GEOTECHNICAL DATA REPORT

CUY-90-6.69 (PID 76779)
Lakewood, Ohio

SME Project Number: 092062.18
April 29, 2024

9375 Chillicothe Road
Kirtland, OH 44094-8501

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www.sme-usa.com

April 29, 2024

Mr. Kyle J. Dohlen, PE
Transportation Engineer
Planning and Engineering
ODOT District 12
5500 Transportation Boulevard
Garfield Heights, Ohio 44125

Via E-Mail: Kyle.Dohlen@dot.ohio.gov

RE: CUY-90-6.69
VAR-District 12/District 3 Subs Inv for Pvmt & Bridges
Lakewood, Ohio
PID No. 110950
Task D-12-17

Dear Mr. Dohlen:

The attached data report presents the results of our geotechnical exploration for CUY-90-6.69 in Lakewood, Ohio.

If you have questions, please feel free to call.

Sincerely,

SME

Brendan P. Lieske, PE
Senior Consultant/Project Manager

Enclosure: Geotechnical Data Report, Dated April 29, 2024

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1. INTRODUCTION

This data report presents the results of our geotechnical exploration for the CUY-90-6.69 project in Lakewood, Ohio. Existing subsurface conditions were evaluated by performing a Standard Penetration Test (SPT) boring at one location, designated B-001-0-24. The boring was located within the inside shoulder of I-90 eastbound, between the Hilliard Road and McKinley Avenue overpasses. This exploration was performed in general accordance with the current ODOT Specifications for Geotechnical Explorations and ODOT's Request for Proposal, emailed to SME on April 23, 2024. The samples were taken to our Kirtland laboratory for visual classification and laboratory testing. No recommendations were requested from ODOT at this time.

2. EXPLORATION

SME visited the site on April 26, 2024, to perform our field exploration. Subsurface conditions were identified by a field exploration program consisting of one SPT boring, designated B-001-0-24, which was advanced to a depth of 26.5 feet below the pavement surface. Drilling equipment consisted of a CME-55 truck rig with a CME auto hammer having an energy transfer ratio of 77 percent based on our August 5, 2022, calibration. The field-measured blow counts are corrected to N_{60} based on the transfer energy of the hammer system. Both the field-measured blow counts for each six-inch penetration interval and the energy-corrected blow counts in blows per foot are reported on the boring log.

SME checked the borehole for the presence of groundwater during drilling; however, a groundwater level at completion of drilling could not be obtained due to the water added as part of the rock coring process. The borehole was backfilled with bentonite chips and the surface was patched with asphalt cold patch. The approximate boring location is shown on the attached *Boring Location Diagram*. The before and after photographs of the boring location are shown in Figures 1 and 2.

FIGURES NO. 1 & 2: Before and After Photographs of B-001-0-24

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Soil and rock samples were taken to our laboratory where they were visually classified in accordance with the ODOT-modified AASHTO procedure. Laboratory testing consisted of water contents and hand penetrometer tests of the soil samples and three uniaxial compressive strength tests of the rock core samples.

3. FINDINGS

At the surface of B-001-0-24, we encountered 4 inches of asphalt over 12 inches of concrete pavement. Below the pavement, we encountered hard gray sandy silt (A-4a) to a depth of 3.7 feet below the pavement surface. Shale was encountered from 3.7 feet to the termination depth of 26.5 feet. The shale was classified as unweathered, slightly strong, thinly laminated bedding, highly to moderately fractured, tight, slickensided, laminated/sheared, and fair surface condition. The RQDs ranged from 34% to 93%, improving with depth. The uniaxial compressive strength tests ranged from approximately 1,800 to 2,900 psi.

4. SIGNATURES

PREPARED BY:

Brendan P. Lieske, PE
Senior Consultant

REVIEWED BY:

Thomas P. Olding, PE
Project Engineer

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APPENDIX A

ODOT BORING LOG TERMINOLOGY
ODOT ROCK CORE TERMINOLOGY
BORING LOCATION DIAGRAM
BORING LOG
ROCK CORE LOG

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1) STRENGTH OF SOIL:

Non-Cohesive (granular) Soils - Compactness	
Description	**Blows Per Ft.**
Very Loose	≤ 4
Loose	5 – 10
Medium Dense	11 – 30
Dense	31 – 50
Very Dense	> 50

2) COLOR :

If a color is a uniform color throughout, the term is single, modified by an adjective such as light or dark. If the predominate color is shaded by a secondary color, the secondary color procedes the primary color. If two major and distinct colors are swirled throughout the soil, the colors are modified by the term "mottled"

3) PRIMARY COMPONENT

Use **DESCRIPTION** from ODOT Soil Classification Chart on Back

Cohesive (fine grained) Soils - Consistency

Description	Qu (TSF)	Blows Per Ft.	Hand Manipulation
Very Soft	<0.25	<2	Easily penetrates 2" by fist
Soft	0.25-0.5	2 - 4	Easily penetrates 2" by thumb
Medium Stiff	0.5-1.0	5 - 8	Penetrates by thumb with moderate effort
Stiff	1.0-2.0	9 - 15	Readily indents by thumb, but not penetrate
Very Stiff	2.0-4.0	16 - 30	Readily indents by thumbnail
Hard	>4.0	>30	Indent with difficulty by thumbnail

4) COMPONENT MODIFIERS:

Description	Percentage By Weight
Trace	0% - 10%
Little	10% - 20%
Some	20% - 35%
"And"	35% -50%

5) Soil Organic Content

Description	% by Weight
Slightly Organic	2% - 4%
Moderately Organic	4% - 10%
Highly Organic	> 10%

6) Relative Visual Moisture

Description	Criteria	
	Cohesive Soil	**Non-cohesive Soils**
Dry	Powdery; Cannot be rolled; Water content well below the plastic limit	No moisture present
Damp	Leaves very little moisture when pressed between fingers; Crumbles at or before rolled to $^1/_8$"; Water content below plastic limit	Internal moisture, but no to little surface moisture
Moist	Leaves small amounts of moisture when pressed between fingers; Rolled to $^1/_8$" or smaller before crumbling; Water content above plastic limit to -3% of the liquid limit	Free water on surface, moist (shiny) appearance
Wet	Very mushy; Rolled multiple times to $^1/_8$" or smaller before crumbles; Near or above the liquid limit	Voids filled with free water, can be poured from split spoon.

CLASSIFICATION OF SOILS

Ohio Department of Transportation

(The classification of a soil is found by proceeding from top to bottom of the chart.
The first classification that the test data fits is the correct classification.)

SYMBOL	DESCRIPTION	Classifcation AASHTO	Classifcation OHIO	LL_O/LL x 100*	% Pass #40	% Pass #200	Liquid Limit (LL)	Plastic Index (PI)	Group Index Max.	REMARKS
	Gravel and/or Stone Fragments	A-1-a			30 Max.	15 Max.		6 Max.	0	Min. of 50% combined gravel, cobble and boulder sizes
	Gravel and/or Stone Fragments with Sand	A-1-b			50 Max.	25 Max.		6 Max.	0	
F.S.	Fine Sand	A-3			51 Min.	10 Max.	NON-PLASTIC		0	
	Coarse and Fine Sand	--	A-3a			35 Max.		6 Max.	0	Min. of 50% combined coarse and fine sand sizes
	Gravel and/or Stone Fragments with Sand and Silt	A-2-4				35 Max.	40 Max.	10 Max.	0	
		A-2-5					41 Min.			
	Gravel and/or Stone Fragments with Sand, Silt and Clay	A-2-6				35 Max.	40 Max.	11 Min.	4	
		A-2-7					41 Min.			
	Sandy Silt	A-4	A-4a	76 Min.		36 Min.	40 Max.	10 Max.	8	Less than 50% silt sizes
	Silt	A-4	A-4b	76 Min.		50 Min.	40 Max.	10 Max.	8	50% or more silt sizes
	Elastic Silt and Clay	A-5		76 Min.		36 Min.	41 Min.	10 Max.	12	
	Silt and Clay	A-6	A-6a	76 Min.		36 Min.	40 Max.	11 - 15	10	
	Silty Clay	A-6	A-6b	76 Min.		36 Min.	40 Max.	16 Min.	16	
	Elastic Clay	A-7-5		76 Min.		36 Min.	41 Min.	≤LL-30	20	
	Clay	A-7-6		76 Min.		36 Min.	41 Min.	>LL-30	20	
	Organic Silt	A-8	A-8a	75 Max.		36 Min.				W/o organics would classify as A-4a or A-4b
	Organic Clay	A-8	A-8b	75 Max.		36 Min.				W/o organics would classify as A-5, A-6a, A-6b, A-7-5 or A-7-6

MATERIAL CLASSIFIED BY VISUAL INSPECTION

Sod and Topsoil

Pavement or Base

Uncontrolled Fill (Describe)

Bouldery Zone

P Peat

* Only perform the oven-dried liquid limit test and this calculation if organic material is present in the sample.

APPENDIX A.2 – ODOT Quick Reference Guide for Rock Description

1: ROCK TYPE: Common rock types are: Claystone; Coal; Dolomite; Limestone; Sandstone; Siltstone; & Shale.

2: COLOR: To be determined when rock is wet. When using the GSA Color charts use only Name, not code.

3: WEATHERING

Description	Field Parameter
Unweathered	No evidence of any chemical or mechanical alternation of the rock mass. Mineral crystals have a bright appearance with no discoloration. Fractures show little or no staining on surfaces.
Slightly weathered	Slight discoloration of the rock surface with minor alterations along discontinuities. Less than 10% of the rock volume presents alteration.
Moderately weathered	Portions of the rock mass are discolored as evident by a dull appearance. Surfaces may have a pitted appearance with weathering "halos" evident. Isolated zones of varying rock strengths due to alteration may be present. 10 to 15% of the rock volume presents alterations.
Highly weathered	Entire rock mass appears discolored and dull. Some pockets of slightly too moderately weathered rock may be present and some areas of severely weathered materials may be present.
Severely weathered	Majority of the rock mass reduced to a soil-like state with relic rock structure discernable. Zones of more resistant rock may be present, but the material can generally be molded and crumbled by hand pressures.

4: TEXTURE

Component		Grain Diameter
Boulder		>12"
Cobble		3"-12"
Gravel		0.08"-3"
Sand	Coarse	0.02"-0.08"
	Medium	0.01"-0.02"
	Fine	0.005"-0.01"
	Very Fine	0.003"-0.005"

5: RELATIVE STRENGTH

Description	Field Parameter
Very Weak	Core can be carved with a knife and scratched by fingernail. Can be excavated readily with a point of a pick. Pieces 1 inch or more in thickness can be broken by finger pressure.
Weak	Core can be grooved or gouged readily by a knife or pick. Can be excavated in small fragments by moderate blows of a pick point. Small, thin pieces can be broken by finger pressure.
Slightly Strong	Core can be grooved or gouged 0.05 inch deep by firm pressure of a knife or pick point. Can be excavated in small chips to pieces about 1-inch maximum size by hard blows of the point of a geologist's pick.
Moderately Strong	Core can be scratched with a knife or pick. Grooves or gouges to ¼" deep can be excavated by hand blows of a geologist's pick. Requires moderate hammer blows to detach hand specimen.
Strong	Core can be scratched with a knife or pick only with difficulty. Requires hard hammer blows to detach hand specimen. Sharp and resistant edges are present on hand specimen.
Very Strong	Core cannot be scratched by a knife or sharp pick. Breaking of hand specimens requires hard repeated blows of the geologist hammer.
Extremely strong	Core cannot be scratched by a knife or sharp pick. Chipping of hand specimens requires hard repeated blows of the geologist hammer.

6: BEDDING

Description	Thickness
Very Thick	>36"
Thick	18" – 36"
Medium	10" – 18"
Thin	2" – 10"
Very Thin	0.4" – 2"
Laminated	0.1" – 0.4"
Thinly Laminated	<0.1"

7: DESCRIPTORS

Arenaceous – sandy	Argillaceous - clayey	Brecciated – contains angular to subangular gravel
Calcareous - contains calcium carbonate	Carbonaceous - contains carbon	Cherty- contains chert fragments
Conglomeritic - contains rounded to subrounded gravel	Crystalline – contains crystalline structure	Dolomitic- contains calcium/magnesium carbonate
Ferriferous – contains iron	Fissile – thin planner partings	Fossiliferous – contains fossils
Friable – easily broken down	Micaceous – contains mica	Pyritic – contains pyrite
Siliceous – contains silica	Stylolitic – contain stylotites (suture like structure)	Vuggy – contains openings

APPENDIX A.2 – ODOT Quick Reference Guide for Rock Description

8: Discontinuities

a: Discontinuity Types

Type	Parameters
Fault	Fracture which expresses displacement parallel to the surface that does not result in a polished surface.
Joint	Planar fracture that does not express displacement. Generally occurs at regularly spaced intervals.
Shear	Fracture which expresses displacement parallel to the surface that results in polished surfaces or slickensides.
Bedding	A surface produced along a bedding plane.
Contact	A surface produced along a contact plane. (generally not seen in Ohio)

b: Degree of Fracturing

Description	Spacing
Unfractured	> 10 ft.
Intact	3 ft. – 10 ft.
Slightly fractured	1 ft. – 3 ft.
Moderately fractured	4 in. – 12 in.
Fractured	2 in. – 4 in.
Highly fractured	< 2 in.

c: Aperture Width

Description	Spacing
Open	> 0.2 in.
Narrow	0.05 in. - 0.2 in.
Tight	<0.05 in.

d: Surface Roughness

Description	Criteria
Very Rough	Near vertical steps and ridges occur on the discontinuity surface.
Slightly Rough	Asperities on the discontinuity surface are distinguishable and can be felt.
Slickensided	Surface has a smooth, glassy finish with visual evidence of striation.

11: Recovery

$Run\ \text{Recov}ery = \left(\frac{R_R}{L_R}\right) * 100$	$Unit\ \text{Recov}ery = \left(\frac{R_U}{L_U}\right) * 100$
L_R = Run Length R_R – Run Recovery	L_U = Rock Unit Length R_U – Rock Unit Recovery

9: GSI Description

a: Structure

Description	Parameters
Intact or Massive	Intact rock with few widely spaced discontinuities
Blocky	Well interlocked undisturbed rock mass consisting of cubical blocks formed by three interesting discontinuity sets
Very Blocky	Interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets
Blocky/Disturbed/ Seamy	Angular blocks formed by many intersecting discontinuity sets, Persistence of bedding planes
Disintegrated	Poorly interlocked, heavily broken rock mass with mixture of angular and rounded rock pieces
Laminated/Sheared	Lack of blockiness due to close spacing of weak shear planes

b: Surface Condition

Description	Parameters
Very Good	Very rough, fresh unweathered surfaces
Good	Rough, slightly weathered, iron stained surface
Fair	Smooth, moderately weathered and altered surfaces
Poor	Slickensided, highly weathered surface with compact coatings or fillings or angular fragments
Very Poor	Slickensided, highly weathered surfaces with soft clay coating or fillings

10: RQD

$$RQD = \left(\frac{\sum Length\ of\ Pieces > 4inches}{Total\ Length\ of\ Core}\right) * 100$$

$$RQD = \left(\frac{25+33+20+12}{120}\right) * 100 = 75\%$$

Table 600.10. Strength of Bedrock

Description	Field Parameters	Range of Unconfined Compressive Strength	
		psi (ksf)	MPa
Extremely Strong	Cannot be scratched by a knife or sharp pick. Chipping of hand specimens requires hard repeated blows of the geologist hammer.	Greater than 30,000 (> 4320)	Greater than 200
Very Strong	Cannot be scratched by a knife or sharp pick. Breaking of hand specimens requires hard repeated blows of the geologist hammer.	15,000 to 30,000 (2160 to 4320)	100 to 200
Strong	Can be scratched with a knife or pick only with difficulty. Requires hard hammer blows to detach hand specimen. Sharp and resistant edges are present on hand specimen.	7500 to 15,000 (1080 to 2160)	50 to 100
Moderately Strong	Can be scratched with a knife or pick. Grooves or gouges to ¼" (6mm) deep can be excavated by hand blows of a geologist's pick. Requires moderate hammer blows to detach hand specimen.	3600 to 7500 (520 to 1080)	25 to 50
Slightly Strong	Can be grooved or gouged 0.05 inch (2 mm) deep by firm pressure of a knife or pick point. Can be excavated in small chips to pieces about 1-inch (25 mm) maximum size by hard blows of the point of a geologist's pick.	1500 to 3600 (215 to 520)	10 to 25
Weak	Can be grooved or gouged readily by a knife or pick. Can be excavated in small fragments by moderate blows of a pick point. Small, thin pieces can be broken by finger pressure.	750 to 1500 (108 to 215)	5 to 10
Very Weak	Can be carved with a knife. Can be excavated readily with a point of a pick. Pieces 1 inch (25 mm) or more in thickness can be broken by finger pressure. Can be scratched by fingernail.	40 to 750 (6 to 108)	0.3 to 5

LOCATION MAP

NOT TO SCALE

N W E S

LEGEND

APPROXIMATE BORING LOCATION

NOTE:
1. AERIAL IMAGE TAKEN FROM GOOGLE EARTH PRO WITH AN IMAGE DATE OF 09-05-2023.

0' 100' 200'

GRAPHIC SCALE: 1" = 100'

N W E S

No.	Revision Date		
		Date	04-29-2024
		Drawn By	CRC
		Designed By	BPL
		Scale	AS NOTED
		Project	092062.18

BORING LOCATION DIAGRAM
CUY-90-6.69
LAKEWOOD, OHIO

SME

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Figure No. 1

Apr 29, 2024 - 12:26pm - cindy.rocha-ceron \\sme-inc\pz\WIP\092062.18\CAD\Design Files\BLD\Rev0\092062.18-BLD.dwg

PROJECT: CUY-90-6.69	DRILLING FIRM / OPERATOR: SME / RM/ EP	DRILL RIG: CME 55 TRUCK	STATION / OFFSET: 597+88, 9' RT.
TYPE: ROADWAY	SAMPLING FIRM / LOGGER: SME / BAM	HAMMER: CME AUTOMATIC	ALIGNMENT:
PID: 76779 SFN:	DRILLING METHOD: 3.75" HSA	CALIBRATION DATE: 6/22/23	ELEVATION: 712.3 (MSL) EOB: 26.5 ft.
START: 4/24/24 END: 4/24/24	SAMPLING METHOD: SPT / NQ2	ENERGY RATIO (%): 77	LAT / LONG: 41.471109, -81.817677

EXPLORATION ID B-001-0-24

PAGE 1 OF 1

MATERIAL DESCRIPTION AND NOTES	ELEV. 712.3	DEPTHS	SPT/ RQD	N_{60}	REC (%)	SAMPLE ID	HP (tsf)	GRADATION (%) GR	CS	FS	SI	CL	ATTERBERG LL	PL	PI	WC	ODOT CLASS (GI)	HOLE SEALED
4" ASPHALT DRILLER'S DESCRIPTION	712.0																	
12" CONCRETE DRILLER'S DESCRIPTION	711.0																	
HARD, GRAY, **SANDY SILT**, TRACE GRAVEL, TRACE SHALE FRAGMENTS, DAMP	708.6	1 2	8 10 9	24	56	SS-1	4.50	-	-	-	-	-	-	-	-	9	A-4a (V)	
SHALE, GRAY, SLIGHTLY STRONG.	705.8	3 4 5 6	50/3"	-	100	SS-2A SS-2B	4.50 -	- -	- -	- -	- -	- -	- -	- -	- -	13 -	A-4a (V) Rock (V)	
SHALE, GRAY, UNWEATHERED, SLIGHTLY STRONG, THIN, LAMINATED, MODERATELY TO HIGHLY FRACTURED, TIGHT, SLICKENSIDED, LAMINATED/SHEARED, FAIR; RQD 34%, REC 92.5%. @ 10.5-10.9 feet Qu=1,840 psi	695.8	7 8 9 10 11 12 13 14 15 16	30		-	NQ2-3											CORE	
SHALE, GRAY, UNWEATHERED, SLIGHTLY STRONG, THIN, LAMINATED, MODERATELY FRACTURED, TIGHT, SLICKENSIDED, LAMINATED/SHEARED, FAIR; RQD 93%, REC 100%. @17.0-17.4 feet Qu=1,740 psi @22.5-22.9 feet Qu=2,890 psi	685.8	17 18 19 20 21 22 23 24 25 26 EOB	81		-	NQ2-4											CORE	

NOTES: NONE

ABANDONMENT METHODS, MATERIALS, QUANTITIES: PLACED ASPHALT PATCH; BACKFILLED WITH BENTONITE CHIPS

STANDARD ODOT SOIL BORING LOG (8.5 X 11) - OH DOT.GDT - 4/29/24 17:32 - W:\092062.18\PROJECT DATA\GINT\092062.18_CUY-90-6.69.GPJ

CUY-90-6.69

I-90 Eastbound, Lakewood, OH

SME PROJECT #: 092062.18

April 29, 2024

B-001-0-24

Run #:	Depth		RQD		Recovery	
NQ2-3	6.5’	16.5’	41/120	34%	111/120	92.5%

CUY-90-6.69

CUY-90-6.69

I-90 Eastbound, Lakewood, OH

SME PROJECT #: 092062.18

April 29, 2024

B-001-0-24

Run #:	Depth		RQD		Recovery	
NQ2-4	16.5’	26.5’	112/120	93%	120/120	100%

CUY-90-6.69

9375 CHILLICOTHE ROAD, KIRTLAND, OH 44094
PHONE: 440-256-6500 FAX: 440-256-6507

Compressive Strength of Intact Rock Core Specimens

ASTM D7012

PROJECT	CUY-90-6.69
LOCATION	Lakewood, OH.
DATE	April 29, 2024
PROJECT #	092062.18
CLIENT	

SAMPLE	**1**	**2**	**3**
SAMPLE LOCATION	B-001; 10.5'	B-001; 17'	B-001; 22.5'
DATE TESTED	April 29, 2024	April 29, 2024	April 29, 2024
SAMPLE DESCRIPTION	SHALE	SHALE	SHALE
CAPPED LENGTH, in	4.19	4.32	4.42
DIAMETER, in	1.97	1.95	1.97
AREA, sq. in.	3.04	2.99	3.05
WEIGHT, gr	497.60	501.10	533.00
WET DENSITY, pcf	148.7	148.0	150.8
LOAD AT FAILURE, lbs.	5,600	5,200	8,800
GROSS UNIT STRESS, psi	1,841	1,741	2,887
LENGTH/DIAMETER RATIO	2.1	2.2	2.2
UNIT STRESS CORRECTED, psi	**1,840**	**1,740**	**2,890**
MOISTURE CONDITION WHEN TESTED	MOIST	MOIST	MOIST

REMARKS:
Samples tested do not meet the requirements for sample preparation per ASTM D4543

APPENDIX B
GENERAL COMMENTS

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GENERAL COMMENTS

BASIS OF GEOTECHNICAL REPORT

This report has been prepared in accordance with generally accepted geotechnical engineering practices to assist in the design and/or evaluation of this project. If the project plans, design criteria, and other project information referenced in this report and utilized by SME to prepare our recommendations are changed, the conclusions and recommendations contained in this report are not considered valid unless the changes are reviewed, and the conclusions and recommendations of this report are modified or approved in writing by our office.

The discussions and recommendations submitted in this report are based on the available project information, described in this report, and the geotechnical data obtained from the field exploration at the locations indicated in the report. Variations in the soil and groundwater conditions commonly occur between or away from sampling locations. The nature and extent of the variations may not become evident until the time of construction. If significant variations are observed during construction, SME should be contacted to reevaluate the recommendations of this report. SME should be retained to continue our services through construction to observe and evaluate the actual subsurface conditions relative to the recommendations made in this report.

In the process of obtaining and testing samples and preparing this report, procedures are followed that represent reasonable and accepted practice in the field of soil and foundation engineering. Specifically, field logs are prepared during the field exploration that describe field occurrences, sampling locations, and other information. Samples obtained in the field are frequently subjected to additional testing and reclassification in the laboratory and differences may exist between the field logs and the report logs. The engineer preparing the report reviews the field logs, laboratory classifications, and test data and then prepares the report logs. Our recommendations are based on the contents of the report logs and the information contained therein.

REVIEW OF DESIGN DETAILS, PLANS, AND SPECIFICATIONS

SME should be retained to review the design details, project plans, and specifications to verify those documents are consistent with the recommendations contained in this report.

REVIEW OF REPORT INFORMATION WITH PROJECT TEAM

Implementation of our recommendations may affect the design, construction, and performance of the proposed improvements, along with the potential inherent risks involved with the proposed construction. The client and key members of the design team, including SME, should discuss the issues covered in this report so that the issues are understood and applied in a manner consistent with the owner's budget, tolerance of risk, and expectations for performance and maintenance.

FIELD VERIFICATION OF GEOTECHNICAL CONDITIONS

SME should be retained to verify the recommendations of this report are properly implemented during construction. This may avoid misinterpretation of our recommendations by other parties and will allow us to review and modify our recommendations if variations in the site subsurface conditions are encountered.

PROJECT INFORMATION FOR CONTRACTOR

This report and any future addenda or other reports regarding this site should be made available to prospective contractors prior to submitting their proposals for their information only and to supply them with facts relative to the subsurface evaluation and laboratory test results. If the selected contractor encounters subsurface conditions during construction, which differ from those presented in this report, the contractor should promptly describe the nature and extent of the differing conditions in writing and SME should be notified so that we can verify those conditions. The construction contract should include provisions for dealing with differing conditions and contingency funds should be reserved for potential problems during earthwork and foundation construction. We would be pleased to assist you in developing the contract provisions based on our experience.

The contractor should be prepared to handle environmental conditions encountered at this site, which may affect the excavation, removal, or disposal of soil; dewatering of excavations; and health and safety of workers. Any Environmental Assessment reports prepared for this site should be made available for review by bidders and the successful contractor.

THIRD PARTY RELIANCE/REUSE OF THIS REPORT

This report has been prepared solely for the use of our Client for the project specifically described in this report. This report cannot be relied upon by other parties not involved in the project, unless specifically allowed by SME in writing. SME also is not responsible for the interpretation by other parties of the geotechnical data and the recommendations provided herein.