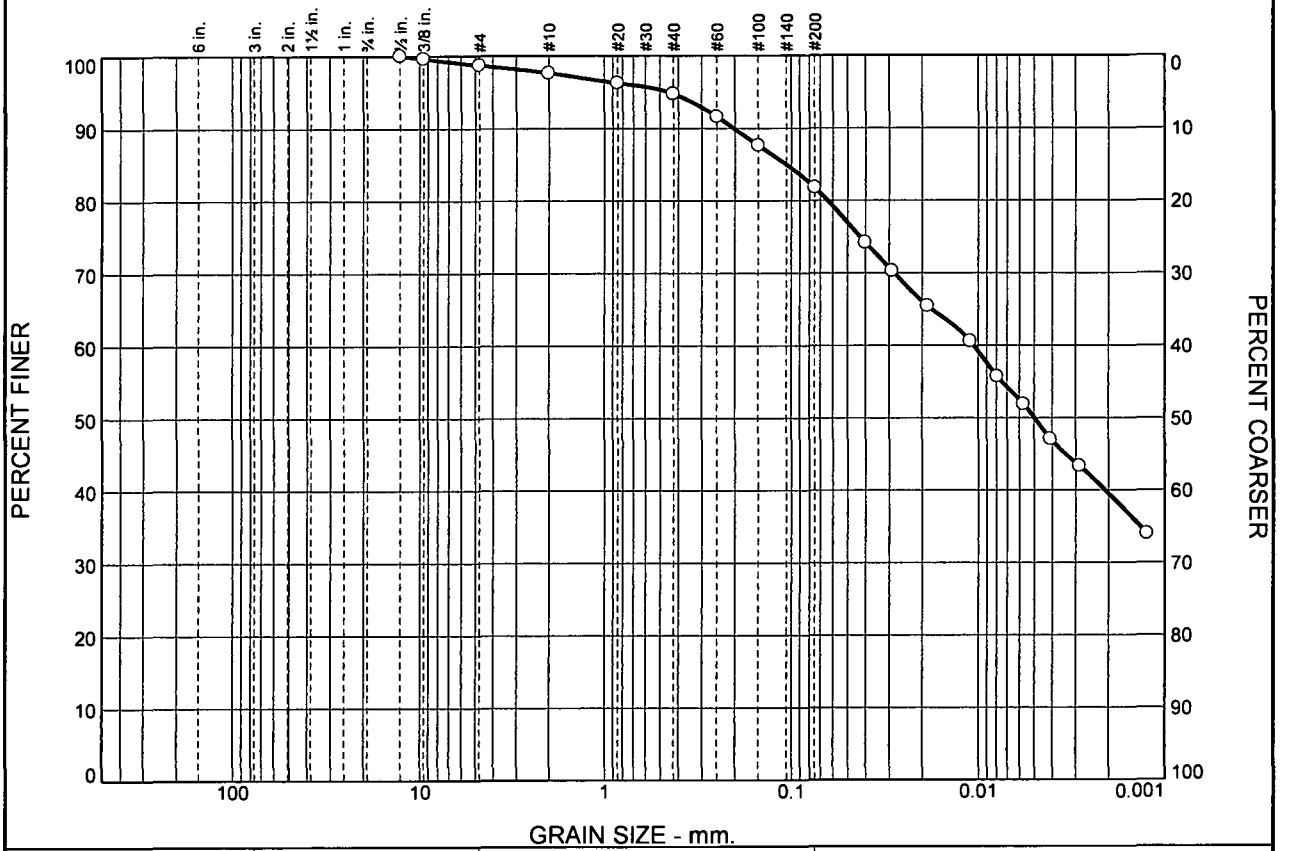
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	3.0	3.0	1.1	2.9	12.9	16.9	33.7	46.4	80.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0066	0.0146	0.0741	0.1326	0.2506	1.2022

Fineness Modulus
0.43

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.3	1.1	2.8	13.0	31.8	50.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5	100.0		
0.375	99.6		
#4	98.7		
#10	97.6		
#20	96.2		
#40	94.8		
#60	91.6		
#100	87.6		
#200	81.8		

* (no specification provided)

Material Description

red/brown lean CLAY with sand

Atterberg Limits

PL= 12 LL= 34 PI= 22

Coefficients

D_{90}= 0.2026 D_{85}= 0.1062 D_{60}= 0.0105
D_{50}= 0.0050 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(16)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 15.7'-16.2'

Location: SA-11-02, Shelby Tube
Sample Number: 1034 **Depth:** 15.0' - 17.0' **Date:** 11/17/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-02, Shelby Tube
Depth: 15.0' - 17.0'
Sample Number: 1034
Material Description: red/brown lean CLAY with sand
Date: 11/17/11
PL: 12
LL: 34
PI: 22
USCS Classification: CL
AASHTO Classification: A-6(16)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 15.7'-16.2'

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
616.48	14.32	0.00	0.5	0.00	100.0	0.0
			0.375	2.21	99.6	0.4
			#4	7.69	98.7	1.3
			#10	14.22	97.6	2.4
50.62	0.00	0.00	#20	0.72	96.2	3.8
			#40	1.49	94.8	5.2
			#60	3.13	91.6	8.4
			#100	5.18	87.6	12.4
			#200	8.20	81.8	18.2

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 97.6
Weight of hydrometer sample =50.621
Hygroscopic moisture correction:
Moist weight and tare = 57.44
Dry weight and tare = 57.27
Tare weight = 37.24
Hygroscopic moisture = 0.9%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x** Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	22.9	42.5	38.1	0.0132	42.5	9.3	0.0402	74.2	25.8
2.00	22.9	40.5	36.1	0.0132	40.5	9.7	0.0289	70.3	29.7
5.00	22.9	38.0	33.6	0.0132	38.0	10.1	0.0187	65.5	34.5
15.00	22.9	35.5	31.1	0.0132	35.5	10.5	0.0110	60.6	39.4
30.00	22.9	33.0	28.6	0.0132	33.0	10.9	0.0079	55.7	44.3
60.00	23.0	31.0	26.7	0.0132	31.0	11.2	0.0057	51.9	48.1
120.00	23.1	28.5	24.2	0.0131	28.5	11.6	0.0041	47.1	52.9
250.00	23.4	26.5	22.3	0.0131	26.5	11.9	0.0029	43.3	56.7

Hydrometer Test Data (continued)

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1440.00	22.3	22.0	17.5	0.0133	22.0	12.7	0.0012	34.0	66.0

Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	1.3	1.3	1.1	2.8	13.0	16.9	31.8	50.0	81.8

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0050	0.0105	0.0638	0.1062	0.2026	0.4521

Fineness Modulus
0.31

Particle Size Distribution Report - ASTM D2487

% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.4	1.4	3.9	14.0	33.8	45.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5	100.0		
0.375	99.2		
#4	98.6		
#10	97.2		
#20	95.0		
#40	93.3		
#60	90.0		
#100	85.5		
#200	79.3		

* (no specification provided)

Material Description

red/brown lean CLAY with sand

Atterberg Limits

PL= 13 LL= 35 PI= 22

Coefficients

D_{90}= 0.2514 D_{85}= 0.1413 D_{60}= 0.0173
D_{50}= 0.0074 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(15)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 10.3'-10.8'

Location: SA-11-03, Shelby Tube
Sample Number: 1034 **Depth:** 10.0' - 12.0' **Date:** 10/27/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-03, Shelby Tube
Depth: 10.0' - 12.0'
Sample Number: 1034
Material Description: red/brown lean CLAY with sand
Date: 10/27/11 **PL:** 13 **LL:** 35 **PI:** 22
USCS Classification: CL
AASHTO Classification: A-6(15)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 10.3'-10.8'

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
608.04	14.38	0.00	0.5	0.00	100.0	0.0
			0.375	4.85	99.2	0.8
			#4	8.36	98.6	1.4
			#10	16.44	97.2	2.8
54.40	0.00	0.00	#20	1.23	95.0	5.0
			#40	2.20	93.3	6.7
			#60	4.07	90.0	10.0
			#100	6.55	85.5	14.5
			#200	10.02	79.3	20.7

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 97.2
Weight of hydrometer sample =54.402
Hygroscopic moisture correction:
Moist weight and tare = 49.80
Dry weight and tare = 49.56
Tare weight = 27.43
Hygroscopic moisture = 1.1%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	22.9	44.0	39.6	0.0132	44.0	9.1	0.0397	71.6	28.4
2.00	22.9	41.0	36.6	0.0132	41.0	9.6	0.0288	66.2	33.8
5.00	22.9	38.0	33.6	0.0132	38.0	10.1	0.0187	60.8	39.2
15.00	22.9	35.0	30.6	0.0132	35.0	10.6	0.0110	55.3	44.7
30.00	22.9	32.5	28.1	0.0132	32.5	11.0	0.0080	50.8	49.2
60.00	23.0	30.5	26.2	0.0132	30.5	11.3	0.0057	47.3	52.7
120.00	23.1	28.0	23.7	0.0131	28.0	11.7	0.0041	42.8	57.2
250.00	23.4	26.0	21.8	0.0131	26.0	12.0	0.0029	39.3	60.7

Hydrometer Test Data (continued)

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1440.00	22.3	21.5	17.0	0.0133	21.5	12.8	0.0012	30.7	69.3

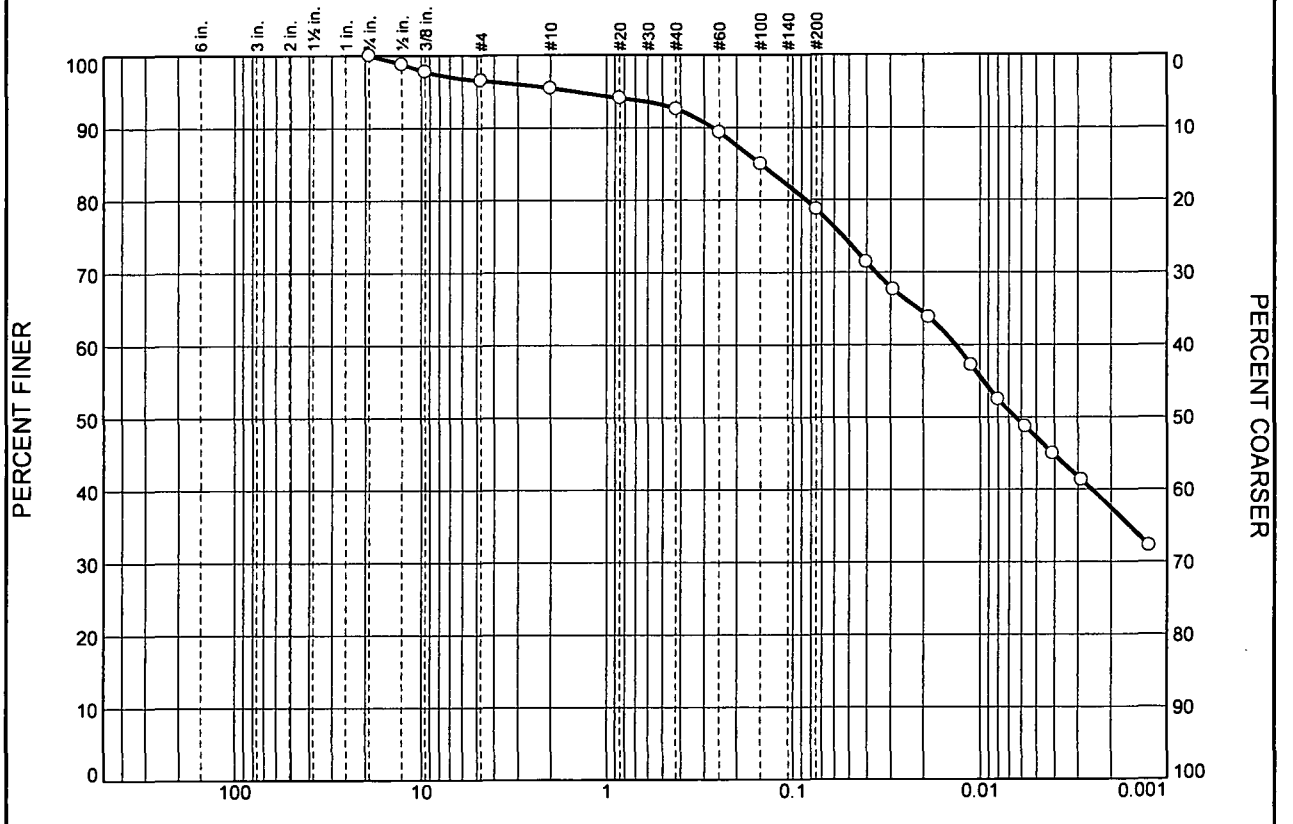
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	1.4	1.4	1.4	3.9	14.0	19.3	33.8	45.5	79.3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0074	0.0173	0.0806	0.1413	0.2514	0.8367

Fineness Modulus
0.38

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.5	1.0	2.9	13.9	31.5	47.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75	100.0		
0.5	98.8		
0.375	97.8		
#4	96.5		
#10	95.5		
#20	94.1		
#40	92.6		
#60	89.4		
#100	85.0		
#200	78.7		

* (no specification provided)

Material Description

red/brown lean CLAY with sand

Atterberg Limits

PL= 13 LL= 34 PI= 21

Coefficients

D_{90}= 0.2718 D_{85}= 0.1502 D_{60}= 0.0135
D_{50}= 0.0065 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(15)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 20.5' - 21.0'

Location: SA-11-04, Shelby Tube
Sample Number: 1034 **Depth:** 20.0' - 22.0' **Date:** 10/28/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-04, Shelby Tube
Depth: 20.0' - 22.0'
Sample Number: 1034
Material Description: red/brown lean CLAY with sand
Date: 10/28/11 **PL:** 13 **LL:** 34 **PI:** 21
USCS Classification: CL
AASHTO Classification: A-6(15)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 20.5' - 21.0'

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
638.40	14.50	0.00	0.75	0.00	100.0	0.0
			0.5	7.68	98.8	1.2
			0.375	13.92	97.8	2.2
			#4	21.79	96.5	3.5
			#10	28.32	95.5	4.5
50.78	0.00	0.00	#20	0.73	94.1	5.9
			#40	1.53	92.6	7.4
			#60	3.24	89.4	10.6
			#100	5.57	85.0	15.0
			#200	8.90	78.7	21.3

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 95.5
Weight of hydrometer sample =50.784
Hygroscopic moisture correction:
Moist weight and tare = 84.12
Dry weight and tare = 83.81
Tare weight = 52.07
Hygroscopic moisture = 1.0%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	22.9	42.0	37.6	0.0132	42.0	9.4	0.0404	71.4	28.6
2.00	22.9	40.0	35.6	0.0132	40.0	9.7	0.0291	67.6	32.4
5.00	22.9	38.0	33.6	0.0132	38.0	10.1	0.0187	63.8	36.2
15.00	22.9	34.5	30.1	0.0132	34.5	10.6	0.0111	57.2	42.8
30.00	22.9	32.0	27.6	0.0132	32.0	11.0	0.0080	52.5	47.5
60.00	23.0	30.0	25.7	0.0132	30.0	11.4	0.0057	48.7	51.3
120.00	23.1	28.0	23.7	0.0131	28.0	11.7	0.0041	45.0	55.0

Hydrometer Test Data (continued)

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
250.00	23.4	26.0	21.8	0.0131	26.0	12.0	0.0029	41.3	58.7
1440.00	22.3	21.5	17.0	0.0133	21.5	12.8	0.0012	32.2	67.8

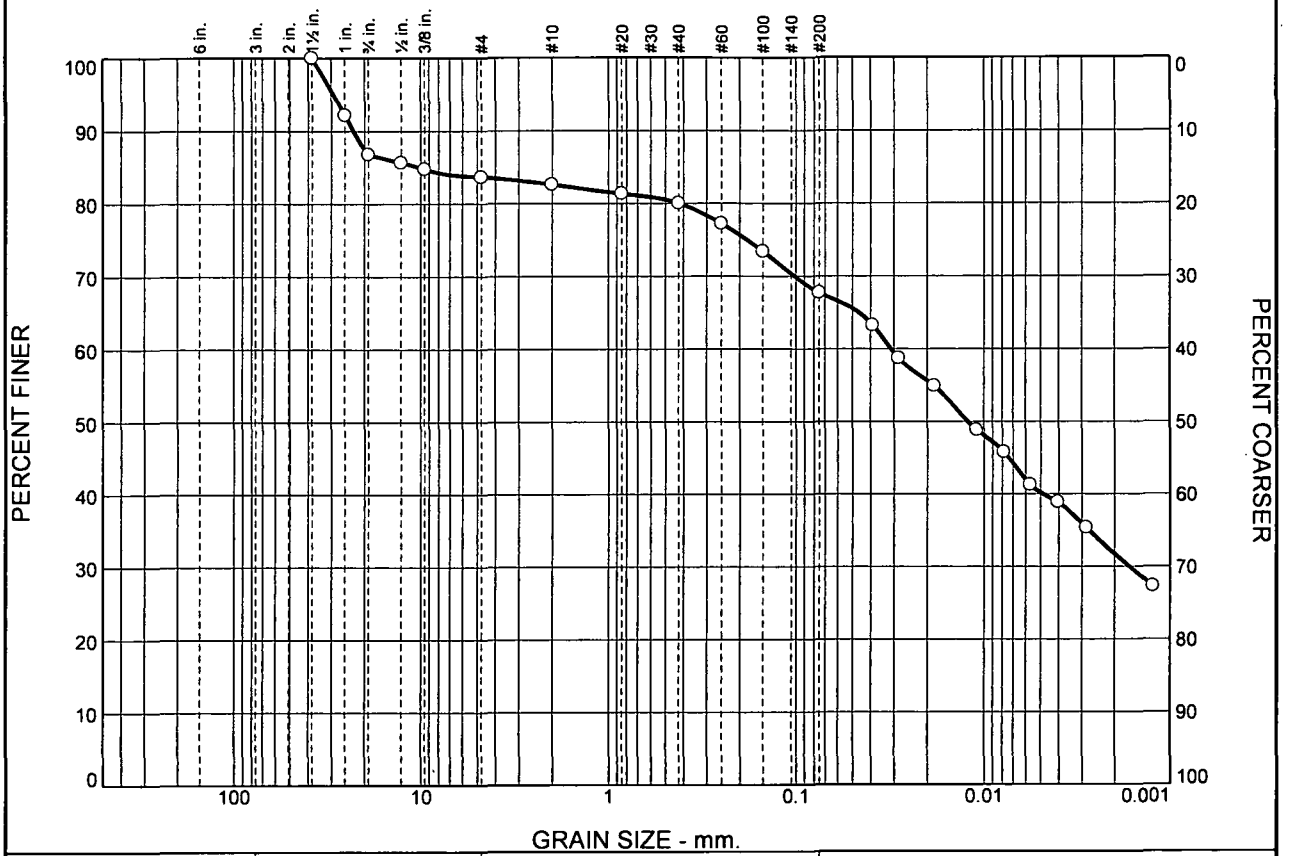
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	3.5	3.5	1.0	2.9	13.9	17.8	31.5	47.2	78.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0065	0.0135	0.0852	0.1502	0.2718	1.4956

Fineness Modulus
0.46

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	13.2	3.1	1.1	2.6	12.2	27.6	40.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1.0	92.2		
0.75	86.8		
0.5	85.6		
0.375	84.8		
#4	83.7		
#10	82.6		
#20	81.4		
#40	80.0		
#60	77.2		
#100	73.4		
#200	67.8		

* (no specification provided)

Material Description

red/brown gravelly lean CLAY with sand

Atterberg Limits

PL= 12 LL= 34 PI= 22

Coefficients

D_{90}= 22.9369 D_{85}= 10.1657 D_{60}= 0.0312
D_{50}= 0.0122 D_{30}= 0.0017 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(12)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 18.8'-19.3'

Location: SA-11-06, Shelby Tube
Sample Number: 1034 **Depth:** 18.0' - 20.0' **Date:** 11/17/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-06, Shelby Tube
Depth: 18.0' - 20.0' **Sample Number:** 1034
Material Description: red/brown gravelly lean CLAY with sand
Date: 11/17/11 **PL:** 12 **LL:** 34 **PI:** 22
USCS Classification: CL **AASHTO Classification:** A-6(12)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 18.8'-19.3'

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
2771.61	893.77	0.00	1.5	0.00	100.0	0.0
			1.0	146.93	92.2	7.8
			0.75	248.02	86.8	13.2
			0.5	269.50	85.6	14.4
			0.375	286.20	84.8	15.2
			#4	306.75	83.7	16.3
			#10	326.23	82.6	17.4
54.90	0.00	0.00	#20	0.84	81.4	18.6
			#40	1.72	80.0	20.0
			#60	3.59	77.2	22.8
			#100	6.12	73.4	26.6
			#200	9.88	67.8	32.2

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 82.6
Weight of hydrometer sample =54.904
Hygroscopic moisture correction:
Moist weight and tare = 60.27
Dry weight and tare = 60.03
Tare weight = 34.76
Hygroscopic moisture = 0.9%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	22.9	46.0	41.6	0.0132	46.0	8.8	0.0390	63.3	36.7
2.00	22.9	43.0	38.6	0.0132	43.0	9.2	0.0283	58.7	41.3
5.00	22.9	40.5	36.1	0.0132	40.5	9.7	0.0183	54.9	45.1
15.00	22.9	36.5	32.1	0.0132	36.5	10.3	0.0109	48.8	51.2
30.00	22.9	34.5	30.1	0.0132	34.5	10.6	0.0078	45.8	54.2

Hydrometer Test Data (continued)

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
60.00	23.0	31.5	27.2	0.0132	31.5	11.1	0.0057	41.3	58.7
120.00	23.1	29.9	25.6	0.0131	29.9	11.4	0.0040	38.9	61.1
250.00	23.4	27.5	23.3	0.0131	27.5	11.8	0.0028	35.4	64.6
1440.00	22.3	22.5	18.0	0.0133	22.5	12.6	0.0012	27.3	72.7

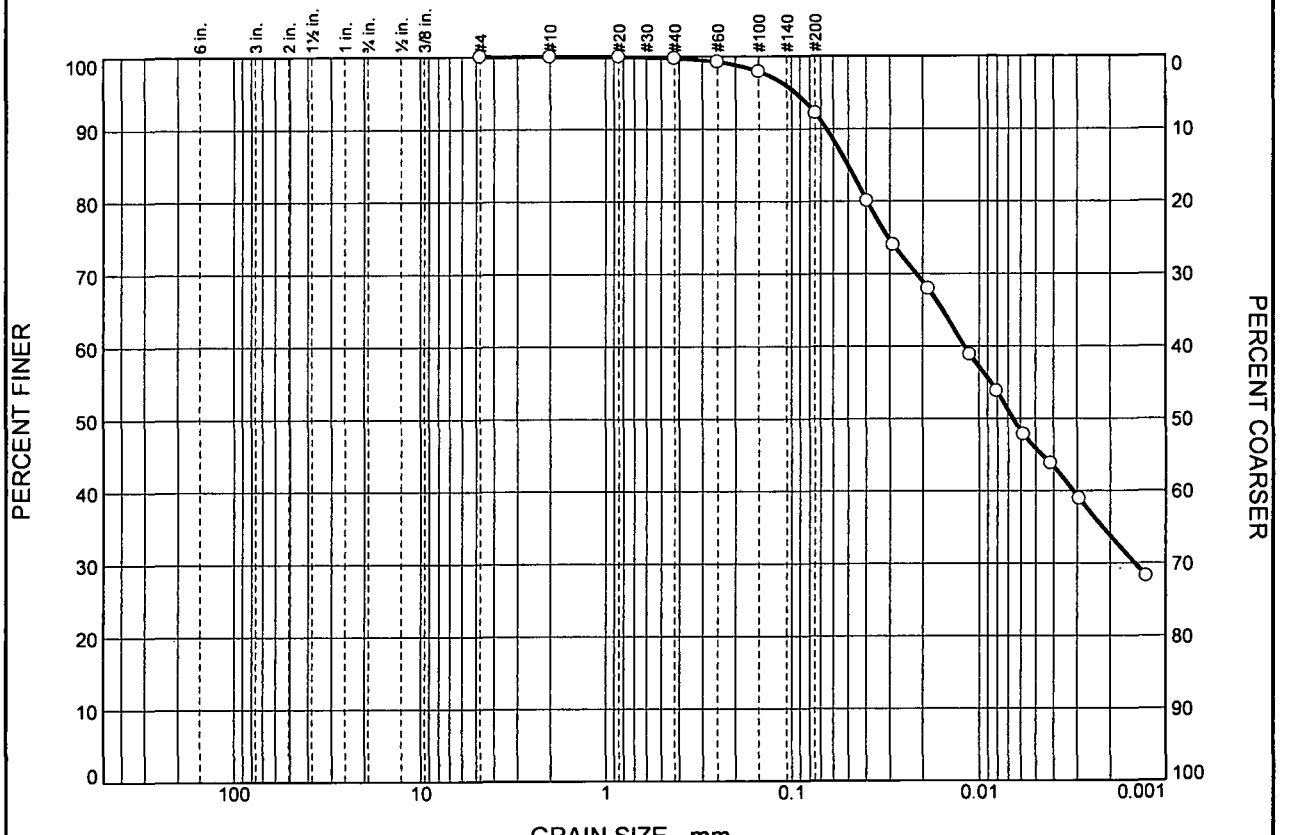
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	13.2	3.1	16.3	1.1	2.6	12.2	15.9	27.6	40.2	67.8

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0017	0.0122	0.0312	0.4205	10.1657	22.9369	29.1871

Fineness Modulus
1.47

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	0.1	7.6	46.4	45.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.9		
#20	99.9		
#40	99.8		
#60	99.3		
#100	97.9		
#200	92.2		

* (no specification provided)

Material Description

red/brown lean CLAY

Atterberg Limits

PL= 14 LL= 31 PI= 17

Coefficients

D_{90}= 0.0654 D_{85}= 0.0503 D_{60}= 0.0120
D_{50}= 0.0066 D_{30}= 0.0015 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(14)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 5.9'-6.4'

Location: SA-11-07, Shelby Tube
Sample Number: 1034 **Depth:** 5.0' - 7.0' **Date:** 11/17/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-07, Shelby Tube
Depth: 5.0' - 7.0'
Sample Number: 1034
Material Description: red/brown lean CLAY
Date: 11/17/11
PL: 14
LL: 31
PI: 17
USCS Classification: CL
AASHTO Classification: A-6(14)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 5.9'-6.4'

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
589.65	14.30	0.00	#4	0.00	100.0	0.0
			#10	0.29	99.9	0.1
50.11	0.00	0.00	#20	0.01	99.9	0.1
			#40	0.10	99.8	0.2
			#60	0.35	99.3	0.7
			#100	1.02	97.9	2.1
			#200	3.90	92.2	7.8

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 99.9
Weight of hydrometer sample =50.108
Hygroscopic moisture correction:
Moist weight and tare = 57.28
Dry weight and tare = 56.91
Tare weight = 27.41
Hygroscopic moisture = 1.3%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	22.9	44.0	39.6	0.0132	44.0	9.1	0.0397	80.1	19.9
2.00	22.9	41.0	36.6	0.0132	41.0	9.6	0.0288	74.0	26.0
5.00	22.9	38.0	33.6	0.0132	38.0	10.1	0.0187	67.9	32.1
15.00	22.9	33.5	29.1	0.0132	33.5	10.8	0.0112	58.9	41.1
30.00	22.9	31.0	26.6	0.0132	31.0	11.2	0.0081	53.8	46.2
60.00	23.0	28.0	23.7	0.0132	28.0	11.7	0.0058	47.8	52.2
120.00	23.1	26.0	21.7	0.0131	26.0	12.0	0.0042	43.8	56.2
250.00	23.4	23.5	19.3	0.0131	23.5	12.4	0.0029	38.9	61.1
1440.00	22.3	18.5	14.0	0.0133	18.5	13.3	0.0013	28.2	71.8

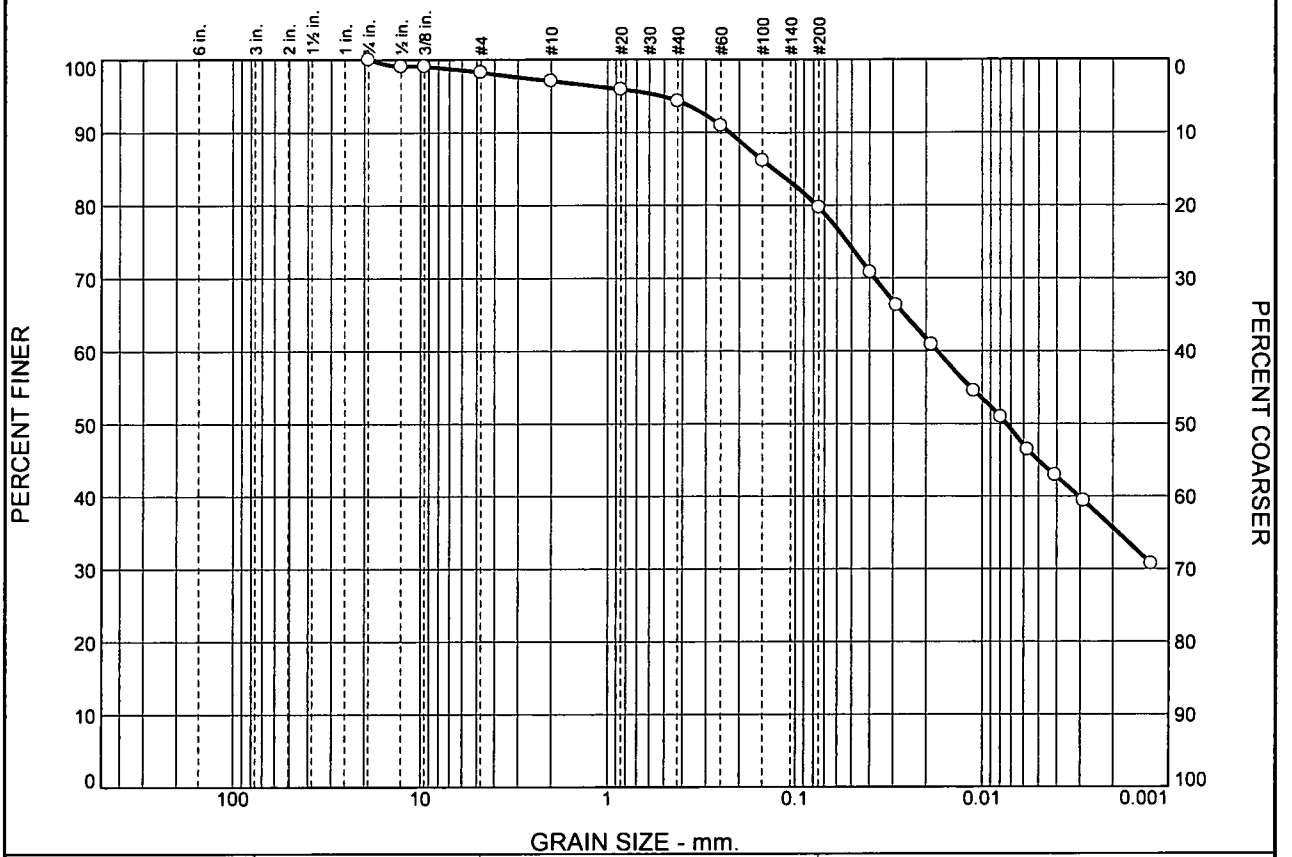
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.1	0.1	7.6	7.8	46.4	45.8	92.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0015	0.0066	0.0120	0.0396	0.0503	0.0654	0.0951

Fineness Modulus
0.03

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.7	1.2	2.8	14.6	34.8	44.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75	100.0		
0.5	99.1		
0.375	99.1		
#4	98.3		
#10	97.1		
#20	95.9		
#40	94.3		
#60	90.9		
#100	86.2		
#200	79.7		

* (no specification provided)

Material Description

red/brown lean CLAY with sand

Atterberg Limits

PL= 13 LL= 34 PI= 21

Coefficients

D_{90}= 0.2248 D_{85}= 0.1309 D_{60}= 0.0174
D_{50}= 0.0074 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(15)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 9.3'-9.8'

Location: SA-11-08, Shelby Tube
Sample Number: 1034 **Depth:** 8.0' - 10.0' **Date:** 10/26/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-08, Shelby Tube
Depth: 8.0' - 10.0'
Sample Number: 1034
Material Description: red/brown lean CLAY with sand
Date: 10/26/11 **PL:** 13 **LL:** 34 **PI:** 21
USCS Classification: CL
AASHTO Classification: A-6(15)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 9.3'-9.8'

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
667.96	14.37	0.00	0.75	0.00	100.0	0.0
			0.5	6.06	99.1	0.9
			0.375	6.06	99.1	0.9
			#4	11.41	98.3	1.7
			#10	19.22	97.1	2.9
54.21	0.00	0.00	#20	0.65	95.9	4.1
			#40	1.54	94.3	5.7
			#60	3.42	90.9	9.1
			#100	6.07	86.2	13.8
			#200	9.67	79.7	20.3

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 97.1
Weight of hydrometer sample =54.208
Hygroscopic moisture correction:
Moist weight and tare = 53.78
Dry weight and tare = 53.53
Tare weight = 30.29
Hygroscopic moisture = 1.1%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	22.9	43.5	39.1	0.0132	43.5	9.2	0.0399	70.8	29.2
2.00	22.9	41.0	36.6	0.0132	41.0	9.6	0.0288	66.3	33.7
5.00	22.9	38.0	33.6	0.0132	38.0	10.1	0.0187	60.9	39.1
15.00	22.9	34.5	30.1	0.0132	34.5	10.6	0.0111	54.5	45.5
30.00	22.9	32.5	28.1	0.0132	32.5	11.0	0.0080	50.9	49.1
60.00	23.0	30.0	25.7	0.0132	30.0	11.4	0.0057	46.4	53.6
120.00	23.2	28.0	23.7	0.0131	28.0	11.7	0.0041	42.9	57.1

Hydrometer Test Data (continued)

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
250.00	23.4	26.0	21.8	0.0131	26.0	12.0	0.0029	39.4	60.6
1440.00	22.3	21.5	17.0	0.0133	21.5	12.8	0.0012	30.7	69.3

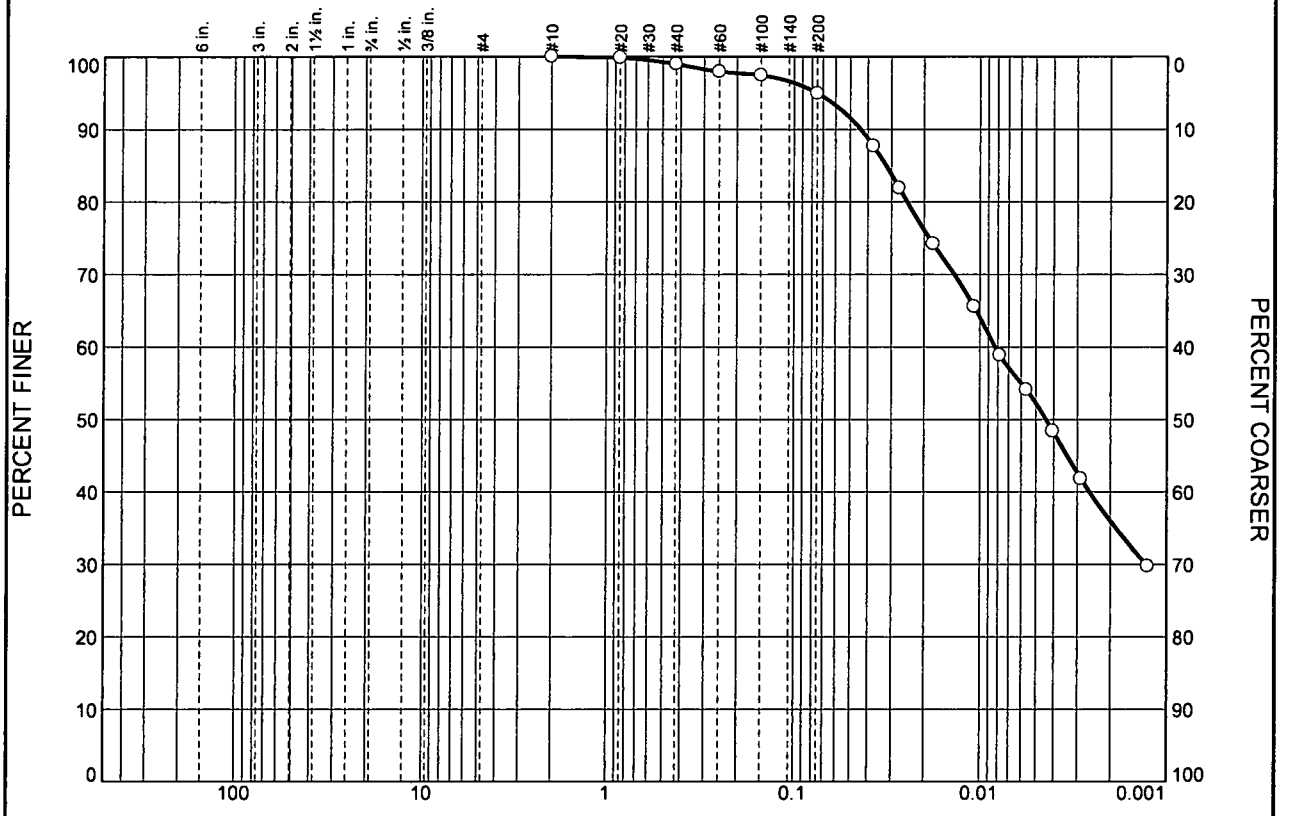
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	1.7	1.7	1.2	2.8	14.6	18.6	34.8	44.9	79.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0074	0.0174	0.0767	0.1309	0.2248	0.5205

Fineness Modulus
0.35

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.0	4.0	42.8	52.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	99.9		
#40	99.0		
#60	98.0		
#100	97.5		
#200	95.0		

* (no specification provided)

Material Description

red/brown lean CLAY

Atterberg Limits

PL= 16 LL= 33 PI= 17

Coefficients

D_{90}= 0.0439 D_{85}= 0.0321 D_{60}= 0.0083
D_{50}= 0.0044 D_{30}= 0.0013 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(16)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 5.6'-6.0'

Location: SA-11-09, Shelby Tube
Sample Number: 1034 **Depth:** 5.0' - 7.0' **Date:** 11/17/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-09, Shelby Tube
Depth: 5.0' - 7.0'
Sample Number: 1034
Material Description: red/brown lean CLAY
Date: 11/17/11
PL: 16
LL: 33
PI: 17
USCS Classification: CL
AASHTO Classification: A-6(16)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 5.6'-6.0'

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
1172.20	477.21	0.00	#10	0.00	100.0	0.0
52.69	0.00	0.00	#20	0.07	99.9	0.1
			#40	0.53	99.0	1.0
			#60	1.08	98.0	2.0
			#100	1.34	97.5	2.5
			#200	2.65	95.0	5.0

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 100.0
Weight of hydrometer sample =52.694
Hygroscopic moisture correction:
Moist weight and tare = 66.66
Dry weight and tare = 66.29
Tare weight = 36.95
Hygroscopic moisture = 1.3%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	22.9	50.0	45.6	0.0132	50.0	8.1	0.0375	87.7	12.3
2.00	22.9	47.0	42.6	0.0132	47.0	8.6	0.0273	81.9	18.1
5.00	22.9	43.0	38.6	0.0132	43.0	9.2	0.0179	74.2	25.8
15.00	22.9	38.5	34.1	0.0132	38.5	10.0	0.0107	65.6	34.4
30.00	22.9	35.0	30.6	0.0132	35.0	10.6	0.0078	58.9	41.1
60.00	23.0	32.5	28.2	0.0132	32.5	11.0	0.0056	54.1	45.9
120.00	23.1	29.5	25.2	0.0131	29.5	11.5	0.0041	48.4	51.6
250.00	23.4	26.0	21.8	0.0131	26.0	12.0	0.0029	41.8	58.2
1440.00	22.3	20.0	15.5	0.0133	20.0	13.0	0.0013	29.8	70.2

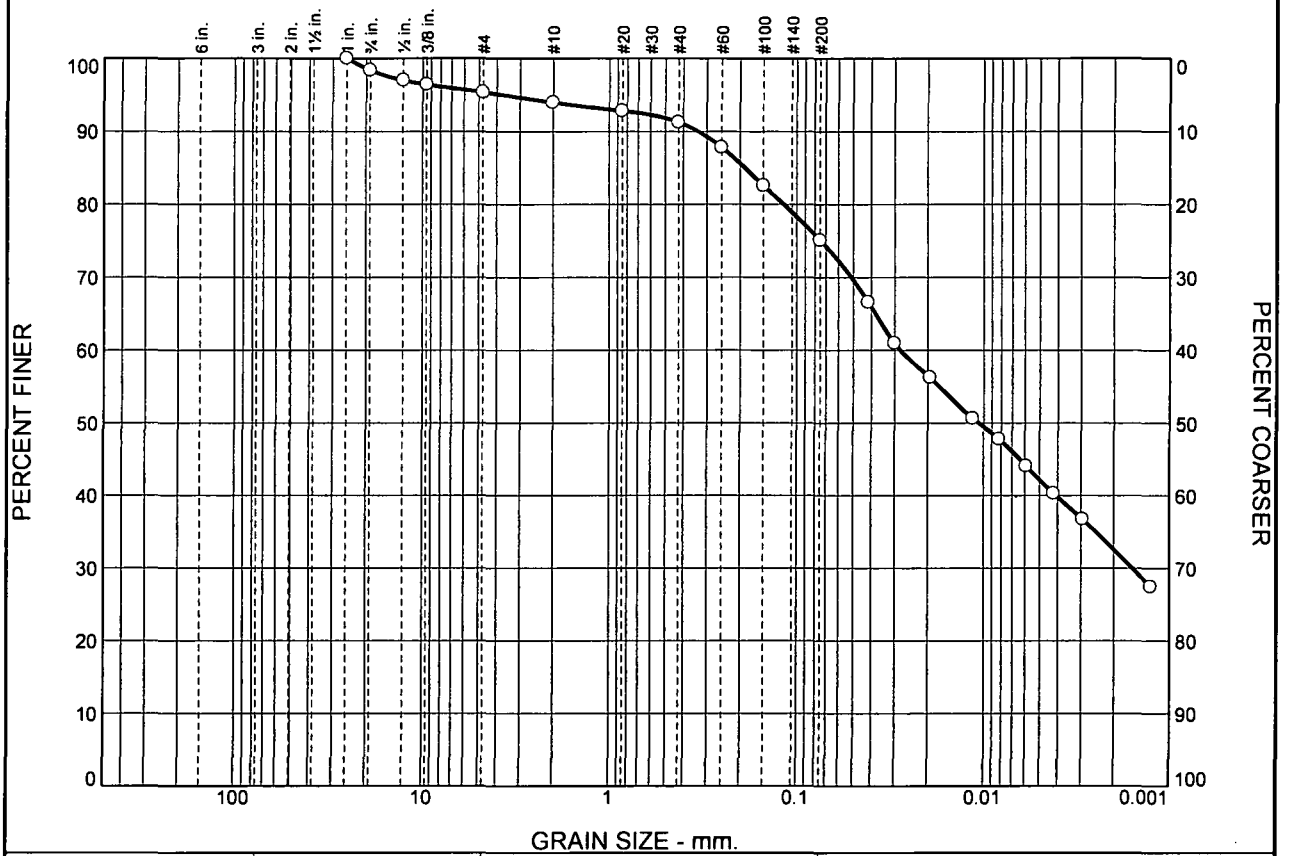
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	1.0	4.0	5.0	42.8	52.2	95.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0013	0.0044	0.0083	0.0247	0.0321	0.0439	0.0754

Fineness Modulus
0.05

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.6	3.0	1.4	2.7	16.2	32.9	42.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.0	100.0		
0.75	98.4		
0.5	97.0		
0.375	96.4		
#4	95.4		
#10	94.0		
#20	92.8		
#40	91.3		
#60	87.8		
#100	82.6		
#200	75.1		

* (no specification provided)

Material Description

red/brown lean CLAY with sand

Atterberg Limits

PL= 11 LL= 29 PI= 18

Coefficients

D_{90}= 0.3338 D_{85}= 0.1882 D_{60}= 0.0281
D_{50}= 0.0107 D_{30}= 0.0016 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(11)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 11.0'-11.5'

Location: SA-11-10, Shelby Tube
Sample Number: 1034 **Depth:** 10.0' - 12.0' **Date:** 11/14/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-10, Shelby Tube
Depth: 10.0' - 12.0' **Sample Number:** 1034
Material Description: red/brown lean CLAY with sand
Date: 11/14/11 **PL:** 11 **LL:** 29 **PI:** 18
USCS Classification: CL **AASHTO Classification:** A-6(11)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 11.0'-11.5'

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
711.80	14.30	0.00	1.0	0.00	100.0	0.0
			0.75	11.17	98.4	1.6
			0.5	21.00	97.0	3.0
			0.375	25.11	96.4	3.6
			#4	32.18	95.4	4.6
			#10	42.01	94.0	6.0
50.38	0.00	0.00	#20	0.62	92.8	7.2
			#40	1.45	91.3	8.7
			#60	3.31	87.8	12.2
			#100	6.11	82.6	17.4
			#200	10.11	75.1	24.9

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 94.0
Weight of hydrometer sample =50.375
Hygroscopic moisture correction:
Moist weight and tare = 87.91
Dry weight and tare = 87.61
Tare weight = 52.06
Hygroscopic moisture = 0.8%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	22.0	40.0	35.4	0.0133	40.0	9.7	0.0415	66.6	33.4
2.00	22.0	37.0	32.4	0.0133	37.0	10.2	0.0301	61.0	39.0
5.00	22.0	34.5	29.9	0.0133	34.5	10.6	0.0194	56.3	43.7
15.00	22.0	31.5	26.9	0.0133	31.5	11.1	0.0115	50.6	49.4
30.00	22.0	30.0	25.4	0.0133	30.0	11.4	0.0082	47.8	52.2
60.00	22.0	28.0	23.4	0.0133	28.0	11.7	0.0059	44.0	56.0

Hydrometer Test Data (continued)

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
120.00	22.1	26.0	21.4	0.0133	26.0	12.0	0.0042	40.3	59.7
250.00	22.5	24.0	19.5	0.0132	24.0	12.4	0.0029	36.7	63.3
1440.00	22.7	19.0	14.6	0.0132	19.0	13.2	0.0013	27.4	72.6

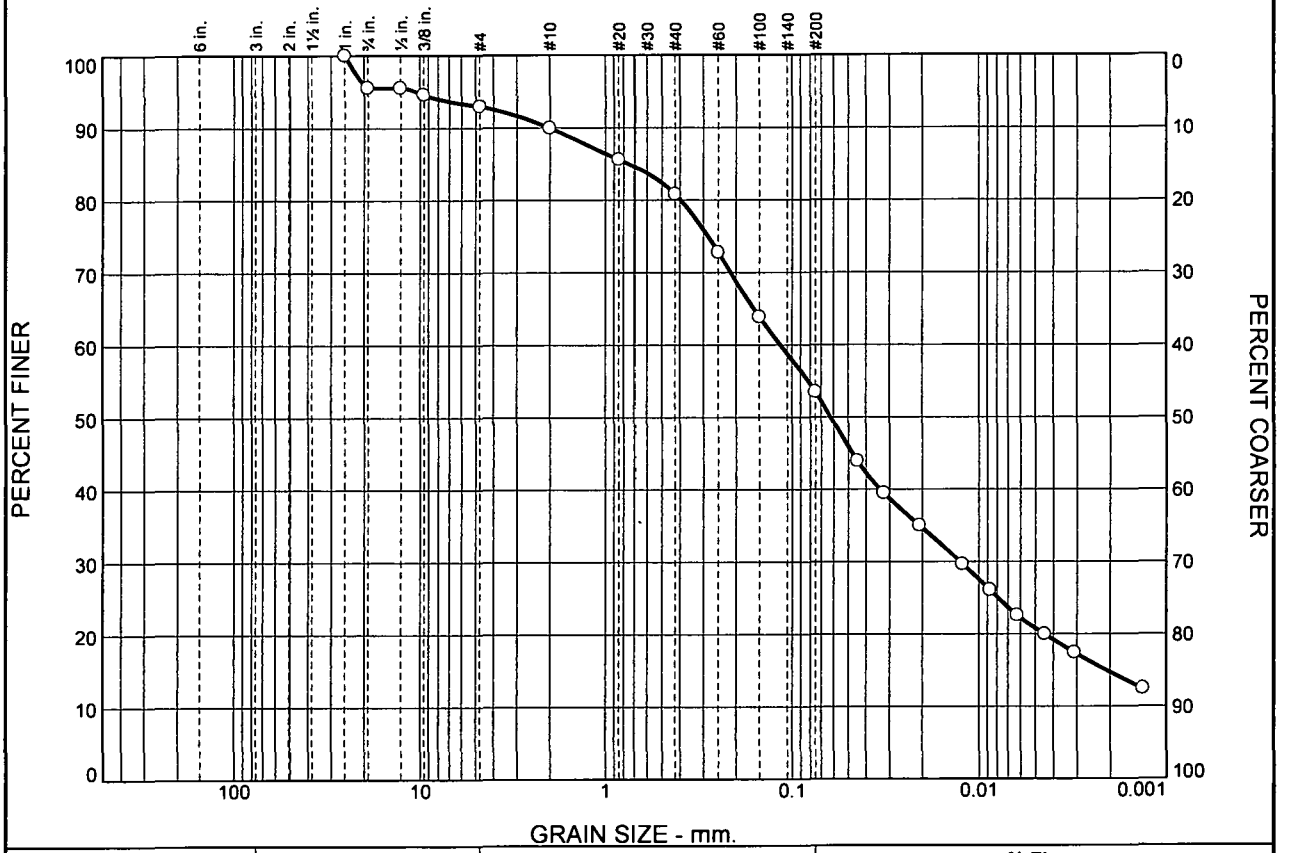
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	1.6	3.0	4.6	1.4	2.7	16.2	20.3	32.9	42.2	75.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0016	0.0107	0.0281	0.1172	0.1882	0.3338	3.7113

Fineness Modulus
0.58

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.4	2.6	3.1	9.1	27.3	32.7	20.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.0	100.0		
0.75	95.6		
0.5	95.6		
0.375	94.6		
#4	93.0		
#10	89.9		
#20	85.6		
#40	80.8		
#60	72.8		
#100	63.9		
#200	53.5		

* (no specification provided)

Material Description

gray/brown sandy lean CLAY

Atterberg Limits

PL= 10 LL= 18 PI= 8

Coefficients

D_{90}= 2.0240 D_{85}= 0.7541 D_{60}= 0.1153
D_{50}= 0.0622 D_{30}= 0.0126 D_{15}= 0.0021
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-4(1)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 10.8'-11.3'

Location: SA-11-12, Shelby Tube
Sample Number: 1034 **Depth:** 10.0' - 12.0' **Date:** 10/26/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-12, Shelby Tube
Depth: 10.0' - 12.0' **Sample Number:** 1034
Material Description: gray/brown sandy lean CLAY
Date: 10/26/11 **PL:** 10 **LL:** 18 **PI:** 8
USCS Classification: CL **AASHTO Classification:** A-4(1)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034
Test Specimen Depth: 10.8'-11.3'

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
784.07	14.45	0.00	1.0	0.00	100.0	0.0
			0.75	34.16	95.6	4.4
			0.5	34.16	95.6	4.4
			0.375	41.58	94.6	5.4
			#4	54.24	93.0	7.0
			#10	77.39	89.9	10.1
50.62	0.00	0.00	#20	2.45	85.6	14.4
			#40	5.13	80.8	19.2
			#60	9.65	72.8	27.2
			#100	14.67	63.9	36.1
			#200	20.52	53.5	46.5

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 89.9
Weight of hydrometer sample =50.616
Hygroscopic moisture correction:
Moist weight and tare = 67.01
Dry weight and tare = 66.89
Tare weight = 34.25
Hygroscopic moisture = 0.4%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	22.9	29.0	24.6	0.0132	29.0	11.5	0.0447	43.9	56.1
2.00	22.9	26.5	22.1	0.0132	26.5	11.9	0.0322	39.5	60.5
5.00	22.9	24.0	19.6	0.0132	24.0	12.4	0.0207	35.0	65.0
15.00	22.9	21.0	16.6	0.0132	21.0	12.9	0.0122	29.7	70.3
30.00	22.9	19.0	14.6	0.0132	19.0	13.2	0.0087	26.1	73.9
60.00	23.0	17.0	12.7	0.0132	17.0	13.5	0.0062	22.6	77.4

Hydrometer Test Data (continued)

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
120.00	23.1	15.5	11.2	0.0131	15.5	13.8	0.0044	20.0	80.0
250.00	23.4	14.0	9.8	0.0131	14.0	14.0	0.0031	17.4	82.6
1440.00	22.3	11.5	7.0	0.0133	11.5	14.4	0.0013	12.5	87.5

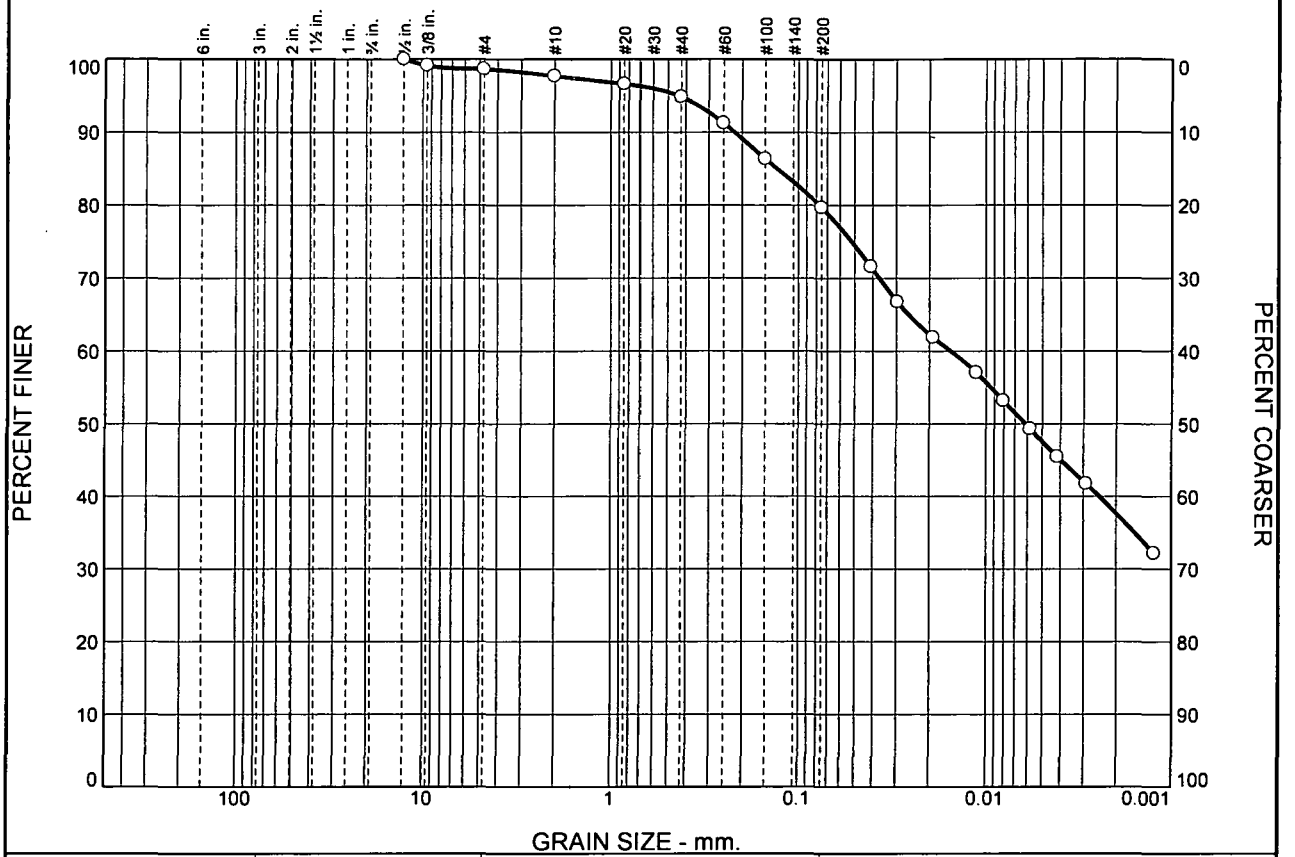
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	4.4	2.6	7.0	3.1	9.1	27.3	39.5	32.7	20.8	53.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0021	0.0045	0.0126	0.0622	0.1153	0.3964	0.7541	2.0240	10.4171

Fineness Modulus
1.15

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.4	0.9	2.9	15.1	32.1	47.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5	100.0		
0.375	99.1		
#4	98.6		
#10	97.7		
#20	96.6		
#40	94.8		
#60	91.2		
#100	86.4		
#200	79.7		

* (no specification provided)

Material Description

red/brown lean CLAY with sand

Atterberg Limits

PL= 11 LL= 34 PI= 23

Coefficients

D_{90}= 0.2186 D_{85}= 0.1293 D_{60}= 0.0154
D_{50}= 0.0062 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(16)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034

Location: SA-11-03, Bag Sample
Sample Number: 1034 **Depth:** 8.0' - 12.0' **Date:** 11/15/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-03, Bag Sample
Depth: 8.0' - 12.0'
Sample Number: 1034
Material Description: red/brown lean CLAY with sand
Date: 11/15/11
PL: 11
LL: 34
PI: 23
USCS Classification: CL
AASHTO Classification: A-6(16)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
3247.78	1324.51	0.00	0.5	0.00	100.0	0.0
			0.375	16.46	99.1	0.9
			#4	26.04	98.6	1.4
			#10	44.40	97.7	2.3
50.89	0.00	0.00	#20	0.57	96.6	3.4
			#40	1.49	94.8	5.2
			#60	3.37	91.2	8.8
			#100	5.90	86.4	13.6
			#200	9.36	79.7	20.3

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 97.7
Weight of hydrometer sample =50.889
Hygroscopic moisture correction:
Moist weight and tare = 60.42
Dry weight and tare = 60.15
Tare weight = 34.24
Hygroscopic moisture = 1.1%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	22.0	41.5	36.9	0.0133	41.5	9.5	0.0410	71.6	28.4
2.00	22.0	39.0	34.4	0.0133	39.0	9.9	0.0296	66.8	33.2
5.00	22.0	36.5	31.9	0.0133	36.5	10.3	0.0191	61.9	38.1
15.00	22.0	34.0	29.4	0.0133	34.0	10.7	0.0113	57.1	42.9
30.00	22.0	32.0	27.4	0.0133	32.0	11.0	0.0081	53.2	46.8
60.00	22.0	30.0	25.4	0.0133	30.0	11.4	0.0058	49.3	50.7
120.00	22.1	28.0	23.4	0.0133	28.0	11.7	0.0042	45.5	54.5
250.00	22.5	26.0	21.5	0.0132	26.0	12.0	0.0029	41.8	58.2
1440.00	22.7	21.0	16.6	0.0132	21.0	12.9	0.0012	32.2	67.8

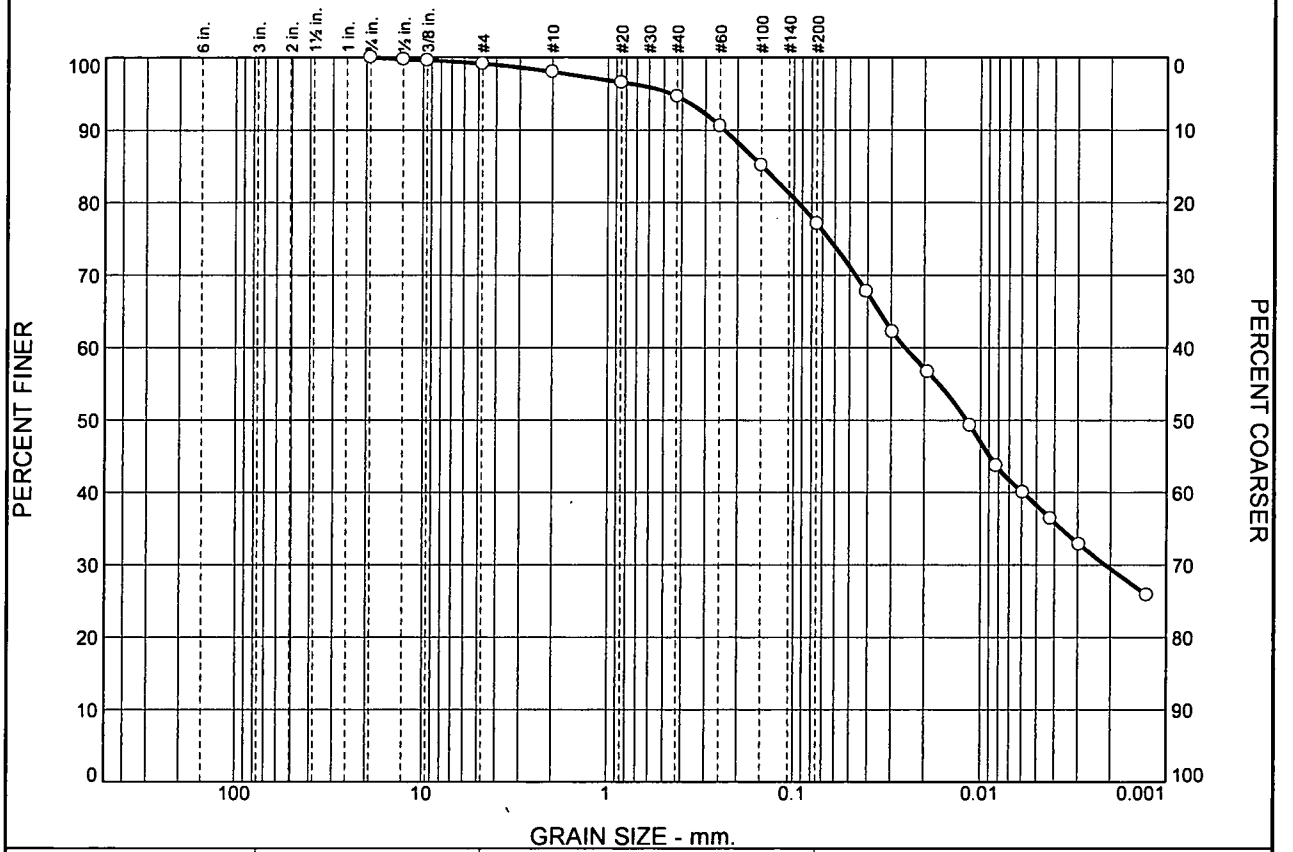
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	1.4	1.4	0.9	2.9	15.1	18.9	32.1	47.6	79.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0062	0.0154	0.0769	0.1293	0.2186	0.4413

Fineness Modulus
0.32

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.9	1.1	3.4	17.5	38.8	38.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75	100.0		
0.5	99.7		
0.375	99.6		
#4	99.1		
#10	98.0		
#20	96.6		
#40	94.6		
#60	90.6		
#100	85.2		
#200	77.1		

* (no specification provided)

Material Description

red/brown lean CLAY with sand

Atterberg Limits

PL= 11 LL= 29 PI= 18

Coefficients

D_{90}= 0.2361 D_{85}= 0.1478 D_{60}= 0.0252
D_{50}= 0.0119 D_{30}= 0.0021 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(11)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034

Location: SA-11-09, Bag Sample
Sample Number: 1034 **Depth:** 18.0' - 25.0' **Date:** 11/17/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-09, Bag Sample
Depth: 18.0' - 25.0'
Sample Number: 1034
Material Description: red/brown lean CLAY with sand
Date: 11/17/11 **PL:** 11 **LL:** 29 **PI:** 18
USCS Classification: CL **AASHTO Classification:** A-6(11)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
3359.00	868.50	0.00	0.75	0.00	100.0	0.0
			0.5	7.01	99.7	0.3
			0.375	10.14	99.6	0.4
			#4	21.77	99.1	0.9
			#10	49.89	98.0	2.0
53.51	0.00	0.00	#20	0.78	96.6	3.4
			#40	1.83	94.6	5.4
			#60	4.06	90.6	9.4
			#100	7.01	85.2	14.8
			#200	11.41	77.1	22.9

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 98.0
Weight of hydrometer sample =53.510
Hygroscopic moisture correction:
Moist weight and tare = 96.46
Dry weight and tare = 96.02
Tare weight = 52.23
Hygroscopic moisture = 1.0%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	22.9	41.0	36.6	0.0132	41.0	9.6	0.0407	67.8	32.2
2.00	22.9	38.0	33.6	0.0132	38.0	10.1	0.0295	62.2	37.8
5.00	22.9	35.0	30.6	0.0132	35.0	10.6	0.0191	56.7	43.3
15.00	22.9	31.0	26.6	0.0132	31.0	11.2	0.0114	49.3	50.7
30.00	22.9	28.0	23.6	0.0132	28.0	11.7	0.0082	43.7	56.3
60.00	22.9	26.0	21.6	0.0132	26.0	12.0	0.0059	40.0	60.0
120.00	23.1	24.0	19.7	0.0131	24.0	12.4	0.0042	36.4	63.6
250.00	23.4	22.0	17.8	0.0131	22.0	12.7	0.0029	32.9	67.1

Hydrometer Test Data (continued)

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1440.00	22.3	18.5	14.0	0.0133	18.5	13.3	0.0013	25.9	74.1

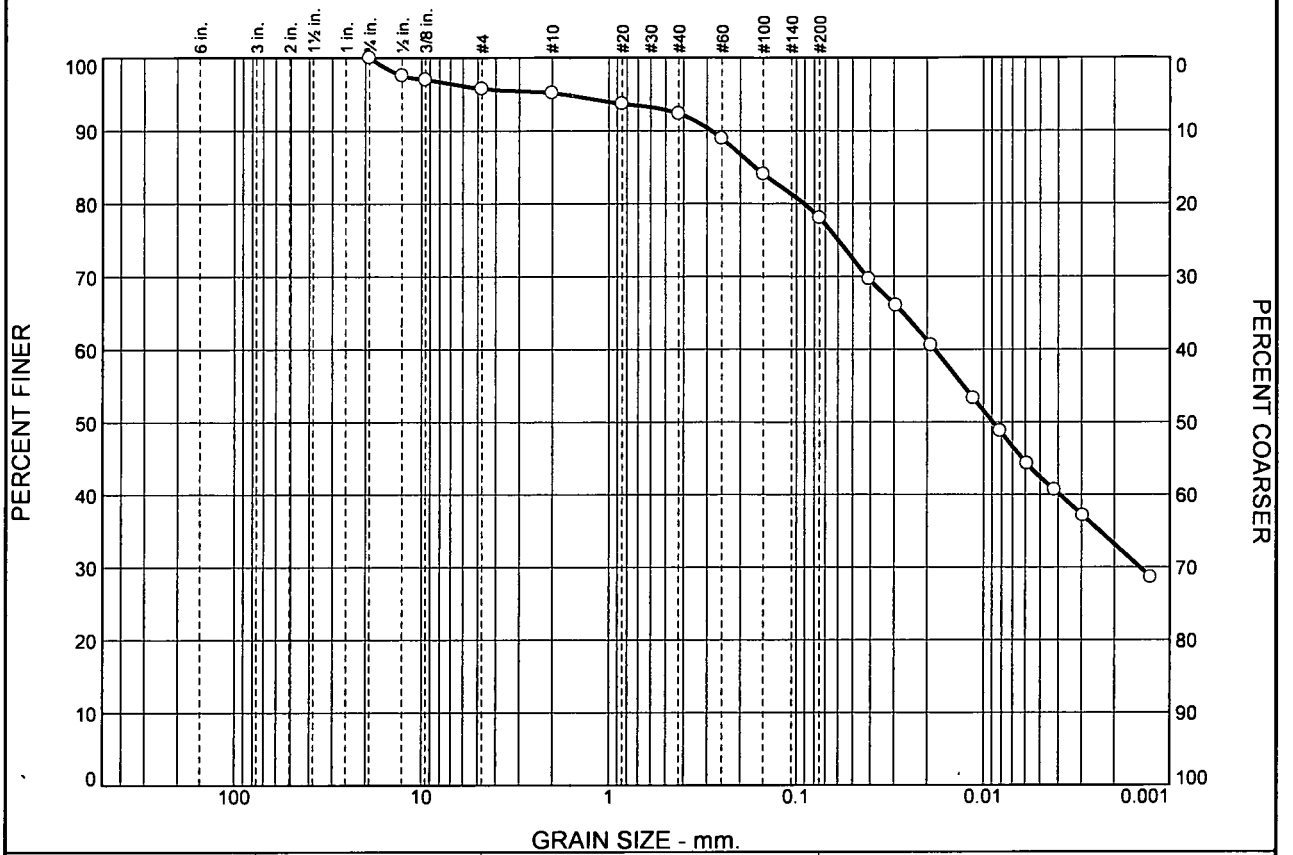
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.9	0.9	1.1	3.4	17.5	22.0	38.8	38.3	77.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0021	0.0119	0.0252	0.0947	0.1478	0.2361	0.4571

Fineness Modulus
0.33

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	4.2	0.6	2.9	14.3	35.6	42.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75	100.0		
0.5	97.6		
0.375	97.0		
#4	95.8		
#10	95.2		
#20	93.7		
#40	92.3		
#60	88.9		
#100	84.1		
#200	78.0		

* (no specification provided)

Material Description

red/brown lean CLAY with sand

Atterberg Limits

PL= 15 LL= 40 PI= 25

Coefficients

D_{90}= 0.2857 D_{85}= 0.1661 D_{60}= 0.0182
D_{50}= 0.0089 D_{30}= 0.0015 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(18)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034
Note: Sample is Undersized

Location: SA-11-01, SS-2
Sample Number: 1034 **Depth:** 2.5' - 4.0' **Date:** 11/13/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-01, SS-2
Depth: 2.5' - 4.0'
Sample Number: 1034
Material Description: red/brown lean CLAY with sand
Date: 11/13/11 **PL:** 15 **LL:** 40 **PI:** 25
USCS Classification: CL
AASHTO Classification: A-6(18)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034
Note: Sample is Undersized

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
418.13	14.52	0.00	0.75	0.00	100.0	0.0
			0.5	9.79	97.6	2.4
			0.375	12.16	97.0	3.0
			#4	17.07	95.8	4.2
			#10	19.55	95.2	4.8
53.51	0.00	0.00	#20	0.83	93.7	6.3
			#40	1.58	92.3	7.7
			#60	3.52	88.9	11.1
			#100	6.23	84.1	15.9
			#200	9.63	78.0	22.0

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 95.2
Weight of hydrometer sample =53.513
Hygroscopic moisture correction:
Moist weight and tare = 57.91
Dry weight and tare = 57.37
Tare weight = 34.76
Hygroscopic moisture = 2.4%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.4	43.0	38.3	0.0134	43.0	9.2	0.0408	69.7	30.3
2.00	21.4	41.0	36.3	0.0134	41.0	9.6	0.0293	66.0	34.0
5.00	21.4	38.0	33.3	0.0134	38.0	10.1	0.0190	60.6	39.4
15.00	21.4	34.0	29.3	0.0134	34.0	10.7	0.0113	53.3	46.7
30.00	21.5	31.5	26.8	0.0134	31.5	11.1	0.0082	48.8	51.2
60.00	21.6	29.0	24.3	0.0134	29.0	11.5	0.0059	44.3	55.7
120.00	21.7	27.0	22.3	0.0134	27.0	11.9	0.0042	40.7	59.3

Hydrometer Test Data (continued)

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
250.00	21.9	25.0	20.4	0.0133	25.0	12.2	0.0029	37.1	62.9
1440.00	21.2	20.5	15.7	0.0134	20.5	12.9	0.0013	28.6	71.4

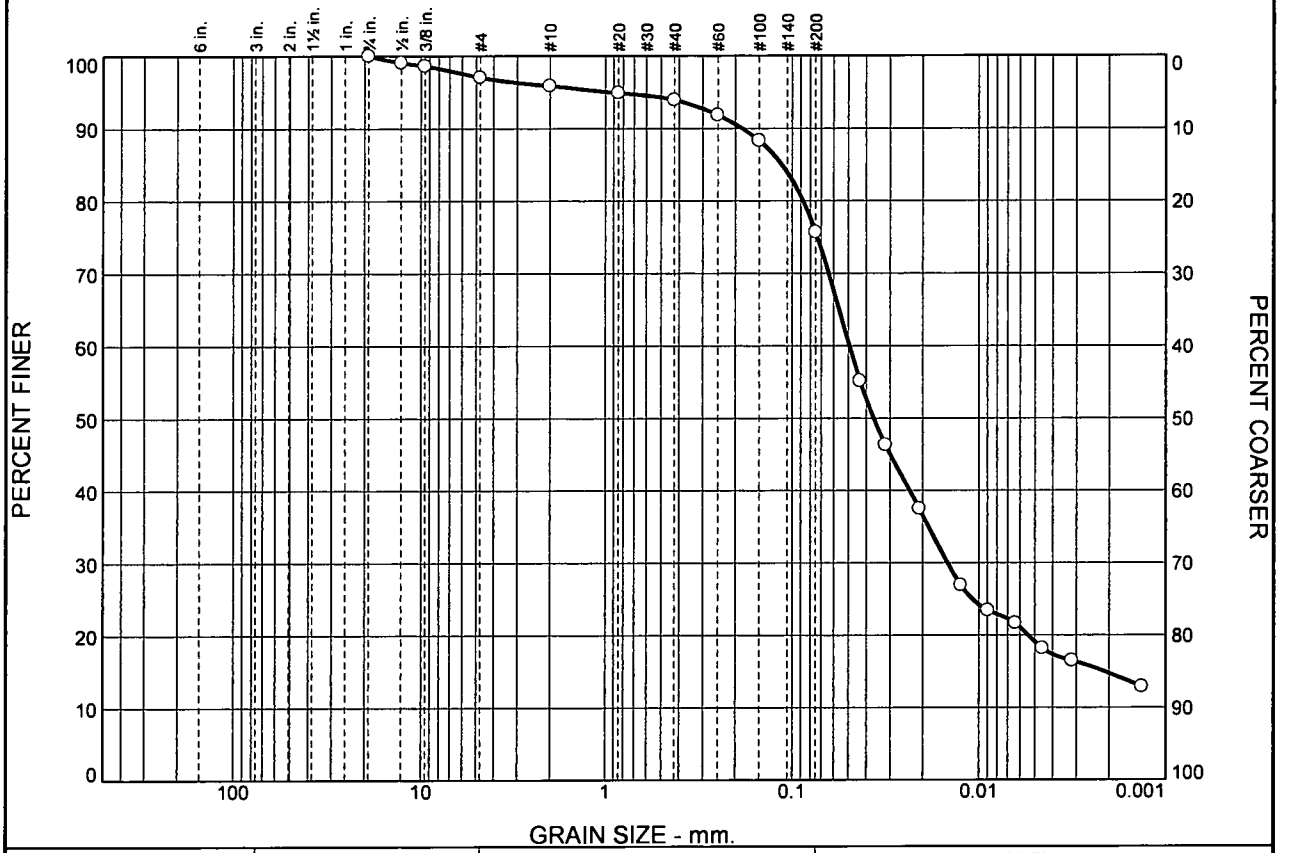
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	4.2	4.2	0.6	2.9	14.3	17.8	35.6	42.4	78.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0015	0.0089	0.0182	0.0907	0.1661	0.2857	1.7811

Fineness Modulus
0.50

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.0	1.1	2.0	18.2	56.6	19.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75	100.0		
0.5	99.1		
0.375	98.6		
#4	97.0		
#10	95.9		
#20	94.9		
#40	93.9		
#60	91.9		
#100	88.3		
#200	75.7		

* (no specification provided)

Material Description

red/brown silty CLAY with sand

Atterberg Limits

PL= 13 LL= 18 PI= 5

Coefficients

D_{90}= 0.1838 D_{85}= 0.1133 D_{60}= 0.0494
D_{50}= 0.0367 D_{30}= 0.0148 D_{15}= 0.0021
D_{10}= C_u= C_c=

Classification

USCS= CL-ML AASHTO= A-4(1)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034

Location: SA-11-02, SS-5
Sample Number: 1034 **Depth:** 10.0' - 11.5' **Date:** 11/14/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: M1051G
Location: SA-11-02, SS-5
Depth: 10.0' - 11.5'
Sample Number: 1034
Material Description: red/brown silty CLAY with sand
Date: 11/14/11 **PL:** 13 **LL:** 18 **PI:** 5
USCS Classification: CL-ML
AASHTO Classification: A-4(1)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
452.13	14.51	0.00	0.75	0.00	100.0	0.0
			0.5	3.98	99.1	0.9
			0.375	5.98	98.6	1.4
			#4	12.94	97.0	3.0
			#10	18.04	95.9	4.1
54.60	0.00	0.00	#20	0.56	94.9	5.1
			#40	1.11	93.9	6.1
			#60	2.29	91.9	8.1
			#100	4.30	88.3	11.7
			#200	11.50	75.7	24.3

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 95.9
Weight of hydrometer sample =54.603
Hygroscopic moisture correction:
Moist weight and tare = 78.98
Dry weight and tare = 78.83
Tare weight = 51.43
Hygroscopic moisture = 0.6%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.3	36.0	31.2	0.0134	36.0	10.4	0.0433	55.2	44.8
2.00	21.3	31.0	26.2	0.0134	31.0	11.2	0.0318	46.3	53.7
5.00	21.3	26.0	21.2	0.0134	26.0	12.0	0.0208	37.5	62.5
15.00	21.3	20.0	15.2	0.0134	20.0	13.0	0.0125	26.9	73.1
30.00	21.4	18.0	13.3	0.0134	18.0	13.3	0.0089	23.4	76.6
60.00	21.4	17.0	12.3	0.0134	17.0	13.5	0.0064	21.7	78.3
120.00	21.5	15.0	10.3	0.0134	15.0	13.8	0.0045	18.2	81.8
250.00	21.7	14.0	9.3	0.0134	14.0	14.0	0.0032	16.5	83.5

Hydrometer Test Data (continued)

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1440.00	21.5	12.0	7.3	0.0134	12.0	14.3	0.0013	12.9	87.1

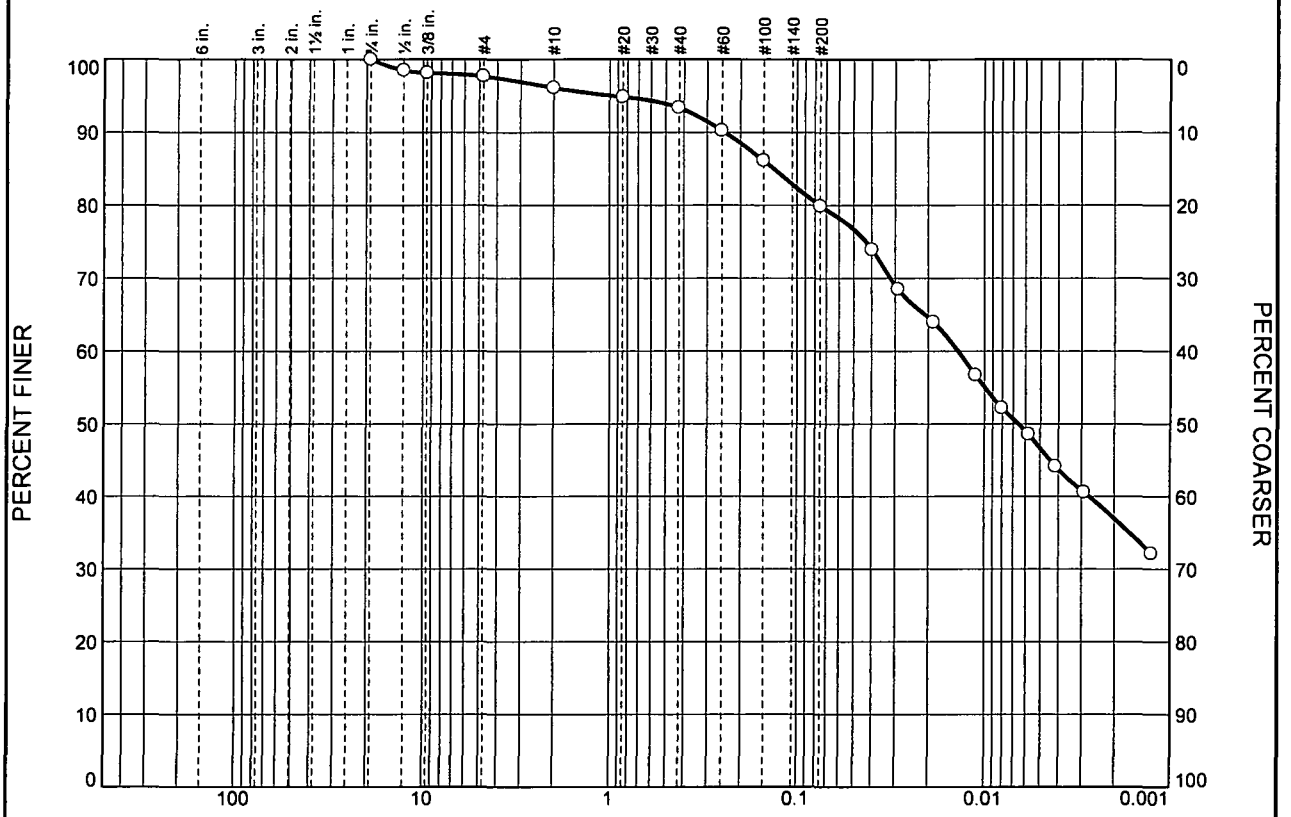
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	3.0	3.0	1.1	2.0	18.2	21.3	56.6	19.1	75.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0021	0.0054	0.0148	0.0367	0.0494	0.0876	0.1133	0.1838	0.9432

Fineness Modulus
0.37

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.3	1.6	2.7	13.5	33.2	46.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75	100.0		
0.5	98.5		
0.375	98.1		
#4	97.7		
#10	96.1		
#20	94.8		
#40	93.4		
#60	90.2		
#100	86.1		
#200	79.9		

* (no specification provided)

Material Description

red/brown lean CLAY with sand

Atterberg Limits

PL= 13 LL= 34 PI= 21

Coefficients

D_{90}= 0.2421 D_{85}= 0.1324 D_{60}= 0.0138
D_{50}= 0.0065 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(15)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034
Note: Sample is Undersized

Location: SA-11-04, SS-7
Sample Number: 1034 **Depth:** 15.0' - 16.5' **Date:** 11/13/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-04, SS-7
Depth: 15.0' - 16.5'
Sample Number: 1034
Material Description: red/brown lean CLAY with sand
Date: 11/13/11 **PL:** 13 **LL:** 34 **PI:** 21
USCS Classification: CL
AASHTO Classification: A-6(15)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034
Note: Sample is Undersized

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
429.65	14.63	0.00	0.75	0.00	100.0	0.0
			0.5	6.31	98.5	1.5
			0.375	7.72	98.1	1.9
			#4	9.60	97.7	2.3
			#10	16.15	96.1	3.9
53.80	0.00	0.00	#20	0.71	94.8	5.2
			#40	1.54	93.4	6.6
			#60	3.29	90.2	9.8
			#100	5.58	86.1	13.9
			#200	9.06	79.9	20.1

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 96.1
Weight of hydrometer sample =53.803
Hygroscopic moisture correction:
Moist weight and tare = 78.61
Dry weight and tare = 78.20
Tare weight = 51.43
Hygroscopic moisture = 1.5%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.4	45.5	40.8	0.0134	45.5	8.8	0.0399	73.9	26.1
2.00	21.4	42.5	37.8	0.0134	42.5	9.3	0.0290	68.5	31.5
5.00	21.4	40.0	35.3	0.0134	40.0	9.7	0.0187	64.0	36.0
15.00	21.4	36.0	31.3	0.0134	36.0	10.4	0.0112	56.7	43.3
30.00	21.4	33.5	28.8	0.0134	33.5	10.8	0.0080	52.2	47.8
60.00	21.5	31.5	26.8	0.0134	31.5	11.1	0.0058	48.6	51.4
120.00	21.7	29.0	24.3	0.0134	29.0	11.5	0.0041	44.1	55.9

Hydrometer Test Data (continued)

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
250.00	21.9	27.0	22.4	0.0133	27.0	11.9	0.0029	40.6	59.4
1440.00	21.2	22.5	17.7	0.0134	22.5	12.6	0.0013	32.1	67.9

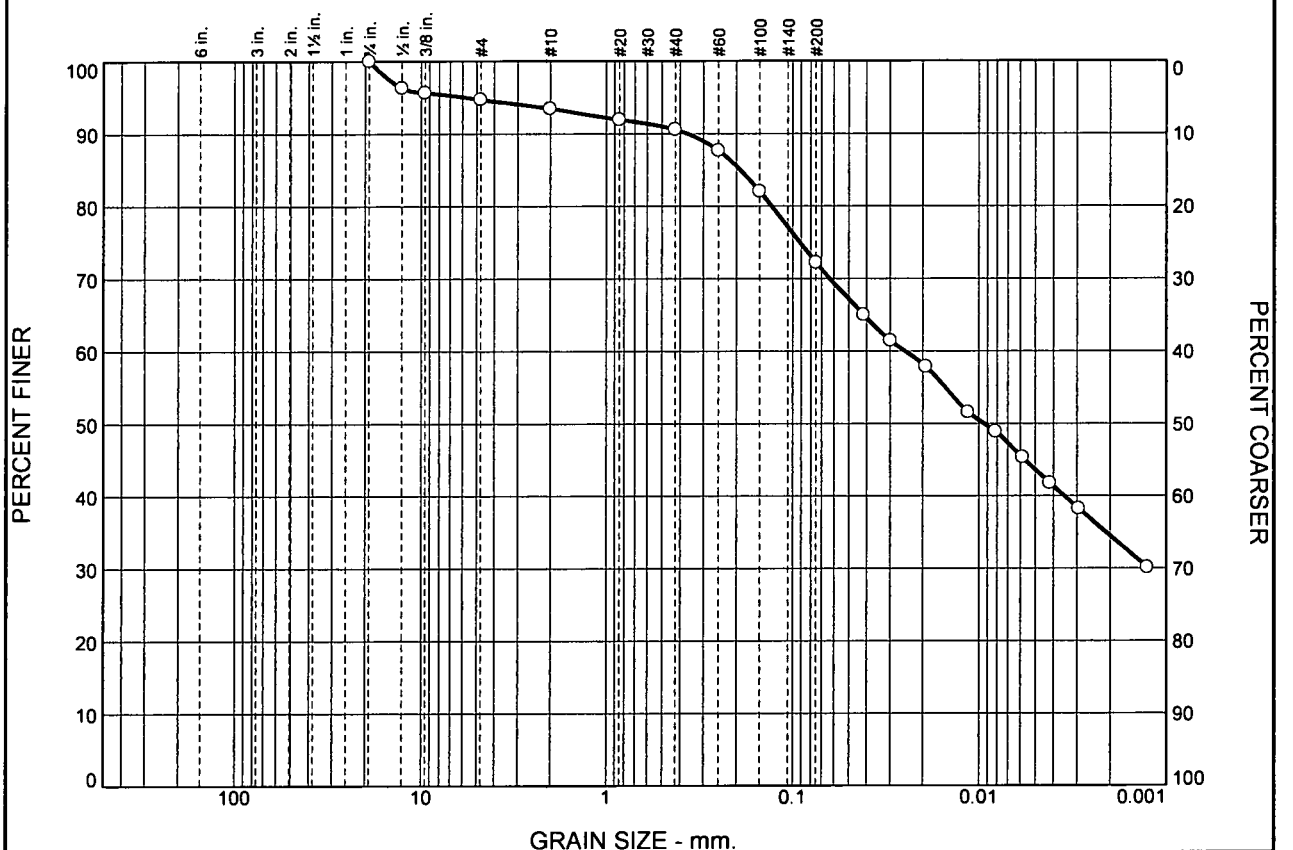
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.3	2.3	1.6	2.7	13.5	17.8	33.2	46.7	79.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0065	0.0138	0.0757	0.1324	0.2421	0.9670

Fineness Modulus
0.41

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	5.3	1.2	2.9	18.4	28.6	43.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75	100.0		
0.5	96.3		
0.375	95.7		
#4	94.7		
#10	93.5		
#20	91.9		
#40	90.6		
#60	87.7		
#100	82.0		
#200	72.2		

* (no specification provided)

Material Description

red/brown lean CLAY with sand

Atterberg Limits

PL= 13 LL= 34 PI= 21

Coefficients

D_{90}= 0.3659 D_{85}= 0.1905 D_{60}= 0.0249
D_{50}= 0.0094 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(13)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034
Note: Sample is Undersized

Location: SA-11-05, SS-11
Sample Number: 1034 **Depth:** 25.0' - 26.5' **Date:** 11/14/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-05, SS-11
Depth: 25.0' - 26.5'
Sample Number: 1034
Material Description: red/brown lean CLAY with sand
Date: 11/14/11
PL: 13
LL: 34
PI: 21
USCS Classification: CL
AASHTO Classification: A-6(13)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034
Note: Sample is Undersized

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
426.04	14.75	0.00	0.75	0.00	100.0	0.0
			0.5	15.12	96.3	3.7
			0.375	17.84	95.7	4.3
			#4	21.77	94.7	5.3
			#10	26.92	93.5	6.5
52.90	0.00	0.00	#20	0.86	91.9	8.1
			#40	1.64	90.6	9.4
			#60	3.27	87.7	12.3
			#100	6.46	82.0	18.0
			#200	12.02	72.2	27.8

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 93.5
Weight of hydrometer sample =52.897
Hygroscopic moisture correction:
Moist weight and tare = 56.79
Dry weight and tare = 56.39
Tare weight = 30.29
Hygroscopic moisture = 1.5%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.3	41.0	36.2	0.0134	41.0	9.6	0.0415	65.0	35.0
2.00	21.3	39.0	34.2	0.0134	39.0	9.9	0.0299	61.4	38.6
5.00	21.3	37.0	32.2	0.0134	37.0	10.2	0.0192	57.8	42.2
15.00	21.3	33.5	28.7	0.0134	33.5	10.8	0.0114	51.6	48.4
30.00	21.3	32.0	27.2	0.0134	32.0	11.0	0.0081	48.9	51.1
60.00	21.4	30.0	25.3	0.0134	30.0	11.4	0.0058	45.3	54.7
120.00	21.5	28.0	23.3	0.0134	28.0	11.7	0.0042	41.8	58.2

Hydrometer Test Data (continued)

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
250.00	21.6	26.0	21.3	0.0134	26.0	12.0	0.0029	38.2	61.8
1440.00	21.5	21.5	16.8	0.0134	21.5	12.8	0.0013	30.1	69.9

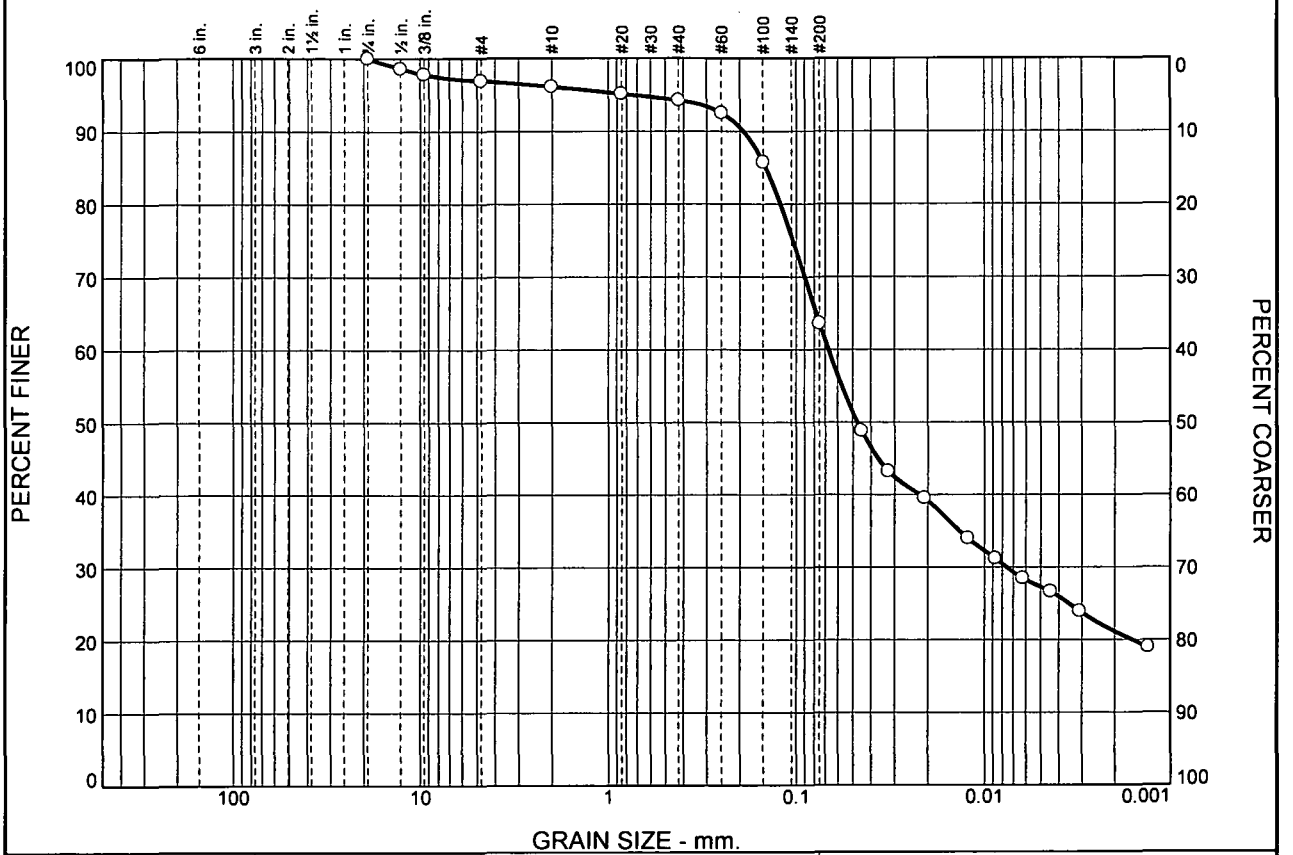
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	5.3	5.3	1.2	2.9	18.4	22.5	28.6	43.6	72.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0094	0.0249	0.1293	0.1905	0.3659	5.7896

Fineness Modulus
0.61

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.1	0.8	1.9	30.6	36.3	27.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75	100.0		
0.5	98.6		
0.375	97.8		
#4	96.9		
#10	96.1		
#20	95.1		
#40	94.2		
#60	92.5		
#100	85.8		
#200	63.6		

* (no specification provided)

Material Description

red/brown sandy lean CLAY

Atterberg Limits

PL= 10 LL= 18 PI= 8

Coefficients

D_{90}= 0.1912 D_{85}= 0.1453 D_{60}= 0.0672
D_{50}= 0.0472 D_{30}= 0.0076 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-4(2)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034

Location: SA-11-05, SS-12
Sample Number: 1034 **Depth:** 27.5' - 29.0' **Date:** 11/16/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-05, SS-12
Depth: 27.5' - 29.0' **Sample Number:** 1034
Material Description: red/brown sandy lean CLAY
Date: 11/16/11 **PL:** 10 **LL:** 18 **PI:** 8
USCS Classification: CL **AASHTO Classification:** A-4(2)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
498.19	14.51	0.00	0.75	0.00	100.0	0.0
			0.5	6.59	98.6	1.4
			0.375	10.57	97.8	2.2
			#4	14.91	96.9	3.1
			#10	18.78	96.1	3.9
52.20	0.00	0.00	#20	0.54	95.1	4.9
			#40	1.03	94.2	5.8
			#60	1.97	92.5	7.5
			#100	5.63	85.8	14.2
			#200	17.65	63.6	36.4

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 96.1
Weight of hydrometer sample =52.202
Hygroscopic moisture correction:
Moist weight and tare = 60.57
Dry weight and tare = 60.35
Tare weight = 37.23
Hygroscopic moisture = 1.0%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.4	31.0	26.3	0.0134	31.0	11.2	0.0449	48.8	51.2
2.00	21.4	28.0	23.3	0.0134	28.0	11.7	0.0324	43.3	56.7
5.00	21.4	26.0	21.3	0.0134	26.0	12.0	0.0208	39.5	60.5
15.00	21.5	23.0	18.3	0.0134	23.0	12.5	0.0122	34.0	66.0
30.00	21.5	21.5	16.8	0.0134	21.5	12.8	0.0087	31.2	68.8
60.00	21.6	20.0	15.3	0.0134	20.0	13.0	0.0062	28.5	71.5
120.00	21.7	19.0	14.3	0.0134	19.0	13.2	0.0044	26.7	73.3
250.00	21.9	17.5	12.9	0.0133	17.5	13.4	0.0031	24.0	76.0

Hydrometer Test Data (continued)

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1440.00	21.2	15.0	10.2	0.0134	15.0	13.8	0.0013	19.0	81.0

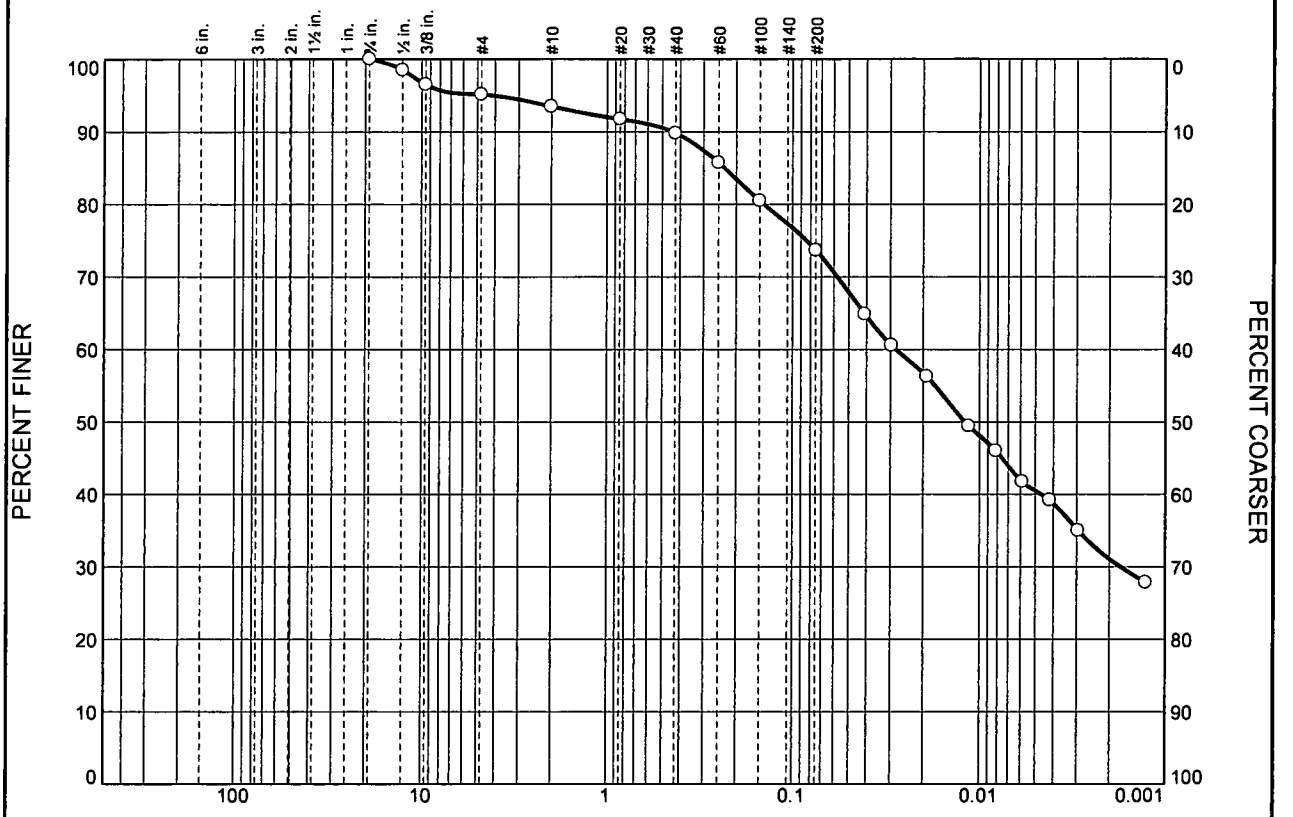
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	3.1	3.1	0.8	1.9	30.6	33.3	36.3	27.3	63.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0016	0.0076	0.0472	0.0672	0.1213	0.1453	0.1912	0.7661

Fineness Modulus
0.40

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	4.9	1.6	3.7	16.1	33.2	40.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75	100.0		
0.5	98.5		
0.375	96.5		
#4	95.1		
#10	93.5		
#20	91.7		
#40	89.8		
#60	85.7		
#100	80.5		
#200	73.7		

* (no specification provided)

Material Description

red/brown lean CLAY with sand

Atterberg Limits

PL= 12 LL= 31 PI= 19

Coefficients

D_{90}= 0.4408 D_{85}= 0.2322 D_{60}= 0.0280
D_{50}= 0.0119 D_{30}= 0.0017 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(11)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034
Note: Sample is Undersized

Location: SA-11-06, SS-7
Sample Number: 1034 **Depth:** 15.0' - 16.5' **Date:** 11/16/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI .
Project Number: MI051G
Location: SA-11-06, SS-7
Depth: 15.0' - 16.5'
Sample Number: 1034
Material Description: red/brown lean CLAY with sand
Date: 11/16/11
PL: 12
LL: 31
PI: 19
USCS Classification: CL
AASHTO Classification: A-6(11)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034
Note: Sample is Undersized

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
464.30	14.22	0.00	0.75	0.00	100.0	0.0
			0.5	6.79	98.5	1.5
			0.375	15.87	96.5	3.5
			#4	21.86	95.1	4.9
			#10	29.36	93.5	6.5
55.17	0.00	0.00	#20	1.03	91.7	8.3
			#40	2.16	89.8	10.2
			#60	4.57	85.7	14.3
			#100	7.65	80.5	19.5
			#200	11.67	73.7	26.3

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 93.5
Weight of hydrometer sample =55.166
Hygroscopic moisture correction:
Moist weight and tare = 67.44
Dry weight and tare = 66.99
Tare weight = 34.58
Hygroscopic moisture = 1.4%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.4	42.5	37.8	0.0134	42.5	9.3	0.0410	64.9	35.1
2.00	21.4	40.0	35.3	0.0134	40.0	9.7	0.0296	60.6	39.4
5.00	21.4	37.5	32.8	0.0134	37.5	10.1	0.0191	56.3	43.7
15.00	21.5	33.5	28.8	0.0134	33.5	10.8	0.0114	49.4	50.6
30.00	21.5	31.5	26.8	0.0134	31.5	11.1	0.0082	46.0	54.0
60.00	21.6	29.0	24.3	0.0134	29.0	11.5	0.0059	41.8	58.2
120.00	21.7	27.5	22.8	0.0134	27.5	11.8	0.0042	39.2	60.8

Hydrometer Test Data (continued)

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
250.00	21.9	25.0	20.4	0.0133	25.0	12.2	0.0029	35.0	65.0
1440.00	21.2	21.0	16.2	0.0134	21.0	12.9	0.0013	27.9	72.1

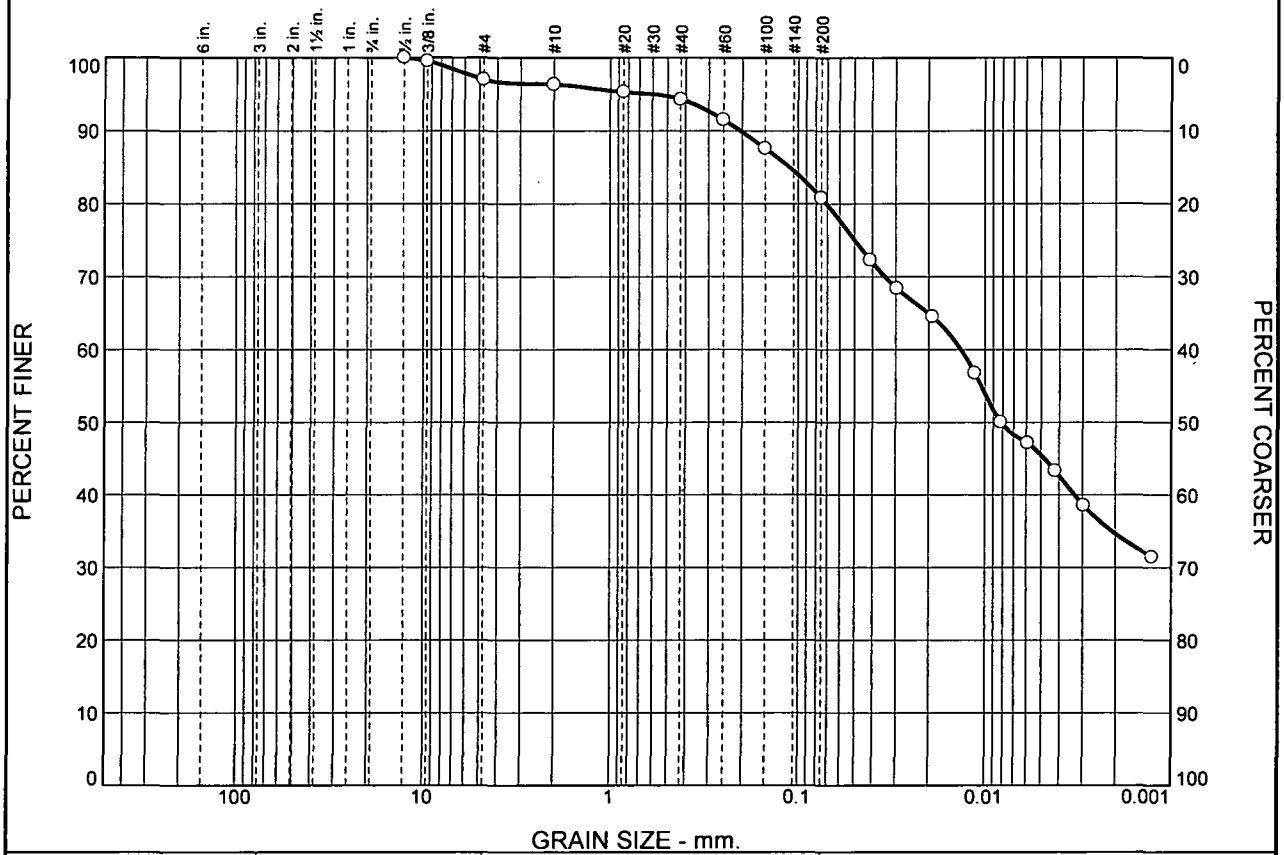
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	4.9	4.9	1.6	3.7	16.1	21.4	33.2	40.5	73.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0017	0.0119	0.0280	0.1421	0.2322	0.4408	4.1177

Fineness Modulus
0.63

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.9	0.7	2.1	13.5	35.2	45.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5	100.0		
0.375	99.5		
#4	97.1		
#10	96.4		
#20	95.3		
#40	94.3		
#60	91.5		
#100	87.6		
#200	80.8		

* (no specification provided)

Material Description

red/brown lean CLAY with sand

Atterberg Limits

PL= 13 LL= 35 PI= 22

Coefficients

D_{90}= 0.2032 D_{85}= 0.1108 D_{60}= 0.0134
D_{50}= 0.0082 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(16)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034

Location: SA-11-07, SS-14
Sample Number: 1034 **Depth:** 32.5' - 34.0' **Date:** 11/16/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-07, SS-14
Depth: 32.5' - 34.0'
Sample Number: 1034
Material Description: red/brown lean CLAY with sand
Date: 11/16/11 **PL:** 13 **LL:** 35 **PI:** 22
USCS Classification: CL
AASHTO Classification: A-6(16)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
369.55	14.56	0.00	0.5	0.00	100.0	0.0
			0.375	1.66	99.5	0.5
			#4	10.47	97.1	2.9
			#10	12.94	96.4	3.6
50.62	0.00	0.00	#20	0.56	95.3	4.7
			#40	1.07	94.3	5.7
			#60	2.55	91.5	8.5
			#100	4.60	87.6	12.4
			#200	8.17	80.8	19.2

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 96.4
Weight of hydrometer sample =50.616
Hygroscopic moisture correction:
Moist weight and tare = 86.59
Dry weight and tare = 85.98
Tare weight = 53.51
Hygroscopic moisture = 1.9%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 x **Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.4	42.0	37.3	0.0134	42.0	9.4	0.0411	72.3	27.7
2.00	21.4	40.0	35.3	0.0134	40.0	9.7	0.0296	68.4	31.6
5.00	21.4	38.0	33.3	0.0134	38.0	10.1	0.0190	64.5	35.5
15.00	21.4	34.0	29.3	0.0134	34.0	10.7	0.0113	56.8	43.2
30.00	21.5	30.5	25.8	0.0134	30.5	11.3	0.0082	50.0	50.0
60.00	21.6	29.0	24.3	0.0134	29.0	11.5	0.0059	47.2	52.8
120.00	21.7	27.0	22.3	0.0134	27.0	11.9	0.0042	43.3	56.7
250.00	21.9	24.5	19.9	0.0133	24.5	12.3	0.0030	38.6	61.4
1440.00	21.2	21.0	16.2	0.0134	21.0	12.9	0.0013	31.5	68.5

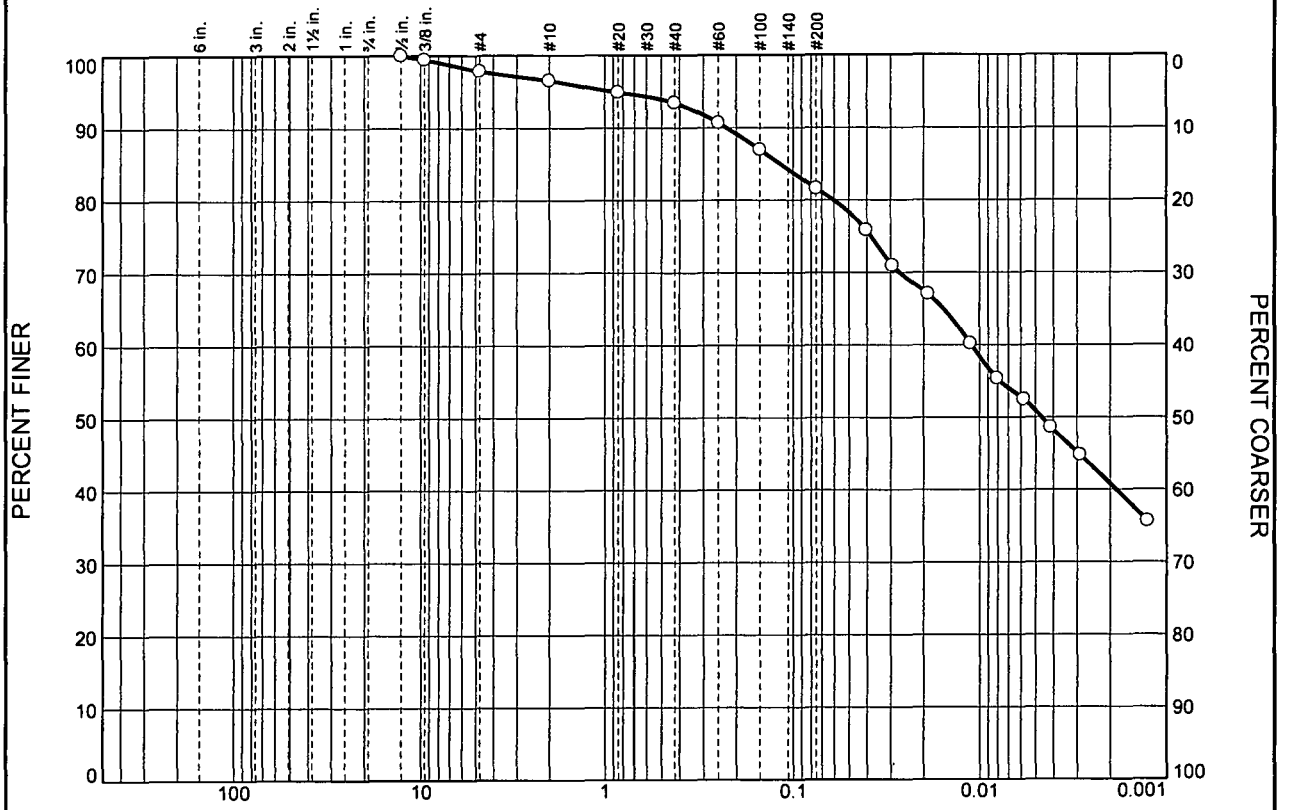
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.9	2.9	0.7	2.1	13.5	16.3	35.2	45.6	80.8

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0082	0.0134	0.0705	0.1108	0.2032	0.5985

Fineness Modulus
0.36

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.1	1.4	3.1	11.8	30.7	50.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5	100.0		
0.375	99.4		
#4	97.9		
#10	96.5		
#20	94.9		
#40	93.4		
#60	90.7		
#100	87.0		
#200	81.6		

* (no specification provided)

Material Description

red/brown lean CLAY with sand

Atterberg Limits

PL= 14 LL= 37 PI= 23

Coefficients

D_{90}= 0.2262 D_{85}= 0.1166 D_{60}= 0.0111
D_{50}= 0.0046 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(17)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034

Location: SA-11-08, SS-13
Sample Number: 1034 **Depth:** 30.0' - 31.5' **Date:** 11/13/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-08, SS-13
Depth: 30.0' - 31.5'
Sample Number: 1034
Material Description: red/brown lean CLAY with sand
Date: 11/13/11
PL: 14
LL: 37
PI: 23
USCS Classification: CL
AASHTO Classification: A-6(17)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
383.56	14.42	0.00	0.5	0.00	100.0	0.0
			0.375	2.05	99.4	0.6
			#4	7.92	97.9	2.1
			#10	12.83	96.5	3.5
50.12	0.00	0.00	#20	0.85	94.9	5.1
			#40	1.60	93.4	6.6
			#60	3.04	90.7	9.3
			#100	4.96	87.0	13.0
			#200	7.74	81.6	18.4

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 96.5
Weight of hydrometer sample =50.122
Hygroscopic moisture correction:
Moist weight and tare = 62.70
Dry weight and tare = 62.19
Tare weight = 30.29
Hygroscopic moisture = 1.6%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.4	43.5	38.8	0.0134	43.5	9.2	0.0406	75.9	24.1
2.00	21.4	41.0	36.3	0.0134	41.0	9.6	0.0293	71.0	29.0
5.00	21.4	39.0	34.3	0.0134	39.0	9.9	0.0189	67.1	32.9
15.00	21.4	35.5	30.8	0.0134	35.5	10.5	0.0112	60.2	39.8
30.00	21.5	33.0	28.3	0.0134	33.0	10.9	0.0081	55.4	44.6
60.00	21.6	31.5	26.8	0.0134	31.5	11.1	0.0058	52.5	47.5
120.00	21.7	29.5	24.8	0.0134	29.5	11.5	0.0041	48.6	51.4
250.00	21.9	27.5	22.9	0.0133	27.5	11.8	0.0029	44.8	55.2
1440.00	21.2	23.0	18.2	0.0134	23.0	12.5	0.0013	35.7	64.3

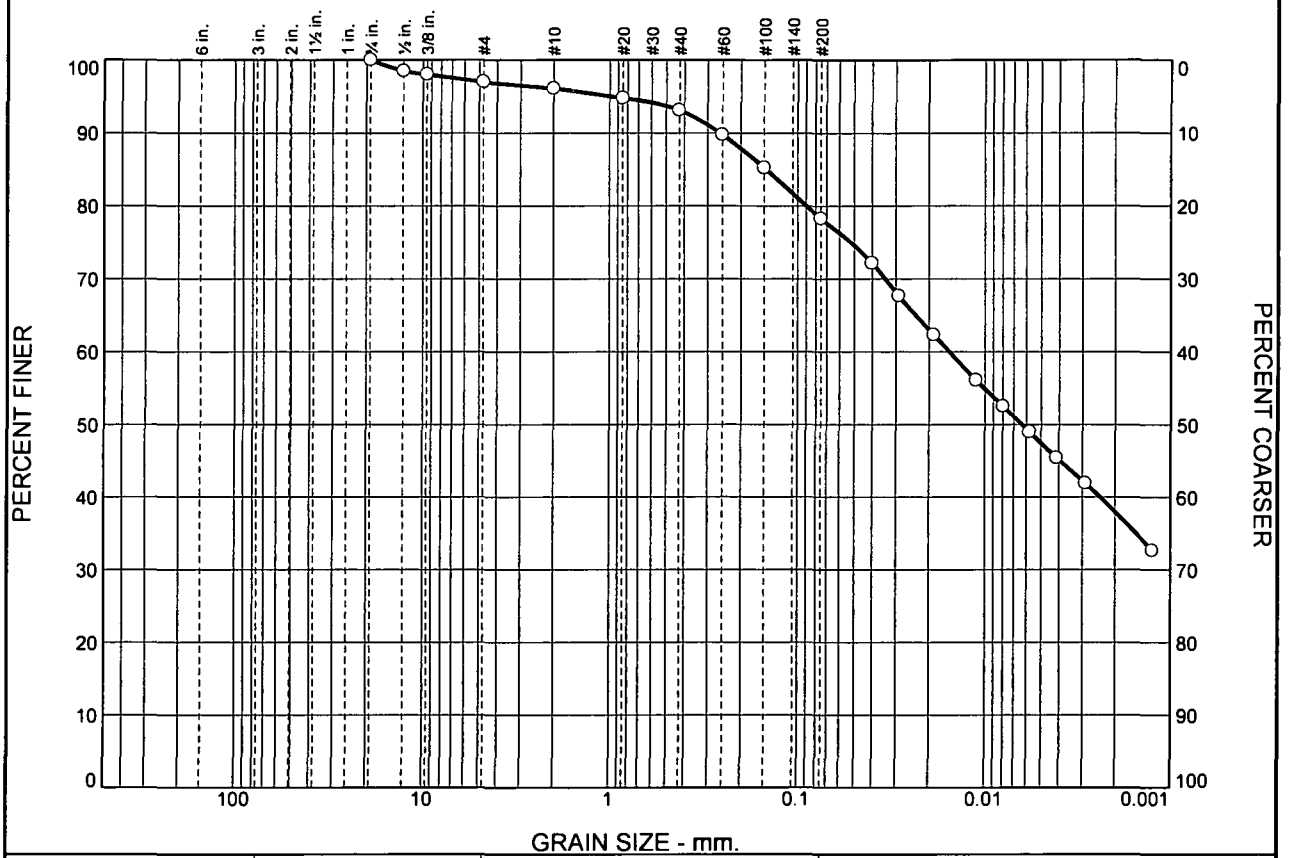
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.1	2.1	1.4	3.1	11.8	16.3	30.7	50.9	81.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0046	0.0111	0.0603	0.1166	0.2262	0.9083

Fineness Modulus
0.37

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.0	0.9	3.0	14.8	30.8	47.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75	100.0		
0.5	98.5		
0.375	98.0		
#4	97.0		
#10	96.1		
#20	94.8		
#40	93.1		
#60	89.7		
#100	85.2		
#200	78.3		

* (no specification provided)

Material Description

red/brown lean CLAY with sand

Atterberg Limits

PL= 11 LL= 37 PI= 26

Coefficients

D_{90}= 0.2585 D_{85}= 0.1466 D_{60}= 0.0155
D_{50}= 0.0063 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(18)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034
Note: Sample is Undersized

Location: SA-11-09, SS-10
Sample Number: 1034 **Depth:** 22.5' - 24.0' **Date:** 11/16/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-09, SS-10
Depth: 22.5' - 24.0' **Sample Number:** 1034
Material Description: red/brown lean CLAY with sand
Date: 11/16/11 **PL:** 11 **LL:** 37 **PI:** 26
USCS Classification: CL **AASHTO Classification:** A-6(18)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034
Note: Sample is Undersized

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
387.32	14.26	0.00	0.75	0.00	100.0	0.0
			0.5	5.61	98.5	1.5
			0.375	7.48	98.0	2.0
			#4	11.23	97.0	3.0
			#10	14.60	96.1	3.9
54.49	0.00	0.00	#20	0.75	94.8	5.2
			#40	1.69	93.1	6.9
			#60	3.60	89.7	10.3
			#100	6.16	85.2	14.8
			#200	10.09	78.3	21.7

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 96.1
Weight of hydrometer sample =54.495
Hygroscopic moisture correction:
Moist weight and tare = 49.82
Dry weight and tare = 49.46
Tare weight = 27.41
Hygroscopic moisture = 1.6%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.4	45.0	40.3	0.0134	45.0	8.9	0.0400	72.2	27.8
2.00	21.4	42.5	37.8	0.0134	42.5	9.3	0.0290	67.7	32.3
5.00	21.4	39.5	34.8	0.0134	39.5	9.8	0.0188	62.3	37.7
15.00	21.5	36.0	31.3	0.0134	36.0	10.4	0.0111	56.1	43.9
30.00	21.5	34.0	29.3	0.0134	34.0	10.7	0.0080	52.5	47.5
60.00	21.6	32.0	27.3	0.0134	32.0	11.0	0.0057	48.9	51.1
120.00	21.7	30.0	25.3	0.0134	30.0	11.4	0.0041	45.4	54.6

Hydrometer Test Data (continued)

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
250.00	21.9	28.0	23.4	0.0133	28.0	11.7	0.0029	41.9	58.1
1440.00	21.2	23.0	18.2	0.0134	23.0	12.5	0.0013	32.7	67.3

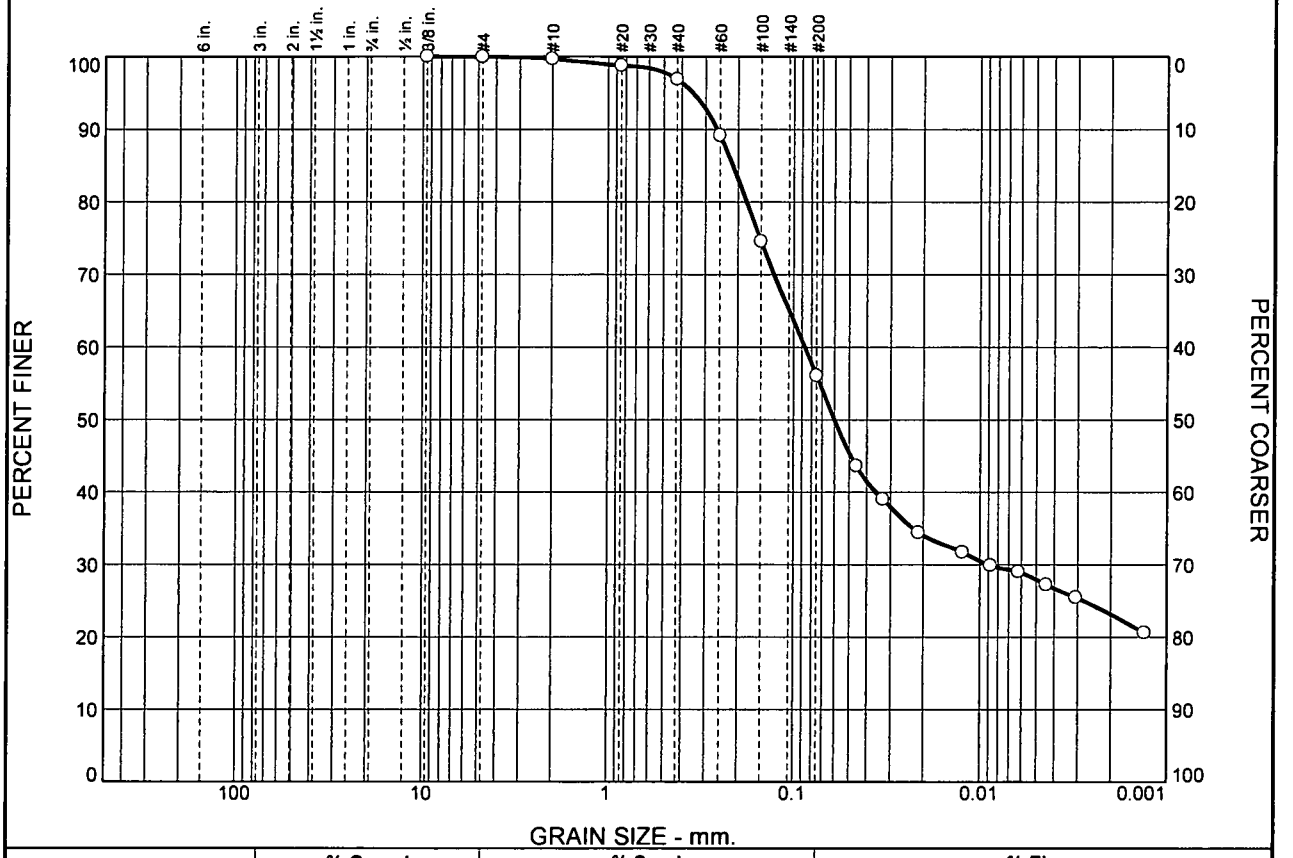
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	3.0	3.0	0.9	3.0	14.8	18.7	30.8	47.5	78.3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0063	0.0155	0.0896	0.1466	0.2585	0.9876

Fineness Modulus
0.43

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.2	2.8	40.8	28.2	27.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375	100.0		
#4	99.9		
#10	99.7		
#20	98.8		
#40	96.9		
#60	89.2		
#100	74.6		
#200	56.1		

* (no specification provided)

Material Description

red/brown sandy lean CLAY

Atterberg Limits

PL= 13 LL= 28 PI= 15

Coefficients

D_{90}= 0.2596 D_{85}= 0.2129 D_{60}= 0.0869
D_{50}= 0.0601 D_{30}= 0.0090 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(5)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034

Location: SA-11-10, SS-2
Sample Number: 1034 **Depth:** 2.5' - 4.0' **Date:** 11/16/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-10, SS-2
Depth: 2.5' - 4.0'
Sample Number: 1034
Material Description: red/brown sandy lean CLAY
Date: 11/16/11 **PL:** 13 **LL:** 28 **PI:** 15
USCS Classification: CL
AASHTO Classification: A-6(5)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
318.93	14.47	0.00	0.375	0.00	100.0	0.0
			#4	0.18	99.9	0.1
			#10	0.99	99.7	0.3
55.69	0.00	0.00	#20	0.50	98.8	1.2
			#40	1.56	96.9	3.1
			#60	5.88	89.2	10.8
			#100	14.01	74.6	25.4
			#200	24.36	56.1	43.9

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 99.7
Weight of hydrometer sample =55.693
Hygroscopic moisture correction:
Moist weight and tare = 56.53
Dry weight and tare = 56.04
Tare weight = 36.95
Hygroscopic moisture = 2.6%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.4	28.5	23.8	0.0134	28.5	11.6	0.0457	43.6	56.4
2.00	21.4	26.0	21.3	0.0134	26.0	12.0	0.0329	39.0	61.0
5.00	21.4	23.5	18.8	0.0134	23.5	12.4	0.0212	34.4	65.6
15.00	21.5	22.0	17.3	0.0134	22.0	12.7	0.0123	31.7	68.3
30.00	21.5	21.0	16.3	0.0134	21.0	12.9	0.0088	29.9	70.1
60.00	21.6	20.5	15.8	0.0134	20.5	12.9	0.0062	29.0	71.0
120.00	21.7	19.5	14.8	0.0134	19.5	13.1	0.0044	27.2	72.8
250.00	21.9	18.5	13.9	0.0133	18.5	13.3	0.0031	25.5	74.5
1440.00	21.2	16.0	11.2	0.0134	16.0	13.7	0.0013	20.6	79.4

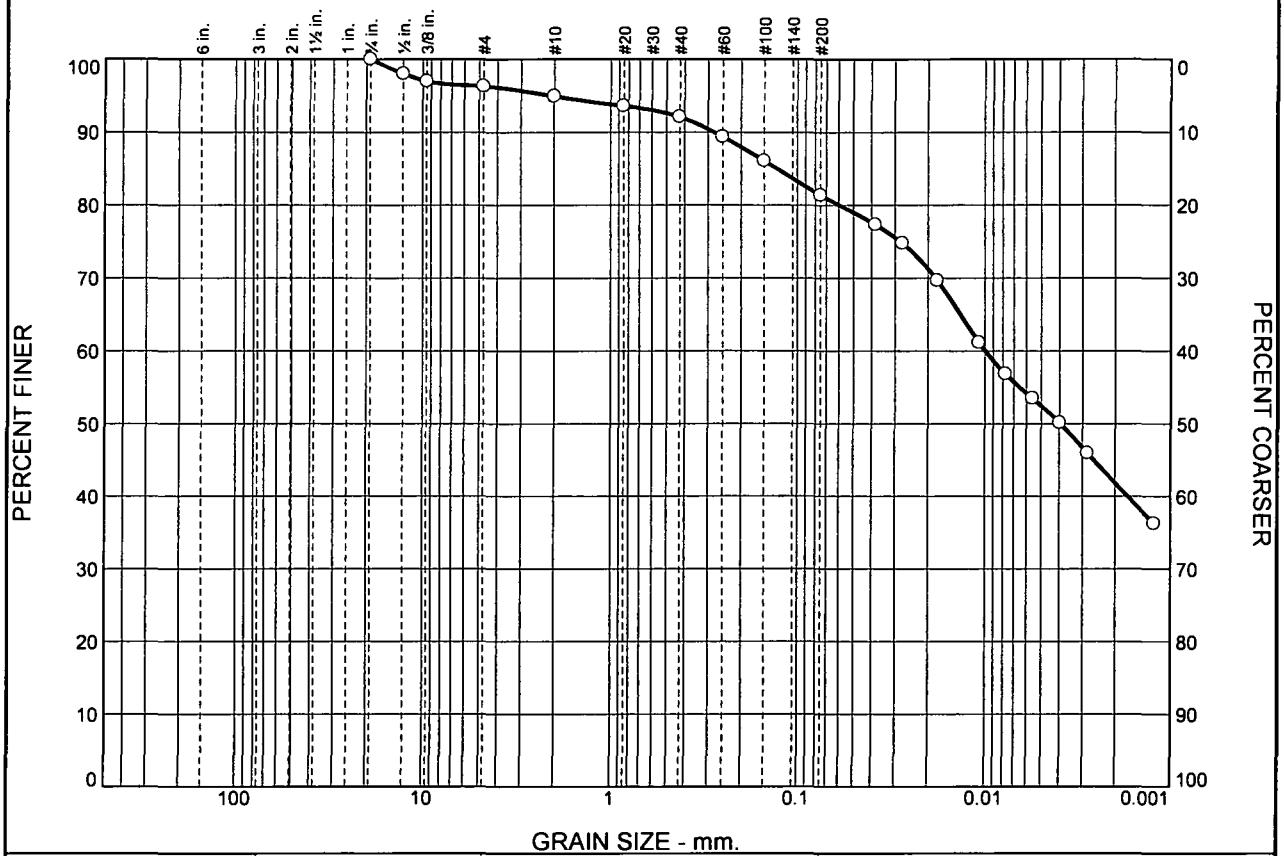
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.1	0.1	0.2	2.8	40.8	43.8	28.2	27.9	56.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0090	0.0601	0.0869	0.1796	0.2129	0.2596	0.3499

Fineness Modulus
0.35

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.7	1.4	2.8	10.7	29.0	52.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75	100.0		
0.5	98.0		
0.375	97.0		
#4	96.3		
#10	94.9		
#20	93.6		
#40	92.1		
#60	89.4		
#100	86.1		
#200	81.4		

* (no specification provided)

Material Description

red/brown lean CLAY with sand

Atterberg Limits

PL= 14 LL= 37 PI= 23

Coefficients

D_{90}= 0.2783 D_{85}= 0.1281 D_{60}= 0.0099
D_{50}= 0.0039 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(17)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034
Note: Sample is Undersized

Location: SA-11-10, SS-15
Sample Number: 1034 **Depth:** 35.0' - 36.5' **Date:** 11/16/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-10, SS-15
Depth: 35.0' - 36.5'
Sample Number: 1034
Material Description: red/brown lean CLAY with sand
Date: 11/16/11 **PL:** 14 **LL:** 37 **PI:** 23
USCS Classification: CL
AASHTO Classification: A-6(17)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034
Note: Sample is Undersized

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
356.78	14.47	0.00	0.75	0.00	100.0	0.0
			0.5	6.86	98.0	2.0
			0.375	10.34	97.0	3.0
			#4	12.64	96.3	3.7
			#10	17.36	94.9	5.1
56.48	0.00	0.00	#20	0.80	93.6	6.4
			#40	1.69	92.1	7.9
			#60	3.31	89.4	10.6
			#100	5.26	86.1	13.9
			#200	8.05	81.4	18.6

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 94.9
Weight of hydrometer sample =56.485
Hygroscopic moisture correction:
Moist weight and tare = 52.52
Dry weight and tare = 52.10
Tare weight = 27.43
Hygroscopic moisture = 1.7%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.4	50.0	45.3	0.0134	50.0	8.1	0.0382	77.4	22.6
2.00	21.4	48.5	43.8	0.0134	48.5	8.3	0.0274	74.8	25.2
5.00	21.4	45.5	40.8	0.0134	45.5	8.8	0.0178	69.7	30.3
15.00	21.4	40.5	35.8	0.0134	40.5	9.6	0.0108	61.2	38.8
30.00	21.4	38.0	33.3	0.0134	38.0	10.1	0.0078	56.9	43.1
60.00	21.5	36.0	31.3	0.0134	36.0	10.4	0.0056	53.5	46.5
120.00	21.7	34.0	29.3	0.0134	34.0	10.7	0.0040	50.1	49.9

Hydrometer Test Data (continued)

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
250.00	21.9	31.5	26.9	0.0133	31.5	11.1	0.0028	45.9	54.1
1440.00	21.2	26.0	21.2	0.0134	26.0	12.0	0.0012	36.3	63.7

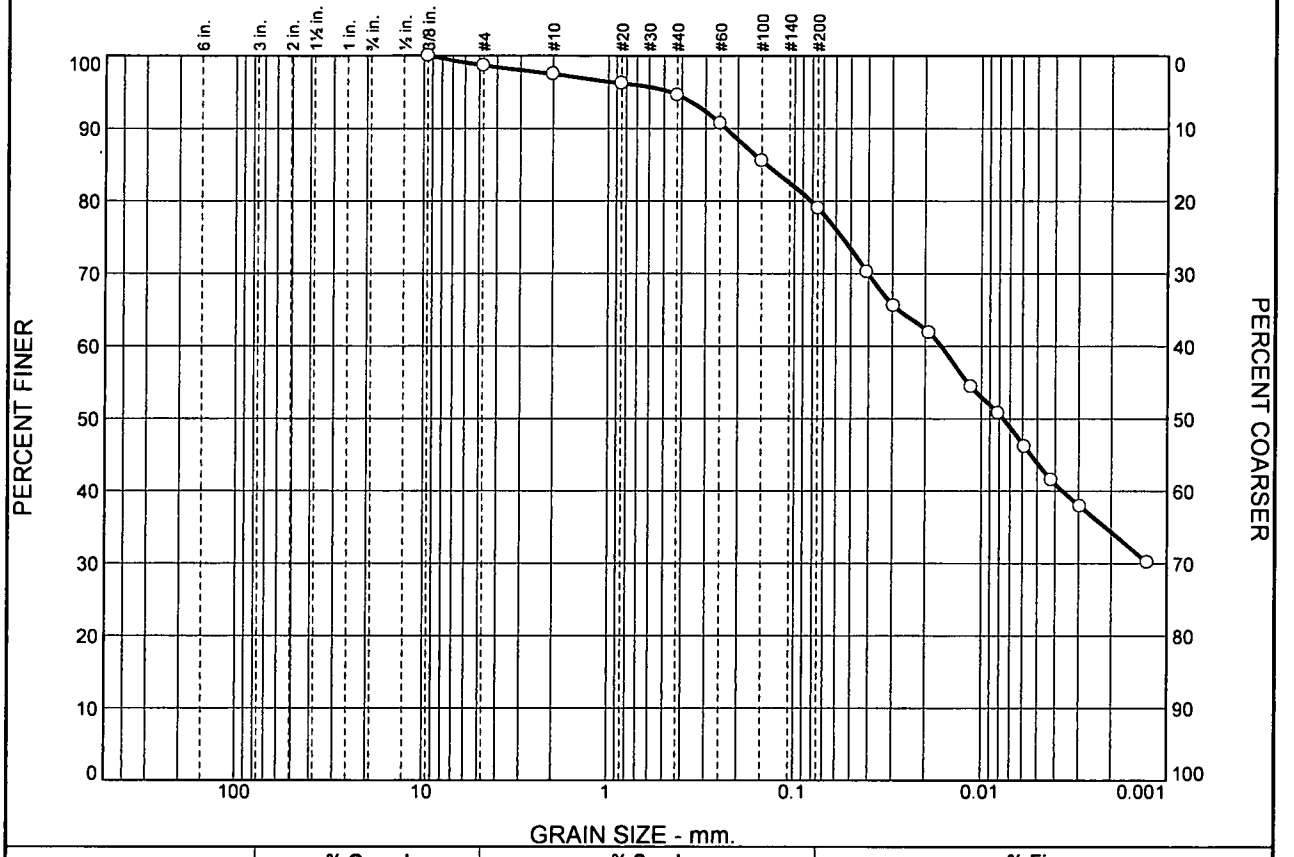
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	3.7	3.7	1.4	2.8	10.7	14.9	29.0	52.4	81.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0039	0.0099	0.0592	0.1281	0.2783	2.0788

Fineness Modulus
0.48

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.3	1.2	2.9	15.5	35.2	43.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375	100.0		
#4	98.7		
#10	97.5		
#20	96.2		
#40	94.6		
#60	90.7		
#100	85.5		
#200	79.1		

* (no specification provided)

Material Description

red/brown lean CLAY with sand

Atterberg Limits

PL= 12 LL= 31 PI= 19

Coefficients

D_{90}= 0.2328 D_{85}= 0.1414 D_{60}= 0.0164
D_{50}= 0.0076 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(13)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034

Location: SA-11-11, SS-6
Sample Number: 1034 **Depth:** 12.5' - 14.0' **Date:** 11/16/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-11, SS-6
Depth: 12.5' - 14.0'
Sample Number: 1034
Material Description: red/brown lean CLAY with sand
Date: 11/16/11
PL: 12
LL: 31
PI: 19
USCS Classification: CL
AASHTO Classification: A-6(13)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
370.80	14.21	0.00	0.375	0.00	100.0	0.0
			#4	4.78	98.7	1.3
			#10	8.96	97.5	2.5
53.14	0.00	0.00	#20	0.70	96.2	3.8
			#40	1.56	94.6	5.4
			#60	3.70	90.7	9.3
			#100	6.51	85.5	14.5
			#200	10.05	79.1	20.9

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 97.5
Weight of hydrometer sample =53.144
Hygroscopic moisture correction:
Moist weight and tare = 60.53
Dry weight and tare = 60.20
Tare weight = 35.95
Hygroscopic moisture = 1.4%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.4	42.5	37.8	0.0134	42.5	9.3	0.0410	70.2	29.8
2.00	21.4	40.0	35.3	0.0134	40.0	9.7	0.0296	65.6	34.4
5.00	21.4	38.0	33.3	0.0134	38.0	10.1	0.0190	61.9	38.1
15.00	21.4	34.0	29.3	0.0134	34.0	10.7	0.0113	54.4	45.6
30.00	21.5	32.0	27.3	0.0134	32.0	11.0	0.0081	50.8	49.2
60.00	21.6	29.5	24.8	0.0134	29.5	11.5	0.0058	46.2	53.8
120.00	21.7	27.0	22.3	0.0134	27.0	11.9	0.0042	41.5	58.5
250.00	21.9	25.0	20.4	0.0133	25.0	12.2	0.0029	37.9	62.1
1440.00	21.2	21.0	16.2	0.0134	21.0	12.9	0.0013	30.2	69.8

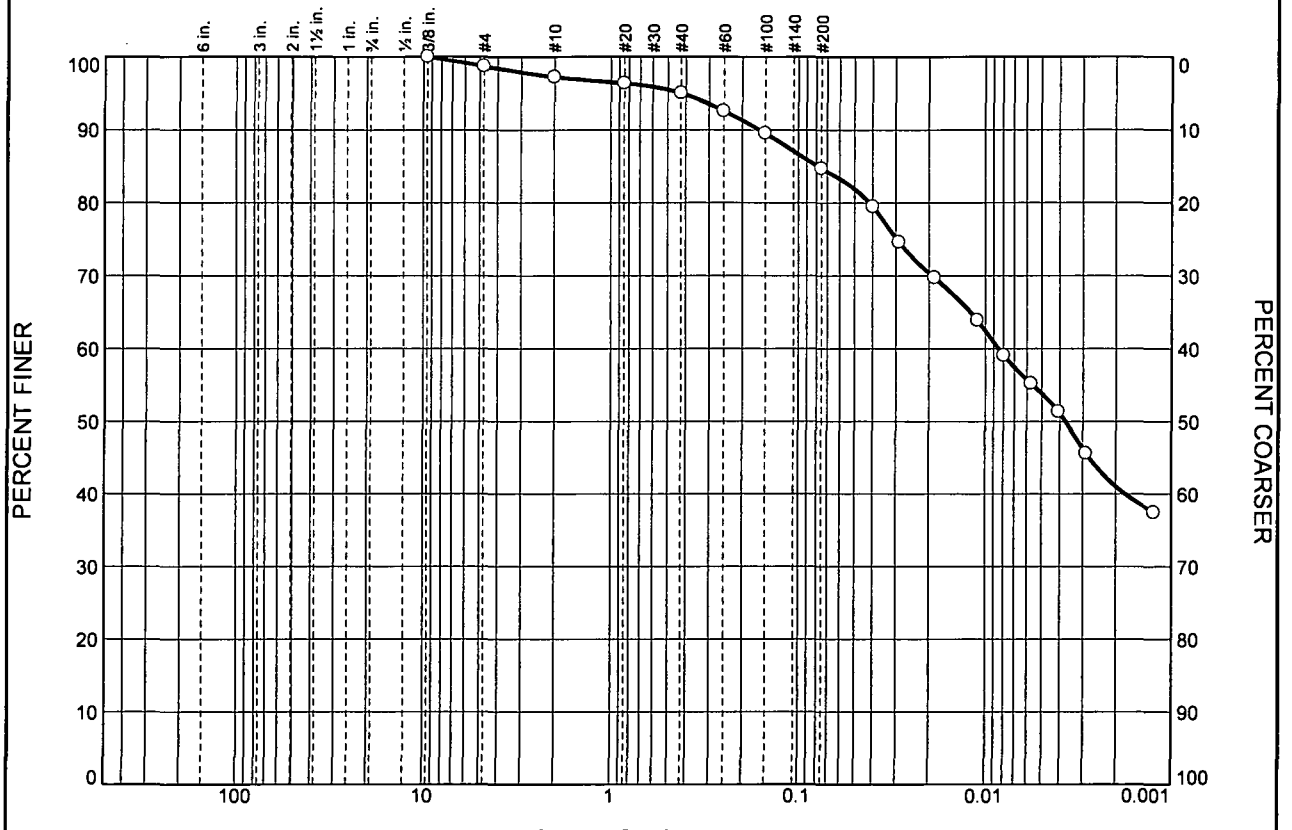
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	1.3	1.3	1.2	2.9	15.5	19.6	35.2	43.9	79.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0076	0.0164	0.0816	0.1414	0.2328	0.4636

Fineness Modulus
0.33

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.3	1.5	2.2	10.3	30.9	53.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375	100.0		
#4	98.7		
#10	97.2		
#20	96.4		
#40	95.0		
#60	92.6		
#100	89.5		
#200	84.7		

* (no specification provided)

Material Description

red/brown lean CLAY

Atterberg Limits

PL= 15 LL= 39 PI= 24

Coefficients

D_{90}= 0.1609 D_{85}= 0.0783 D_{60}= 0.0085
D_{50}= 0.0037 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(20)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034

Location: SA-11-11, SS-16
Sample Number: 1034 **Depth:** 37.5' - 39.0' **Date:** 11/13/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-11, SS-16
Depth: 37.5' - 39.0' **Sample Number:** 1034
Material Description: red/brown lean CLAY
Date: 11/13/11 **PL:** 15 **LL:** 39 **PI:** 24
USCS Classification: CL **AASHTO Classification:** A-6(20)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
322.61	14.30	0.00	0.375	0.00	100.0	0.0
			#4	3.88	98.7	1.3
			#10	8.49	97.2	2.8
50.76	0.00	0.00	#20	0.46	96.4	3.6
			#40	1.16	95.0	5.0
			#60	2.44	92.6	7.4
			#100	4.02	89.5	10.5
			#200	6.54	84.7	15.3

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 97.2
Weight of hydrometer sample =50.759
Hygroscopic moisture correction:
Moist weight and tare = 56.96
Dry weight and tare = 56.46
Tare weight = 28.18
Hygroscopic moisture = 1.8%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.4	45.5	40.8	0.0134	45.5	8.8	0.0399	79.5	20.5
2.00	21.4	43.0	38.3	0.0134	43.0	9.2	0.0288	74.6	25.4
5.00	21.4	40.5	35.8	0.0134	40.5	9.7	0.0186	69.7	30.3
15.00	21.4	37.5	32.8	0.0134	37.5	10.1	0.0110	63.9	36.1
30.00	21.5	35.0	30.3	0.0134	35.0	10.6	0.0079	59.1	40.9
60.00	21.6	33.0	28.3	0.0134	33.0	10.9	0.0057	55.2	44.8
120.00	21.7	31.0	26.3	0.0134	31.0	11.2	0.0041	51.4	48.6
250.00	21.9	28.0	23.4	0.0133	28.0	11.7	0.0029	45.6	54.4
1440.00	21.2	24.0	19.2	0.0134	24.0	12.4	0.0012	37.5	62.5

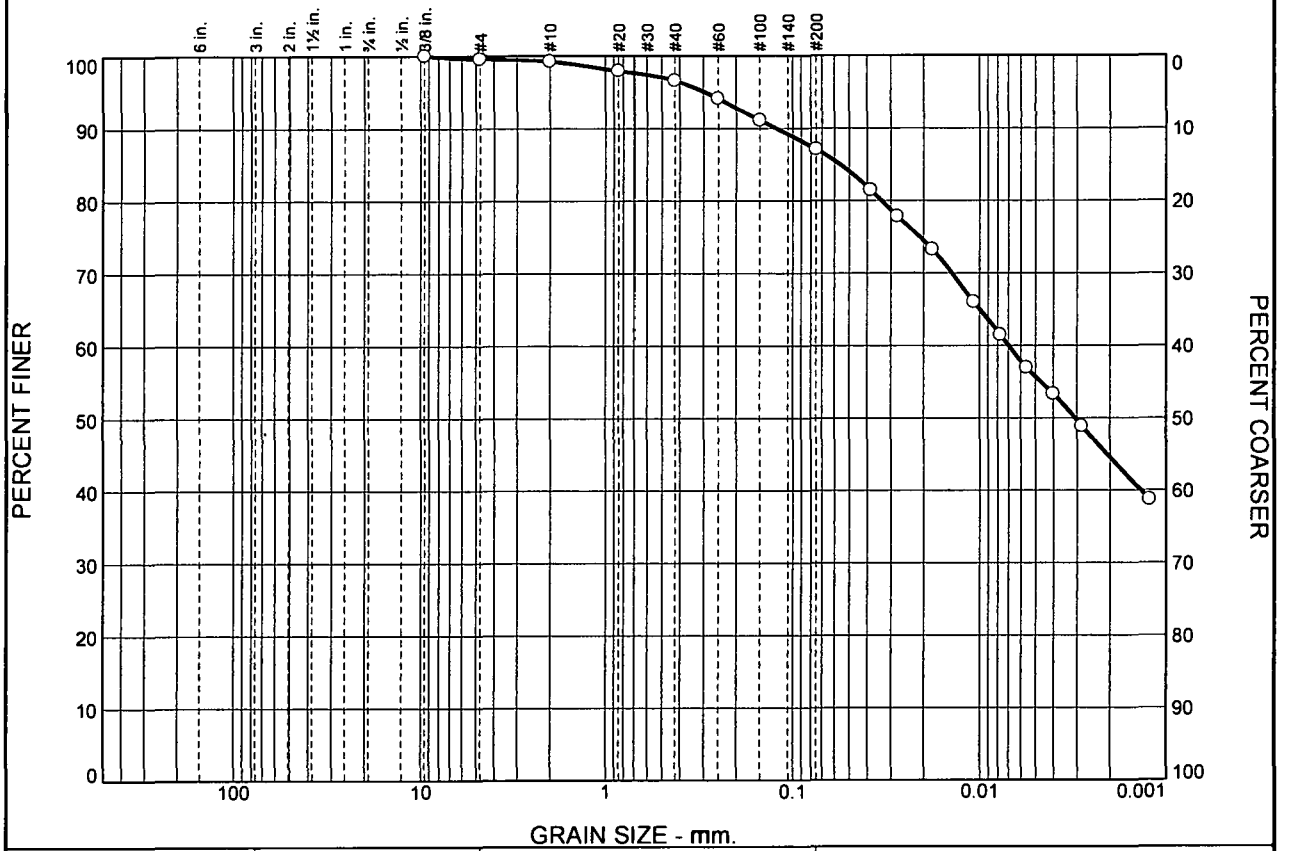
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	1.3	1.3	1.5	2.2	10.3	14.0	30.9	53.8	84.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0037	0.0085	0.0415	0.0783	0.1609	0.4221

Fineness Modulus
0.28

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.4	0.4	2.6	9.5	31.4	55.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375	100.0		
#4	99.6		
#10	99.2		
#20	97.9		
#40	96.6		
#60	94.1		
#100	91.1		
#200	87.1		

* (no specification provided)

Material Description

red/brown lean CLAY

Atterberg Limits

PL= 15 LL= 41 PI= 26

Coefficients

D_{90}= 0.1224 D_{85}= 0.0560 D_{60}= 0.0070
D_{50}= 0.0031 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(22)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034

Location: SA-11-12, SS-20
Sample Number: 1034 **Depth:** 47.5' - 49.0' **Date:** 11/14/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: M1051G
Location: SA-11-12, SS-20
Depth: 47.5' - 49.0'
Sample Number: 1034
Material Description: red/brown lean CLAY
Date: 11/14/11
PL: 15
LL: 41
PI: 26
USCS Classification: CL
AASHTO Classification: A-7-6(22)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
327.66	14.38	0.00	0.375	0.00	100.0	0.0
			#4	1.27	99.6	0.4
			#10	2.36	99.2	0.8
55.33	0.00	0.00	#20	0.73	97.9	2.1
			#40	1.48	96.6	3.4
			#60	2.85	94.1	5.9
			#100	4.52	91.1	8.9
			#200	6.76	87.1	12.9

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 99.2
Weight of hydrometer sample =55.333
Hygroscopic moisture correction:
Moist weight and tare = 54.97
Dry weight and tare = 54.69
Tare weight = 35.96
Hygroscopic moisture = 1.5%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.3	49.5	44.7	0.0134	49.5	8.2	0.0384	81.5	18.5
2.00	21.3	47.5	42.7	0.0134	47.5	8.5	0.0277	77.8	22.2
5.00	21.3	45.0	40.2	0.0134	45.0	8.9	0.0179	73.3	26.7
15.00	21.3	41.0	36.2	0.0134	41.0	9.6	0.0107	66.0	34.0
30.00	21.4	38.5	33.8	0.0134	38.5	10.0	0.0077	61.5	38.5
60.00	21.4	36.0	31.3	0.0134	36.0	10.4	0.0056	56.9	43.1
120.00	21.5	34.0	29.3	0.0134	34.0	10.7	0.0040	53.3	46.7
250.00	21.7	31.5	26.8	0.0134	31.5	11.1	0.0028	48.9	51.1
1440.00	21.5	26.0	21.3	0.0134	26.0	12.0	0.0012	38.8	61.2

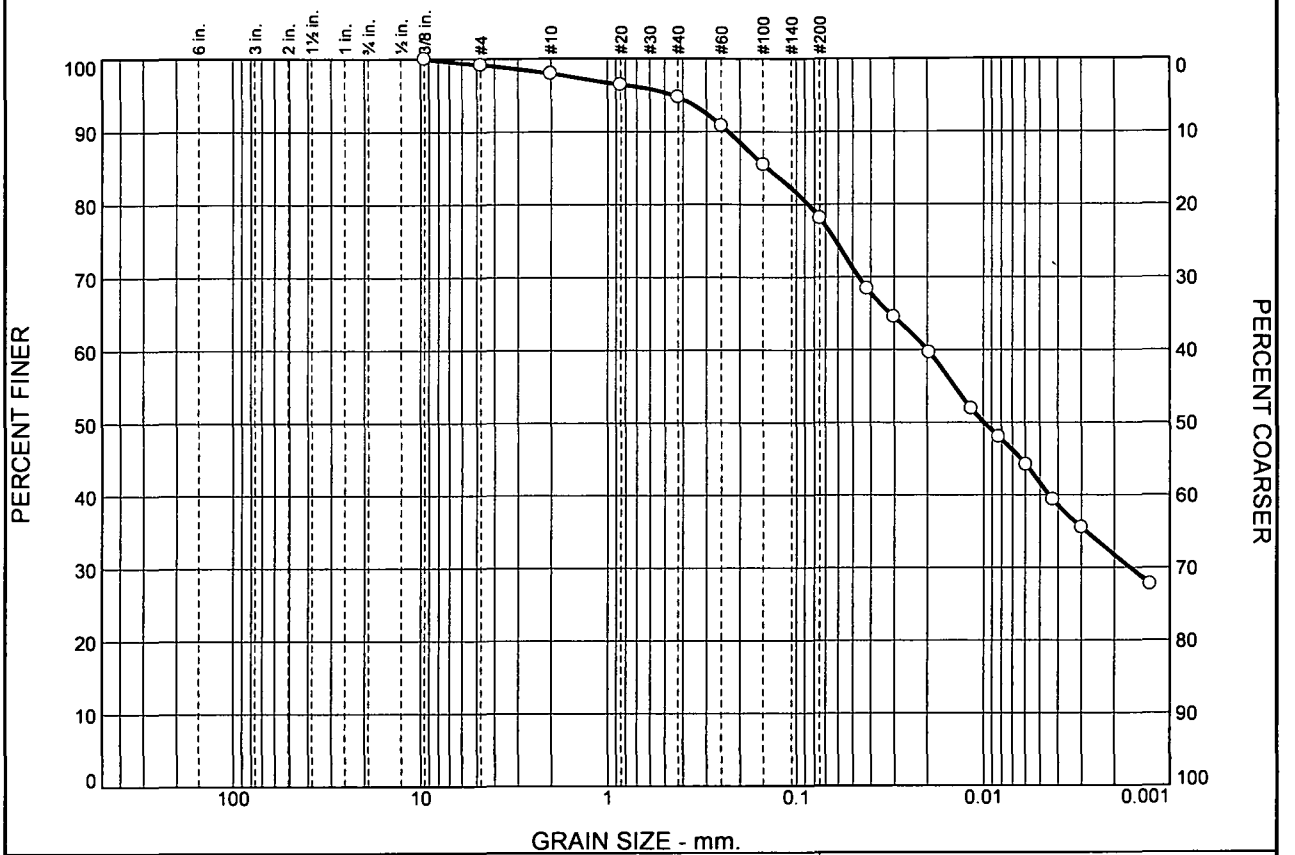
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.4	0.4	0.4	2.6	9.5	12.5	31.4	55.7	87.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0031	0.0070	0.0336	0.0560	0.1224	0.2934

Fineness Modulus
0.19

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.8	1.2	3.3	16.6	36.4	41.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375	100.0		
#4	99.2		
#10	98.0		
#20	96.4		
#40	94.7		
#60	90.8		
#100	85.5		
#200	78.1		

* (no specification provided)

Material Description

red/brown lean CLAY with sand

Atterberg Limits

PL= 14 LL= 32 PI= 18

Coefficients

D_{90}= 0.2304 D_{85}= 0.1427 D_{60}= 0.0199
D_{50}= 0.0099 D_{30}= 0.0016 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(12)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034

Location: SA-11-13, SS-2
Sample Number: 1034 **Depth:** 2.5' - 4.0' **Date:** 11/14/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-13, SS-2
Depth: 2.5' - 4.0'
Sample Number: 1034
Material Description: red/brown lean CLAY with sand
Date: 11/14/11 **PL:** 14 **LL:** 32 **PI:** 18
USCS Classification: CL **AASHTO Classification:** A-6(12)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
336.33	14.46	0.00	0.375	0.00	100.0	0.0
			#4	2.68	99.2	0.8
			#10	6.52	98.0	2.0
51.21	0.00	0.00	#20	0.81	96.4	3.6
			#40	1.70	94.7	5.3
			#60	3.74	90.8	9.2
			#100	6.53	85.5	14.5
			#200	10.37	78.1	21.9

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 98.0
Weight of hydrometer sample =51.212
Hygroscopic moisture correction:
Moist weight and tare = 76.03
Dry weight and tare = 75.72
Tare weight = 53.52
Hygroscopic moisture = 1.4%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.3	40.0	35.2	0.0134	40.0	9.7	0.0419	68.4	31.6
2.00	21.3	38.0	33.2	0.0134	38.0	10.1	0.0301	64.5	35.5
5.00	21.3	35.5	30.7	0.0134	35.5	10.5	0.0194	59.7	40.3
15.00	21.3	31.5	26.7	0.0134	31.5	11.1	0.0116	51.9	48.1
30.00	21.3	29.5	24.7	0.0134	29.5	11.5	0.0083	48.0	52.0
60.00	21.4	27.5	22.8	0.0134	27.5	11.8	0.0059	44.2	55.8
120.00	21.5	25.0	20.3	0.0134	25.0	12.2	0.0043	39.4	60.6
250.00	21.6	23.0	18.3	0.0134	23.0	12.5	0.0030	35.5	64.5
1440.00	21.5	19.0	14.3	0.0134	19.0	13.2	0.0013	27.7	72.3

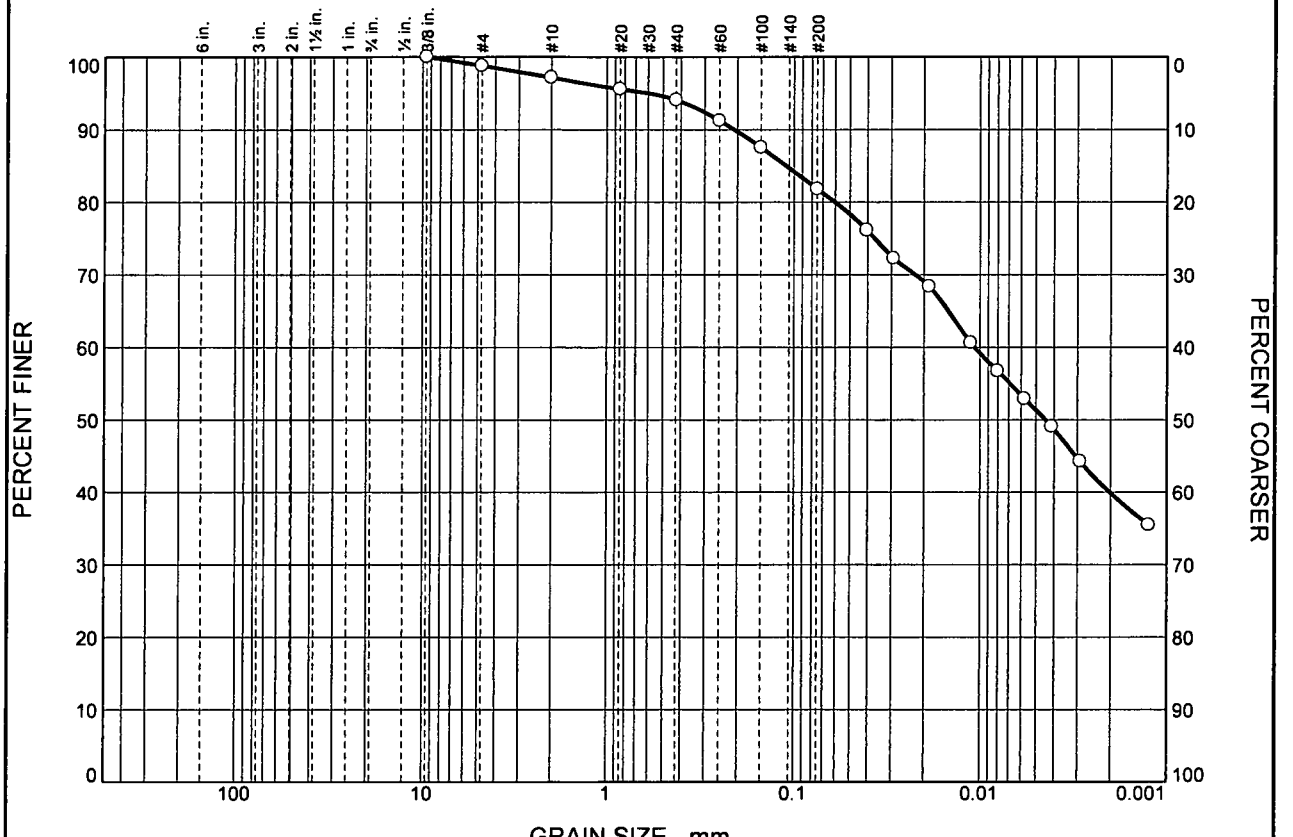
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.8	0.8	1.2	3.3	16.6	21.1	36.4	41.7	78.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
			0.0016	0.0099	0.0199	0.0862	0.1427	0.2304	0.4525

Fineness Modulus
0.32

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.2	1.6	3.1	12.3	30.5	51.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375	100.0		
#4	98.8		
#10	97.2		
#20	95.6		
#40	94.1		
#60	91.3		
#100	87.6		
#200	81.8		

* (no specification provided)

Material Description

red/brown lean CLAY with sand

Atterberg Limits

PL= 13 LL= 38 PI= 25

Coefficients

D_{90}= 0.2079 D_{85}= 0.1097 D_{60}= 0.0107
D_{50}= 0.0044 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(19)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034

Location: SA-11-13, SS-17
Sample Number: 1034 **Depth:** 40.0' - 41.5' **Date:** 11/14/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-13, SS-17
Depth: 40.0' - 41.5'
Sample Number: 1034
Material Description: red/brown lean CLAY with sand
Date: 11/14/11
PL: 13
LL: 38
PI: 25
USCS Classification: CL
AASHTO Classification: A-6(19)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
324.18	14.33	0.00	0.375	0.00	100.0	0.0
			#4	3.74	98.8	1.2
			#10	8.78	97.2	2.8
50.77	0.00	0.00	#20	0.83	95.6	4.4
			#40	1.60	94.1	5.9
			#60	3.09	91.3	8.7
			#100	5.02	87.6	12.4
			#200	8.02	81.8	18.2

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 97.2
Weight of hydrometer sample =50.771
Hygroscopic moisture correction:
Moist weight and tare = 52.89
Dry weight and tare = 52.55
Tare weight = 28.18
Hygroscopic moisture = 1.4%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.3	44.0	39.2	0.0134	44.0	9.1	0.0405	76.2	23.8
2.00	21.3	42.0	37.2	0.0134	42.0	9.4	0.0291	72.3	27.7
5.00	21.3	40.0	35.2	0.0134	40.0	9.7	0.0187	68.4	31.6
15.00	21.3	36.0	31.2	0.0134	36.0	10.4	0.0112	60.6	39.4
30.00	21.3	34.0	29.2	0.0134	34.0	10.7	0.0080	56.8	43.2
60.00	21.4	32.0	27.3	0.0134	32.0	11.0	0.0058	52.9	47.1
120.00	21.5	30.0	25.3	0.0134	30.0	11.4	0.0041	49.1	50.9
250.00	21.6	27.5	22.8	0.0134	27.5	11.8	0.0029	44.3	55.7
1440.00	21.5	23.0	18.3	0.0134	23.0	12.5	0.0012	35.5	64.5

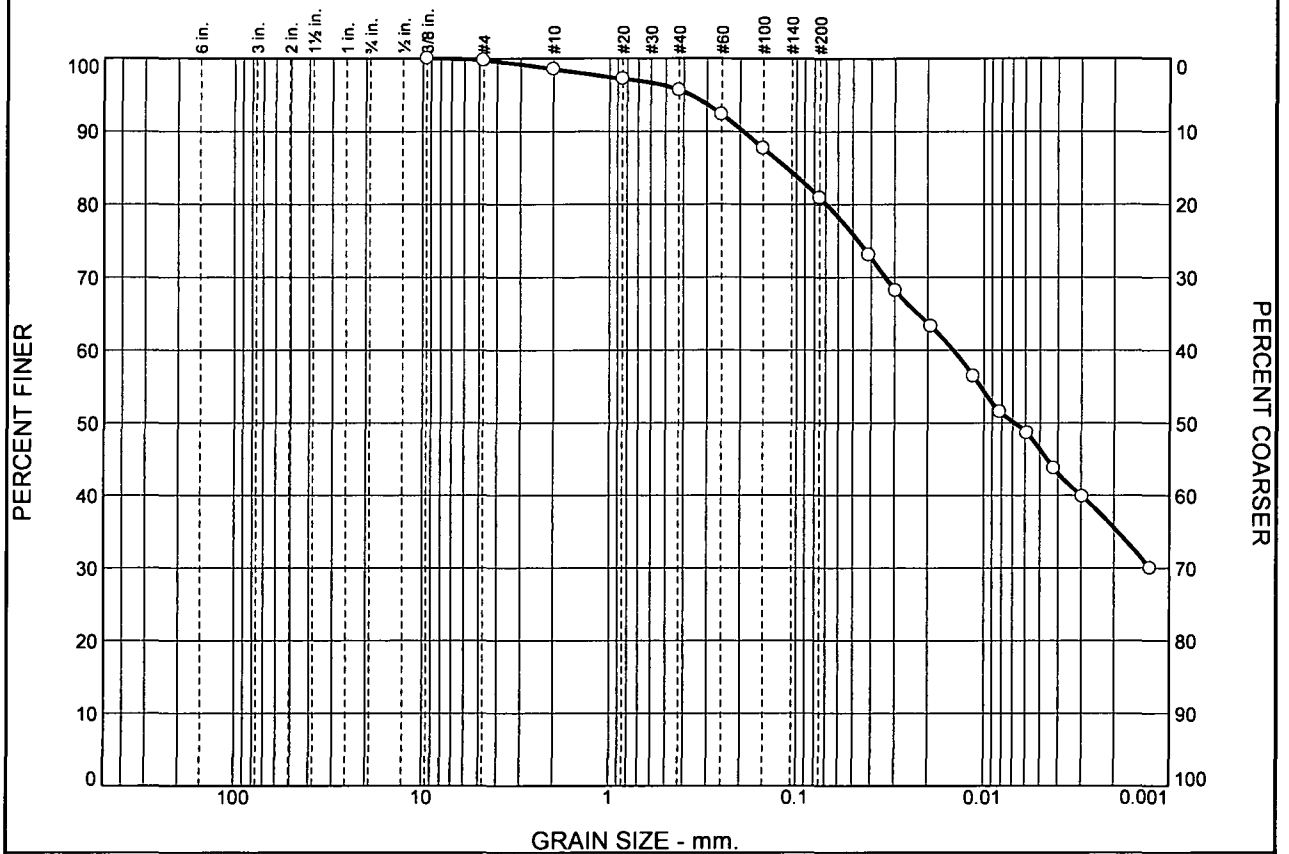
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	1.2	1.2	1.6	3.1	12.3	17.0	30.5	51.3	81.8

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0044	0.0107	0.0601	0.1097	0.2079	0.5901

Fineness Modulus
0.33

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	1.2	2.8	14.8	34.5	46.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375	100.0		
#4	99.7		
#10	98.5		
#20	97.2		
#40	95.7		
#60	92.3		
#100	87.7		
#200	80.9		

* (no specification provided)

Material Description

red/brown lean CLAY with sand

Atterberg Limits

PL= 14 LL= 34 PI= 20

Coefficients

D_{90}= 0.1916 D_{85}= 0.1123 D_{60}= 0.0146
D_{50}= 0.0069 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(14)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034

Location: SA-11-14, SS-3
Sample Number: 1034 **Depth:** 5.0' - 6.5' **Date:** 11/14/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-14, SS-3
Depth: 5.0' - 6.5'
Sample Number: 1034
Material Description: red/brown lean CLAY with sand
Date: 11/14/11 **PL:** 14 **LL:** 34 **PI:** 20
USCS Classification: CL
AASHTO Classification: A-6(14)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
381.10	14.49	0.00	0.375	0.00	100.0	0.0
			#4	0.93	99.7	0.3
			#10	5.40	98.5	1.5
51.00	0.00	0.00	#20	0.68	97.2	2.8
			#40	1.48	95.7	4.3
			#60	3.21	92.3	7.7
			#100	5.60	87.7	12.3
			#200	9.12	80.9	19.1

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 98.5
Weight of hydrometer sample =51.004
Hygroscopic moisture correction:
Moist weight and tare = 60.47
Dry weight and tare = 60.09
Tare weight = 36.95
Hygroscopic moisture = 1.6%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.3	42.0	37.2	0.0134	42.0	9.4	0.0412	73.1	26.9
2.00	21.3	39.5	34.7	0.0134	39.5	9.8	0.0297	68.2	31.8
5.00	21.3	37.0	32.2	0.0134	37.0	10.2	0.0192	63.3	36.7
15.00	21.3	33.5	28.7	0.0134	33.5	10.8	0.0114	56.4	43.6
30.00	21.3	31.0	26.2	0.0134	31.0	11.2	0.0082	51.5	48.5
60.00	21.4	29.5	24.8	0.0134	29.5	11.5	0.0059	48.6	51.4
120.00	21.5	27.0	22.3	0.0134	27.0	11.9	0.0042	43.8	56.2
250.00	21.6	25.0	20.3	0.0134	25.0	12.2	0.0030	39.9	60.1
1440.00	21.5	20.0	15.3	0.0134	20.0	13.0	0.0013	30.0	70.0

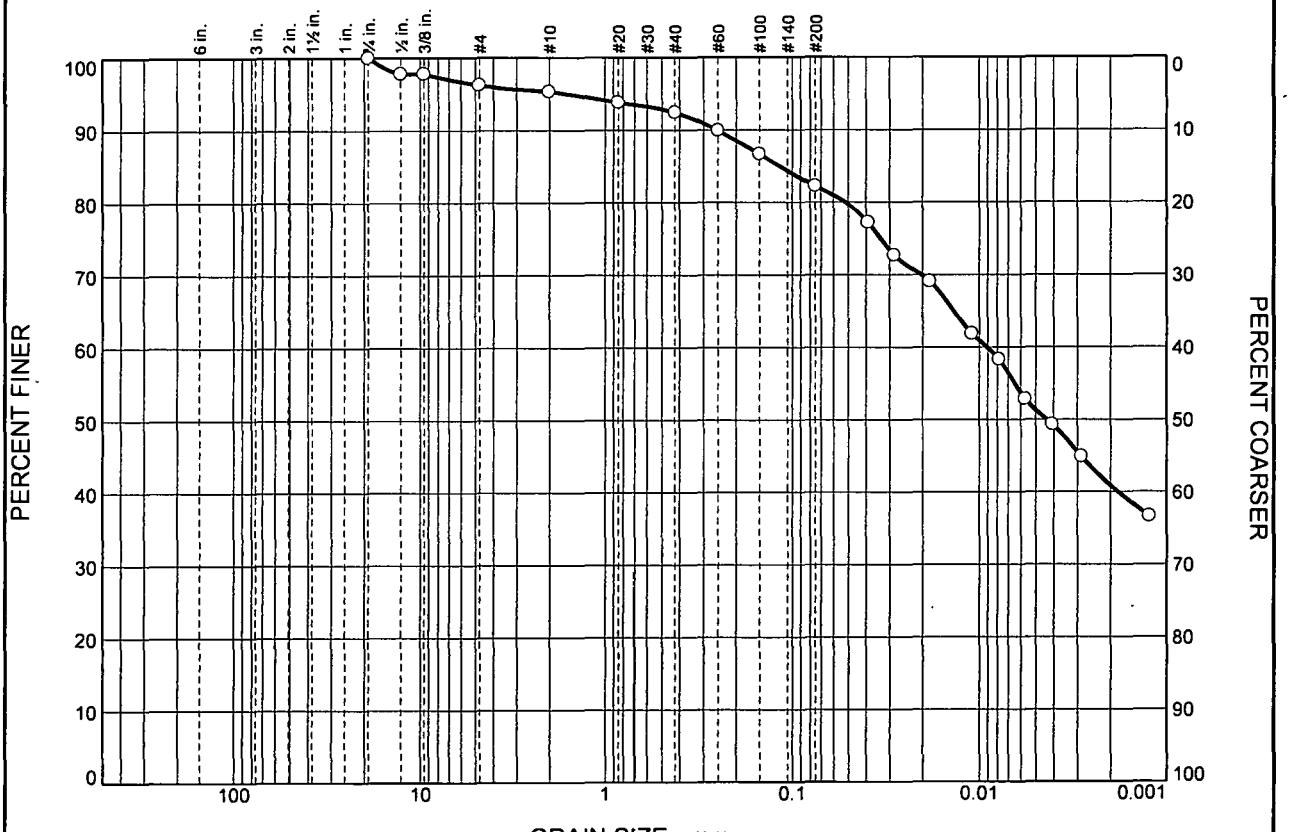
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.3	0.3	1.2	2.8	14.8	18.8	34.5	46.4	80.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0069	0.0146	0.0692	0.1123	0.1916	0.3699

Fineness Modulus
0.26

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.7	1.0	2.9	10.1	31.0	51.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75	100.0		
0.5	97.8		
0.375	97.8		
#4	96.3		
#10	95.3		
#20	93.8		
#40	92.4		
#60	89.9		
#100	86.7		
#200	82.3		

* (no specification provided)

Material Description

dark red/brown lean CLAY with sand

Atterberg Limits

PL= 14 LL= 40 PI= 26

Coefficients

D_{90}= 0.2543 D_{85}= 0.1166 D_{60}= 0.0091
D_{50}= 0.0044 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(20)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034
Note: Sample is Undersized

Location: SA-11-14, SS-18
Sample Number: 1034 **Depth:** 42.5' - 44.0' **Date:** 11/14/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-14, SS-18
Depth: 42.5' - 44.0' **Sample Number:** 1034
Material Description: dark red/brown lean CLAY with sand
Date: 11/14/11 **PL:** 14 **LL:** 40 **PI:** 26
USCS Classification: CL **AASHTO Classification:** A-6(20)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034
Note: Sample is Undersized

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
341.00	14.45	0.00	0.75	0.00	100.0	0.0
			0.5	7.24	97.8	2.2
			0.375	7.24	97.8	2.2
			#4	12.13	96.3	3.7
			#10	15.29	95.3	4.7
53.50	0.00	0.00	#20	0.85	93.8	6.2
			#40	1.62	92.4	7.6
			#60	3.04	89.9	10.1
			#100	4.85	86.7	13.3
			#200	7.33	82.3	17.7

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 95.3
Weight of hydrometer sample =53.501
Hygroscopic moisture correction:
Moist weight and tare = 50.63
Dry weight and tare = 50.31
Tare weight = 27.41
Hygroscopic moisture = 1.4%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.3	47.5	42.7	0.0134	47.5	8.5	0.0392	77.2	22.8
2.00	21.3	45.0	40.2	0.0134	45.0	8.9	0.0283	72.7	27.3
5.00	21.3	43.0	38.2	0.0134	43.0	9.2	0.0183	69.1	30.9
15.00	21.3	39.0	34.2	0.0134	39.0	9.9	0.0109	61.9	38.1
30.00	21.4	37.0	32.3	0.0134	37.0	10.2	0.0078	58.3	41.7
60.00	21.3	34.0	29.3	0.0134	34.0	10.7	0.0057	52.8	47.2
120.00	21.5	32.0	27.3	0.0134	32.0	11.0	0.0041	49.3	50.7

Hydrometer Test Data (continued)

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
250.00	21.7	29.5	24.8	0.0134	29.5	11.5	0.0029	44.9	55.1
1440.00	21.5	25.0	20.3	0.0134	25.0	12.2	0.0012	36.7	63.3

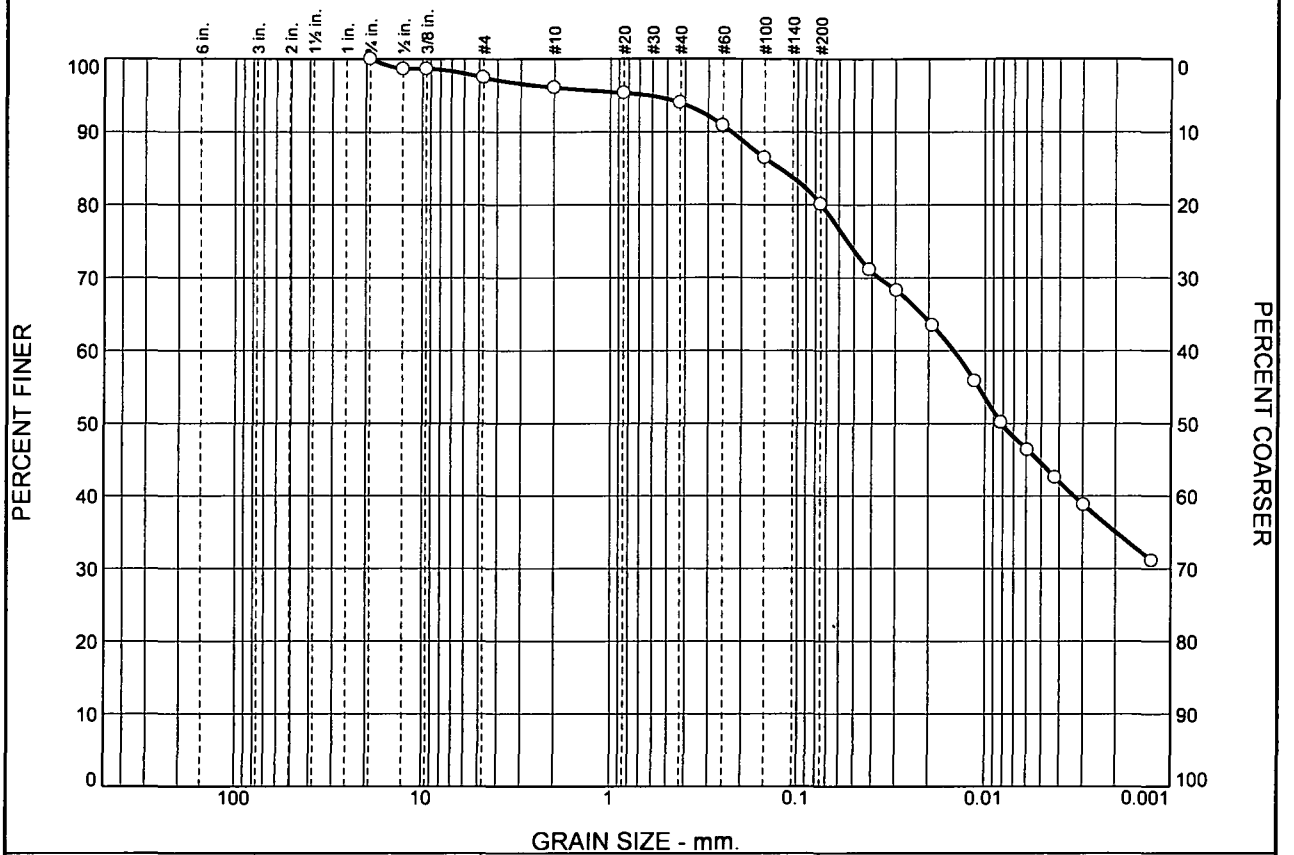
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	3.7	3.7	1.0	2.9	10.1	14.0	31.0	51.3	82.3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0044	0.0091	0.0517	0.1166	0.2543	1.6108

Fineness Modulus
0.45

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.5	1.4	2.1	13.9	35.6	44.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75	100.0		
0.5	98.6		
0.375	98.6		
#4	97.5		
#10	96.1		
#20	95.3		
#40	94.0		
#60	90.9		
#100	86.5		
#200	80.1		

* (no specification provided)

Material Description

dark red/brown lean CLAY with sand

Atterberg Limits

PL= 11 LL= 32 PI= 21

Coefficients

D_{90}= 0.2252 D_{85}= 0.1241 D_{60}= 0.0147
D_{50}= 0.0081 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(14)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034

Location: SA-11-15, SS-9
Sample Number: 1034 **Depth:** 20.0' - 21.5' **Date:** 11/14/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-15, SS-9
Depth: 20.0' - 21.5' **Sample Number:** 1034
Material Description: dark red/brown lean CLAY with sand
Date: 11/14/11 **PL:** 11 **LL:** 32 **PI:** 21
USCS Classification: CL **AASHTO Classification:** A-6(14)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
345.57	14.60	0.00	0.75	0.00	100.0	0.0
			0.5	4.49	98.6	1.4
			0.375	4.49	98.6	1.4
			#4	8.38	97.5	2.5
			#10	12.99	96.1	3.9
50.85	0.00	0.00	#20	0.40	95.3	4.7
			#40	1.11	94.0	6.0
			#60	2.76	90.9	9.1
			#100	5.09	86.5	13.5
			#200	8.44	80.1	19.9

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 96.1
Weight of hydrometer sample =50.852
Hygroscopic moisture correction:
Moist weight and tare = 57.09
Dry weight and tare = 56.85
Tare weight = 34.58
Hygroscopic moisture = 1.1%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.3	42.0	37.2	0.0134	42.0	9.4	0.0412	71.1	28.9
2.00	21.3	40.5	35.7	0.0134	40.5	9.7	0.0295	68.3	31.7
5.00	21.3	38.0	33.2	0.0134	38.0	10.1	0.0190	63.5	36.5
15.00	21.3	34.0	29.2	0.0134	34.0	10.7	0.0114	55.9	44.1
30.00	21.3	31.0	26.2	0.0134	31.0	11.2	0.0082	50.1	49.9
60.00	21.4	29.0	24.3	0.0134	29.0	11.5	0.0059	46.3	53.7
120.00	21.5	27.0	22.3	0.0134	27.0	11.9	0.0042	42.6	57.4
250.00	21.6	25.0	20.3	0.0134	25.0	12.2	0.0030	38.8	61.2

Hydrometer Test Data (continued)

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1440.00	21.5	21.0	16.3	0.0134	21.0	12.9	0.0013	31.1	68.9

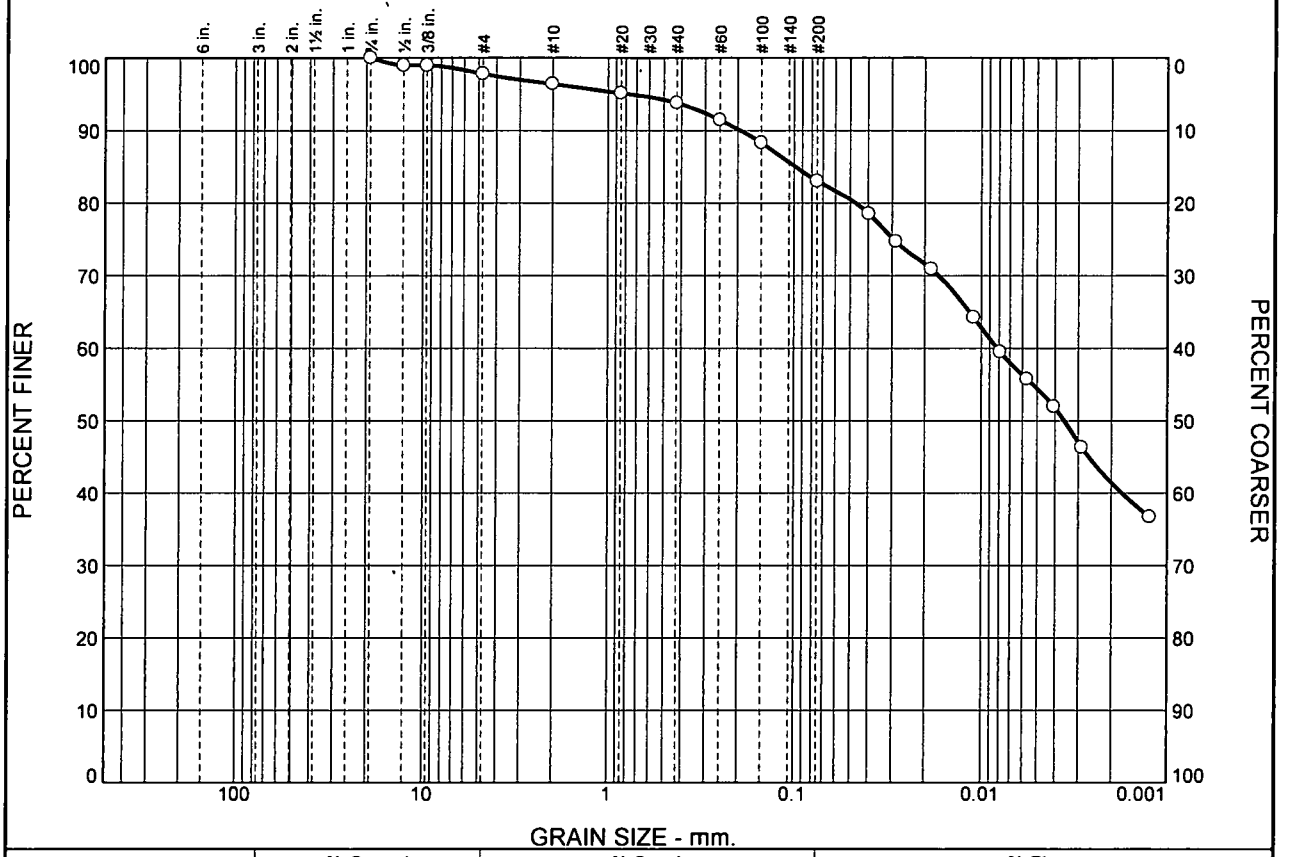
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.5	2.5	1.4	2.1	13.9	17.4	35.6	44.5	80.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0081	0.0147	0.0743	0.1241	0.2252	0.6393

Fineness Modulus
0.38

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.2	1.4	2.6	10.8	28.6	54.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75	100.0		
0.5	99.0		
0.375	99.0		
#4	97.8		
#10	96.4		
#20	95.1		
#40	93.8		
#60	91.5		
#100	88.3		
#200	83.0		

* (no specification provided)

Material Description

dark red/brown lean CLAY with sand

Atterberg Limits

PL= 14 LL= 40 PI= 26

Coefficients

D_{90}= 0.1934 D_{85}= 0.0981 D_{60}= 0.0082
D_{50}= 0.0036 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(20)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034

Location: SA-11-15, SS-19
Sample Number: 1034 **Depth:** 45.0' - 46.5' **Date:** 11/15/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-15, SS-19
Depth: 45.0' - 46.5' **Sample Number:** 1034
Material Description: dark red/brown lean CLAY with sand
Date: 11/15/11 **PL:** 14 **LL:** 40 **PI:** 26
USCS Classification: CL **AASHTO Classification:** A-6(20)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
313.50	14.42	0.00	0.75	0.00	100.0	0.0
			0.5	3.13	99.0	1.0
			0.375	3.13	99.0	1.0
			#4	6.59	97.8	2.2
			#10	10.73	96.4	3.6
51.35	0.00	0.00	#20	0.68	95.1	4.9
			#40	1.39	93.8	6.2
			#60	2.64	91.5	8.5
			#100	4.31	88.3	11.7
			#200	7.12	83.0	17.0

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 96.4
Weight of hydrometer sample =51.346
Hygroscopic moisture correction:
Moist weight and tare = 58.36
Dry weight and tare = 58.03
Tare weight = 34.76
Hygroscopic moisture = 1.4%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.3	46.0	41.2	0.0134	46.0	8.8	0.0397	78.5	21.5
2.00	21.3	44.0	39.2	0.0134	44.0	9.1	0.0286	74.7	25.3
5.00	21.3	42.0	37.2	0.0134	42.0	9.4	0.0184	70.9	29.1
15.00	21.3	38.5	33.7	0.0134	38.5	10.0	0.0110	64.3	35.7
30.00	21.3	36.0	31.2	0.0134	36.0	10.4	0.0079	59.5	40.5
60.00	21.4	34.0	29.3	0.0134	34.0	10.7	0.0057	55.7	44.3
120.00	21.5	32.0	27.3	0.0134	32.0	11.0	0.0041	52.0	48.0
250.00	21.7	29.0	24.3	0.0134	29.0	11.5	0.0029	46.3	53.7

Hydrometer Test Data (continued)

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1440.00	21.5	24.0	19.3	0.0134	24.0	12.4	0.0012	36.7	63.3

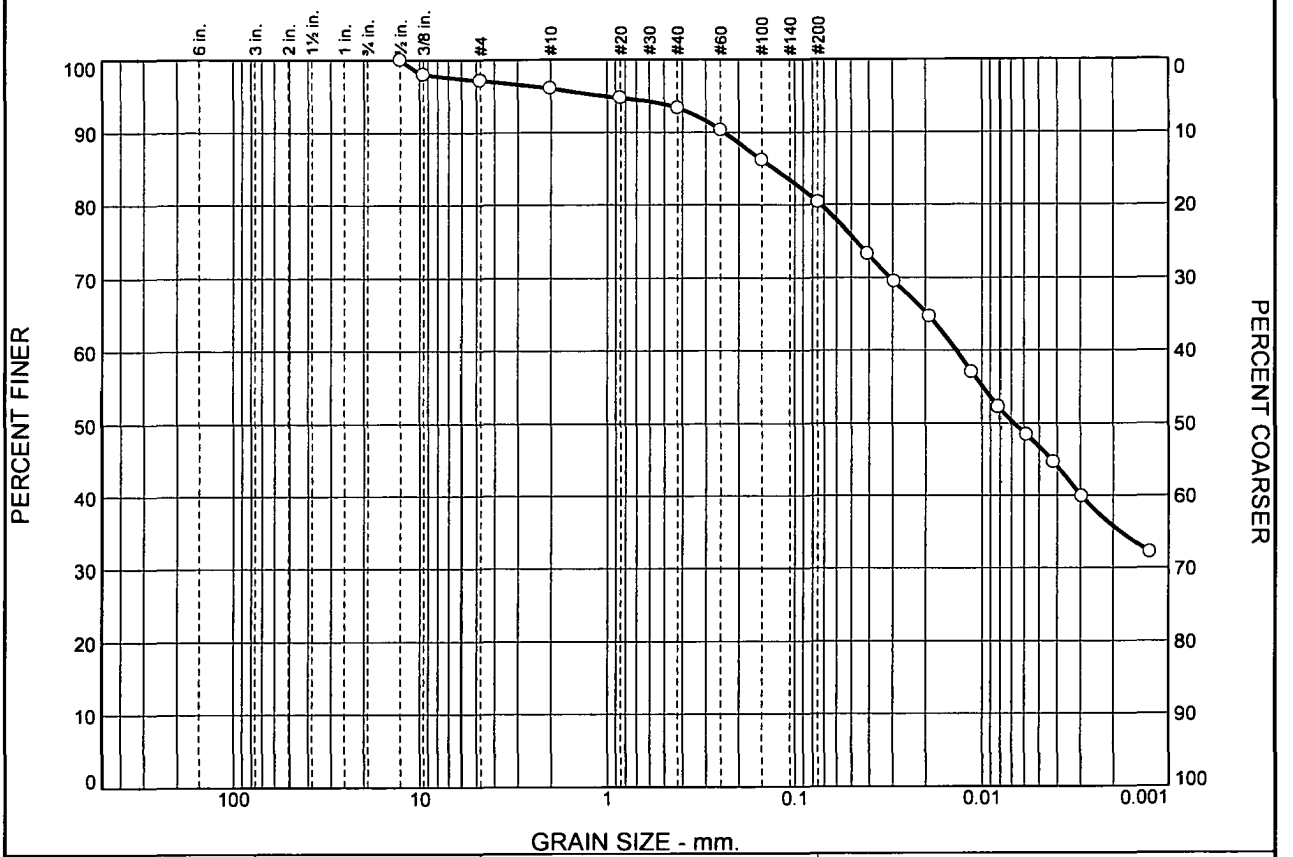
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.2	2.2	1.4	2.6	10.8	14.8	28.6	54.4	83.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0036	0.0082	0.0467	0.0981	0.1934	0.7701

Fineness Modulus
0.36

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.9	1.0	2.8	12.9	33.7	46.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.5	100.0		
0.375	98.0		
#4	97.1		
#10	96.1		
#20	94.7		
#40	93.3		
#60	90.3		
#100	86.2		
#200	80.4		

* (no specification provided)

Material Description

dark red/brown lean CLAY with sand

Atterberg Limits

PL= 13 LL= 34 PI= 21

Coefficients

D_{90}= 0.2404 D_{85}= 0.1292 D_{60}= 0.0137
D_{50}= 0.0068 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(15)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034
Note: Sample is Undersized

Location: SA-11-16, SS-4
Sample Number: 1034 **Depth:** 7.5' - 9.0' **Date:** 11/14/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-16, SS-4
Depth: 7.5' - 9.0' **Sample Number:** 1034
Material Description: dark red/brown lean CLAY with sand
Date: 11/14/11 **PL:** 13 **LL:** 34 **PI:** 21
USCS Classification: CL **AASHTO Classification:** A-6(15)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034
Note: Sample is Undersized

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
371.82	14.42	0.00	0.5	0.00	100.0	0.0
			0.375	7.27	98.0	2.0
			#4	10.24	97.1	2.9
			#10	14.10	96.1	3.9
50.68	0.00	0.00	#20	0.71	94.7	5.3
			#40	1.44	93.3	6.7
			#60	3.04	90.3	9.7
			#100	5.21	86.2	13.8
			#200	8.28	80.4	19.6

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 96.1
Weight of hydrometer sample =50.680
Hygroscopic moisture correction:
Moist weight and tare = 52.36
Dry weight and tare = 52.09
Tare weight = 27.43
Hygroscopic moisture = 1.1%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 **x Rm**

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.3	43.0	38.2	0.0134	43.0	9.2	0.0408	73.3	26.7
2.00	21.3	41.0	36.2	0.0134	41.0	9.6	0.0294	69.5	30.5
5.00	21.3	38.5	33.7	0.0134	38.5	10.0	0.0190	64.7	35.3
15.00	21.3	34.5	29.7	0.0134	34.5	10.6	0.0113	57.0	43.0
30.00	21.3	32.0	27.2	0.0134	32.0	11.0	0.0081	52.2	47.8
60.00	21.4	30.0	25.3	0.0134	30.0	11.4	0.0058	48.4	51.6
120.00	21.5	28.0	23.3	0.0134	28.0	11.7	0.0042	44.6	55.4
250.00	21.6	25.5	20.8	0.0134	25.5	12.1	0.0029	39.9	60.1

Hydrometer Test Data (continued)

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1440.00	21.5	21.5	16.8	0.0134	21.5	12.8	0.0013	32.2	67.8

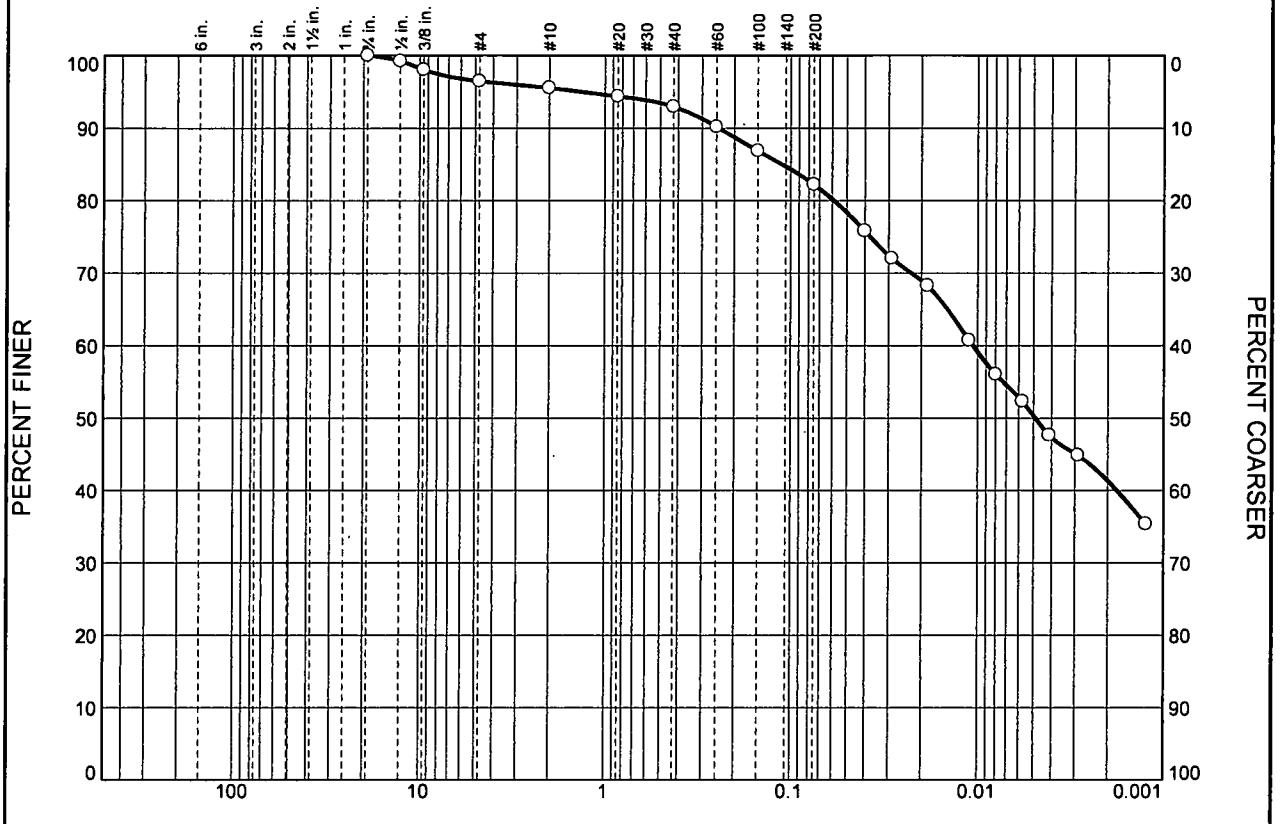
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.9	2.9	1.0	2.8	12.9	16.7	33.7	46.7	80.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0068	0.0137	0.0724	0.1292	0.2404	1.0538

Fineness Modulus
0.41

Particle Size Distribution Report - ASTM D2487



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.5	1.0	2.5	10.8	31.9	50.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75	100.0		
0.5	99.2		
0.375	98.0		
#4	96.5		
#10	95.5		
#20	94.4		
#40	93.0		
#60	90.2		
#100	86.9		
#200	82.2		

* (no specification provided)

Material Description

dark red/brown lean CLAY with sand

Atterberg Limits

PL= 14 LL= 40 PI= 26

Coefficients

D_{90}= 0.2427 D_{85}= 0.1111 D_{60}= 0.0106
D_{50}= 0.0049 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(20)

Remarks

Date of Instructions: 11/07/11
Lab No.: 1034
Note: Sample is Undersized

Location: SA-11-16, SS-10
Sample Number: 1034 **Depth:** 22.5' - 24.0' **Date:** 11/14/11

TESTECH

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Project No: MI051G **Figure**

GRAIN SIZE DISTRIBUTION TEST DATA

11/21/2011

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI
Project Number: MI051G
Location: SA-11-16, SS-10
Depth: 22.5' - 24.0' **Sample Number:** 1034
Material Description: dark red/brown lean CLAY with sand
Date: 11/14/11 **PL:** 14 **LL:** 40 **PI:** 26
USCS Classification: CL **AASHTO Classification:** A-6(20)
Testing Remarks: Date of Instructions: 11/07/11
Lab No.: 1034
Note: Sample is Undersized

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer	Percent Retained
384.58	14.52	0.00	0.75	0.00	100.0	0.0
			0.5	2.86	99.2	0.8
			0.375	7.23	98.0	2.0
			#4	13.08	96.5	3.5
			#10	16.50	95.5	4.5
51.40	0.00	0.00	#20	0.63	94.4	5.6
			#40	1.39	93.0	7.0
			#60	2.88	90.2	9.8
			#100	4.67	86.9	13.1
			#200	7.16	82.2	17.8

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 95.5
Weight of hydrometer sample =51.396
Hygroscopic moisture correction:
Moist weight and tare = 72.28
Dry weight and tare = 71.81
Tare weight = 37.23
Hygroscopic moisture = 1.4%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
1.00	21.3	45.0	40.2	0.0134	45.0	8.9	0.0401	75.8	24.2
2.00	21.3	43.0	38.2	0.0134	43.0	9.2	0.0289	72.1	27.9
5.00	21.3	41.0	36.2	0.0134	41.0	9.6	0.0186	68.3	31.7
15.00	21.3	37.0	32.2	0.0134	37.0	10.2	0.0111	60.7	39.3
30.00	21.3	34.5	29.7	0.0134	34.5	10.6	0.0080	56.0	44.0
60.00	21.4	32.5	27.8	0.0134	32.5	11.0	0.0057	52.3	47.7
120.00	21.5	30.0	25.3	0.0134	30.0	11.4	0.0041	47.6	52.4

Hydrometer Test Data (continued)

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer	Percent Retained
250.00	21.6	28.5	23.8	0.0134	28.5	11.6	0.0029	44.9	55.1
1440.00	21.5	23.5	18.8	0.0134	23.5	12.4	0.0012	35.4	64.6

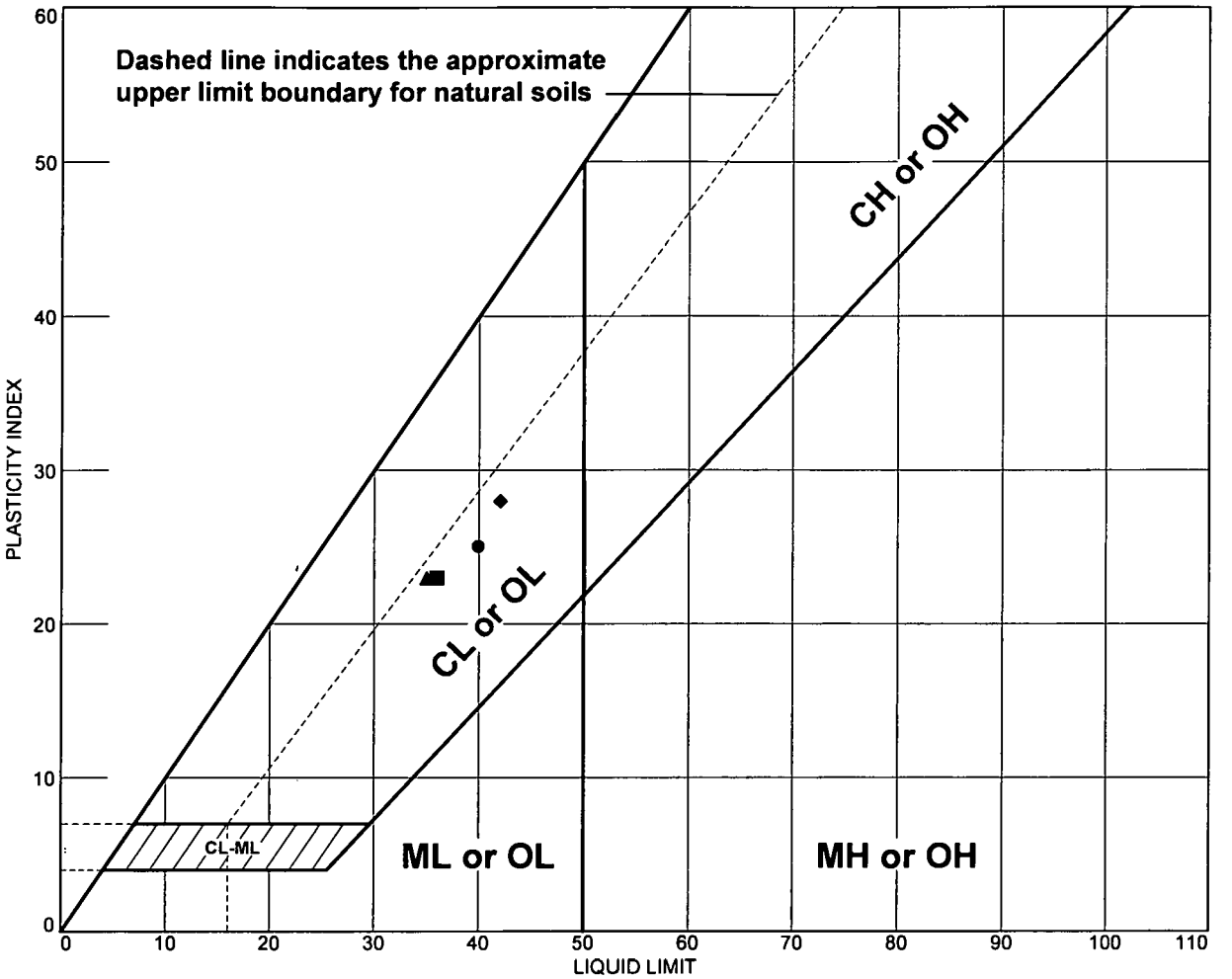
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	3.5	3.5	1.0	2.5	10.8	14.3	31.9	50.3	82.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0049	0.0106	0.0586	0.1111	0.2427	1.3316

Fineness Modulus
0.43

LIQUID AND PLASTIC LIMITS TEST REPORT - ASTM D4319



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	red/brown lean CLAY with sand	40	15	25	92.3	78.0	CL
■	red/brown lean CLAY with sand (visual)	36	13	23			
▲	red/brown lean CLAY with sand	35	12	23	93.0	80.1	CL
◆	red/brown lean CLAY (visual)	42	14	28			

Project No. MI051G **Client:** U.S. Army Corps of Engineers - Detroit District

Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

●**Location:** SA-11-01, SS-2 **Depth:** 2.5' - 4.0' **Sample Number:** 1034

■**Location:** SA-11-01, SS-3 **Depth:** 5.0' - 6.5' **Sample Number:** 1034

▲**Loc.:** SA-11-01, Shelby Tube **Depth:** 18.0' - 20.0' **Sample No.:** 1034

◆**Loc.:** SA-11-01, SS-17 **Depth:** 40.0' - 41.5' **Sample No.:** 1034

TESTECH

Remarks:

●Date of Instructions: 11/07/11
Lab No.: 1034

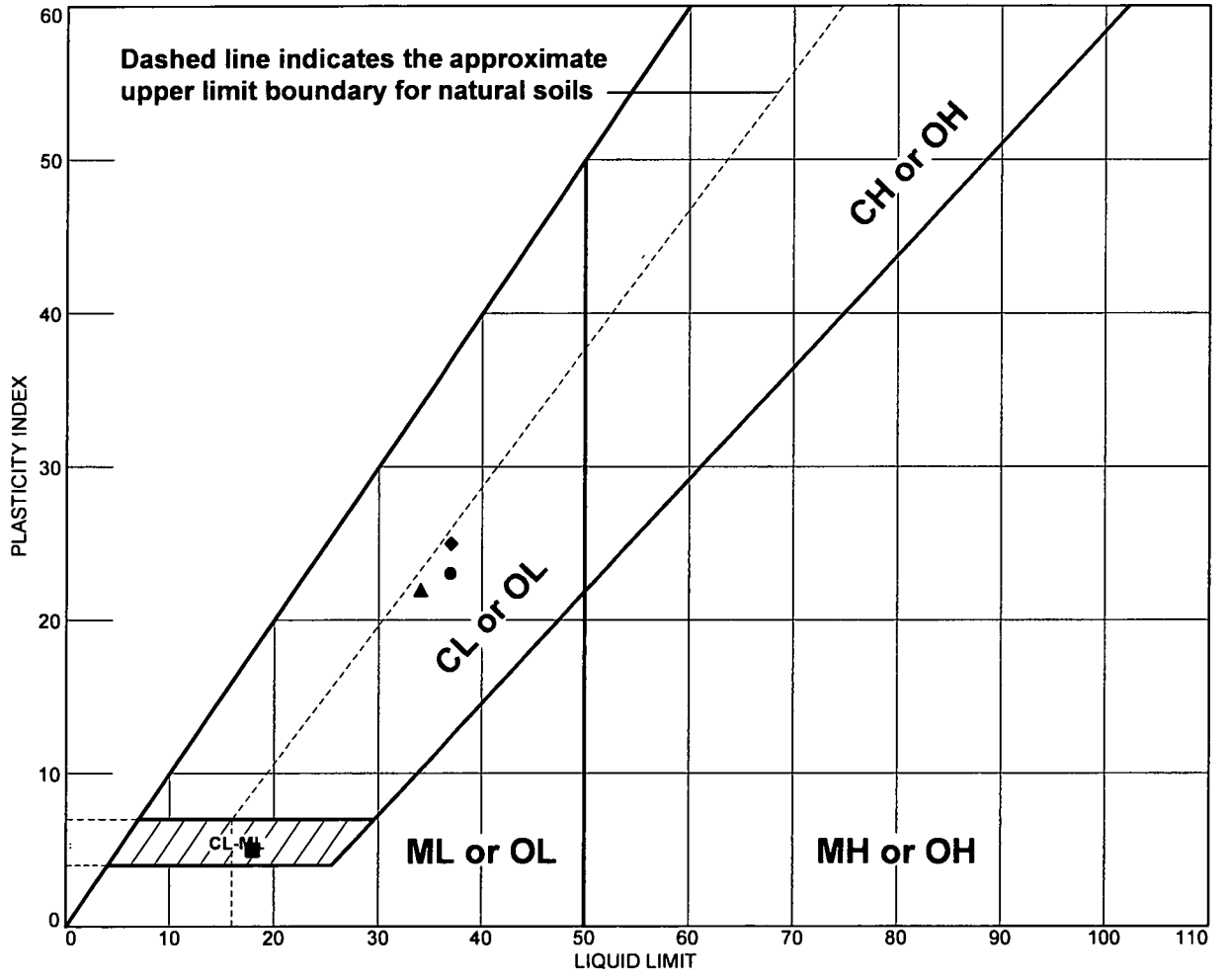
■Date of Instructions: 11/07/11
Lab No.: 1034

▲Date of Instructions: 11/07/11
Lab No.: 1034

◆Date of Instructions: 11/07/11
Lab No.: 1034

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT - ASTM D4319



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	red/brown lean CLAY with sand (visual)	37	14	23			
■	red/brown silty CLAY with sand	18	13	5	93.9	75.7	CL-ML
▲	red/brown lean CLAY with sand	34	12	22	94.8	81.8	CL
◆	red/brown lean CLAY with sand (visual)	37	12	25			

Project No. MI051G **Client:** U.S. Army Corps of Engineers - Detroit District

Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

●**Location:** SA-11-02, SS-2 **Depth:** 2.5' - 4.0' **Sample Number:** 1034

■**Location:** SA-11-02, SS-5 **Depth:** 10.0' - 11.5' **Sample Number:** 1034

▲**Loc.:** SA-11-02, Shelby Tube **Depth:** 15.0' - 17.0' **Sample No.:** 1034

◆**Loc.:** SA-11-02, SS-11 **Depth:** 25.0' - 26.5' **Sample No.:** 1034

TESTECH

Remarks:

●Date of Instructions: 11/07/11
Lab No.: 1034

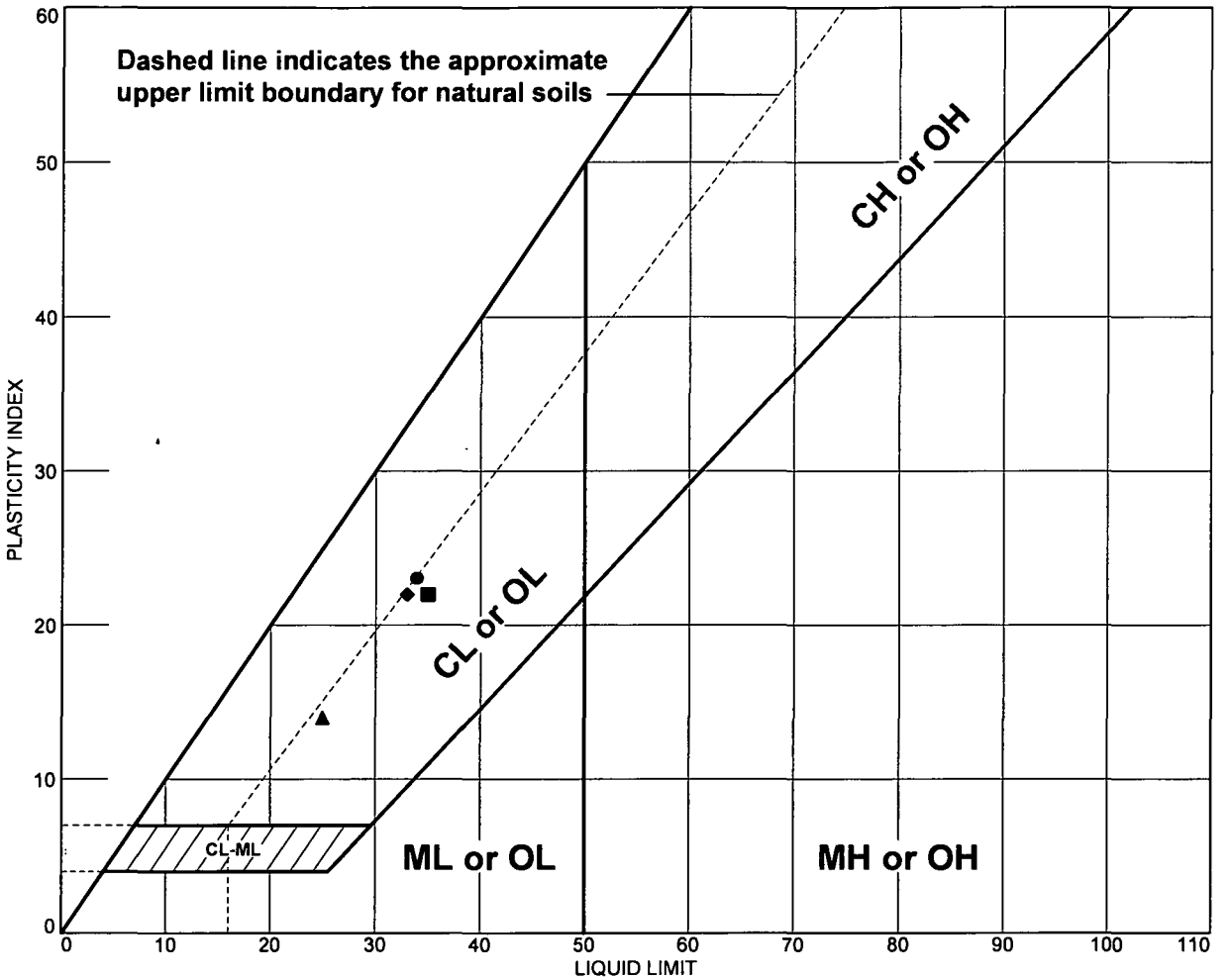
■Date of Instructions: 11/07/11
Lab No.: 1034

▲Date of Instructions: 11/07/11
Lab No.: 1034

◆Date of Instructions: 11/07/11
Lab No.: 1034

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT - ASTM D4319



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	red/brown lean CLAY with sand	34	11	23	94.8	79.7	CL
■	red/brown lean CLAY with sand	35	13	22	93.3	79.3	CL
▲	red/brown sandy CLAY (visual)	25	11	14			
◆	red/brown lean CLAY with sand (visual)	33	11	22			

Project No. MI051G **Client:** U.S. Army Corps of Engineers - Detroit District

Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

●**Loc.:** SA-11-03, Bag Sample **Depth:** 8.0' - 12.0' **Sample No.:** 1034

■**Loc.:** SA-11-03, Shelby Tube **Depth:** 10.0' - 12.0' **Sample No.:** 1034

▲**Location:** SA-11-03, SS-6 **Depth:** 12.5' - 14.0' **Sample Number:** 1034

◆**Loc.:** SA-11-03, SS-12 **Depth:** 27.5' - 29.0' **Sample No.:** 1034

TESTECH

Remarks:

●Date of Instructions: 11/07/11
Lab No.: 1034

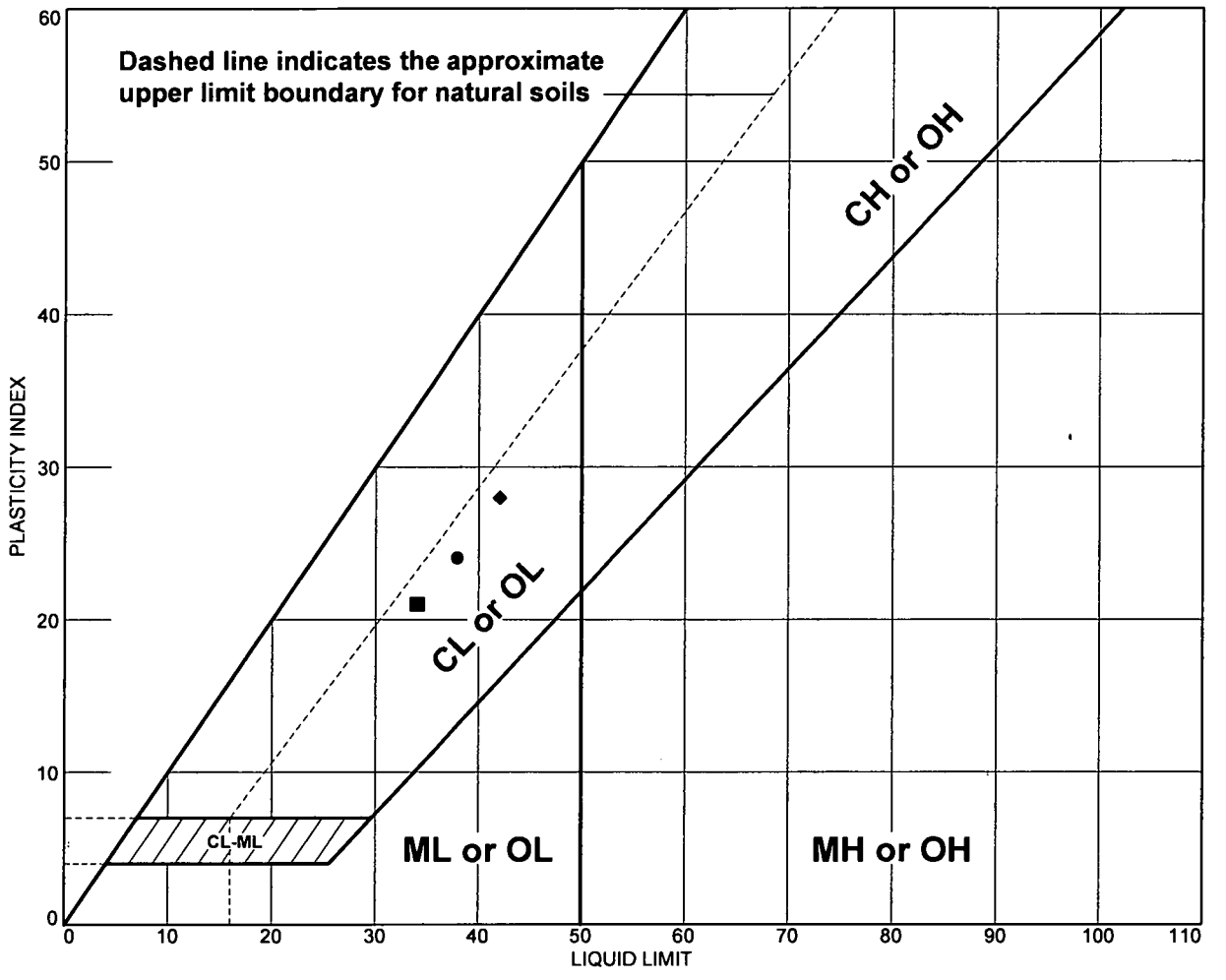
■Date of Instructions: 11/07/11
Lab No.: 1034

▲Date of Instructions: 11/07/11
Lab No.: 1034

◆Date of Instructions: 11/07/11
Lab No.: 1034

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT - ASTM D4319



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	red/brown lean CLAY with sand (visual)	38	14	24			
■	red/brown lean CLAY with sand	34	13	21	93.4	79.9	CL
▲	red/brown lean CLAY with sand	34	13	21	92.6	78.7	CL
◆	red/brown lean CLAY (visual)	42	14	28			

Project No. MI051G **Client:** U.S. Army Corps of Engineers - Detroit District

Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

●**Location:** SA-11-04, SS-2 **Depth:** 2.5' - 4.0' **Sample Number:** 1034

■**Location:** SA-11-04, SS-7 **Depth:** 15.0' - 16.5' **Sample Number:** 1034

▲**Loc.:** SA-11-04, Shelby Tube **Depth:** 20.0' - 22.0' **Sample No.:** 1034

◆**Loc.:** SA-11-04, SS-19 **Depth:** 45.0' - 46.5' **Sample No.:** 1034

TESTECH

Remarks:

●Date of Instructions: 11/07/11
Lab No.: 1034

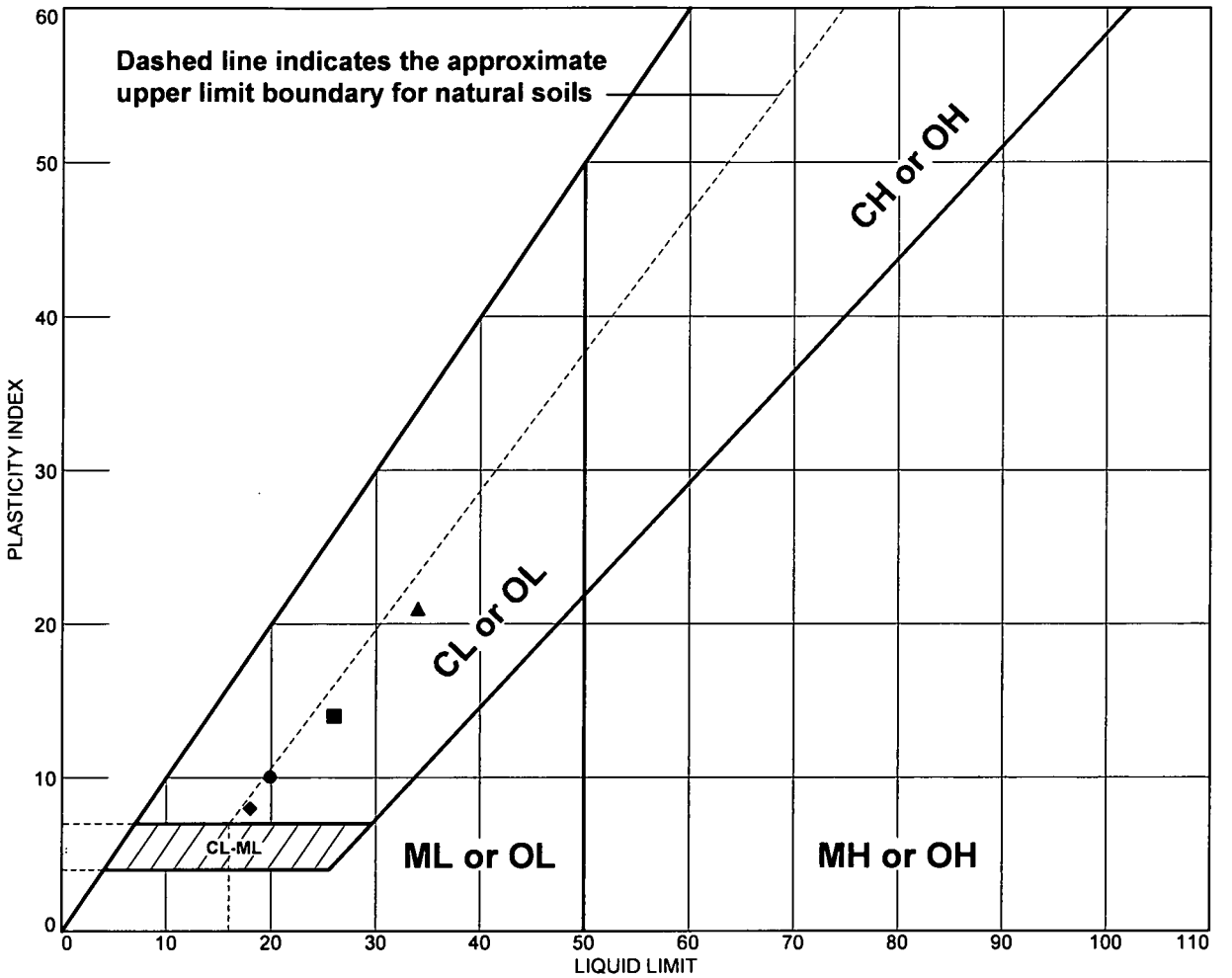
■Date of Instructions: 11/07/11
Lab No.: 1034

▲Date of Instructions: 11/07/11
Lab No.: 1034

◆Date of Instructions: 11/07/11
Lab No.: 1034

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT - ASTM D4319



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	red/brown sandy CLAY (visual)	20	10	10			
■	red/brown sandy CLAY (visual)	26	12	14			
▲	red/brown lean CLAY with sand	34	13	21	90.6	72.2	CL
◆	red/brown sandy lean CLAY	18	10	8	94.2	63.6	CL

Project No. MI051G **Client:** U.S. Army Corps of Engineers - Detroit District

Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

●**Location:** SA-11-05, SS-2 **Depth:** 2.5' - 4.0' **Sample Number:** 1034

■**Location:** SA-11-05, SS-6 **Depth:** 12.5' - 14.0' **Sample Number:** 1034

▲**Loc.:** SA-11-05, SS-11 **Depth:** 25.0' - 26.5' **Sample No.:** 1034

◆**Loc.:** SA-11-05, SS-12 **Depth:** 27.5' - 29.0' **Sample No.:** 1034

TESTECH

Remarks:

●Date of Instructions: 11/07/11
Lab No.: 1034

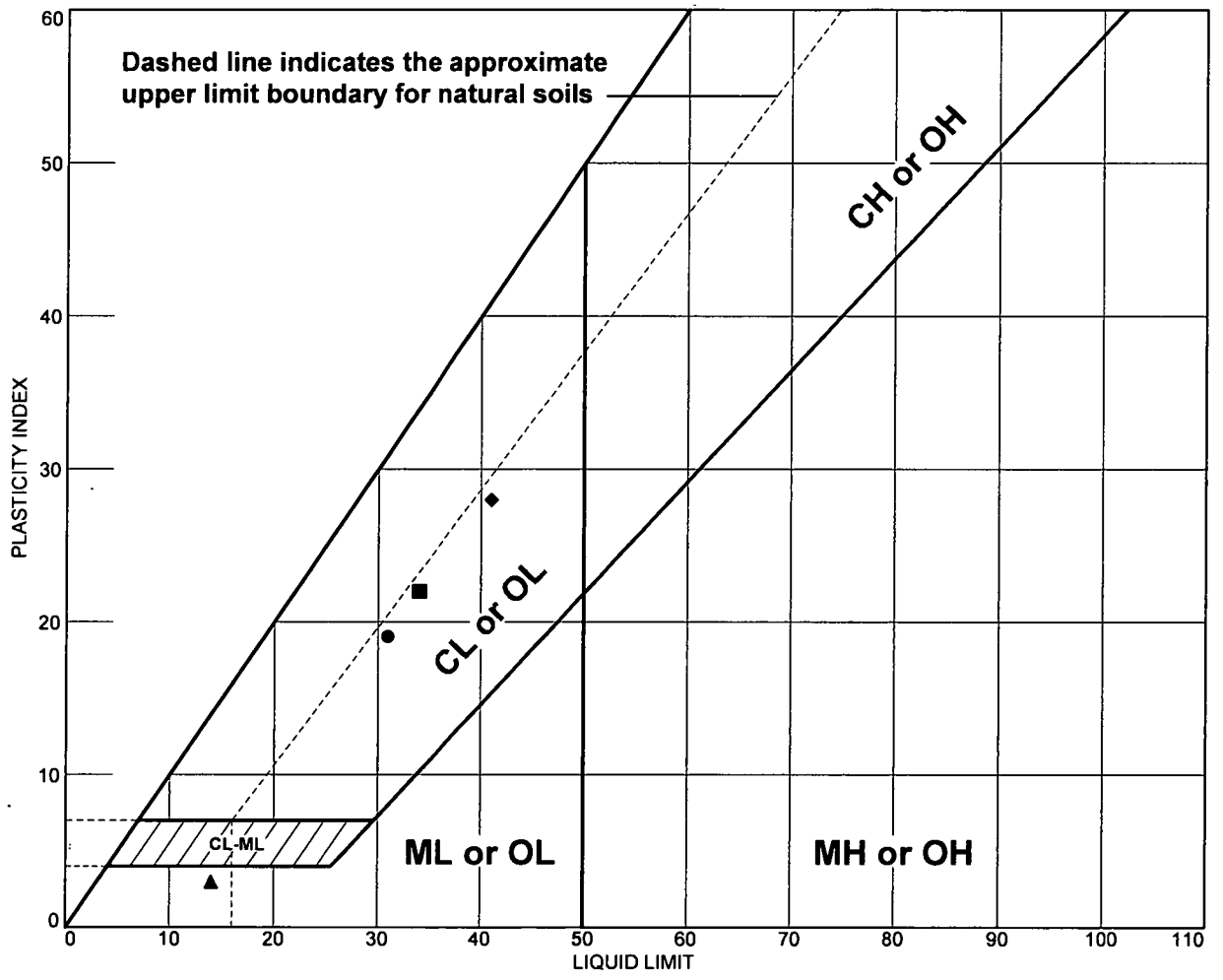
■Date of Instructions: 11/07/11
Lab No.: 1034

▲Date of Instructions: 11/07/11
Lab No.: 1034

◆Date of Instructions: 11/07/11
Lab No.: 1034

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT - ASTM D4319



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	red/brown lean CLAY with sand	31	12	19	89.8	73.7	CL
■	red/brown gravelly lean CLAY with sand	34	12	22	80.0	67.8	CL
▲	red/brown silty fine SAND (visual)	14	11	3			
◆	red/brown lean CLAY (visual)	41	13	28			

Project No. MI051G **Client:** U.S. Army Corps of Engineers - Detroit District

Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

●**Location:** SA-11-06, SS-7 **Depth:** 15.0' - 16.5' **Sample Number:** 1034

■**Loc.:** SA-11-06, Shelby Tube **Depth:** 18.0' - 20.0' **Sample No.:** 1034

▲**Loc.:** SA-11-06, SS-11 **Depth:** 25.0' - 26.5' **Sample No.:** 1034

◆**Loc.:** SA-11-06, SS-13 **Depth:** 30.0' - 31.5' **Sample No.:** 1034

TESTECH

Remarks:

●Date of Instructions: 11/07/11
Lab No.: 1034

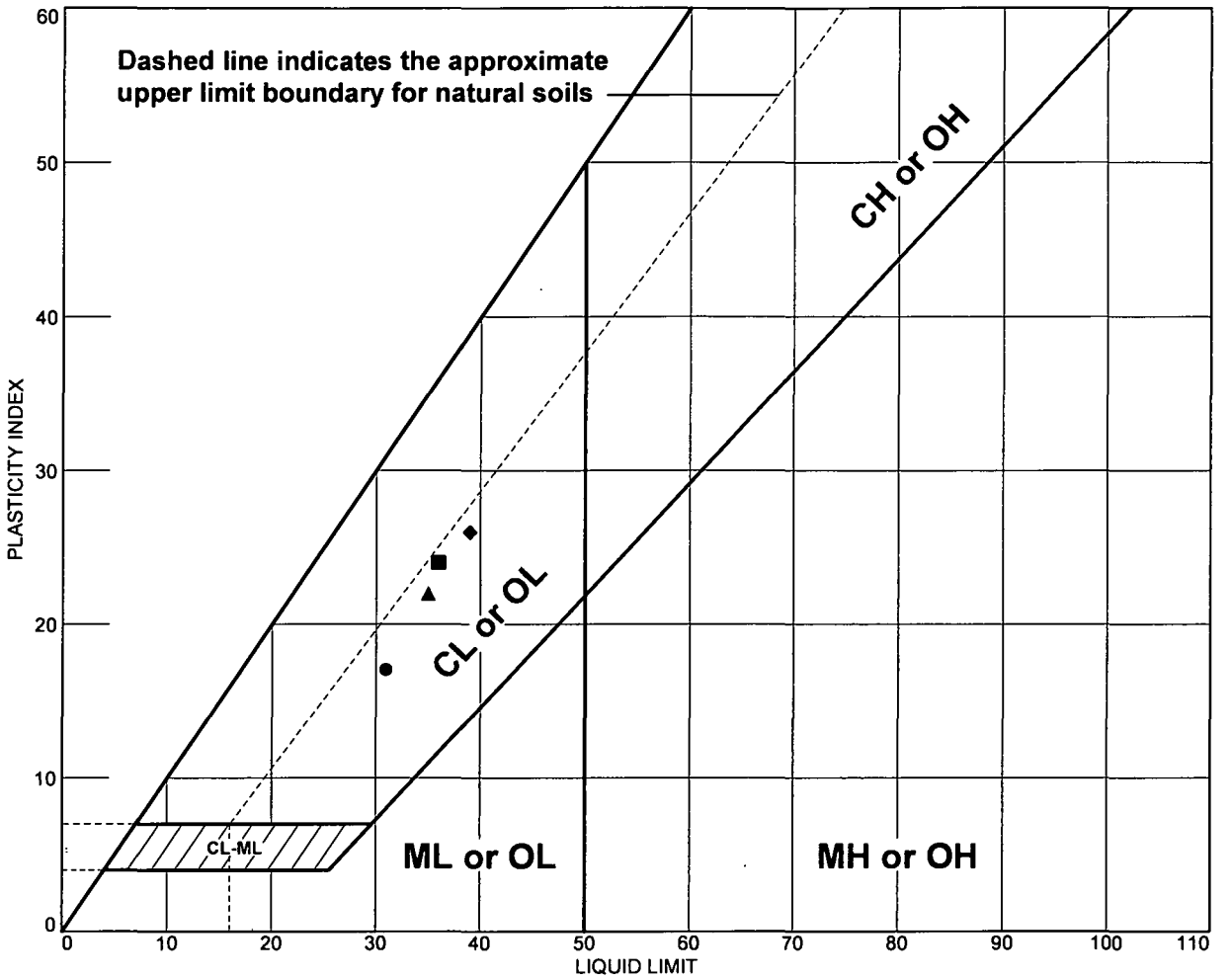
■Date of Instructions: 11/07/11
Lab No.: 1034

▲Date of Instructions: 11/07/11
Lab No.: 1034

◆Date of Instructions: 11/07/11
Lab No.: 1034

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT - ASTM D4319



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	red/brown lean CLAY	31	14	17	99.8	92.2	CL
■	red/brown lean CLAY with sand (visual)	36	12	24			
▲	red/brown lean CLAY with sand	35	13	22	94.3	80.8	CL
◆	red/brown lean CLAY (visual)	39	13	26			

Project No. MI051G **Client:** U.S. Army Corps of Engineers - Detroit District

Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

●**Loc.:** SA-11-07, Shelby Tube **Depth:** 5.0' - 7.0' **Sample No.:** 1034

■**Loc.:** SA-11-07, SS-10 **Depth:** 22.5' - 24.0' **Sample No.:** 1034

▲**Loc.:** SA-11-07, SS-14 **Depth:** 32.5' - 34.0' **Sample No.:** 1034

◆**Loc.:** SA-11-07, SS-18 **Depth:** 42.5' - 44.0' **Sample No.:** 1034

TESTECH

Remarks:

●Date of Instructions: 11/07/11
Lab No.: 1034

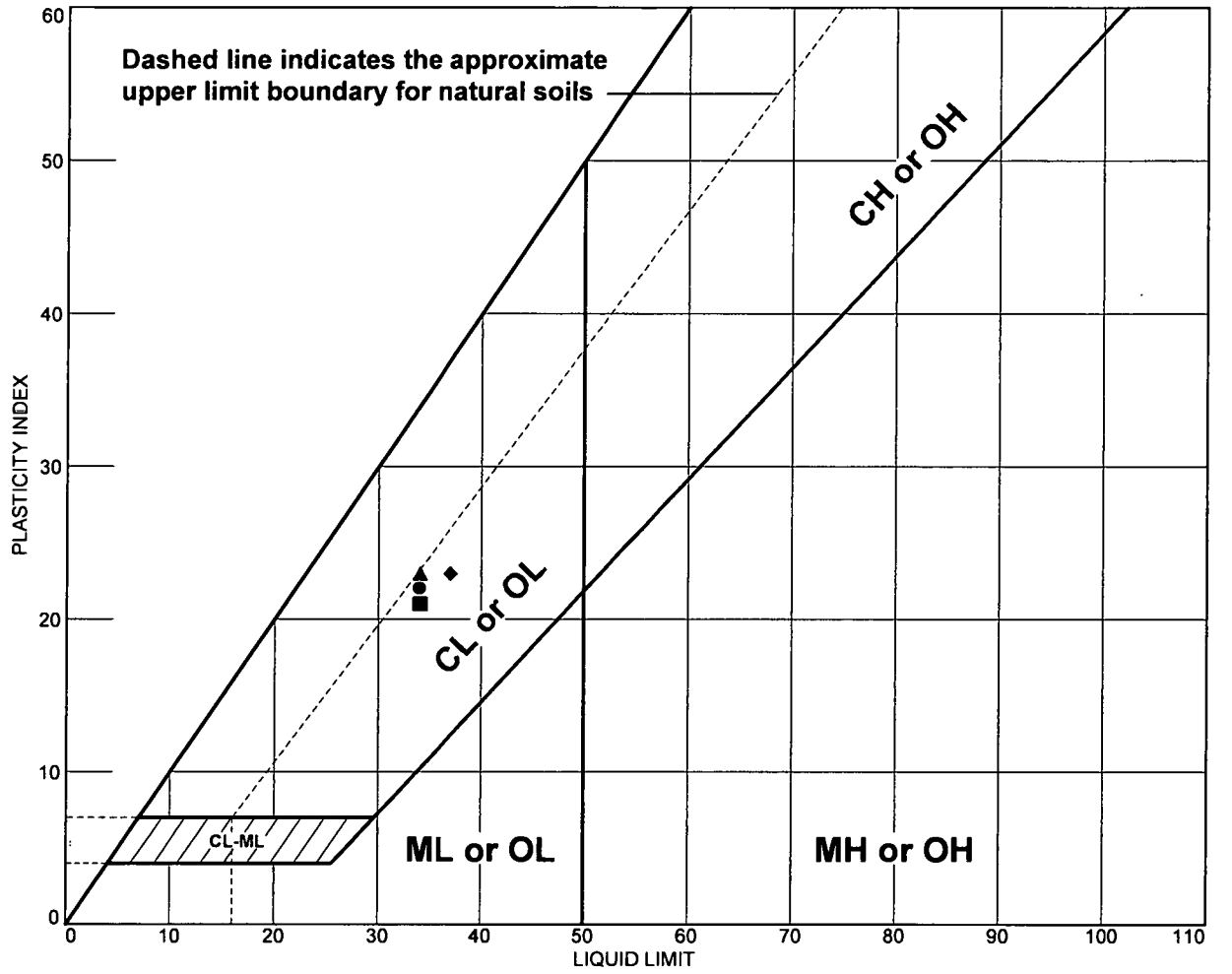
■Date of Instructions: 11/07/11
Lab No.: 1034

▲Date of Instructions: 11/07/11
Lab No.: 1034

◆Date of Instructions: 11/07/11
Lab No.: 1034

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT - ASTM D4319



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	red/brown lean CLAY with sand (visual)	34	12	22			
■	red/brown lean CLAY with sand	34	13	21	94.3	79.7	CL
▲	red/brown lean CLAY with sand (visual)	34	11	23			
◆	red/brown lean CLAY with sand	37	14	23	93.4	81.6	CL

Project No. MI051G **Client:** U.S. Army Corps of Engineers - Detroit District

Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

●**Location:** SA-11-08, SS-3 **Depth:** 5.0' - 6.5' **Sample Number:** 1034

■**Loc.:** SA-11-08, Shelby Tube **Depth:** 8.0' - 10.0' **Sample No.:** 1034

▲**Location:** SA-11-08, SS-7 **Depth:** 15.0' - 16.5' **Sample Number:** 1034

◆**Loc.:** SA-11-08, SS-13 **Depth:** 30.0' - 31.5' **Sample No.:** 1034

TESTECH

Remarks:

●Date of Instructions: 11/07/11
Lab No.: 1034

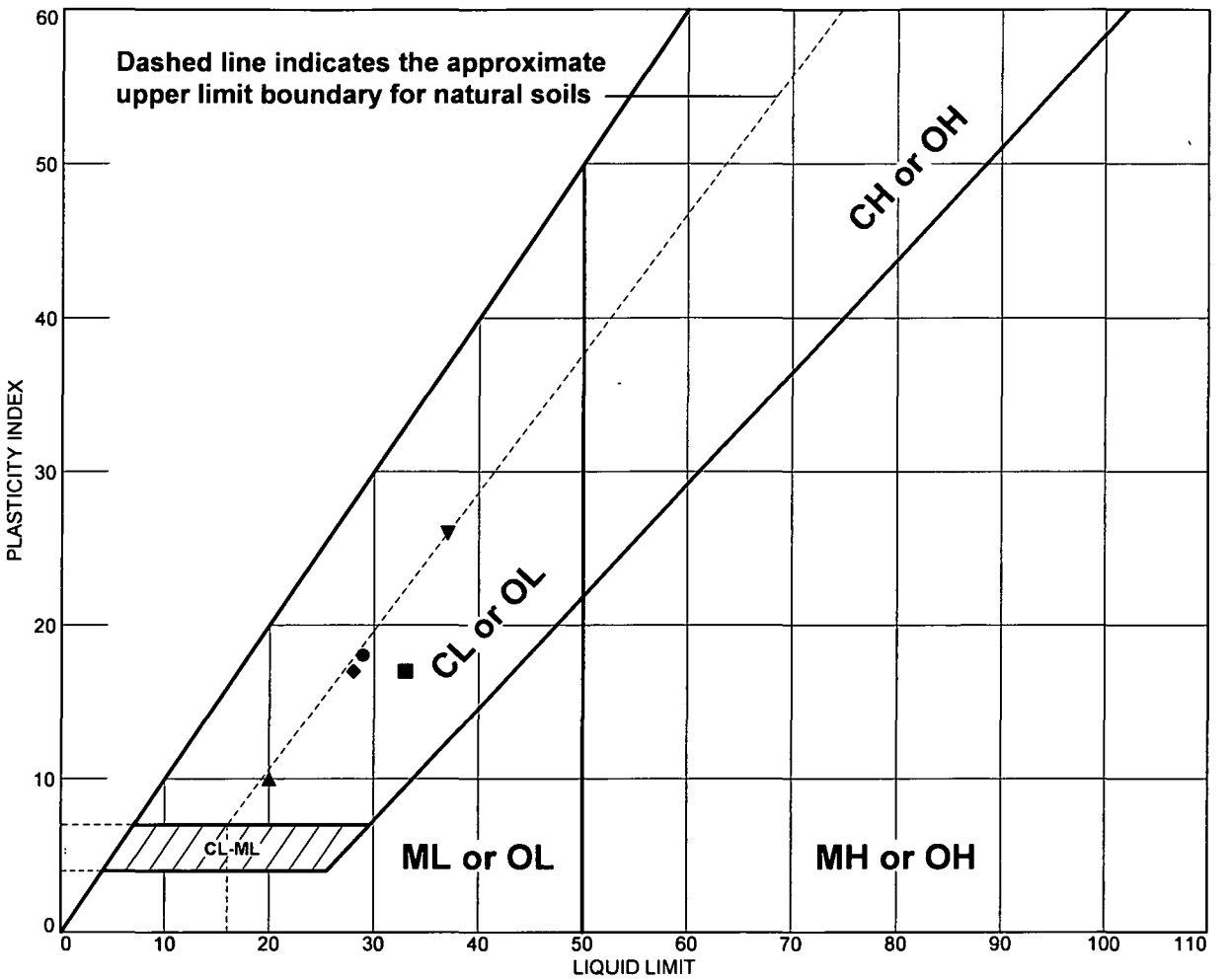
■Date of Instructions: 11/07/11
Lab No.: 1034

▲Date of Instructions: 11/07/11
Lab No.: 1034

◆Date of Instructions: 11/07/11
Lab No.:1034

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT - ASTM D4319



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	red/brown lean CLAY with sand	29	11	18	94.6	77.1	CL
■	red/brown lean CLAY	33	16	17	99.0	95.0	CL
▲	red/brown sandy CLAY (visual)	20	10	10			
◆	red/brown sandy CLAY (visual)	28	11	17			
▼	red/brown lean CLAY with sand	37	11	26	93.1	78.3	CL

Project No. MI051G **Client:** U.S. Army Corps of Engineers - Detroit District

Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

●**Loc.:** SA-11-09, Bag Sample **Depth:** 18.0' - 25.0' **Sample No.:** 1034

■**Loc.:** SA-11-09, Shelby Tube **Depth:** 5.0' - 7.0' **Sample No.:** 1034

▲**Location:** SA-11-09, SS-4 **Depth:** 7.5' - 9.0' **Sample Number:** 1034

◆**Location:** SA-11-09, SS-8 **Depth:** 17.5' - 19.0' **Sample Number:** 1034

▼**Loc.:** SA-11-09, SS-10 **Depth:** 22.5' - 24.0' **Sample No.:** 1034

TESTECH

Remarks:

●Date of Instructions: 11/07/11
Lab No.: 1034

■Date of Instructions: 11/07/11
Lab No.: 1034

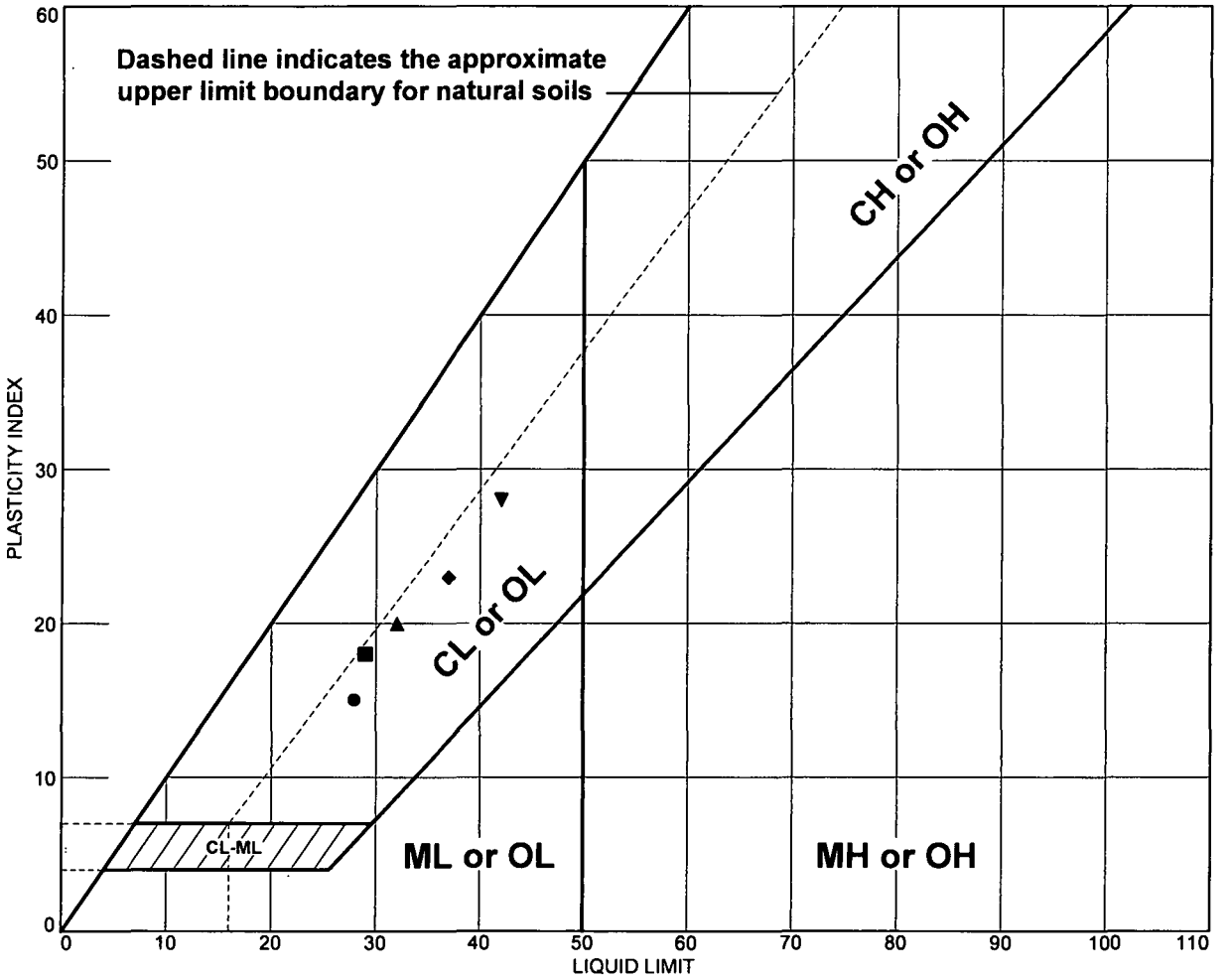
▲Date of Instructions: 11/07/11
Lab No.: 1034

◆Date of Instructions: 11/07/11
Lab No.: 1034

▼Date of Instructions: 11/07/11
Lab No.: 1034

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT - ASTM D4319



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	red/brown sandy lean CLAY	28	13	15	96.9	56.1	CL
■	red/brown lean CLAY with sand	29	11	18	91.3	75.1	CL
▲	red/brown lean CLAY with sand (visual)	32	12	20			
◆	red/brown lean CLAY with sand	37	14	23	92.1	81.4	CL
▼	red/brown lean CLAY with sand (visual)	42	14	28			

Project No. MI051G **Client:** U.S. Army Corps of Engineers - Detroit District

Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

●**Location:** SA-11-10, SS-2 **Depth:** 2.5' - 4.0' **Sample Number:** 1034

■**Loc.:** SA-11-10, Shelby Tube **Depth:** 10.0' - 12.0' **Sample No.:** 1034

▲**Location:** SA-11-10, SS-9 **Depth:** 20.0' - 21.5' **Sample Number:** 1034

◆**Loc.:** SA-11-10, SS-15 **Depth:** 35.0' - 36.5' **Sample No.:** 1034

▼**Loc.:** SA-11-10, SS-18 **Depth:** 42.5' - 44.0' **Sample No.:** 1034

TESTECH

Remarks:

●Date of Instructions: 11/07/11
Lab No.: 1034

■Date of Instructions: 11/07/11
Lab No.: 1034

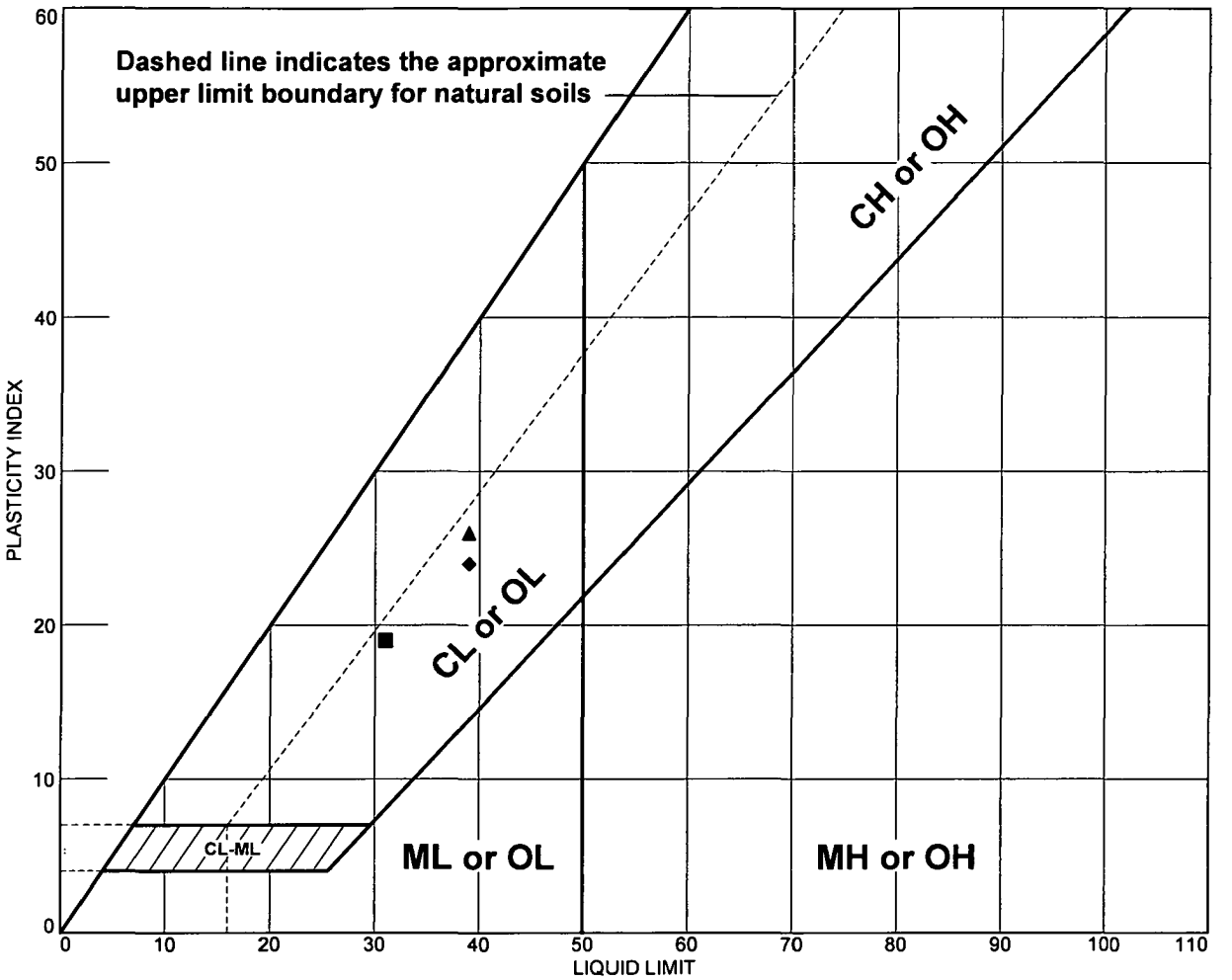
▲Date of Instructions: 11/07/11
Lab No.: 1034

◆Date of Instructions: 11/07/11
Lab No.: 1034

▼Date of Instructions: 11/07/11
Lab No.: 1034

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT - ASTM D4319



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	brown SAND (visual)	NV	NP	NP			
■	red/brown lean CLAY with sand	31	12	19	94.6	79.1	CL
▲	red/brown lean CLAY (visual)	39	13	26			
◆	red/brown lean CLAY	39	15	24	95.0	84.7	CL

Project No. MI051G **Client:** U.S. Army Corps of Engineers - Detroit District

Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

●**Location:** SA-11-11, SS-2 **Depth:** 2.5' - 4.0' **Sample Number:** 1034

■**Location:** SA-11-11, SS-6 **Depth:** 12.5' - 14.0' **Sample Number:** 1034

▲**Loc.:** SA-11-11, SS-15 **Depth:** 35.0' - 36.5' **Sample No.:** 1034

◆**Loc.:** SA-11-11, SS-16 **Depth:** 37.5' - 39.0' **Sample No.:** 1034

TESTECH

Remarks:

●Date of Instructions: 11/07/11
Lab No.: 1034

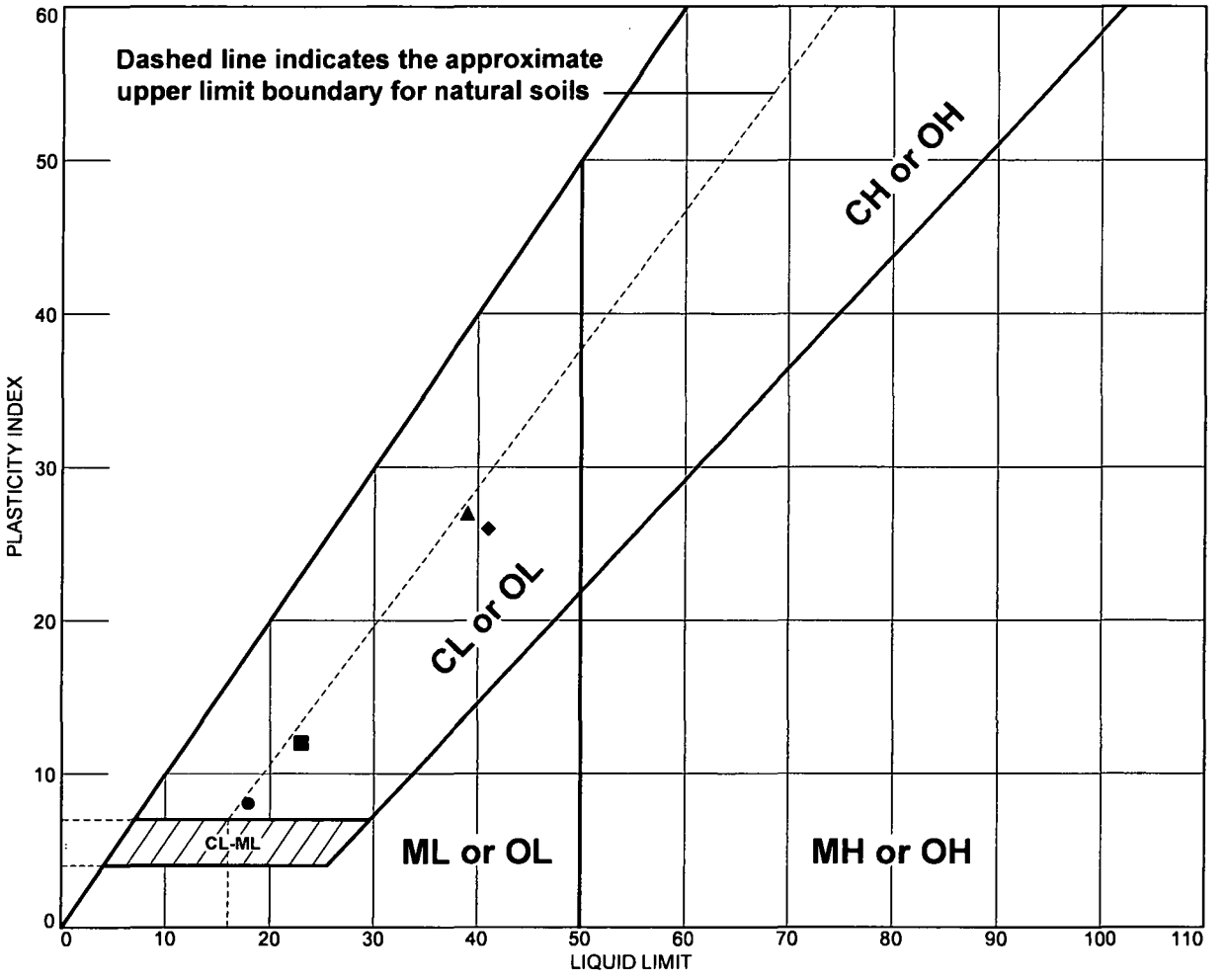
■Date of Instructions: 11/07/11
Lab No.: 1034

▲Date of Instructions: 11/07/11
Lab No.: 1034

◆Date of Instructions: 11/07/11
Lab No.: 1034

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT - ASTM D4319



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	gray/brown sandy lean CLAY	18	10	8	80.8	53.5	CL
■	red/brown sandy CLAY (visual)	23	11	12			
▲	red/brown lean CLAY (visual)	39	12	27			
◆	red/brown lean CLAY	41	15	26	96.6	87.1	CL

Project No. MI051G **Client:** U.S. Army Corps of Engineers - Detroit District

Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

●**Loc.:** SA-11-12, Shelby Tube **Depth:** 10.0' - 12.0' **Sample No.:** 1034

■**Location:** SA-11-12, SS-7 **Depth:** 15.0' - 16.5' **Sample Number:** 1034

▲**Loc.:** SA-11-12, SS-14 **Depth:** 32.5' - 34.0' **Sample No.:** 1034

◆**Loc.:** SA-11-12, SS-20 **Depth:** 47.5' - 49.0' **Sample No.:** 1034

TESTECH

Remarks:

●Date of Instructions: 11/07/11
Lab No.: 1034

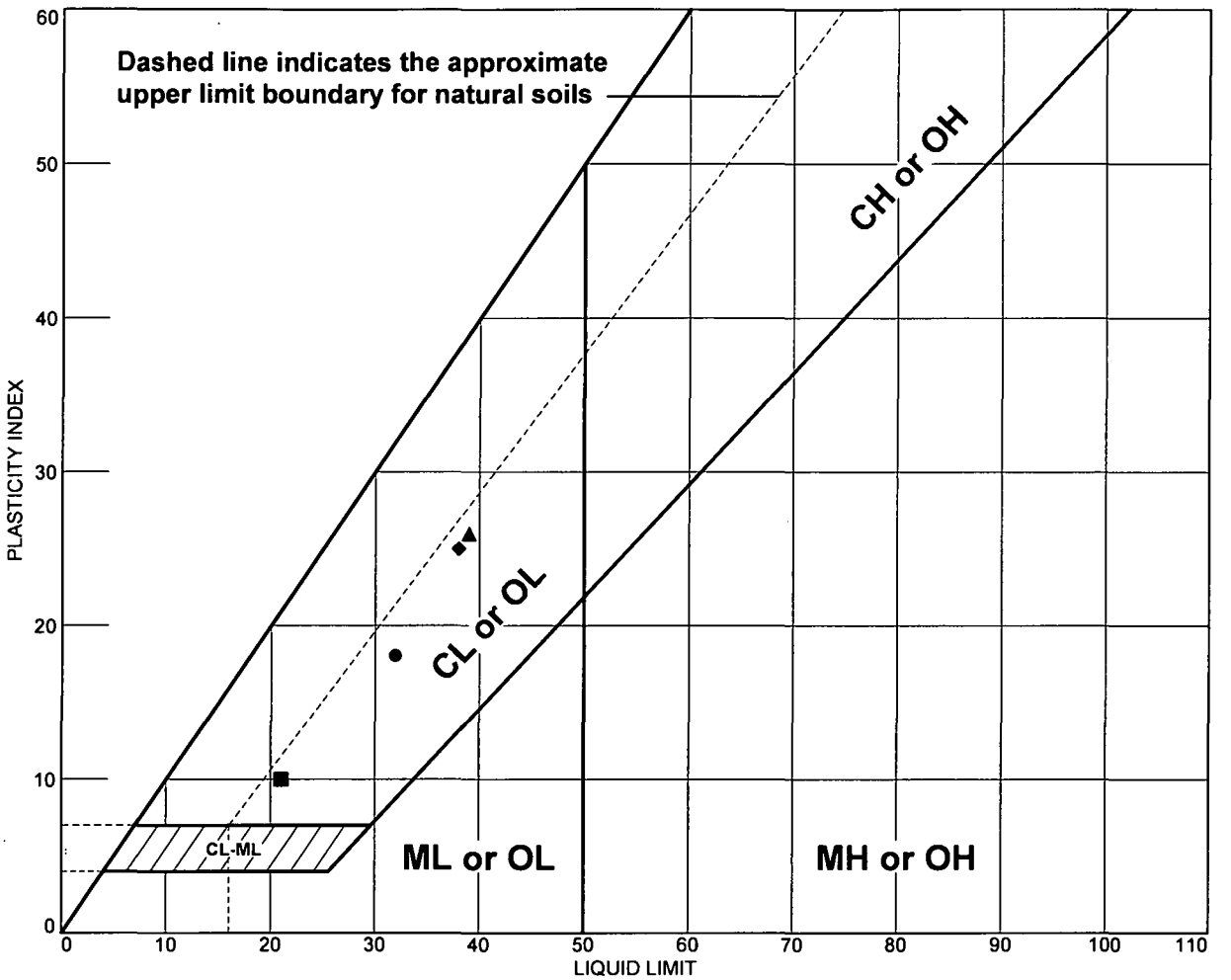
■Date of Instructions: 11/07/11
Lab No.: 1034

▲Date of Instructions: 11/07/11
Lab No.: 1034

◆Date of Instructions: 11/07/11
Lab No.: 1034

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT - ASTM D4319



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	red/brown lean CLAY with sand	32	14	18	94.7	78.1	CL
■	red/brown sandy CLAY (visual)	21	11	10			
▲	red/brown lean CLAY (visual)	39	13	26			
◆	red/brown lean CLAY with sand	38	13	25	94.1	81.8	CL

Project No. MI051G **Client:** U.S. Army Corps of Engineers - Detroit District

Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

●**Location:** SA-11-13, SS-2 **Depth:** 2.5' - 4.0' **Sample Number:** 1034

■**Location:** SA-11-13, SS-8 **Depth:** 17.5' - 19.0' **Sample Number:** 1034

▲**Loc.:** SA-11-13, SS-16 **Depth:** 37.5' - 39.0' **Sample No.:** 1034

◆**Loc.:** SA-11-13, SS-17 **Depth:** 40.0' - 41.5' **Sample No.:** 1034

TESTECH

Remarks:

●Date of Instructions: 11/07/11
Lab No.: 1034

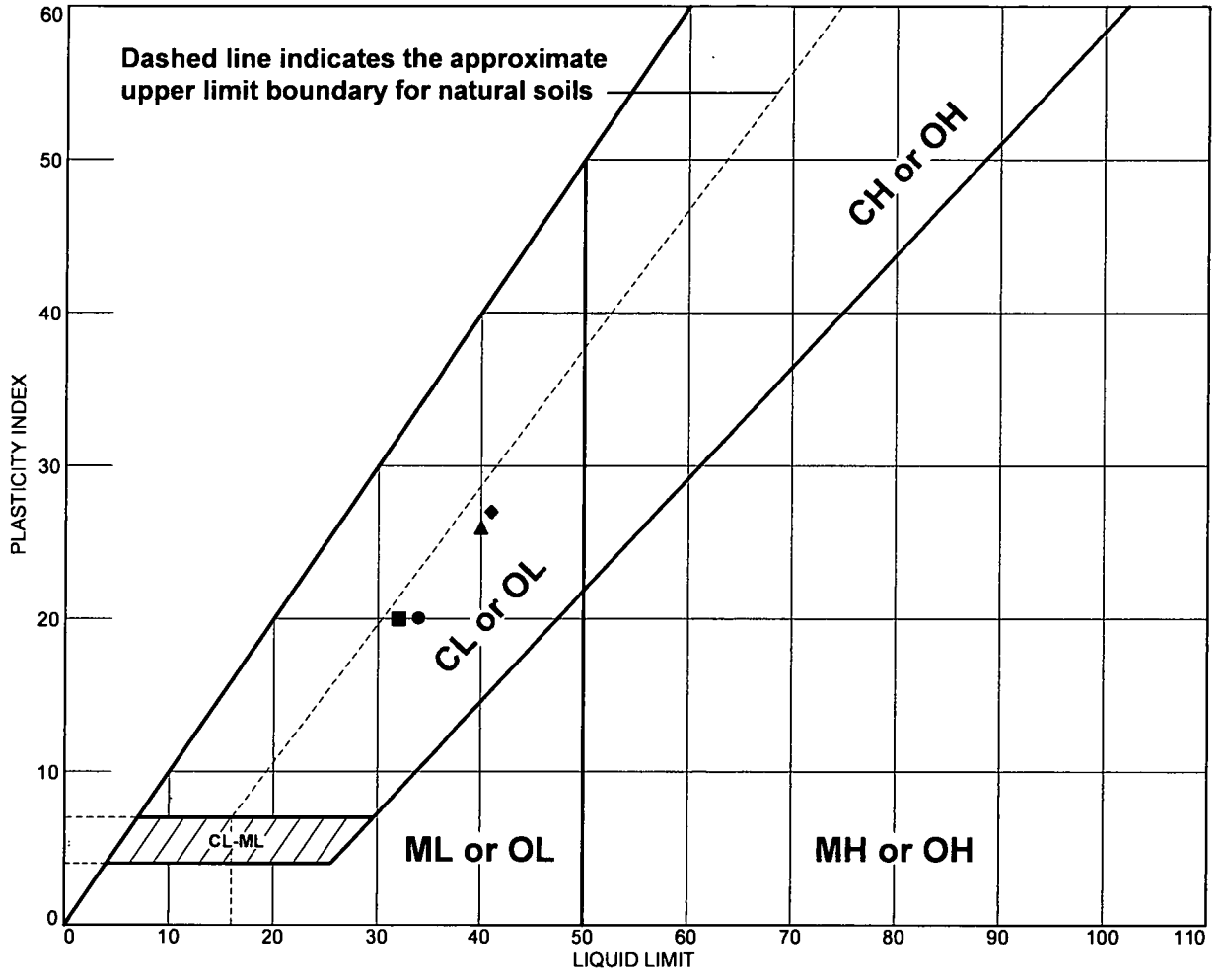
■Date of Instructions: 11/07/11
Lab No.: 1034

▲Date of Instructions: 11/07/11
Lab No.: 1034

◆Date of Instructions: 11/07/11
Lab No.: 1034

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT - ASTM D4319



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	red/brown lean CLAY with sand	34	14	20	95.7	80.9	CL
■	red/brown lean CLAY with sand (visual)	32	12	20			
▲	dark red/brown lean CLAY with sand	40	14	26	92.4	82.3	CL
◆	red/brown lean CLAY (visual)	41	14	27			

Project No. MI051G **Client:** U.S. Army Corps of Engineers - Detroit District

Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

●**Location:** SA-11-14, SS-3 **Depth:** 5.0' - 6.5' **Sample Number:** 1034

■**Location:** SA-11-14, SS-9 **Depth:** 20.0' - 21.5' **Sample Number:** 1034

▲**Loc.:** SA-11-14, SS-18 **Depth:** 42.5' - 44.0' **Sample No.:** 1034

◆**Loc.:** SA-11-14, SS-20 **Depth:** 47.5' - 49.0' **Sample No.:** 1034

TESTECH

Remarks:

●Date of Instructions: 11/07/11
Lab No.: 1034

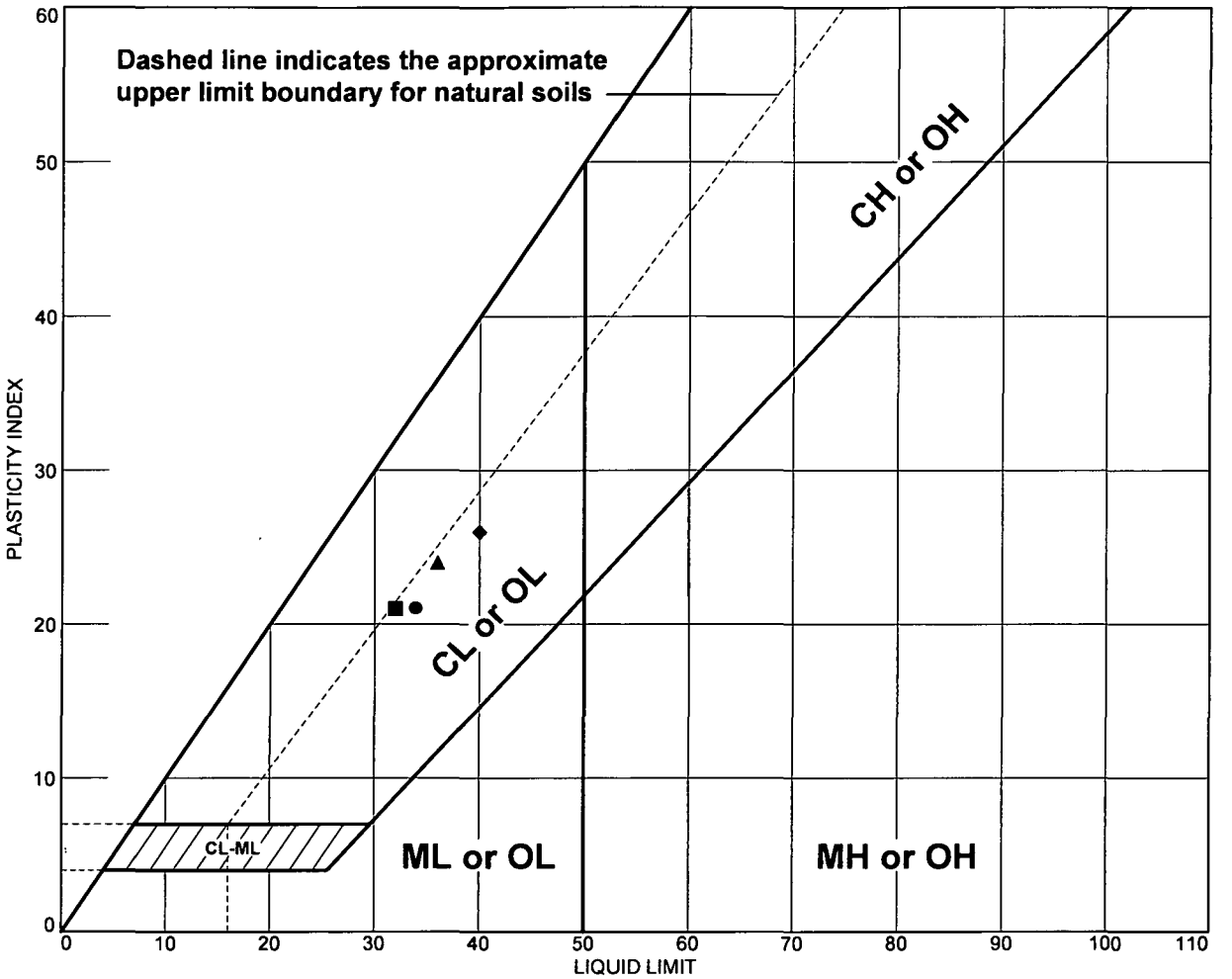
■Date of Instructions: 11/07/11
Lab No.: 1034

▲Date of Instructions: 11/07/11
Lab No.: 1034

◆Date of Instructions: 11/07/11
Lab No.: 1034

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT - ASTM D4319



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	red/brown lean CLAY with sand (visual)	34	13	21			
■	dark red/brown lean CLAY with sand	32	11	21	94.0	80.1	CL
▲	red/brown lean CLAY with sand (visual)	36	12	24			
◆	dark red/brown lean CLAY with sand	40	14	26	93.8	83.0	CL

Project No. MI051G **Client:** U.S. Army Corps of Engineers - Detroit District

Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

●**Location:** SA-11-15, SS-4 **Depth:** 7.5' - 9.0' **Sample Number:** 1034

■**Location:** SA-11-15, SS-9 **Depth:** 20.0' - 21.5' **Sample Number:** 1034

▲**Loc.:** SA-11-15, SS-12 **Depth:** 27.5' - 29.0' **Sample No.:** 1034

◆**Loc.:** SA-11-15, SS-19 **Depth:** 45.0' - 46.5' **Sample No.:** 1034

TESTECH

Remarks:

●Date of Instructions: 11/07/11
Lab No.: 1034

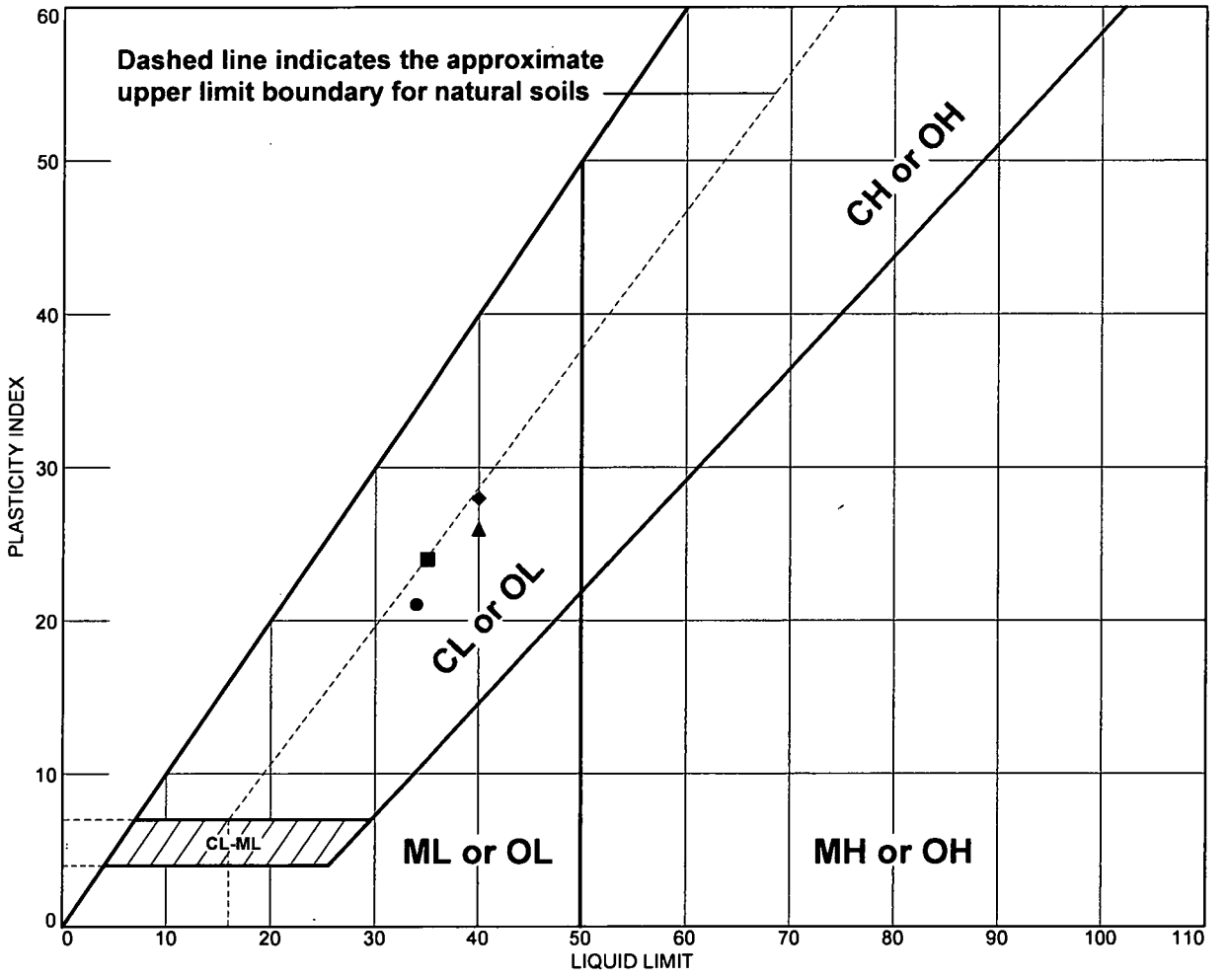
■Date of Instructions: 11/07/11
Lab No.: 1034

▲Date of Instructions: 11/07/11
Lab No.: 1034

◆Date of Instructions: 11/07/11
Lab No.: 1034

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT - ASTM D4319



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	dark red/brown lean CLAY with sand	34	13	21	93.3	80.4	CL
■	red/brown lean CLAY with sand (visual)	35	11	24			
▲	dark red/brown lean CLAY with sand	40	14	26	93.0	82.2	CL
◆	red/brown lean CLAY (visual)	40	12	28			

Project No. MI051G **Client:** U.S. Army Corps of Engineers - Detroit District

Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

●**Location:** SA-11-16, SS-4 **Depth:** 7.5' - 9.0' **Sample Number:** 1034

■**Location:** SA-11-16, SS-5 **Depth:** 10.0' - 11.5' **Sample Number:** 1034

▲**Loc.:** SA-11-16, SS-10 **Depth:** 22.5' - 24.0' **Sample No.:** 1034

◆**Loc.:** SA-11-16, SS-16 **Depth:** 37.5' - 39.0' **Sample No.:** 1034

TESTECH

Remarks:

●Date of Instructions: 11/07/11
Lab No.: 1034

■Date of Instructions: 11/07/11
Lab No.: 1034

▲Date of Instructions: 11/07/11
Lab No.: 1034

◆Date of Instructions: 11/07/11
Lab No.: 1034

Figure

TesTech, Inc.

ASTM D2216 - Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Lab No.: 1034
Project No.: MI051G
Date: 11/23/2011

Boring Number	Sample Number	Depth (ft)	Depth (m)	Moisture Content (%)	Comments
SA-11-01	SS-2	2.5 - 4.0	0.8 - 1.2	13.7	
SA-11-01	SS-3	5.0 - 6.5	1.5 - 2.0	13.1	
SA-11-01	ST	18.0 - 20.0	5.5 - 6.1	17.3	
SA-11-01	SS-17	40.0 - 41.5	12.2 - 12.6	18.2	
SA-11-02	SS-2	2.5 - 4.0	0.8 - 1.2	16.8	
SA-11-02	SS-5	10.0 - 11.5	3.0 - 3.5	15.4	
SA-11-02	ST	15.0 - 17.0	4.6 - 5.2	17.3	
SA-11-02	SS-11	25.0 - 26.5	7.6 - 8.1	17.7	
SA-11-03	ST	10.0 - 12.0	3.0 - 3.7	16.7	
SA-11-03	SS-6	12.5 - 14.0	3.8 - 4.3	13.3	
SA-11-03	SS-12	27.5 - 29.0	8.4 - 8.8	16.6	
SA-11-04	SS-2	2.5 - 4.0	0.8 - 1.2	15.0	
SA-11-04	SS-7	15.0 - 16.5	4.6 - 5.0	18.1	
SA-11-04	ST	20.0 - 22.0	6.1 - 6.7	17.4	
SA-11-04	SS-19	45.0 - 46.5	13.7 - 14.2	19.4	
SA-11-05	SS-2	2.5 - 4.0	0.8 - 1.2	9.7	
SA-11-05	SS-6	12.5 - 14.0	3.8 - 4.3	13.3	
SA-11-05	SS-11	25.0 - 26.5	7.6 - 8.1	18.4	
SA-11-05	SS-12	27.5 - 29.0	8.4 - 8.8	16.9	
SA-11-06	SS-7	15.0 - 16.5	4.6 - 5.0	16.7	
SA-11-06	ST	18.0 - 20.0	5.5 - 6.1	14.3	
SA-11-06	SS-11	25.0 - 26.5	7.6 - 8.1	10.6	
SA-11-06	SS-13	30.0 - 31.5	9.1 - 9.6	17.5	
SA-11-07	ST	5.0 - 7.0	1.5 - 2.1	18.6	
SA-11-07	SS-10	22.5 - 24.0	6.9 - 7.3	15.7	
SA-11-07	SS-14	32.5 - 34.0	9.9 - 10.4	16.9	
SA-11-07	SS-18	42.5 - 44.0	13.0 - 13.4	17.8	
SA-11-08	SS-3	5.0 - 6.5	1.5 - 2.0	16.9	
SA-11-08	ST	8.0 - 10.0	2.4 - 3.0	17.3	
SA-11-08	SS-7	15.0 - 17.0	4.6 - 5.0	17.5	
SA-11-08	SS-13	30.0 - 31.5	9.1 - 9.6	18.2	
SA-11-09	ST	5.0 - 7.0	1.5 - 2.1	18.8	

TesTech, Inc.

ASTM D2216 - Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass

Client: U.S. Army Corps of Engineers - Detroit District
Project: Sheboygan Harbor Airport Interim - Sheboygan Falls, WI

Lab No.: 1034
Project No.: MI051G
Date: 11/23/2011

Boring Number	Sample Number	Depth (ft)	Depth (m)	Moisture Content (%)	Comments
SA-11-09	SS-4	7.5 - 9.0	2.3 - 2.7	8.4	
SA-11-09	SS-8	17.5 - 19.0	5.3 - 5.8	13.0	
SA-11-09	SS-10	22.5 - 24.0	6.9 - 7.3	16.4	
SA-11-10	SS-2	2.5 - 4.0	0.8 - 1.2	16.7	
SA-11-10	ST	10.0 - 12.0	3.0 - 3.7	12.6	
SA-11-10	SS-9	20.0 - 21.5	6.1 - 6.6	15.8	
SA-11-10	SS-15	35.0 - 36.5	10.7 - 11.1	17.8	
SA-11-10	SS-18	42.5 - 44.0	13.0 - 13.4	18.6	
SA-11-11	SS-2	2.5 - 4.0	0.8 - 1.2	8.6	
SA-11-11	SS-6	12.5 - 14.0	3.8 - 4.3	17.9	
SA-11-11	SS-15	35.0 - 36.5	10.7 - 11.1	17.6	
SA-11-11	SS-16	37.5 - 39.0	11.4 - 11.9	18.8	
SA-11-12	ST	10.0 - 12.0	3.0 - 3.7	10.9	
SA-11-12	SS-7	15.0 - 16.5	4.6 - 5.0	12.8	
SA-11-12	SS-14	32.5 - 34.0	9.9 - 10.4	17.9	
SA-11-12	SS-20	47.5 - 49.0	14.5 - 14.9	19.8	
SA-11-13	SS-2	2.5 - 4.0	0.8 - 1.2	14.1	
SA-11-13	SS-8	17.5 - 19.0	5.3 - 5.8	11.5	
SA-11-13	SS-16	37.5 - 39.0	11.4 - 11.9	17.8	
SA-11-13	SS-17	40.0 - 41.5	12.2 - 12.6	17.9	
SA-11-14	SS-3	5.0 - 6.5	1.5 - 2.0	15.9	
SA-11-14	SS-9	20.0 - 21.5	6.1 - 6.6	17.4	
SA-11-14	SS-18	42.5 - 44.0	13.0 - 13.4	19.5	
SA-11-14	SS-20	47.5 - 49.0	14.5 - 14.9	18.5	
SA-11-15	SS-4	7.5 - 9.0	2.3 - 2.7	15.2	
SA-11-15	SS-9	20.0 - 21.5	6.1 - 6.6	17.6	
SA-11-15	SS-12	27.5 - 29.0	8.4 - 8.8	17.4	
SA-11-15	SS-19	45.0 - 46.5	13.7 - 14.2	19.3	
SA-11-16	SS-4	7.5 - 9.0	2.3 - 2.7	15.8	
SA-11-16	SS-5	10.0 - 11.5	3.0 - 3.5	16.7	
SA-11-16	SS-10	22.5 - 24.0	6.9 - 7.3	17.9	
SA-11-16	SS-16	37.5 - 39.0	11.4 - 11.9	16.8	

APPENDIX D

Field Data

Field Logs of Test Borings

Geotechnical Engineering & Environmental Services

TESTECH

Construction Testing & Inspection Services

Field Boring Log

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-01

Project No.: MEOSIG Project name: SHEBOYGAN COUNTY MEMORIAL AIRPORT
Drill Crew: AMOS-KING Drilling Method/Auger Size: 4.25 Rig No. CME 55 TRK Weather: COOL SUNNY
Date Started: 10/27/11 Date Completed: 10/27/11 Sealing/Backfilling Type: _____ Quantity: _____

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
0	1.5	VERY STIFF DRK BRN SILTY CLAY W/ SOME TOPSOIL AND ROCK FRAG.	#1	SS	0-1.5	6	6	8	—	0.8	4.5
			2	SS	2.5-4	5	9	10	—	1.4	4.5
2.5	4	"	3	SS	5-6.5	6	9	8	—	1.5	4.5
5	6.5	VERY STIFF DARK REDISH BRN SILTY CLAY W/ ROCK FRAG.	4	SS	7.5-9	6	12	14	—	1.5	4.5
			5	SS	10-11.5	7	11	14	—	1.5	4.5
7.5	9	HARD DARK BROWN SILTY CLAY W/ ROCK FRAG.	6	SS	12.5-14	5	7	10	—	1.5	3.0
			7	SS	15-17	5	7	10	—	0	—
10	11.5	"	8	ST	18-20	—	—	—	—	24"	—
12.5	14	VERY STIFF DRK BRN SILTY CLAY W/ ROCK FRAG.	9	SS	20-21.5	4	6	7	—	1.5	2.0
15	17	SHELBY TUBE (HIT A ROCK) (PARTIAL SAMPLE SPLIT BY ROCK)	10	SS	23.5-24	4	5	8	—	0.8	0.5
18	20	SHELBY TUBE (24" RECOVERY)									
20	21.5	VERY STIFF DARK BRN SILTY CLAY W/ ROCK FRAG									
22.5	24	VERY STIFF DARK BROWN SILTY CLAY W/ ROCK CLPS									

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay **Consistency**	Sand & Gravel **Rel. Density**	**Relative Proportions**
Very Soft 0-2 bpf	Very Loose <4 bpf	Trace < 5%
Soft 3-5 bpf	Loose 4-10 bpf	Few 5-10%
Medium Stiff 6-9 bpf	Medium Dense 11-30 bpf	Little 10-20%
Stiff 10-16 bpf	Dense 31-50 bpf	Some 20-35%
Very Stiff 17-30 bpf	Very Dense > 50 bpf	And 35-50%
Hard >30		

Drilling Method
HSA - Hollow Stem Augers
CFA – Continuous Flight Augers
DC – Drive Casting
MD – Mud Drilling
HA – Hand Augers

Sample Type
SS - Split Spoon
ST - Shelby Tube
CA – Continuous Auger
RC Rock Core
CU – Cuttings
CT – Continuous Tube

Total Boring Depth 49 **Rock Coring Feet** 0

Geotechnical Engineering & Environmental Services

TESTECH

Construction Testing & Inspection Services

Field Boring Log

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-01

Project No. M10S1G Project name: SHEBOYGAN COUNTY MEMORIAL AIRPORT
Drill Crew: KM/DS Drilling Method/Auger Size: 4.25 Rig No. CME55 TRK Weather: COOL, [redacted], SUNNY
Date Started: 10/27/11 Date Completed: 10/27/11 Sealing/Backfilling Type: Quantity:

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
25	26.5	VERY STIFF DARK BROWN SILTY CLAY W/ ROCK FRAG.	#11	SS	25-26.5	5	7	8	—	1.5	2.5
			12	SS	27.5-29	4	6	10	—	0.7	2.5
27.5	29	"									
			13	SS	30-31.5	7	9	9	—	1.5	2.5
30	31.5	"									
			14	SS	32.5-34	4	5	7	—	1.5	3.0
32.5	34	STIFF DRK BRN SILTY CLAY W/ ROCK FRAG.	15	SS	35-36.5	4	5	7	—	1.5	2.5
35	36.5	"	16	SS	37.5-39	4	5	8	—	1.5	2.0
37.5	39	VERY STIFF DARK BRN SILTY CLAY W/ ROCK FRAG.	17	SS	40-41.5	5	5	10	—	1.5	3.5
			18	SS	42.5-44	4	7	8	—	1.5	2.5
40	41.5	"									
			19	SS	45-46.5	5	7	9	—	1.5	3.0
42.5	44	"									
45	46.5	"	20	SS	47.5-49	4	8	11	—	1.5	
47.5	49										

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level
10/27/11	6:30	42.5	—	NO WATER

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay **Consistency**	Sand & Gravel **Rel. Density**	**Relative Proportions**
Very Soft 0-2 bpf	Very Loose <4 bpf	Trace < 5%
Soft 3-5 bpf	Loose 4-10 bpf	Few 5-10%
Medium Stiff 6-9 bpf	Medium Dense 11-30 bpf	Little 10-20%
Stiff 10-16 bpf	Dense 31-50 bpf	Some 20-35%
Very Stiff 17-30 bpf	Very Dense > 50 bpf	And 35-50%
Hard >30		

Drilling Method	**Sample Type**
HSA - Hollow Stem Augers	SS - Split Spoon
CFA – Continuous Flight Augers	ST - Shelby Tube
DC – Drive Casting	CA – Continuous Auger
MD – Mud Drilling	RC - Rock Core
HA – Hand Augers	CU – Cuttings
	CT – Continuous Tube

Total Boring Depth 49 **Rock Coring Feet** 0

Geotechnical Engineering & Environmental Services

TESTECH

Construction Testing & Inspection Services

Field Boring Log

TesTech Inc.
8534 Yonkee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-02

Project No.: MI0516 Project name:
Drill Crew: AM/DS Drilling Method/Auger Size: Rig No.: Weather: Partly 50°F
Date Started: 10/28/11 Date Completed: 10/28/11 Sealing/Backfilling Type: Quantity:

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
0	1.5	Brown silty clay, few rock fragments	1	SS	1.0	3	4	4		16	3.5
2.5	4.0	same	2		3.0	3	6	8		18	4.0
5.0	6.5	same	3		5.0	4	7	9		24	4.5
7.5	9.0	same	4		7.0	4	8	9		24	3.4
10.0	11.5	Brown silty clay fr 11.0 lt. brown silty clay, soft	5		11.0	4	7	8		18	2.0
12.5	14.0	brown silty clay, Rock fragment, lt. brown silty clay soft	6	↓	13.0	11	15	8		12	2.0
15.0	17.0		7	ST	15-17	—	—	—		22	—
17.5	19.0	lt. brown silty clay rock frag.	8	SS	18.5	4	6	7		6	1.5
20.0	21.5	same	9		21.5	7	10	11		4	1.0
22.5	24	same	10		23.0	5	7	9			1.0

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay Consistency	Sand & Gravel Rel. Density	Relative Proportions
Very Soft 0-2 bpf	Very Loose <4 bpf	Trace < 5%
Soft 3-5 bpf	Loose 4-10 bpf	Few 5-10%
Medium Stiff 6-9 bpf	Medium Dense 11-30 bpf	Little 10-20%
Stiff 10-16 bpf	Dense 31-50 bpf	Some 20-35%
Very Stiff 17-30 bpf	Very Dense > 50 bpf	And 35-50%
Hard >30		

Drilling Method	Sample Type
HSA - Hollow Stem Augers	SS - Split Spoon
CFA – Continuous Flight Augers	ST - Shelby Tube
DC - Drive Casting	CA – Continuous Auger
MD – Mud Drilling	RC – Rock Core
HA – Hand Augers	CU – Cuttings
	CT – Continuous Tube

Total Boring Depth _____ **Rock Coring Feet** _____

Geotechnical Engineering & Environmental Services

TESTECH

Construction Testing & Inspection Services

Field Boring Log

Boring Number SA-11-02

TesTech Inc.
8534 Yonkee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Project No.: MI051G Project name: _____
Drill Crew: AM/DS Drilling Method/Auger Size: _____ Rig No.: _____ Weather: _____
Date Started: 10/28/11 Date Completed: 10/28/11 Sealing/Backfilling Type: _____ Quantity: _____

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
25	26.5	Brown silty clay rock frags.	11	SS	25.5-26	3	3	6		24	2.0
27.5	29	Same	12		28-29	5	5	6		24	2.5
30.0	31.5	Same	13		30.5-31	3	4	6		24	2.5
32.5	34	Same	14		33-34	4	6	7		24	2.5
35	36.5	Same	15		35.5-36	4	6	7		24	3.0
37.5	39	Same	16		38-38.5	5	7	9		24	3.5
40	41.5	Same	17		40.5-41	4	6	9		24	3.5
42.5	44	Same	18		43-44	5	8	9		24	3.0
45	46.5	Same	19		45.5-46	4	7	10		24	3.25
47.5	49	Same	20		48.5-49	4	6	9		24	3.5

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay Consistency	Sand & Gravel Rel. Density	Relative Proportions
Very Soft 0-2 bpf	Very Loose <4 bpf	Trace < 5%
Soft 3-5 bpf	Loose 4-10 bpf	Few 5-10%
Medium Stiff 6-9 bpf	Medium Dense 11-30 bpf	Little 10-20%
Stiff 10-16 bpf	Dense 31-50 bpf	Some 20-35%
Very Stiff 17-30 bpf	Very Dense > 50 bpf	And 35-50%
Hard >30		

Drilling Method	Sample Type
HSA - Hollow Stem Augers	SS - Split Spoon
CFA – Continuous Flight Augers	ST - Shelby Tube
DC – Drive Casting	CA – Continuous Auger
MD – Mud Drilling	RC – Rock Core
HA – Hand Augers	CU – Cuttings
	CT – Continuous Tube

Total Boring Depth _____ **Rock Coring Feet** _____

Geotechnical Engineering & Environmental Services

TESTECH

Construction Testing & Inspection Services

Field Boring Log

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-03

Project No.: MT 0516 Project name: SIDNEY-SHELBY COUNTY MEMORIAL AIRPORT
Drill Crew: AM/DS - KING Drilling Method/Auger Size: 4.25 Rig No.: CME 55 Weather: CLOUDY, COOL, WINDY
Date Started: 10/27/11 Date Completed: 10/27/11 Sealing/Backfilling Type: _____ Quantity: _____

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
25	26.5	VERY STIFF BRN SICTY CLAY W ROCK FRAG.	#11	SS	25-26.5	4	6	8	—	1.4	—
"			12	SS	27.5-29	6	10	10	—	0.8	—
27.5	29	"	13	SS	30-31.5	5	6	9	—	1.5	2.0
30	31.5	"	14	SS	32.5-34	3	6	7	—	1.2	0.5
32.5	34	STIFF DRK BRN SICTY CLAY W/ ROCK FRAG.	15	SS	35-36.5	4	6	7	—	1.5	2.0
35	36.5	VERY STIFF DRK BRN SICTY CLAY W/ ROCK FRAG.	16	SS	37.5-39	4	6	9	—	1.5	2.0
37.5	39	"	17	SS	40-41.5	3	6	8	—	1.5	2.5
40	41.5	"	18	SS	42.5-44	4	6	9	—	1.5	3.0
42.5	44	"	19	SS	45-46.5	4	8	9	—	1.5	2.5
45	46.5	"	20	SS	47.5-49	20	38	30	—	0.4	1.0
47.5	49										

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level
10/27/11	3:20	47.5'	—	(NO WATER)
10/27/11	3:35	(PULLED)	43	41.1

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay Consistency
Very Soft 0-2 bpf
Soft 3-5 bpf
Medium Stiff 6-9 bpf
Stiff 10-16 bpf
Very Stiff 17-30 bpf
Hard >30

Sand & Gravel Rel. Density
Very Loose <4 bpf
Loose 4-10 bpf
Medium Dense 11-30 bpf
Dense 31-50 bpf
Very Dense > 50 bpf

Relative Proportions
Trace < 5%
Few 5-10%
Little 10-20%
Some 20-35%
And 35-50%

Drilling Method
HSA - Hollow Stem Augers
CFA – Continuous Flight Augers
DC – Drive Casting
MD – Mud Drilling
HA – Hand Augers

Sample Type
SS - Split Spoon
ST - Shelby Tube
CA – Continuous Auger
RC - Rock Core
CU – Cuttings
CT – Continuous Tube

Total Boring Depth 49' **Rock Coring Feet** 0

Geotechnical Engineering & Environmental Services

TESTECH

Construction Testing & Inspection Services

Field Boring Log

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-03

Project No.: MLOSIG Project name: SHEBOYGAN COUNTY MEMORIAL AIRPORT
Drill Crew: AM/DS - KING Drilling Method/Auger Size: 4.25 Rig No.: CME 55 TK Weather: COLD, RAIN, WINDY
Date Started: 10/27/11 Date Completed: 10/27/11 Sealing/Backfilling Type: Quantity:

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
0	1.5	VERY STIFF BRN SILTY CLAY W/ STRGRS AND ROCK FRAG.	#1	SS	0-1.5	5	6	8	–	1.3	4.0
			2	SS	2.5-4	6	9	9	–	1.5	4.0
2.5	4	VERY STIFF LT BRN SILTY CLAY W/ ROCK FRAG AND VERY THIN SAND LENS	3	SS	5-6.5	5	7	8	–	1.5	2.5
			4	ST	8-10	–	–	–	–	0	–
5	6.5	VERY STIFF REDISH BRN SILTY CLAY W/ ROCK FRAG.	5	ST	10-12	–	–	–	–	20"	–
			6	SS	12.5-14	3	3	5	–	1.5	1.0
8	10	SHELBY TUBE (NO RECOVERY)	7	SS	15-16.5	6	4	6	–	1.5	2.0
10	12	SHELBY TUBE (20" RECOVERED)	8	SS	17.5-19	4	4	6	–	1.5	1.5
12.5	14	STIFF BRN SILTY CLAY W/ ROCK FRAG.	9	SS	20-21.5	10	10	5	–	0.9	1.5
			10	SS	22.5-24	3	5	7	–	1.5	2.5
15	16.5	"									
17.5	19	STIFF BRN SILTY CLAY W/ ROCK FRAG + SOME TRACE SAND									
20	21.5	VERY STIFF BRN SILTY CLAY W/ ROCK FRAG.									
22.5	24	STIFF DRK BRN SILTY CLAY W/ ROCK FRAG.									

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay Consistency
Very Soft 0-2 bpf
Soft 3-5 bpf
Medium Stiff 6-9 bpf
Stiff 10-16 bpf
Very Stiff 17-30 bpf
Hard >30

Sand & Gravel Rel. Density
Very Loose <4 bpf
Loose 4-10 bpf
Medium Dense 11-30 bpf
Dense 31-50 bpf
Very Dense > 50 bpf

Relative Proportions
Trace < 5%
Few 5-10%
Little 10-20%
Some 20-35%
And 35-50%

Drilling Method
HSA - Hollow Stem Augers
CFA – Continuous Flight Augers
DC – Drive Casting
MD - Mud Drilling
HA – Hand Augers

Sample Type
SS - Split Spoon
ST - Shelby Tube
CA – Continuous Auger
RC – Rock Core
CU – Cuttings
CT – Continuous Tube

Total Boring Depth 49 **Rock Coring Feet** 0

Geotechnical Engineering & Environmental Services

TESTECH

Construction Testing & Inspection Services

Field Boring Log

Boring Number SA-11-04

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Project No.: M1051G Project name:
Drill Crew: AM/DS Drilling Method/Auger Size: Rig No.: Weather: Pt. Cldy ~50°F
Date Started: 10/28/11 Date Completed: 10/28/11 Sealing/Backfilling Type: Quantity:

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
0	1.5	Brown silty loam	1	SS	1.0	2	3	4		12	3.75
2.5	4	Brown, silty loam rock fragments	2		3-4	4	6	7		20	4.5
5	7		3	ST	-	-	-	-		22	—
7.5	9	Brown silty clay rock fragments	4	SS	8-8.5	5	6	9		18	4.5
10	11.5	Brown silty clay rock fragments, some sand @ 11.5	5		10.5-11.5	4	5	6		18	3.5
12.5	14	Brown silty clay tr. rock fragments	6		13-14	4	4	4		24	2.0
15	16.5	Brown silty clay few rocks	7		15.5-16.5	6	5	6		14	2.5
17.5	19		8	ST	-	-	-	-	Jar	<12	
20	22		9	ST	-	-	-			15	
22.5	24	Brown, silty clay rock	10	SS	-	5	5	7		15	1.5
25	26.5	Same	11			5	5	6		16	2.5

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay Consistency	Sand & Gravel Rel. Density	Relative Proportions
Very Soft 0-2 bpf	Very Loose <4 bpf	Trace < 5%
Soft 3-5 bpf	Loose 4-10 bpf	Few 5-10%
Medium Stiff 6-9 bpf	Medium Dense 11-30 bpf	Little 10-20%
Stiff 10-16 bpf	Dense 31-50 bpf	Some 20-35%
Very Stiff 17-30 bpf	Very Dense > 50 bpf	And 35-50%
Hard >30		

Drilling Method	Sample Type
HSA - Hollow Stem Augers	SS - Split Spoon
CFA – Continuous Flight Augers	ST - Shelby Tube
DC – Drive Casting	CA – Continuous Auger
MD – Mud Drilling	RC – Rock Core
HA – Hand Augers	CU – Cuttings
	CT – Continuous Tube

Total Boring Depth _____ **Rock Coring Feet** _____

Geotechnical Engineering & Environmental Services

TESTECH

Construction Testing & Inspection Services

Field Boring Log

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-04

Project No.: MI051 6 Project name:
Drill Crew: AM/DS Drilling Method/Auger Size: Rig No.: Weather: PC, Wy, ~45°F
Date Started: 10/28/11 Date Completed: 10/28/11 Sealing/Backfilling Type: Quantity:

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
27.5	29	Same	12	SS	28-29	5	7	7		18	3.5
30	31.5	same	13		30.5-31	4	6	7		24	3.0
32.5	34	Brown silty clay	14		33-34	5	6	8		24	3.5
35	36.5	same	15		35.5-36.5	5	7	10		20	3.25
37.5	39	Same	16		38-39	3	5	8		14	1.5
40	41.5	Same	17		40-41.5	4	5	8		12	3.0
42.5	44	Same	18		43-44	4	6	8		22	3.5
45	46.5	Same	19		45.5-46.5	4	7	7		24	3.5
47.5	49	Same	20		48-49	6	7	8		24	3.0

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay **Consistency**	Sand & Gravel **Rel. Density**	**Relative Proportions**
Very Soft 0-2 bpf	Very Loose <4 bpf	Trace < 5%
Soft 3-5 bpf	Loose 4-10 bpf	Few 5-10%
Medium Stiff 6-9 bpf	Medium Dense 11-30 bpf	Little 10-20%
Stiff 10-16 bpf	Dense 31-50 bpf	Some 20-35%
Very Stiff 17-30 bpf	Very Dense > 50 bpf	And 35-50%
Hard >30		

Drilling Method	**Sample Type**
HSA - Hollow Stem Augers	SS - Split Spoon
CFA – Continuous Flight Augers	ST - Shelby Tube
DC -- Drive Casting	CA -- Continuous Auger
MD – Mud Drilling	RC – Rock Core
HA - Hand Augers	CU – Cuttings
	CT – Continuous Tube

Total Boring Depth _____ **Rock Coring Feet** _____ **Page** ____ **of** ____

Geotechnical Engineering & Environmental Services

TESTECH

Construction Testing & Inspection Services

Field Boring Log

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-05

Project No.: MT 0516 Project name: SHEBOYGAN COUNTY MEMORIAL AIRPORT
Drill Crew: BM/DS-KING Drilling Method/Auger Size: 4.25 Rig No.: CME-55TK Weather: COOL, CLOUDY, 48
Date Started: 10/27/11 Date Completed: 10/27/11 Sealing/Backfilling Type: _____ Quantity: _____

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
0	1.5	VERY STIFF LITE BRN SILTY CLAY W/ ROCK FRAG. & TRACE SAND	#1	SS	0-1.5	6	7	7	—	1.3	4.5
			2	SS	2.5-4	6	5	6	—	1.2	3.5
2.5	4	VERY STIFF BRN SILTY CLAY W/ ROCK FRAG.	3	SS	5-6.5	5	6	7	—	1.4	3.0
			4	SS	7.5-9	6	6	7	—	1.3	0.5
5	6.5	"									
			5	ST	10-12	—	—	—	—	16"	—
7.5	9	"									
10	12	SHELBY TUBE (16" RECOVERY)	6	SS	12.5-14	5	6	8	—	0.4	3.5
			7	SS	15-16.5	3	4	5	—	1.5	1.5
12.5	14	VERY STIFF BRN SILTY CLAY W/ ROCK FRAG.	8	SS	17.5-19	4	5	5	—	1.5	1.0
15	16.5	STIFF DRK BRN SILTY CLAY W/ ROCK FRAG.	9	SS	20-21.5	2	3	5	—	1.5	1.0
			10	SS	22.5-24	14	7	7	—	1.5	3.0
17.5	19	"									
20	21.5	"									
22.5	24	VERY STIFF DRK BRN SILTY CLAY W/ ROCK FRAG.									

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay Consistency	Sand & Gravel Rel. Density	Relative Proportions
Very Soft 0-2 bpf	Very Loose <4 bpf	Trace < 5%
Soft 3-5 bpf	Loose 4-10 bpf	Few 5-10%
Medium Stiff 6-9 bpf	Medium Dense 11-30 bpf	Little 10-20%
Stiff 10-16 bpf	Dense 31-50 bpf	Some 20-35%
Very Stiff 17-30 bpf	Very Dense > 50 bpf	And 35-50%
Hard >30		

Drilling Method	Sample Type
HSA - Hollow Stem Augers	SS - Split Spoon
CFA – Continuous Flight Augers	ST - Shelby Tube
DC – Drive Casting	CA – Continuous Auger
MD – Mud Drilling	RC – Rock Core
HA – Hand Augers	CU – Cuttings
	CT – Continuous Tube

Total Boring Depth 49' **Rock Coring Feet** 0

Geotechnical Engineering & Environmental Services

TESTECH

Construction Testing & Inspection Services

Field Boring Log

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-05

Project No.: MI-051G Project name: SHEBOYGAN COUNTY MEMORIAL AIRPORT
Drill Crew: BM/DS-KMG Drilling Method/Auger Size: 4.25 Rig No.: CME 55 TRK Weather: COLD, RAINY, WINDY
Date Started: 10/27/11 Date Completed: 10/27/11 Sealing/Backfilling Type: Quantity:

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
25	26.5	WET VERY STIFF SILTY SANDY CLAY W/ ROCK FRAG AND THIN SAND LAYER (TOO THIN TO MEASURE)	#11	SS	25-26.5	15	8	10	—	1.5	2.0
			12	SS	27.5-29	4	6	8	—	1.5	2.5
			13	SS	30-31.5	4	7	8	—	1.5	3.0
27.5	29	WET VERY STIFF BRN SANDY SILTY CLAY W/ ROCK FRAG.	14	SS	32.5-34	5	6	9	—	1.5	4.0
			15	SS	35-36.5	5	8	10	-	1.5	3.5
30	31.5	"									
32.5	34	VERY STIFF BRN BRN SILTY CLAY W/ ROCK FRAG.	16	SS	37.5-39	5	8	10	-	1.5	3.5
			17	SS	40-41.5	6	7	8	-	1.5	3.0
35	36.5	"	18	SS	42.5-44	5	16	11	-	1.5	3.0
37.5	39	"	19	SS	45-46.5	6	9	11	-	1.5	2.5
40	41.5	"	20	SS	47.5-49	5	8	14	-	1.4	2.5
42.5	44	"									
45	46.5	VERY STIFF BRN SILTY CLAY W/ ROCK FRAG.									
47.5	49	"									

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level
10/27/11	11:25	—	41.4	(NO WATER)

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay Consistency	Sand & Gravel Rel. Density	Relative Proportions
Very Soft 0-2 bpf	Very Loose <4 bpf	Trace < 5%
Soft 3-5 bpf	Loose 4-10 bpf	Few 5-10%
Medium Stiff 6-9 bpf	Medium Dense 11-30 bpf	Little 10-20%
Stiff 10-16 bpf	Dense 31-50 bpf	Some 20-35%
Very Stiff 17-30 bpf	Very Dense > 50 bpf	And 35-50%
Hard >30		

Drilling Method	Sample Type
HSA - Hollow Stem Augers	SS - Split Spoon
CFA – Continuous Flight Augers	ST - Shelby Tube
DC - Drive Casting	CA – Continuous Auger
MD – Mud Drilling	RC - Rock Core
HA - Hand Augers	CU – Cuttings
	CT – Continuous Tube

Total Boring Depth 49 **Rock Coring Feet** 0

Geotechnical Engineering & Environmental Services

TES TECH

Construction Testing & Inspection Services

Field Boring Log

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-06

Project No.: MI0516 Project name: _____
Drill Crew: AM/DS Drilling Method/Auger Size: _____ Rig No.: _____ Weather: Partly ~50°F
Date Started: 10/29/11 Date Completed: 10/29/11 Sealing/Backfilling Type: _____ Quantity: ____

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
0	1.5	Brown silty clay tr rock frag. tr sand	1	SS		3	3	4		9	3.5
2.5	4	Same	2			7	7	9		20	4.0
5	6.5	Same	3			5	5	8		20	4.5
7.5	9	Same	4			5	6	7		20	3.0
10	11.5	same rock	5			7	7	8		-	-
12.5	14	Same rock	6			5	5	5		20	2.0
15	16.5	Same	7			3	4	5		24	2.0
17.5	19		8	ST		-	-	-		26	-
20	21.5	Brown silty clay 1" sand @ 21, tr rock frags at 15	9			4	4	6		24	3.0
22.5	24	Brown silty clay tr. sand, tr. rock frag	10			5	8	12		6	-

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay Consistency
Very Soft 0-2 bpf
Soft 3-5 bpf
Medium Stiff 6-9 bpf
Stiff 10-16 bpf
Very Stiff 17-30 bpf
Hard >30

Sand & Gravel Rel. Density
Very Loose <4 bpf
Loose 4-10 bpf
Medium Dense 11-30 bpf
Dense 31-50 bpf
Very Dense > 50 bpf

Relative Proportions
Trace < 5%
Few 5-10%
Little 10-20%
Some 20-35%
And 35-50%

Drilling Method
HSA - Hollow Stem Augers
CFA – Continuous Flight Augers
DC – Drive Casting
MD – Mud Drilling
HA – Hand Augers

Sample Type
SS - Split Spoon
ST - Shelby Tube
CA – Continuous Auger
RC – Rock Core
CU – Cuttings
CT – Continuous Tube

Total Boring Depth _____ **Rock Coring Feet** _____

Geotechnical Engineering & Environmental Services

TESTECH

Construction Testing & Inspection Services

Field Boring Log

Boring Number SA-11-06

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Project No.: MTOSIG Project name: _____
Drill Crew: AM/OS Drilling Method/Auger Size: _____ Rig No.: _____ Weather: Pt Cldy ~40°F
Date Started: 10/29/11 Date Completed: 10/29/11 Sealing/Backfilling Type: _____ Quantity: _____

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
25	26.5	Brown silty clay; Brown silty sand @ 26.1 rock	11	SS		4	8	9		20	2.5
27.5	29	Brown silty clay rock @ 28, Brown silty clay, tr sand	12			7	7	7		20	3.25
30	31.5	Brown silty clay, tr sand, tr rock frag	13			6	6	7		24	2.5
32.5	34	Same	14			7	8	9		24	4.0
35	36.5	Same	15			4	7	7		24	4.5
37.5	39	Same	16			3	6	8		24	4.0
40	41.5	Same	17			6	8	10		24	4.0
42.5	44	same (rock)	18			16	20	21		4	2.0
45	46.5	Same	19			5	6	10		20	3.0
47.5	49	Same	20			5	7	8		24	4.5

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay Consistency
Very Soft 0-2 bpf
Soft 3-5 bpf
Medium Stiff 6-9 bpf
Stiff 10-16 bpf
Very Stiff 17-30 bpf
Hard >30

Sand & Gravel Rel. Density
Very Loose <4 bpf
Loose 4-10 bpf
Medium Dense 11-30 bpf
Dense 31-50 bpf
Very Dense > 50 bpf

Relative Proportions
Trace < 5%
Few 5-10%
Little 10-20%
Some 20-35%
And 35-50%

Drilling Method
HSA - Hollow Stem Augers
CFA – Continuous Flight Augers
DC – Drive Casting
MD – Mud Drilling
HA – Hand Augers

Sample Type
SS - Split Spoon
ST - Shelby Tube
CA – Continuous Auger
RC – Rock Core
CU – Cuttings
CT – Continuous Tube

Total Boring Depth _____ **Rock Coring Feet** _____

Geotechnical Engineering & Environmental Services

TESTECH

Construction Testing & Inspection Services

Field Boring Log

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-07

Project No.: MT051G Project name: _____
Drill Crew: AM/DS Drilling Method/Auger Size: _____ Rig No.: _____ Weather: Pt. Cldy ~40°F
Date Started: 10/29/11 Date Completed: 10/29/11 Sealing/Backfilling Type: _____ Quantity: _____

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
0	1.5	Brown silty clay Rock frag	1	SS	1.0	3	3	3		14	2.5
2.5	4.0	lt. brown silty clay fr sand + rock frag	2		3.0	4	4	6		24	2.75
5.0	7.0		3	ST	–	–	–	–	–	27	–
7.5	9.0	Same	4	CU	8.0	4	6	6		N/A	–
10	11.5	Same	5	SS	10.5	5	7	8		12	2.0
12.5	14	Same	6		13.0	5	7	7		20	0.75
15	16.5	Same	7		15.5-16	4	4	5		20	2.5
17.5	19	Same	8		18-19	3	5	8		24	4.0
20	21.5	Same	9		20.5-21.5	5	7	8		12	3.5
22.5	24	Same	10		23.0	4	6	9		24	4.0

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay Consistency
Very Soft 0-2 bpf
Soft 3-5 bpf
Medium Stiff 6-9 bpf
Stiff 10-16 bpf
Very Stiff 17-30 bpf
Hard >30

Sand & Gravel Rel. Density
Very Loose <4 bpf
Loose 4-10 bpf
Medium Dense 11-30 bpf
Dense 31-50 bpf
Very Dense > 50 bpf

Relative Proportions
Trace < 5%
Few 5-10%
Little 10-20%
Some 20-35%
And 35-50%

Drilling Method
HSA - Hollow Stem Augers
CFA – Continuous Flight Augers
DC – Drive Casting
MD – Mud Drilling
HA – Hand Augers

Sample Type
SS - Split Spoon
ST - Shelby Tube
CA – Continuous Auger
RC – Rock Core
CU – Cuttings
CT – Continuous Tube

Total Boring Depth _____ **Rock Coring Feet** _____

Geotechnical Engineering & Environmental Services

TESTECH

Construction Testing & Inspection Services

Field Boring Log

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-07

Project No.: MT0516 Project name: _____
Drill Crew: AM/DS Drilling Method/Auger Size: _____ Rig No.: _____ Weather: PTCL, ~40°F
Date Started: 10/29/11 Date Completed: 10/29/11 Sealing/Backfilling Type: _____ Quantity: _____

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
25	26.5	Brown silty clay rock frags	11	SS	25.5-26	6	6	9		24	+.0
27.5	29	Same	12		29	8	12	14		9	1.0
30	31.5	SAME	13		30.5	9	7	7		24	4.0
32.5	34	Same rk @ bottom	14		34	11	14	16		10	1.5
35	36.5	Same rk in middle	15		35.5	6	8	10		14	4.0
37.5	39	Same	16		38	6	7	6		20	3.5
40	41.5	Same	17		40.5	7	7	7		20	4.0
42.5	44	Same	18		43	8	8	10		20	4.25
45	46.5	Same rock	19		46.5	11	20	24		2	2.0
47.5	49	Same rock/clay	20		48.5	7	8	7		24	4.5

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay Consistency
Very Soft 0-2 bpf
Soft 3-5 bpf
Medium Stiff 6-9 bpf
Stiff 10-16 bpf
Very Stiff 17-30 bpf
Hard >30

Sand & Gravel Rel. Density
Very Loose <4 bpf
Loose 4-10 bpf
Medium Dense 11-30 bpf
Dense 31-50 bpf
Very Dense > 50 bpf

Relative Proportions
Trace < 5%
Few 5-10%
Little 10-20%
Some 20-35%
And 35-50%

Drilling Method
HSA - Hollow Stem Augers
CFA – Continuous Flight Augers
DC – Drive Casting
MD – Mud Drilling
HA – Hand Augers

Sample Type
SS - Split Spoon
ST - Shelby Tube
CA – Continuous Auger
RC - Rock Core
CU – Cuttings
CT – Continuous Tube

Total Boring Depth _____ **Rock Coring Feet** _____

Geotechnical Engineering & Environmental Services

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Field Boring Log

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-08

Project No. MI0516 Project name: SHEBOYGAN COUNTY MEMORIAL AIRPORT
Drill Crew: AM/DS - KING Drilling Method/Auger Size: 4.25 Rig No. CME 55 TRK Weather: COOL, CLOUDY, WINDY
Date Started: 10/26/11 Date Completed: 10/26/11 Sealing/Backfilling Type: _____ Quantity: _____

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
25	26.5	STIFF DRK BRN SILTY CLAY W/ ROCK FRAG.	#11	SS	25-26.5	3	5	6	—	1.5	2.0
			12	SS	27.5-29	2	4	5	—	1.5	2.5
27.5	29	"									
			13	SS	30-31.5	6	6	8	—	1.5	2.0
30	31.5	VERY STIFF DRK BRN SILTY CLAY W/ ROCK FRAG.	14	SS	32.5-34	5	6	8	—	0.3	—
32.5	34	"	15	SS	35-36.5	8	7	8	—	1.5	3.0
35	36.5	"	16	SS	37.5-39	5	5	8	—	1.4	2.5
37.5	39	"	17	SS	40-41.5	5	7	11	—	1.0	1.0
40	41.5	"									
42.5	44	HARD DARK BRN SILTY CLAY W/ ROCK FRAG.	18	SS	42.5-44	12	13	14	—	1.5	1.0
			19	SS	45-46.5	11	17	14	—	0.5	0.5
45	46.5	"									
			20	SS	47.5-49	6	7	8	—		
47.5	49	VERY STIFF DARK BRN SILTY CLAY W/ ROCK FRAG.									

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level
10/26/11	5:15	47.5	[redacted]	(NO WATER)
10/27/11	6:00		46.8	44.5

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay Consistency	Sand & Gravel Rel. Density	Relative Proportions
Very Soft 0-2 bpf	Very Loose <4 bpf	Trace < 5%
Soft 3-5 bpf	Loose 4-10 bpf	Few 5-10%
Medium Stiff 6-9 bpf	Medium Dense 11-30 bpf	Little 10-20%
Stiff 10-16 bpf	Dense 31-50 bpf	Some 20-35%
Very Stiff 17-30 bpf	Very Dense > 50 bpf	And 35-50%
Hard >30		

Drilling Method	Sample Type
HSA - Hollow Stem Augers	SS - Split Spoon
CFA – Continuous Flight Augers	ST - Shelby Tube
DC – Drive Casting	CA – Continuous Auger
MD – Mud Drilling	RC – Rock Core
HA – Hand Augers	CU – Cuttings
	CT – Continuous Tube

Total Boring Depth 49' **Rock Coring Feet** 0

Geotechnical Engineering & Environmental Services

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Construction Testing & Inspection Services

Field Boring Log

TesTech Inc.
8534 Yonkee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-08

Project No.: MI 0516 Project name: SHEBOYGAN COUNTY MEMORIAL AIRPORT
Drill Crew: AM/DS Drilling Method/Auger Size: 4.25 Rig No. CME 55 TRK Weather: COLD, CLOUDY, WINDY
Date Started: 10/26/11 Date Completed: 10/26/11 Sealing/Backfilling Type: _____ Quantity: _____

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
0	1.5	STIFF BRN SILTY CLAY, STRONGLY W/ ROCK FRAG.	#1	SS	0-1.5	3	4	8	—	1.2	3.0
			2	SS	2.5-4	5	6	8	—	1.5	4.5
2.5	4	VERY STIFF REDISH BRN SILTY CLAY W/ ROCK FRAG. + GRAM STREAKS	3	SS	5-6.5	4	6	6	—	1.5	2.5
			4	ST	8-10	—	—	—	—	24"	—
5	6.5	STIFF REDISH BRN SILTY CLAY W/ ROCK FRAG. STRONGLY TO BE	5	SS	10-11.5	3	4	6	—	1.5	1.0
8	10		6	SS	12.5-14	3	3	4	—	1.5	1.5
10	11.5	"	7	SS	15-16.5	3	4	5	—	1.5	1.5
12.5	14	"	8	SS	17.5-19	3	5	6	—	0.3	—
15	16.5	"	9	SS	20-21.5	4	6	8	—	1.5	2.5
17.5	19	" (WET GRAVEL/ROCK)	10	SS	22.5-24	4	6	7	—	1.5	2.5
20	22.5	VERY STIFF BRN SILTY CLAY W/ ROCK FRAG.									
22.5	24	"									

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay Consistency	Sand & Gravel Rel. Density	Relative Proportions
Very Soft 0-2 bpf	Very Loose <4 bpf	Trace < 5%
Soft 3-5 bpf	Loose 4-10 bpf	Few 5-10%
Medium Stiff 6-9 bpf	Medium Dense 11-30 bpf	Little 10-20%
Stiff 10-16 bpf	Dense 31-50 bpf	Some 20-35%
Very Stiff 17-30 bpf	Very Dense > 50 bpf	And 35-50%
Hard >30		

Drilling Method	Sample Type
HSA - Hollow Stem Augers	SS - Split Spoon
CFA – Continuous Flight Augers	ST - Shelby Tube
DC – Drive Casting	CA – Continuous Auger
MD – Mud Drilling	RC - Rock Core
HA – Hand Augers	CU – Cuttings
	CT – Continuous Tube

Total Boring Depth 49 **Rock Coring Feet** 0 **Page** 1 **of** 2

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Construction Testing & Inspection Services

Field Boring Log

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-09

Project No.: MOSIG Project name: SHEBOYGAN COUNTY MEMORIAL AIRPORT
Drill Crew: AM/DS-KNG Drilling Method/Auger Size: 4.25 Rig No.: MESSTR Weather: COLD, WINDY, RAINY
Date Started: 10/26/11 Date Completed: 10/26/11 Sealing/Backfilling Type: _____ Quantity: _____

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
0	1.5	MED STIFF BRN SANDY SILTY CLAY W/ ROCK FRAG	#1	SS	0-1.5	3	3	3	—	1.4	2.5
2.5	4	VERY STIFF BRN SILTY CLAY W/ ROCK FRAG	2	SS	2.5-4	5	7	10	—	1.5	4.0
			3	ST	5-7	—	—	—	—	20"	—
5	7	SHELBY TUBE (PARTIALLY CRUSHED) (20" RECOVERY)	4	SS	7.5-9	5	12	17	—	1.4	4.0
			5	SS	10-11.5	6	8	10	—	1.4	3.5
7.5	9	HARD SILTY BRN CLAY W/ ROCK FRAG	6	SS	12.5-14	5	6	10	—	1.5	4.0
10	11.5	VERY STIFF DRK BRN SILTY CLAY W/ ROCK FRAG.	7	SS	15-16.5	5	7	9	—	1.5	4.0
			8	SS	17.5-19	7	11	11	—	1.5	3.0
12.5	14	"	9	SS	20-21.5	6	8	10	—	1.5	4.0
15	16.5	"									
17.5	19	"	10	SS	22.5-24	4	7	10	—	1.5	3.0
20	21.5	"									
22.5	24	"									

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay Consistency	Sand & Gravel Rel. Density	Relative Proportions
Very Soft 0-2 bpf	Very Loose <4 bpf	Trace < 5%
Soft 3-5 bpf	Loose 4-10 bpf	Few 5-10%
Medium Stiff 6-9 bpf	Medium Dense 11-30 bpf	Little 10-20%
Stiff 10-16 bpf	Dense 31-50 bpf	Some 20-35%
Very Stiff 17-30 bpf	Very Dense > 50 bpf	And 35-50%
Hard >30		

Drilling Method	Sample Type
HSA - Hollow Stem Augers	SS - Split Spoon
CFA – Continuous Flight Augers	ST - Shelby Tube
DC – Drive Casting	CA – Continuous Auger
MD – Mud Drilling	RC – Rock Core
HA – Hand Augers	CU – Cuttings
	CT – Continuous Tube

Total Boring Depth 49 **Rock Coring Feet** 0 **Page** 1 **of** 2

ATTN: FAX: 937-291-6549

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Construction Testing & Inspection Services

Field Boring Log

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-09

Project No.: 0110516 Project name: SHEBOYGAN COUNTY MEMORIAL AIRPORT
Drill Crew: AMATOS - KING Drilling Method/Auger Size: 4.25 Rig No. CHESSIE Weather: COLD, CLOUDY
Date Started: 10/26/11 Date Completed: 10/26/11 Sealing/Backfilling Type: _____ Quantity: ____

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
25	26.5	VERY STIFF BRN SILTY CLAY W/ ROCK FRAG.	#11	SS	25-26.5	5	7	12	-	1.5	3.0
			12	SS	27.5 29	4	6	9	-	1.5	3.5
27.5	29	"	13	SS	30-31.5	4	6	8	-	1.5	3.0
30	31.5	"	14	SS	32.5-34	4	6	8	-	1.5	2.5
32.5	34	"	15	SS	35-36.5	3	5	8	-	1.5	2.5
35	36.5	STIFF BRN SILTY CLAY W/ ROCK FRAG.	16	SS	37.5-38	4	6	10	-	1.5	2.0
37.5	39	VERY STIFF BRN SILTY CLAY W/ ROCK FRAG.	17	SS	40-41.5	4	6	10	-	1.5	1.5
			18	SS	42.5-44	4	6	9	-	1.5	3.0
40	41.5	"	19	SS	45-46.5	3	4	7	-	1.5	2.0
42.5	44	"	20	SS	47.5-49	4	7	9	-		
45	46.5	STIFF BRN SILTY CLAY W/ ROCK FRAG.									
47.5	49	VERY STIFF DRK BRN SILTY CLAY W/ ROCK FRAG.									

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level
10/26/11	1:45	47.5	42.1	(NO WATER)
10/27/11	6:50	—	41.8	39.8

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay Consistency
Very Soft 0-2 bpf
Soft 3-5 bpf
Medium Stiff 6-9 bpf
Stiff 10-16 bpf
Very Stiff 17-30 bpf
Hard >30

Sand & Gravel Rel. Density
Very Loose <4 bpf
Loose 4-10 bpf
Medium Dense 11-30 bpf
Dense 31-50 bpf
Very Dense > 50 bpf

Relative Proportions
Trace < 5%
Few 5-10%
Little 10-20%
Some 20-35%
And 35-50%

Drilling Method
HSA - Hollow Stem Augers
CFA – Continuous Flight Augers
DC – Drive Casting
MD – Mud Drilling
HA – Hand Augers

Sample Type
SS - Split Spoon
ST - Shelby Tube
CA – Continuous Auger
RC – Rock Core
CU – Cuttings
CT – Continuous Tube

Total Boring Depth 49 **Rock Coring Feet** 0

ATTN: GREG

937-291-6549

Geotechnical Engineering & Environmental Services

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Construction Testing & Inspection Services

Field Boring Log

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-10

Project No.: MLOSIG Project name: SHEBOYGAN COUNTY MEMORIAL AIRPORT
Drill Crew: AM/DS - KING Drilling Method/Auger Size: 4.25 Rig No.: CME55TRK Weather: COOL, CLOUDY, RAINY
Date Started: 10/25/11 Date Completed: 10/25/11 Sealing/Backfilling Type: _____ Quantity: _____

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
0	1.5	MED STIFF BRN SAND W/ CLAY AND SILT	#1	SS	0-1.5	2	3	3	–	1.2	–
			#2	SS	2.5-4	4	3	3	–	1.4	–
2.5	4	STIFF BRN SAND W/ SILT + CLAY	#3	SS	5-6.5	4	6	7	–	1.2	2.0
5	6.5	VERY STIFF LT BROWN SANDY SILTY CLAY W/ ROCK FRAG.	4	SS	7.5-9	6	6	8	–	1.4	3.5
			5	ST	10-12	–	–	–	–	2.0	–
7.5	9	VERY STIFF GRAY CLAY W/ TRACE SAND W/ ROCK FRAG.	6	SS	12.5-14	3	6	9	–	1.5	4.0
			7	SS	15-16.5	6	8	10	–	1.5	3.5
			8	SS	17.5-19	4	4	7	–	1.5	3.0
10	12	SPLIT SPOON (NO RECOVERY)	9	SS	20-21.5	4	4	7	–	1.5	2.5
12.5	14	VERY STIFF GRAYISH BRN SILTY CLAY W/ ROCK FRAG.	10	SS	22.5-24	3	6	8	–	1.5	
15	16.5	VERY STIFF BRN SILTY CLAY W/ ROCK FRAG.									
17.5	19	STIFF GRAYISH BRN SILTY CLAY W/ ROCK FRAG.									
20	21.5	"									
22.5	24	VERY STIFF BRN SILTY CLAY W/ ROCK FRAG.									

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay Consistency	Sand & Gravel Rel. Density	Relative Proportions
Very Soft 0-2 bpf	Very Loose <4 bpf	Trace < 5%
Soft 3-5 bpf	Loose 4-10 bpf	Few 5-10%
Medium Stiff 6-9 bpf	Medium Dense 11-30 bpf	Little 10-20%
Stiff 10-16 bpf	Dense 31-50 bpf	Some 20-35%
Very Stiff 17-30 bpf	Very Dense > 50 bpf	And 35-50%
Hard >30		

Drilling Method	Sample Type
HSA - Hollow Stem Augers	SS - Split Spoon
CFA – Continuous Flight Augers	ST - Shelby Tube
DC – Drive Casting	CA – Continuous Auger
MD – Mud Drilling	RC – Rock Core
HA – Hand Augers	CU – Cuttings
	CT – Continuous Tube

Total Boring Depth 49 **Rock Coring Feet** 0

Geotechnical Engineering & Environmental Services

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Construction Testing & Inspection Services

Field Boring Log

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-10

Project No.: MI0516 Project name: SHEBOYGAN COUNTY MEMORIAL AIRPORT
Drill Crew: AM/DS-KMB Drilling Method/Auger Size: 4.25 Rig No.: CME 55TRK Weather: COLD, WINDY
Date Started: 10/25/11 Date Completed: 10/25/11 Sealing/Backfilling Type: _____ Quantity: _____

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
25	26.5	STIFF DRK BRN SILTY CLAY W ROCK FRAG	#11	SS	25-26.5	3	5	8	—	1.5	3.0
			12	SS	27.5-29	3	4	7	—	1.5	3.5
27.5	29	STIFF DRK BRN SILTY CLAY W ROCK FRAG									
			13	SS	30-31.5	7	10	10	—	1.0	2.5
30	31.5	VERY STIFF DRK BRN SILTY CLAY W/ ROCK FRAG.	14	SS	32.5-34	6	10	11	—	0.8	—
			15	SS	35-36.5	4	7	10	—	1.5	3.0
32.5	34	"	16	SS	37.5-39	4	5	8	—	1.3	2.5
35	36.5	"	17	SS	40-41.5	7	8	39	—	1.5	2.5
37.5	39	"	18	SS	42.5-44	6	8	10	—	1.5	2.5
40	41.5	"	19	SS	45-46.5	4	8	11	—	0.9	2.5
42.5	44	"	20	SS	47.5-49	7	5	6	—	1.5	1.5
45	46.5	"									
47.5	49	"									

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level
10/25/11	6:40	37.5'	—	NO WATER
10/27/11	6:10		37.4	29.4

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay Consistency
Very Soft 0-2 bpf
Soft 3-5 bpf
Medium Stiff 6-9 bpf
Stiff 10-16 bpf
Very Stiff 17-30 bpf
Hard >30

Sand & Gravel Rel. Density
Very Loose <4 bpf
Loose 4-10 bpf
Medium Dense 11-30 bpf
Dense 31-50 bpf
Very Dense > 50 bpf

Relative Proportions
Trace < 5%
Few 5-10%
Little 10-20%
Some 20-35%
And 35-50%

Drilling Method
HSA - Hollow Stem Augers
CFA – Continuous Flight Augers
DC -- Drive Casting
MD – Mud Drilling
HA -- Hand Augers

Sample Type
SS - Split Spoon
ST - Shelby Tube
CA – Continuous Auger
RC – Rock Core
CU – Cuttings
CT – Continuous Tube

Total Boring Depth 49 **Rock Coring Feet** 0

Geotechnical Engineering & Environmental Services

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Construction Testing & Inspection Services

Field Boring Log

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-11

Project No.: M1051G Project name: SHEBOYGAN COUNTY MEMORIAL AIRPORT
Drill Crew: AMOS - KING Drilling Method/Auger Size: 4.25 Rig No. CME 55 TRK Weather: COOL, CLOUDY
Date Started: 10/ /11 Date Completed: _____ Sealing/Backfilling Type: _____ Quantity: _____

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
0	1.5	STIFF DRK BRN SILTY CLAY W/ ROCK FRAG.	#1	SS	0-1.5	3	4	5	—	1.1	2.0
						[illegible]	[illegible]	[illegible]	—	[illegible]	[illegible]
2.5	4	VERY STIFF BRN SANDY CLAY	2	SS	2.5-4	5	6	7	-	1.3	0.5
			3	SS	5-6.5	9	9	10	—	1.0	0.5
5	6.5	VERY STIFF BRN SANDY, SILTY, CLAY W/ ROCK FRAG.	4	SS	7.5-9	5	5	11	—	1.4	2.5
7.5	-9	VERY STIFF DARK BRN SILTY CLAY W/ ROCK FRAG.	5	ST	10-12	—	—	—	—	0	CRUSHED
			6	SS	12.5-14	12	4	4	—	1.4	1.5
10	12	SHELBY TUBE (CRUSHED)	7	SS	15-16.5	9	4	5	—	1.5	1.0
12.5	14	VERY STIFF DRK BRN SILTY CLAY W/ ROCK FRAG.	8	SS	17.5-19	14	5	6	—	1.5	1.5
15	16.5	"	9		20-21.5	8	5	6	—	1.2	1.5
17.5	19	"	10		22.5-24	5	5	7	—	1.5	2.0
20	21.5	"									
22.5	24	"									

BULK SAMPLE @ 15'-20'

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay **Consistency**	Sand & Gravel **Rel. Density**	**Relative Proportions**
Very Soft 0-2 bpf	Very Loose <4 bpf	Trace < 5%
Soft 3-5 bpf	Loose 4-10 bpf	Few 5-10%
Medium Stiff 6-9 bpf	Medium Dense 11-30 bpf	Little 10-20%
Stiff 10-16 bpf	Dense 31-50 bpf	Some 20-35%
Very Stiff 17-30 bpf	Very Dense > 50 bpf	And 35-50%
Hard >30		

Drilling Method	**Sample Type**
HSA - Hollow Stem Augers	SS - Split Spoon
CFA – Continuous Flight Augers	ST - Shelby Tube
DC – Drive Casting	CA – Continuous Auger
MD – Mud Drilling	RC – Rock Core
HA – Hand Augers	CU – Cuttings
	CT – Continuous Tube

Total Boring Depth 49 **Rock Coring Feet** 0

Geotechnical Engineering & Environmental Services

TESTECH

Construction Testing & Inspection Services

Field Boring Log

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-11

Project No.: MI.0516 Project name: SHEBOYGAN COUNTY MEMORIAL AIRPORT
Drill Crew: AM/DS: KING Drilling Method/Auger Size: 4.25 Rig No.: CMESSTRK Weather: COOL, CLOUDY
Date Started: 10/25/11 Date Completed: 10/25/11 Sealing/Backfilling Type: _____ Quantity: _____

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
25	26.5	HARD DRK BRN SILTY CLAY W/ ROCK FRAG.	#11	SS	25-26.5	18	7	7	—	1.4	2.0
			12	SS	27.5-29	22	22	7	-	1.2	3.0
27.5	29	"									
			13	SS	30-31.5	20	11	9	-	1.0	0.5
30	31.5	"									
			14	SS	32.5-34	9	7	9	-	0.8	—
32.5	34	VERY STIFF DRK BRN SILTY CLAY W/ ROCK FRAG.									
			15	SS	35-36.5	5	8	12	—	1.5	3.0
35	36.5	"									
			16	SS	37.5-39	5	6	8	-	1.5	2.0
37.5	39	"									
			17	SS	40-41.5	4	6	8	-	1.5	2.5
40	41.5	"									
			18	SS	42.5-44	4	6	8	-	1.5	2.5
42.5	44	"									
			19	SS	45-46.5	6	7	9	-	1.5	2.5
45	46.5	"									
			20	SS	47.5-49	3	5	5	—	1.5	1.5
47.5	49	STIFF									

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level
10/25/11	4:00	42.5'	—	NO WATER
10/26/11	5:45		44'	"

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay Consistency	Sand & Gravel Rel. Density	Relative Proportions
Very Soft 0-2 bpf	Very Loose <4 bpf	Trace < 5%
Soft 3-5 bpf	Loose 4-10 bpf	Few 5-10%
Medium Stiff 6-9 bpf	Medium Dense 11-30 bpf	Little 10-20%
Stiff 10-16 bpf	Dense 31-50 bpf	Some 20-35%
Very Stiff 17-30 bpf	Very Dense > 50 bpf	And 35-50%
Hard >30		

Drilling Method	Sample Type
HSA - Hollow Stem Augers	SS - Split Spoon
CFA – Continuous Flight Augers	ST - Shelby Tube
DC – Drive Casting	CA – Continuous Auger
MD – Mud Drilling	RC – Rock Core
HA – Hand Augers	CU – Cuttings
	CT – Continuous Tube

Total Boring Depth 49' **Rock Coring Feet** 0

Geotechnical Engineering & Environmental Services

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Construction Testing & Inspection Services

Field Boring Log

TesTech Inc.
8534 Yonkee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-12

Project No.: MT0516 Project name: SHEBOYGAN COUNTY MEMORIAL AIRPORT
Drill Crew: AM/DS-KING Drilling Method/Auger Size: 4.25 Rig No.: SME 55TRK Weather: COLD, RAIN, WIND
Date Started: 10/26/11 Date Completed: 10/26/11 Sealing/Backfilling Type: _____ Quantity: ____

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
25	26.5	VERY STIFF BRN SILTY CLAY W/ ROCK FRAG	#11	SS	25-26.5	4	6	8	—	1.5	2.5
			12	SS	27.5-29	3	6	7	—	1.5	2.0
27.5	29	STIFF BRN SILTY CLAY W/ ROCK FRAG.									
			13	SS	30-31.5	4	5	7	—	1.5	2.5
30	31.5	"									
			14	SS	32.5-34	3	5	6	—	1.5	2.5
32.5	34	"									
			15	SS	35-36.5	4	5	8	—	1.5	2.0
35	36.5	VERY STIFF BRN SILTY CLAY W/ ROCK FRAG.									
			16	SS	37.5-39	8	12	8	-	1.2	1.0
37.5	39	"									
			17	SS	40-41.5	5	6	9	-	1.5	2.5
40	41.5	"									
			18	SS	42.5-44	3	6	8	—	1.5	2.5
42.5	44	"									
			19	SS	45-46.5	3	6	8	—	1.5	2.5
45	46.5	"									
			20	SS	47.5-49	4	6	9	-	1.5	3.0
47.5	49										

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level
10/26/11	10:45	~~47.5'~~	—	(NO WATER)
10/27/11	6:		13.0	9.5'

CAVED TO 44'

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay Consistency	Sand & Gravel Rel. Density	Relative Proportions
Very Soft 0-2 bpf	Very Loose <4 bpf	Trace < 5%
Soft 3-5 bpf	Loose 4-10 bpf	Few 5-10%
Medium Stiff 6-9 bpf	Medium Dense 11-30 bpf	Little 10-20%
Stiff 10-16 bpf	Dense 31-50 bpf	Some 20-35%
Very Stiff 17-30 bpf	Very Dense > 50 bpf	And 35-50%
Hard >30		

Drilling Method	Sample Type
HSA - Hollow Stem Augers	SS - Split Spoon
CFA – Continuous Flight Augers	ST - Shelby Tube
DC – Drive Casting	CA – Continuous Auger
MD – Mud Drilling	RC - Rock Core
HA – Hand Augers	CU – Cuttings
	CT – Continuous Tube

Total Boring Depth 49 **Rock Coring Feet** 0 **Page** 2 **of** 2

Geotechnical Engineering & Environmental Services

TESTECH

Construction Testing & Inspection Services

Field Boring Log

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-12

Project No.: MOSIC Project name: SHEBOYGA COUNTY MEMORIAL AIRPORT
Drill Crew: AM/DS-KING Drilling Method/Auger Size: 4.25 Rig No.: CME 55 TRK Weather: COLD, RAIN, WINDY
Date Started: 10/26/11 Date Completed: 10/26/11 Sealing/Backfilling Type: _____ Quantity: _____

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
0	1.5	VERY STIFF DRK BRN SILTY CLAY W/ ROCK FRAG	#1	SS	0-1.5	4	6	8	—	1.2	4.0
			2	SS	2.5-4	5	6	7	—	1.4	2.5
2.5	4	VERY STIFF BRN SILTY CLAY W/ ROCK FRAG	3	SS	5-6.5	3	5	7	—	1.5	2.5
			4	SS	7.5-9	10	11	8	—	0.5	1.5
5	6.5	STIFF BRN SILTY CLAY W/ ROCK FRAG	5	ST	10-12	—	—	—	—	1.5'	—
7.5	9	VERY STIFF BRN SILTY CLAY W/ ROCK FRAG	6	SS	12.5-14	4	4	6	-	0.3	2.5
			7	SS	15-16.5	3	4	5	—	1.5	2.5
10	12	SHELBY TUBE (0" RECOVERY)	8	SS	17.5-19	5	7	7	—	0.2	—
12.5	14	STIFF BRN SILTY CLAY W/ ROCK FRAG	9	SS	20-21.5	5	6	6	—	1.5	2.0
15	16.5	STIFF GRAY BRN SILTY CLAY W/ ROCK FRAG.	10	SS	22.5-24	3	5	7	—	1.5	1.5
17.5	19	VERY STIFF GRAYISH BRN SILTY CLAY W/ ROCK FRAG									
20	21.5	VERY STIFF BRN SILTY CLAY W/ ROCK FRAG.									
22.5	24	STIFF BRN SILTY CLAY W/ ROCK FRAG.									

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay **Consistency**	Sand & Gravel **Rel. Density**	**Relative Proportions**
Very Soft 0-2 bpf	Very Loose <4 bpf	Trace < 5%
Soft 3-5 bpf	Loose 4-10 bpf	Few 5-10%
Medium Stiff 6-9 bpf	Medium Dense 11-30 bpf	Little 10-20%
Stiff 10-16 bpf	Dense 31-50 bpf	Some 20-35%
Very Stiff 17-30 bpf	Very Dense > 50 bpf	And 35-50%
Hard >30		

Drilling Method	**Sample Type**
HSA - Hollow Stem Augers	SS - Split Spoon
CFA – Continuous Flight Augers	ST - Shelby Tube
DC – Drive Casting	CA – Continuous Auger
MD – Mud Drilling	RC - Rock Core
HA – Hand Augers	CU – Cuttings
	CT – Continuous Tube

Total Boring Depth 49 **Rock Coring Feet** 0

Geotechnical Engineering & Environmental Services

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Construction Testing & Inspection Services

Field Boring Log

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-13

Project No.: MILOS/G Project name: SHEBOYGAN COUNTY MEMORIAL AIRPORT
Drill Crew: AMOS-KING Drilling Method/Auger Size: 4.25 Rig No. CME55TRK Weather: COOL, ECAY,
Date Started: 10/23/11 Date Completed: 10/23/11 Sealing/Backfilling Type: _____ Quantity: _____

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
0	1.5	STIFF REDISH BRN SILTY CLAY W/ ROCK FRAG.	1	SS	0-1.5	4	4	5	–	0.8	3.0
			2	SS	2.5-4	8	10	12	–	1.5	4.0
2.5	4	VERY STIFF REDISH BRN SILTY CLAY W/ ROCK FRAG.	3	SS	5-6.5	6	6	8	–	0.5	0.5
5	6.5	" (SAMPLE WAS SHORT BECAUSE OF ROCK FRAG)	4	SS	7.5-9	4	5	7	–	1.5	2.0
			5	SS	10-11.5	16	8	7	–	0.6	1.0
7.5	9	STIFF BRN SILTY CLAY W/ ROCK FRAG, TRACE SAND	6	SS	12.5-14	14	10	9	–	0.3	–
			7	SS	15-16.5	4	6	6	–	1.5	1.0
10	11.5	HARD BRN SILTY CLAY W/ ROCK	8	SS	17.5-19	5	5	7	–	1.5	2.0
12.5	14	WET BRN SANDY CLAY W/ ROCK FRAG.	9	SS	20-21.5	9	10	12	–	0.2	–
15	16.5	STIFF BRN SILTY CLAY W/ ROCK FRAG.	10	SS	22.5-24	3	4	6	–	1.5	1.5
17.5	19	VERY STIFF SILTY BROWN CLAY W/ ROCK FRAG & TRACE SAND									
20	21.5	HARD BRN SILTY CLAY W/ SOME GRAV, ROCK FRAG.									
22.5	24	STIFF DRK BRWN SILTY CLAY W/ ROCK FRAG.									

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level
10/23/11	1:15	12.5	—	HIT WET SAND LAYER
10/24/11	5:45	—		

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay **Consistency**	Sand & Gravel **Rel. Density**	**Relative Proportions**
Very Soft 0-2 bpf	Very Loose <4 bpf	Trace < 5%
Soft 3-5 bpf	Loose 4-10 bpf	Few 5-10%
Medium Stiff 6-9 bpf	Medium Dense 11-30 bpf	Little 10-20%
Stiff 10-16 bpf	Dense 31-50 bpf	Some 20-35%
Very Stiff 17-30 bpf	Very Dense > 50 bpf	And 35-50%
Hard >30		

Drilling Method	**Sample Type**
HSA - Hollow Stem Augers	SS - Split Spoon
CFA – Continuous Flight Augers	ST - Shelby Tube
DC – Drive Casting	CA – Continuous Auger
MD – Mud Drilling	RC – Rock Core
HA – Hand Augers	CU – Cuttings
	CT – Continuous Tube

Total Boring Depth _____ **Rock Coring Feet** _____

Geotechnical Engineering & Environmental Services

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Construction Testing & Inspection Services

Field Boring Log

Boring Number SA-11-13

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Project No.: MI0516 Project name: SHEBOYGAN COUNTY MEMORIAL AIRPORT
Drill Crew: AM/OS-SING Drilling Method/Auger Size: 4.25 Rig No.: CMES5TRK Weather: COOL, ROGGY
Date Started: 10/23/11 Date Completed: 10/23/11 Sealing/Backfilling Type: _____ Quantity: _____

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
25	26.5	VERY STIFF DRK BRN SILTY CLAY W/ ROCK FRAG.	11	SS	25-26.5	7	7	8	—	1.0	1.5
			12	SS	27.5-29	5	7	9	—	1.5	2.5
27.5	29	"	13	SS	30-31.5	7	5	8	—	1.5	2.0
30	31.5	"	14	SS	32.5-34	6	9	9	-	1.5	3.5
32.5	34	"	15	SS	35-36.5	5	6	10	—	1.5	1.5
35	36.5	"	16	SS	37.5-39	5	7	9	-	1.5	2.5
37.5	39	"	17	SS	40-41.5	9	10	14	-	1.5	1.5
40	41.5	HARD DRK BRN SILTY CLAY W/ ROCK FRAG.	18	SS	42.5-44	5	7	9	-	1.5	2.5
			19	SS	45-46.5	6	6	8	-	1.5	2.0
42.5	44	VERY STIFF DRK BRN SILTY CLAY W/ ROCK FRAG.	20	SS	47.5-49	5	8	11	-	1.5	3.0
45	46.5	"									
47.5	49	"									

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level
10/23	4:30	45		NO WATER
10/26	5:45	—	23'	22' DOWN

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay Consistency	Sand & Gravel Rel. Density	Relative Proportions
Very Soft 0-2 bpf	Very Loose <4 bpf	Trace < 5%
Soft 3-5 bpf	Loose 4-10 bpf	Few 5-10%
Medium Stiff 6-9 bpf	Medium Dense 11-30 bpf	Little 10-20%
Stiff 10-16 bpf	Dense 31-50 bpf	Some 20-35%
Very Stiff 17-30 bpf	Very Dense > 50 bpf	And 35-50%
Hard >30		

Drilling Method	Sample Type
HSA - Hollow Stem Augers	SS - Split Spoon
CFA – Continuous Flight Augers	ST - Shelby Tube
DC – Drive Casting	CA – Continuous Auger
MD – Mud Drilling	RC – Rock Core
HA – Hand Augers	CU – Cuttings
	CT – Continuous Tube

Total Boring Depth 49 **Rock Coring Feet** 0

Geotechnical Engineering & Environmental Services

TES TECH

Construction Testing & Inspection Services

Field Boring Log

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-14

Project No.: MI05I6 Project name: SHEBOYGAN COUNTY MEMORIAL AIRPORT
Drill Crew: AM/DS-KING Drilling Method/Auger Size: 4.25 Rig No.: CME55TRK Weather: CLEAR, WARM
Date Started: 10/22/11 Date Completed: 10/22/11 Sealing/Backfilling Type: _____ Quantity: _____
(PULLED CASING ON 10/23/11 & MEASURED WATER LEVEL)

From	To	Description
0	1.5	STIFF BRN SILTY CLAY W/ ROCK FRAG.
2.5	4	VERY STIFF BRN SILTY CLAY W/ TRC SAND
5	6.5	STIFF REDISH BRN SILTY CLAY W/ STREAKS OF GRAY & ROCK FRAG.
7.5	9	VERY STIFF BRN SILTY CLAY W/ TRACE SAND AND ROCK FRAG.
10	11.5	STIFF DRK BRN SILTY CLAY W/ ROCK FRAG.
12.5	14	"
15	16.5	"
17.5	19	"
20	21.5	"
22.5	24	"

Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
1	SS	0-1.5	3	4	4	-	1.2	3.0
2	SS	2.5-4	6	10	11	-	1.5	3.5
3	SS	5-6.5	3	6	7	-	1.3	3.5
4	SS	7.5-9	5	6	9	-	1.5	3.5
5	SS	10-11.5	2	3	6	-	1.5	2.5
6	SS	12.5-14	2	5	5	-	1.5	2.5
7	SS	15-16.5	3	4	5	-	1.5	2.0
8	SS	17.5-19	3	4	5	-	1.5	1.5
9	SS	20-21.5	4	3	5	-	1.5	1.0
10	SS	22.5-24	4	4	7	-	1.5	1.0

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level
10/23/11	12:15	—	34	22 FEET DRY

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay Consistency	Sand & Gravel Rel. Density	Relative Proportions
Very Soft 0-2 bpf	Very Loose <4 bpf	Trace < 5%
Soft 3-5 bpf	Loose 4-10 bpf	Few 5-10%
Medium Stiff 6-9 bpf	Medium Dense 11-30 bpf	Little 10-20%
Stiff 10-16 bpf	Dense 31-50 bpf	Some 20-35%
Very Stiff 17-30 bpf	Very Dense > 50 bpf	And 35-50%
Hard >30		

Drilling Method	Sample Type
HSA - Hollow Stem Augers	SS - Split Spoon
CFA – Continuous Flight Augers	ST - Shelby Tube
DC - Drive Casting	CA – Continuous Auger
MD – Mud Drilling	RC - Rock Core
HA – Hand Augers	CU – Cuttings
	CT – Continuous Tube

Total Boring Depth 49 **Rock Coring Feet** 0

Geotechnical Engineering & Environmental Services

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Construction Testing & Inspection Services

Field Boring Log

TesTech Inc.
8534 Yonkee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-14

Project No.: MILOSIG Project name: SHEBOYGAN COUNTY MEMORIAL AIRPORT
Drill Crew: AM/DR - KING Drilling Method/Auger Size: 4.25 Rig No.: CMESSTEK Weather: CLEAR COOL
Date Started: 10/22/11 Date Completed: 10/22/11 Sealing/Backfilling Type: _____ Quantity: _____

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
25	26.5	STIFF MOIST BRN SILTY CLAY W/ROCK FRAG	11	SS	25-26.5	3	5	7	–	0.5	0.5
27.5	29	STIFF DRK BRN SILTY CLAY W/ ROCK FRAG.	12	SS	27.5-29	6	4	6	–	1.5	2.0
			13	SS	30-31.5	7	10	11	–	0.5	0.0
30	31.5	WET BUT VERY STIFF BRN SILTY CLAY - ROCK?	14	SS	32.5-34	4	6	8	–	1.5	2.5
			15	SS	35-36.5	5	7	7	–	1.5	1.5
32.5	34	MOIST, VERY STIFF DRK BRN SILTY CLAY W/ ROCK FRAG	16	SS	37.5-39	5	14	7	–	1.3	1.5
			17	SS	40-41.5	4	5	7	–	1.5	1.5
35	36.5	WET, VERY STIFF DRK BRN SILTY CLAY W/ ROCK FRAG.	18	SS	42.5-44	4	4	7	–	1.5	2.0
			19	SS	45-46.5	4	6	7	–	1.5	2.5
37.5	39	WET, VERY STIFF DRK BRN SILTY CLAY	20	SS	47.5-49	4	8	8	–	1.5	2.0
40	41.5	WET, STIFF DRK BRN SILTY CLAY W/ROCK FRAG.									
42.5	44	WET, STIFF DRK BRN SILTY CLAY W/ ROCK FRAG									
45	46.5	WET, VERY STIFF DRK BRN SILTY CLAY W/ ROCK FRAG									
47.5	49										

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level
10/22/11	6:35	30'	—	HIT WATER @ ±30'
10/26/11	5:45	—	42'	21' DOWN

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay Consistency	Sand & Gravel Rel. Density	Relative Proportions
Very Soft 0-2 bpf	Very Loose <4 bpf	Trace < 5%
Soft 3-5 bpf	Loose 4-10 bpf	Few 5-10%
Medium Stiff 6-9 bpf	Medium Dense 11-30 bpf	Little 10-20%
Stiff 10-16 bpf	Dense 31-50 bpf	Some 20-35%
Very Stiff 17-30 bpf	Very Dense > 50 bpf	And 35-50%
Hard >30		

Drilling Method	Sample Type
HSA - Hollow Stem Augers	SS - Split Spoon
CFA – Continuous Flight Augers	ST - Shelby Tube
DC – Drive Casting	CA – Continuous Auger
MD – Mud Drilling	RC – Rock Core
HA – Hand Augers	CU – Cuttings
	CT – Continuous Tube

Total Boring Depth 49' **Rock Coring Feet** 0

Geotechnical Engineering & Environmental Services

TESTECH

Construction Testing & Inspection Services

Field Boring Log

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-15

Project No.: MIOS1G Project name: SHEBOYGAN COUNTY MEMORIAL AIRPORT
Drill Crew: AM/DS Drilling Method/Auger Size: 4.25 Rig No.: CME55TRK Weather: COLD, CLOUDY
Date Started: 11/21/11 Date Completed: 11/22/11 Sealing/Backfilling Type: _____ Quantity: _____

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
0	1.5	STIFF REDISH BROWN CLAY W/ ROCK FRAG.	1	SS	0-1.5	3	6	5		1.5	3.5
2.5	4	VERY STIFF REDISH BROWN SILTY CLAY W/ LITTLE SAND	2	SS	2.5-4	6	9	10		1.5	3.0
5	6.5	VERY STIFF REDISH BROWN CLAY W/ ROCK FRAG.	3	SS	5-6.5	5	9	8		1.3	3.5
			4	SS	7.5-9	4	7	9		1.5	4.0
7.5	9	"	5	SS	10-11.5	4	6	7		1.5	3.0
10	11.5	"									
12.5	14	STIFF BROWN CLAY W/ ROCK FRAG	6	SS	12.5-14	4	3	5		1.5	1.5
15	16.5	"	7	SS	15-16.5	4	4	5		1.5	1.5
17.5	19	VERY STIFF BROWN CLAY W/ ROCK FRAG.	8	SS	17.5-19	8	7	9		1.5	1.5
20	21.5	STIFF BROWN CLAY W/SMALL ROCK FRAG.	9	SS	20-21.5	3	3	4		1.5	1.5
			10	SS	22.5-24	3	4	6		1.5	1.75
22.5	24	"									

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay **Consistency**	Sand & Gravel **Rel. Density**	**Relative Proportions**
Very Soft 0-2 bpf	Very Loose <4 bpf	Trace < 5%
Soft 3-5 bpf	Loose 4-10 bpf	Few 5-10%
Medium Stiff 6-9 bpf	Medium Dense 11-30 bpf	Little 10-20%
Stiff 10-16 bpf	Dense 31-50 bpf	Some 20-35%
Very Stiff 17-30 bpf	Very Dense > 50 bpf	And 35-50%
Hard >30		

Drilling Method	**Sample Type**
HSA - Hollow Stem Augers	SS - Split Spoon
CFA – Continuous Flight Augers	ST - Shelby Tube
DC - Drive Casting	CA – Continuous Auger
MD – Mud Drilling	RC - Rock Core
HA – Hand Augers	CU – Cuttings
	CT – Continuous Tube

Total Boring Depth _____ **Rock Coring Feet** _____

Geotechnical Engineering & Environmental Services

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Construction Testing & Inspection Services

Field Boring Log

Boring Number SA-11-15

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Project No.: M1051G Project name: SHEBOYGAN COUNTY MEMORIAL AIRPORT
Drill Crew: AW/OS/KW6 Drilling Method/Auger Size: 4.25 Rig No.: CME 55 TRK Weather: CLEAR WARM ON 22ND
Date Started: 10/21/11 (22/11) Date Completed: 10/22/0 Sealing/Backfilling Type: _____ Quantity: _____

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
25	26.5	VERY STIFF BRN CLAY W/ TRACE SAND + ROCK FRAG.	11	SS	25-26.5	9	9	9	—	1.0	1.5
			12	SS	27.5-29	5	7	8	—	1.5	2.0
27.5	29	VERY STIFF BRN CLAY W/ ROCK FRAG	13	SS	30-31.5	5	6	7	—	1.5	2.5
30	31.5	VERY STIFF BRN CLAY W/ TRACE SAND + ROCK FRAG.	14	SS	32.5-34	3	5	8	—	1.5	2.0
10/22/4 32.5	34	STIFF BROWN CLAY W/ ROCK FRAG.	15	SS	35-36.5	3	5	6	—	1.5	2.5
			16	SS	37.5-39	7	8	8	—	1.5	2.5
35	36.5	"	17	SS	40-41.5	5	7	8	—	1.5	3.0
37.5	39	VERY STIFF DRK BRN CLAY W/ ROCK FRAG.	18	SS	42.5-44	18	14	13	—	0.2	—
40	41.5	"	19	SS	45-46.5	5	9	7	—	1.4	2.5
42.5	44	WET HARD BROWN CLAY W/ ROCK (DRIVE ROCK)	20	SS	47.5-49	4	5	6	—	1.4	2.5
45	46.5	VERY MOIST, VERY STIFF BRN CLAY W/ ROCK FRAG.									
47.5	49	MOIST, STIFF DRK BROWN CLAY W/ ROCK FRAG.									

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level
10/22/11	5:00	40	—	HIT WATER @ (42.5±)
10/23/11	5:00	—	43	NO WATER

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay Consistency
Very Soft 0-2 bpf
Soft 3-5 bpf
Medium Stiff 6-9 bpf
Stiff 10-16 bpf
Very Stiff 17-30 bpf
Hard >30

Sand & Gravel Rel. Density
Very Loose <4 bpf
Loose 4-10 bpf
Medium Dense 11-30 bpf
Dense 31-50 bpf
Very Dense > 50 bpf

Relative Proportions
Trace < 5%
Few 5-10%
Little 10-20%
Some 20-35%
And 35-50%

Drilling Method
HSA - Hollow Stem Augers
CFA – Continuous Flight Augers
DC – Drive Casting
MD – Mud Drilling
HA – Hand Augers

Sample Type
SS - Split Spoon
ST - Shelby Tube
CA – Continuous Auger
RC – Rock Core
CU – Cuttings
CT – Continuous Tube

Total Boring Depth 49 **Rock Coring Feet** 0

Geotechnical Engineering & Environmental Services

TESTECH

Construction Testing & Inspection Services

Field Boring Log

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-16

Project No.: MT051G Project name: SHEBOYGAN COUNTY MEMORIAL AIRPORT
Drill Crew: AM/DS-KNL Drilling Method/Auger Size: 4.25 Rig No. CME 55 TRK Weather: COLD, WINDY, RAINY
Date Started: 10/20/11 Date Completed: 10/20/11 Sealing/Backfilling Type: _____ Quantity: _____

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
0	1.5	STIFF RED CLAY W/ ROCK	1	SS	0-1.5	2	4	5		1.3'	3.5
2.5	4	V STIFF RED CLAY	2	SS	2.5-4	5	9	12		1.4	3.5
5	6.5	V STIFF RED SILTY SANDY CLAY	3	SS	5-6.5	4	6	8		1.6	4.0
7.5	9	V STIFF RED SDY, SILTY CLAY	4	SS	7.5-9	6	7	9		1.5	3.0
10	11.5	STIFF REDISH BRN SILTY CLAY	5	SS	10-11.5	2	4	5		1.5	2.5
12.5	14	V STIFF BRN SILTY CLAY W/ ROCK	6	SS	12.5-14	3	8	7		0.8	1.5
15	16.5	BRN WET SILTY CLAY W/SAND	7	SS	15-16.5	4	4	4		1.5	2.0
17.5	19	STIFF RED BRN SILTY CLAY	8	SS	17.5-19	3	6	7		1.5	3.0
20	21.5	STIFF RED BRN SILTY CLAY W/ GRAVEL	9	SS	20-21.5	3	5	8		1.6	3.0
			10	SS	22.5-24	5	6	10		1.5	3.0
22.5	24	BRN SILTY CLAY W/ ROCK FRAG. V STIFF MOIST									

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level
10/20/11	2:15	47.5	—	0 AT COMPLETION

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay Consistency	Sand & Gravel Rel. Density	Relative Proportions
Very Soft 0-2 bpf	Very Loose <4 bpf	Trace < 5%
Soft 3-5 bpf	Loose 4-10 bpf	Few 5-10%
Medium Stiff 6-9 bpf	Medium Dense 11-30 bpf	Little 10-20%
Stiff 10-16 bpf	Dense 31-50 bpf	Some 20-35%
Very Stiff 17-30 bpf	Very Dense > 50 bpf	And 35-50%
Hard >30		

Drilling Method	Sample Type
HSA - Hollow Stem Augers	SS - Split Spoon
CFA – Continuous Flight Augers	ST - Shelby Tube
DC – Drive Casting	CA – Continuous Auger
MD – Mud Drilling	RC - Rock Core
HA – Hand Augers	CU – Cuttings
	CT – Continuous Tube

Total Boring Depth _____ **Rock Coring Feet** _____

Geotechnical Engineering & Environmental Services

TESTECH

Construction Testing & Inspection Services

Field Boring Log

TesTech Inc.
8534 Yankee St., Dayton, Ohio 45458
Tel) 937-435-3200, Fax)937-291-6549

Boring Number SA-11-16

Project No.: MI0519 Project name: SHEBOYGAN COUNTY MEMORIAL AIRPORT
Drill Crew: ANDS-KING Drilling Method/Auger Size: 4.25 Rig No. CME 55 LK Weather: COLD, WIND & RAINY
Date Started: 10/20/11 Date Completed: 10/20/11 Sealing/Backfilling Type: _____ Quantity: ____

From	To	Description	Sample No.	Type	Sample Depth	1st-6"	2nd-6"	3rd-6"	4th-6"	Recovery	Pocket Pen
25	26.5	BRN SILTY CLAY VERY STIFF	11	SS	25-26.5	5	7	9		1.5	3.0
27.5	29	STIFF SILTY BRN CLAY	12	SS	27.5-29	3	6	7		1.5	3.0
30	31.5	VERY STIFF BRN SILTY CLAY W/ ROCK FRAG.	13	SS	30-31.5	6	7	8		1.5	3.0
			14	SS	32.5-34	19	50/5	—		0.8	1.5
32.5	34	HARD BROWN SILTY CLAY W/ ROCK FRAG.	15	SS	36-36.5	9	50/5	—		0.5	1.25
35	36.5	HARD BROWN SILTY CLAY W/ ROCK FRAG	16	SS	37.5-39	26	50/5	—		0.5	1.0
			17	SS	40-41.5	42	27	10		1.0	2.0
37.5	39	HARD BROWN SILTY CLAY W/ ROCK FRAG	18	SS	42.5-44	18	8	9		1.3	2.0
40	41.5	HARD BROWN SILTY CLAY W/ ROCK FRAG.	19	SS	45-46.5	3	7	9		1.5	1.5
			20	SS	47.5-49	28	34	62			
42.5	44	HARD BROWN SILTY CLAY W ROCK FRAG.									
45	46.5	VER STIFF BRN SILTY CLAY W/ ROCK FRAG + THIN MOIST LAYER IN MIDDLE									
47.5	49	HARD									

Groundwater Observations

Date	Time	Casing Depth	Cave-in Depth	Water Level
10/21/11	7:30	47.5	—	1.5' (CASING IN HOLE)

Legend: N/A: Not applicable bpf: Blows per foot

Silt & Clay Consistency	Sand & Gravel Rel. Density	Relative Proportions
Very Soft 0-2 bpf	Very Loose <4 bpf	Trace < 5%
Soft 3-5 bpf	Loose 4-10 bpf	Few 5-10%
Medium Stiff 6-9 bpf	Medium Dense 11-30 bpf	Little 10-20%
Stiff 10-16 bpf	Dense 31-50 bpf	Some 20-35%
Very Stiff 17-30 bpf	Very Dense > 50 bpf	And 35-50%
Hard >30		

Drilling Method	Sample Type
HSA - Hollow Stem Augers	SS - Split Spoon
CFA – Continuous Flight Augers	ST - Shelby Tube
DC – Drive Casting	CA – Continuous Auger
MD – Mud Drilling	RC – Rock Core
HA – Hand Augers	CU – Cuttings
	CT – Continuous Tube

Total Boring Depth 49.5' **Rock Coring Feet** 0 **Page** 2 **of** 2