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Exhibit AA. Kitchco Ryans Way Preliminary Geotechnical Engineering Report

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Kitchco Ryans Way
Preliminary Geotechnical Engineering Report

ECS Southeast, LLP

Geotechnical Engineering Report

Kitcho Ryans Way – Webster Parish, LA

Industrial Drive and Ryans Way
Minden, Louisiana

ECS Project Number 65-1120

January 6, 2022

January 6, 2022

Ms. Liz Pierre
North Louisiana Economic Partnership
1816 North 18th Street
Suite 501
Monroe, Louisiana 71210

ECS Project No. 65-1120

Reference: Preliminary Geotechnical Site Characterization Report
Kitcho Ryans Way
Industrial Drive and Ryan's Way
Minden, LA 71055

Dear Ms. Pierre:

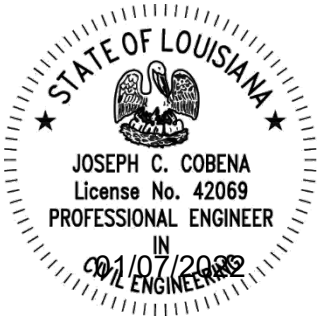
ECS Southeast, LLP (ECS) has completed the subsurface exploration, laboratory testing, and geotechnical engineering analyses for the referenced project. Our services were performed in general accordance with our Proposal No. 65-1240-P dated June 28th, 2021. ***This report is not a comprehensive geotechnical engineering report but is solely intended to address specific preliminary issues posed in a June 23, 2021, document from CSRS relative to this site. It must be emphasized that additional borings and testing will be required prior to development of the site.*** This report presents our understanding of the geotechnical aspects of the project along with the results of the field exploration and laboratory testing conducted. The report also contains our findings and recommendations for design and construction.

It has been our pleasure to be of service to the North Louisiana Economic Partnership during the design phase of this project. We would appreciate the opportunity to remain involved during the continuation of the design phase, and we would like to provide our services during construction phase operations as well to verify the assumptions of subsurface conditions made for this report. Should you have any questions concerning the information contained in this report, or if we can be of further assistance to you, please contact us.

Respectfully,
ECS SOUTHEAST, LLP

Nathan Burke, E.I.
Project Manager

Joe Cobena, P.E.
Office Manager



David Marsh, P.E.
Principal Engineer

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1.0 INTRODUCTION

1.1 GENERAL

The purpose of this study was to conduct a *Preliminary* Geotechnical Characterization Investigation for the site that would generally characterize the site's soil, rock, and groundwater conditions to evaluate whether geotechnical concerns were observed at the site. **This document specifically addresses preliminary design issues posed in the June 23rd, 2021, document from CSRS.**

The preliminary recommendations developed for this report are based on project information provided by the client. This report contains the results of our subsurface exploration and geotechnical laboratory testing program, site characterization, engineering analyses, and preliminary recommendations.

1.2 SCOPE OF SERVICES

In order to obtain the necessary geotechnical information required for evaluation of subsurface soil conditions, two (2) borings varying from 30 to 50 feet below existing site grade were performed. A laboratory-testing program was also implemented to characterize the physical and geotechnical engineering properties of the subsurface soils.

This report discusses our exploratory and testing procedures, presents our findings and evaluation and includes the following:

- A brief review and description of our field and laboratory test procedures and the results of testing conducted.
- A review of surface topographical features and site conditions.
- A review of subsurface soil stratigraphy with pertinent available physical properties.
- A final copy of our preliminary soil test borings.
- Preliminary recommendations for site preparation.
- Preliminary Recommended foundation types.

1.3 AUTHORIZATION

Our services were provided in accordance with our Proposal No. 65-1240P dated June 28th, 2021 and authorized by the client on August 25th, 2021.

2.0 PROJECT INFORMATION

2.1 PROJECT LOCATION

The project is located near the corner of Industrial Drive and Ryans Way in Minden, Louisiana. The location is depicted in the Figure shown below:

Site Location Map

2.2 CURRENT SITE CONDITIONS

The site is currently undeveloped and mostly tree covered located in a commercial setting. The topography of the site varies with surface elevations ranging from +271 feet to +285 feet MSL. The elevations and topographic variations were estimated from Google Earth Pro.

2.3 PROPOSED CONSTRUCTION

ECS understands that the Louisiana Economic Development (LED) Site Certification requires preliminary confirmation that the site is compatible with industrial development and that it could support the construction of a 'typical' manufacturing building encompassing 100,000 square feet and appurtenant on-site roadways and infrastructure. Detailed loadings were not provided to ECS at the time of this report. Soil augmentation that may be required for the construction of the foundations, buildings and roadways is addressed in this report.

3.0 FIELD EXPLORATION

3.1 FIELD EXPLORATION PROGRAM

The field exploration was planned with the objective of characterizing the project site in general geotechnical and geological terms and to evaluate subsequent field and laboratory data to assist in the determination of geotechnical recommendations consistent with the aforementioned CSRS criterion.

3.1.1 Test Borings

The subsurface conditions were explored by drilling a total of two (2) soil test borings. One (1) boring was drilled to a terminal depth of approximately 30 feet and one (1) boring was drilled to a depth of approximately 50 feet below the existing site grades.

An ATV rig was utilized to drill the borings with continuous flight auger and wet rotary drilling techniques. The subsurface exploration was completed under the general supervision of an ECS representative.

The boring locations were selected by representatives of ECS based on the site plan provide by the client and identified in the field by ECS personnel using the supplied diagram and handheld GPS unit. The approximate as-drilled boring locations are shown on the Boring Location Diagram in Appendix A. The approximate ground surface elevations noted in this report were obtained from Google Earth.

Representative soil samples were obtained by means of Standard Penetration Test (SPT) procedures in accordance with ASTM Specifications D 1586 in granular soils and by means of Shelby tube sampling procedures in accordance with ASTM Specifications D 1587 in cohesive soils. SPT sampling is performed by driving a split-barrel sampler into the soil in 1.5-feet intervals with a 140-lb hammer and measures the resistance of the soil to penetration of the 2-inch diameter sampler. In the Shelby tube sampling procedure, a thin walled, steel, seamless tube with sharp cutting edges is pushed hydraulically into the soil, and a relatively undisturbed sample is obtained.

Field logs of the soils encountered in the borings were maintained by the drill crew. After recovery, each geotechnical soil sample was removed for the sampler and visually classified. Representative portions of each soil sample were then wrapped in plastic and transported to our laboratory for further visual examination and laboratory testing. After completion of the drilling operations, the boreholes were backfilled with cuttings to the existing ground surface.

3.2 SUBSURFACE CHARACTERIZATION

The following Table provides generalized characterizations of the soil strata encountered during our subsurface exploration. For subsurface specific information, please refer to the Boring Logs in Appendix B.

General Subsurface Stratigraphy

Approximate Depth (ft)	Elevation [(1)] (ft, MSL)	Stratum No.	Soil Description[(2)]
0-0.5 ft	EL. + 283 to + 282.5	-	**Topsoil**
0.5-6.5 ft	EL. +282.5 to + 276.5	I	**CLAYEY SAND (SC)**, Dense to Very Dense, Moist
6.5- 8.5 ft	EL. + 276.5 to + 274.5	II	**SANDY SILT WITH GRAVEL (ML),** Very Hard, Moist
8.5- 13.5 ft	EL. + 274.5 to + 269.5	III	**LEAN CLAY (CL),** Firm, Moist
13.5-23 ft	EL. + 269.5 to + 260	IV	**CLAYEY SAND (SC),** Dense to Very Dense, Moist
23- 28.5 ft	EL. + 260 to + 254.5	V	**LEAN CLAY WITH SAND (CL),** Stiff, Moist
28.5- 33.5 ft	EL. + 254.5 to + 249.5	VI	**CLAYEY SAND (SC),** Very Dense, Moist
33.5- 38.5 ft	EL. + 249.5 to + 244.5	VII	**SANDY LEAN CLAY (CL),** Very Hard, Moist
38.5- 43.5 ft	EL. + 244.5 to + 239.5	VIII	**CLAYEY SAND (SC),** Very Dense, Moist
43.5- 48.5 ft	EL. + 239.5 to + 234.5	IX	**SILTY SAND (SM),** Very Dense, Moist
48.5- 50 ft	EL. + 234.5 to + 233	X	**SANDY LEAN CLAY (CL),** Very Hard, Moist

1 Please note that the ground surface elevations were or were not surveyed by a licensed surveyor; these elevations are approximate based on Google-Earth© or topographic survey provided; therefore. Elevation ranges are approximate +/- several feet.

2 Soil descriptions show approximate strata to 50' for B-1 only. Strata in B-1 and B-2 vary, please see attached boring logs in Appendix B.

Please refer to the attached boring logs and laboratory data summary for this field exploration for a more detailed description of the subsurface conditions encountered in the borings as the stratification descriptions above are generalized for presentation purposes.

3.3 GROUNDWATER OBSERVATIONS

Groundwater levels were not observed in the borings during drilling operations. In auger drilling operations, water is not introduced into the borehole and the groundwater position can often be determined by observing water flowing into and out of the excavation. Furthermore, visual observation of soil samples retrieved can often be used in evaluating the groundwater conditions. Groundwater was not encountered in the borings at the time of drilling.

The highest groundwater observations are normally encountered in the late winter or early spring, or following seasonal heavy rainfall events. Fluctuation in the location of the long-term water table may occur as a result of changes in precipitation, evaporation, surface water runoff and other factors not immediately apparent at the time of his investigation. Therefore, the groundwater conditions at this site are expected to be significantly influenced by surface water runoff and rainfall.

4.0 LABORATORY TESTING

The laboratory testing was performed by ECS on selected samples obtained during our field exploration operations. Classification and index property tests were performed on representative soil samples obtained from the test borings in order to aid in classifying soils according to the Unified Soil Classification System and to quantify and correlate engineering properties. The soil samples were tested for moisture content, Atterberg Limits, and percent passing the US Standard No. 200 sieve.

An experienced geotechnical professional visually classified each soil sample from the test borings on the basis of texture and plasticity in accordance with the Unified Soil Classification System (USCS) and ASTM D-2488 (Description and Identification of Soils-Visual/Manual Procedures). After classification, the geotechnical professional grouped the various soil types into the major zones noted on the boring logs in Appendix B. The group symbols for each soil type are indicated in parentheses following the soil descriptions on the boring logs. The stratification lines designating the interfaces between earth materials on the boring logs are approximate; in situ, the transitions may be gradual.

The soil samples will be retained in our laboratory for a period of 60 days, after which, they will be discarded unless other instructions are received as to their disposition.

5.0 GEOTECHNICAL RECOMMENDATIONS

The following **preliminary recommendations** have been developed on the basis of the previously described project characteristics and subsurface conditions. These recommendations are preliminary in nature and are for planning purposes only as they are based on a very limited geotechnical exploration. They should not be used for design or construction. Design and construction recommendations for planned structures will require a thorough design-level geotechnical investigation and engineering analysis.

The proposed site is generally compatible with industrial development depending on the type and anticipated loads of the proposed structures. The following Sections of this document present our general recommendations with regard to the proposed site:

5.1 SITE PREPARATION

In a dry and undisturbed state, the near-surface soils should provide subgrade support for engineered fill placement and construction operations. However, when wet, this soil will degrade quickly with disturbance from contractor operations. Chemical stabilization of the in-situ soils with lime, lime kiln dust (LKD), or Portland cement may be necessary depending on seasonal conditions.

Therefore, good site drainage should be maintained during earthwork operations, which can help maintain the integrity of the soil.

The surface of the site should be kept properly graded to promote drainage of the surface water away from the proposed building areas during the construction phase. We recommend that an attempt be made to enhance the natural drainage without interrupting its pattern.

The soils at the site are moisture and disturbance sensitive and contain fines which are considered moderately erodible. Therefore, the contractor should carefully plan his operation to minimize exposure of the subgrade to weather and construction equipment traffic and provide and maintain good site drainage during earthwork operations to help maintain the integrity of the surficial soils. All erosion and sedimentation shall be controlled in accordance with sound engineering practice and current jurisdictional requirements.

In preparing the site for construction, all loose, poorly compacted existing soils, vegetation, organic soil, existing pavements, foundations or utilities, existing fill material, or other unsuitable materials should be removed from all proposed building and paving areas, and any areas receiving new fill.

5.2 SHALLOW FOUNDATIONS

Given that subgrades and structural fills are prepared properly, a typical lightly to moderately-loaded industrial structure should be able to be supported by conventional shallow spread footings. A net allowable soil bearing pressure on the order of 2,500 psf may be used for preliminary planning and budgeting purposes for footings bearing on compacted in-situ clayey sand or on compacted select fill. Footings should extend at least 24 inches below grade in order to utilize this bearing pressure. The Table (below) provides estimated size for square footing dimensions based on assumed column loads as required by the CSRS document:

ESTIMATED SQUARE SHALLOW FOOTING SIZE Net Allowable Bearing Capacity = 2,500 psf F.S.=3		
Assumed Column Load (Kips)	**Spread Footing Plan Dimensions**	
	Depth (ft.)	**Width (ft.)**
25	2	3.5
50	2	5
100	2	6.5

These design parameters assume that positive drainage will be provided away from structures and with no excessive wetting or drying of soils adjacent to the foundations. Greater potential

movements could occur with extreme wetting or drying of the soils due to ponding of water, plumbing leaks or lack of irrigation.

The net allowable soil bearing pressure refers to that pressure which may be transmitted to the foundation bearing soils in excess of the final minimum surrounding overburden pressure. The final footing and/or grade beam elevation should be evaluated by competent geotechnical engineering personnel to verify that the bearing soils are capable of supporting the recommended net allowable bearing pressure and suitable for foundation construction.

5.3 DEEP FOUNDATIONS

Typical considerations are provided below for deep foundations should a more heavily loaded structure be proposed for the subject site. *It should be reemphasized that these values provided should be used for planning and budgeting purposes and should be reevaluated once a specific design is developed for the site.*

The recommended pile length and the estimated corresponding allowable capacities for 14-inch square precast prestressed concrete piles are presented in the following Table for use in feasibility studies, planning, and cost estimating purposes per the CSRS document:

PRELIMINARY ESTIMATED ALLOWABLE SINGLE PILE CAPACITIES (TONS)		
Pile Length (feet)	**14-inch Square PPC Pile**	
	Compression (TONS)	**Tension (TONS)**
35	91	29
40	102	36
45	112	43
50	123	50

The estimated pile capacities include a factor of safety of two (2) in compression and three (3) in tension which requires that a static load test will be performed. If a field load test is not performed, ECS recommends using a factor of safety of 3.0 for compression to determine the allowable capacities. The recommended pile lengths are referenced from the existing ground surface at the time of drilling. The allowable capacity estimates provided in the Table are based on field and laboratory testing and assume proper design and installation. Please note that these estimated

capacities do not account for negative skin friction effects that may reduce total capacity if fill is placed on site.

6.0 REPORT LIMITATIONS AND CLOSING

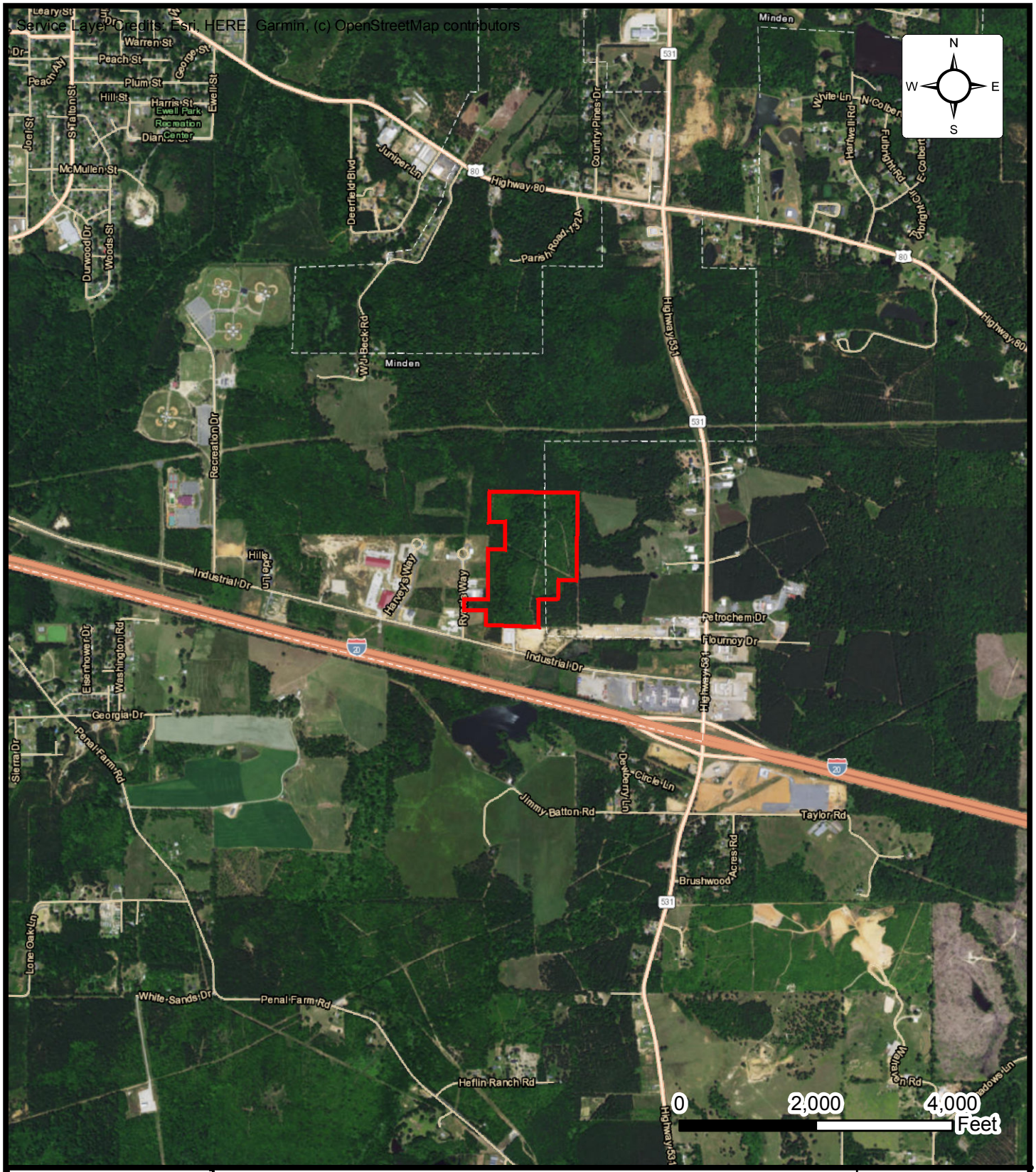
ECS has prepared this report of findings, evaluations, and *preliminary* recommendations to generally characterize the sites soil and groundwater conditions to evaluate whether geotechnical concerns were observed at the site.

The preliminary recommendations provided in this report are based on the data obtained from the limited field exploration and laboratory testing at the specified boring locations for the purpose of a general site characterization. The recommendations are not intended for use in final design or construction. Final design and construction recommendations for any structure proposed on the site will require a more detailed investigation and engineering analysis.

The description of the proposed site is based on information provided to ECS by the client. If any of this information is inaccurate, either due to our interpretation of the documents provided or site that may occur later, ECS should be contacted immediately in order that we can review the report in light of the changes and provide additional or alternate recommendations as may be required to reflect the proposed site.

APPENDIX A – Diagrams & Reports

Site Location Diagram
Boring Location Diagram
Subsurface Cross-Section

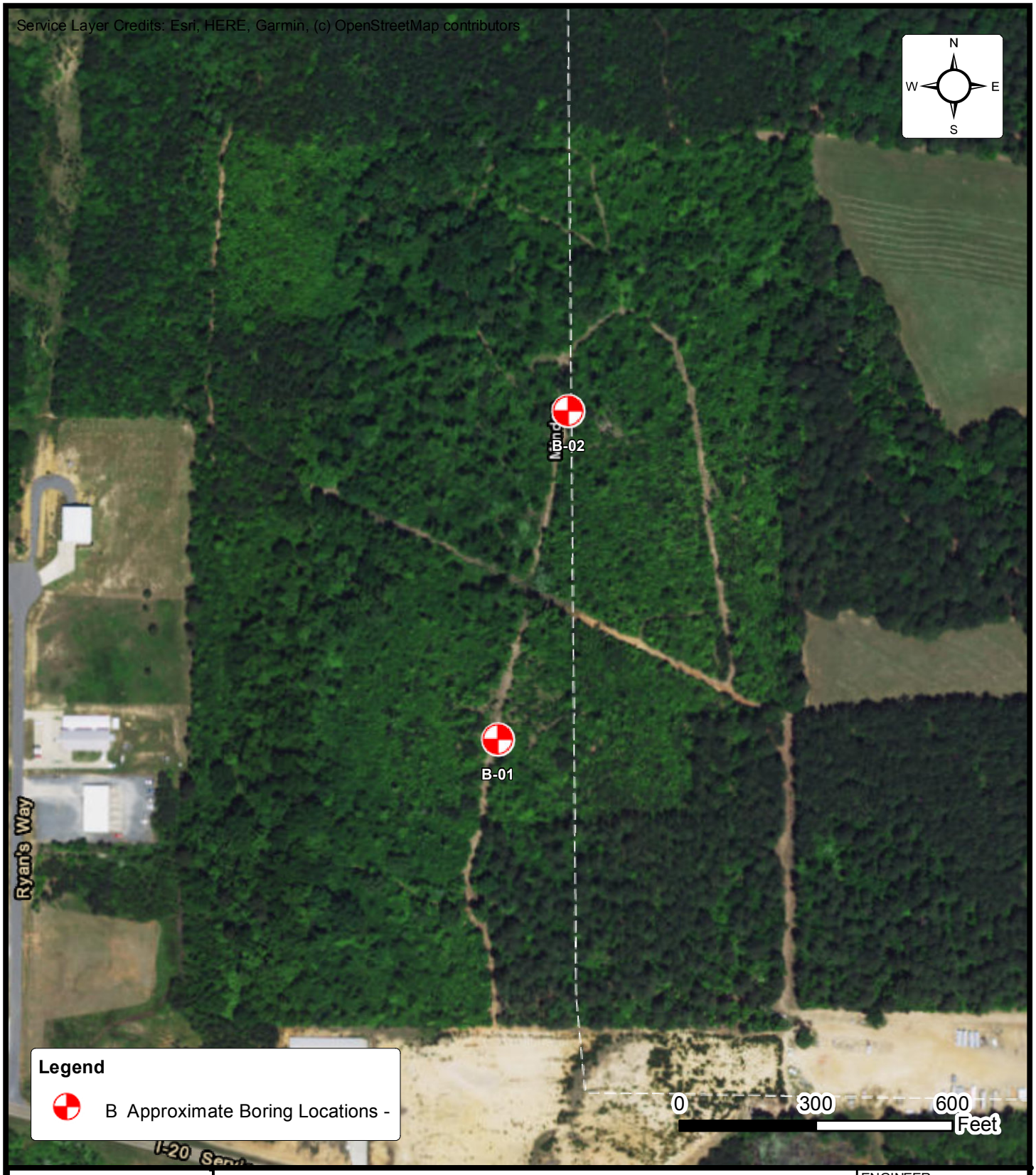


SITE LOCATION DIAGRAM
KITCHO RYANS WAY

INDUSTRIAL DRIVE AND RYAN'S WAY, MINDEN, LA

NORTH LOUISIANA ECONOMIC DEVELOPMENT

ENGINEER	DM01
SCALE	AS NOTED
PROJECT NO.	65:1120
SHEET	1 OF 1
DATE	11/18/2021

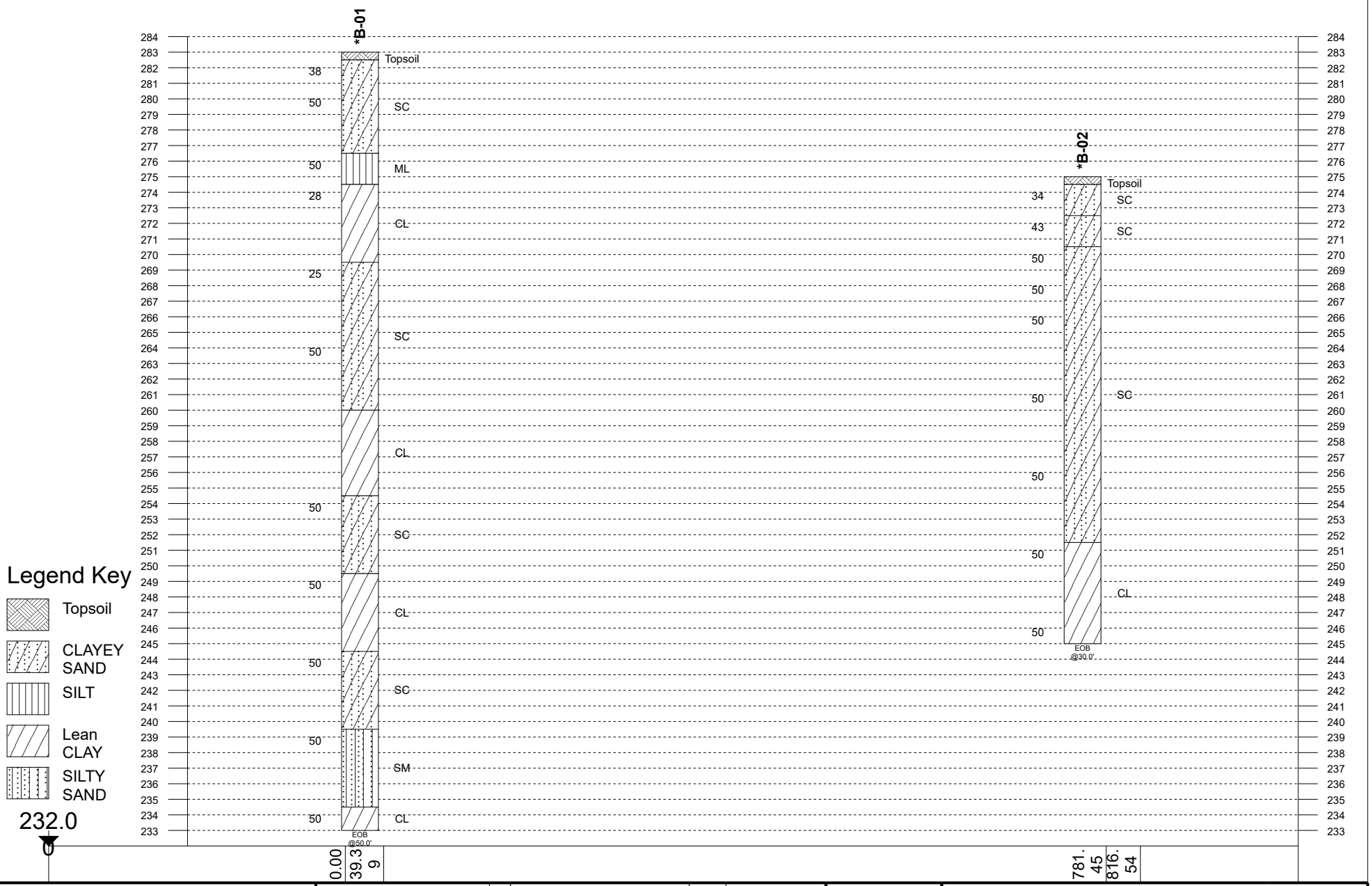


BORING LOCATION DIAGRAM
KITCHO RYANS WAY

INDUSTRIAL DRIVE AND RYAN'S WAY, MINDEN, LA

NORTH LOUISIANA ECONOMIC DEVELOPMENT

ENGINEER	DM01
SCALE	AS NOTED
PROJECT NO.	65:1120
SHEET	1 OF 1
DATE	11/29/2021



Legend Key

- Topsoil
- CLAYEY SAND
- SILT
- Lean CLAY
- SILTY SAND

232.0

0

Notes:

1- EOB: END OF BORING AR: AUGER REFUSAL SR: SAMPLER REFUSAL.
2- THE NUMBER BELOW THE STRIPS IS THE DISTANCE ALONG THE BASELINE.
3- SEE INDIVIDUAL BORING LOG AND GEOTECHNICAL INFORMATION.
4- STANDARD PENETRATION TEST RESISTANCE (LEFT OF BORING) IN BLOWS PER FOOT (ASTM D1586).

Plastic Limit Water Content Liquid Limit X—●—△	WL (First Encountered)		Fill
[FINES CONTENT %]	WL (Completion)		Possible Fill
BOTTOM OF CASING	WL (Seasonal High Water)		Probable Fill
100% LOSS OF CIRCULATION	WL (Stabilized)		Rock

GENERALIZED SUBSURFACE SOIL PROFILE Section line 1

Kitcho Ryans Way

North Louisiana Economic Development Partnership

Industrial Drive and Ryan's Way, Minden, Louisiana 71055

Project No: 65:1120 Date: 12/20/2021

APPENDIX B – Field Operations

Reference Notes for Boring Logs
Boring Logs B-1 to B-2

REFERENCE NOTES FOR BORING LOGS

MATERIAL[1,2]	
	ASPHALT
	CONCRETE
	GRAVEL
	TOPSOIL
	VOID
	BRICK
	AGGREGATE BASE COURSE
	FILL[3] MAN-PLACED SOILS
GW	**WELL-GRADED GRAVEL** gravel-sand mixtures, little or no fines
GP	**POORLY-GRADED GRAVEL** gravel-sand mixtures, little or no fines
GM	**SILTY GRAVEL** gravel-sand-silt mixtures
GC	**CLAYEY GRAVEL** gravel-sand-clay mixtures
SW	**WELL-GRADED SAND** gravelly sand, little or no fines
SP	**POORLY-GRADED SAND** gravelly sand, little or no fines
SM	**SILTY SAND** sand-silt mixtures
SC	**CLAYEY SAND** sand-clay mixtures
ML	**SILT** non-plastic to medium plasticity
MH	**ELASTIC SILT** high plasticity
CL	**LEAN CLAY** low to medium plasticity
CH	**FAT CLAY** high plasticity
OL	**ORGANIC SILT or CLAY** non-plastic to low plasticity
OH	**ORGANIC SILT or CLAY** high plasticity
PT	**PEAT** highly organic soils

DRILLING SAMPLING SYMBOLS & ABBREVIATIONS			
SS	Split Spoon Sampler	PM	Pressuremeter Test
ST	Shelby Tube Sampler	RD	Rock Bit Drilling
WS	Wash Sample	RC	Rock Core, NX, BX, AX
BS	Bulk Sample of Cuttings	REC	Rock Sample Recovery %
PA	Power Auger (no sample)	RQD	Rock Quality Designation %
HSA	Hollow Stem Auger		

PARTICLE SIZE IDENTIFICATION		
DESIGNATION		**PARTICLE SIZES**
Boulders		12 inches (300 mm) or larger
Cobbles		3 inches to 12 inches (75 mm to 300 mm)
Gravel:	Coarse	¾ inch to 3 inches (19 mm to 75 mm)
	Fine	4.75 mm to 19 mm (No. 4 sieve to ¾ inch)
Sand:	Coarse	2.00 mm to 4.75 mm (No. 10 to No. 4 sieve)
	Medium	0.425 mm to 2.00 mm (No. 40 to No. 10 sieve)
	Fine	0.074 mm to 0.425 mm (No. 200 to No. 40 sieve)
Silt & Clay ("Fines")		<0.074 mm (smaller than a No. 200 sieve)

COHESIVE SILTS & CLAYS		
UNCONFINED COMPRESSIVE STRENGTH, Q_P[4]	**SPT[5] (BPF)**	**CONSISTENCY[7] (COHESIVE)**
<0.25	<3	Very Soft
0.25 - <0.50	3 - 4	Soft
0.50 - <1.00	5 - 8	Firm
1.00 - <2.00	9 - 15	Stiff
2.00 - <4.00	16 - 30	Very Stiff
4.00 - 8.00	31 - 50	Hard
>8.00	>50	Very Hard

GRAVELS, SANDS & NON-COHESIVE SILTS	
SPT[5]	**DENSITY**
<5	Very Loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
>50	Very Dense

RELATIVE AMOUNT[7]	COARSE GRAINED (%)[8]	FINE GRAINED (%)[8]
Trace	≤5	≤5
Dual Symbol *(ex: SW-SM)*	10	10
With	15 - 20	15 - 25
Adjective *(ex: "Silty")*	≥25	≥30

WATER LEVELS[6]		
	WL	Water Level (WS)(WD)
		(WS) While Sampling
		(WD) While Drilling
	SHW	Seasonal High WT
	ACR	After Casing Removal
	SWT	Stabilized Water Table
	DCI	Dry Cave-In
	WCI	Wet Cave-In

[1] Classifications and symbols per ASTM D 2488-09 (Visual-Manual Procedure) unless noted otherwise.

[2] To be consistent with general practice, "POORLY GRADED" has been removed from GP, GP-GM, GP-GC, SP, SP-SM, SP-SC soil types on the boring logs.

*[3] Non-ASTM designations are included in soil descriptions and symbols along with ASTM symbol [Ex: (SM-**FILL**)].*

[4] Typically estimated via pocket penetrometer or Torvane shear test and expressed in tons per square foot (tsf).

[5] Standard Penetration Test (SPT) refers to the number of hammer blows (blow count) of a 140 lb. hammer falling 30 inches on a 2 inch OD split spoon sampler required to drive the sampler 12 inches (ASTM D 1586). "N-value" is another term for "blow count" and is expressed in blows per foot (bpf).

[6] The water levels are those levels actually measured in the borehole at the times indicated by the symbol. The measurements are relatively reliable when augering, without adding fluids, in granular soils. In clay and cohesive silts, the determination of water levels may require several days for the water level to stabilize. In such cases, additional methods of measurement are generally employed.

[7] Minor deviation from ASTM D 2488-09 Note 16.

[8] Percentages are estimated to the nearest 5% per ASTM D 2488-09.

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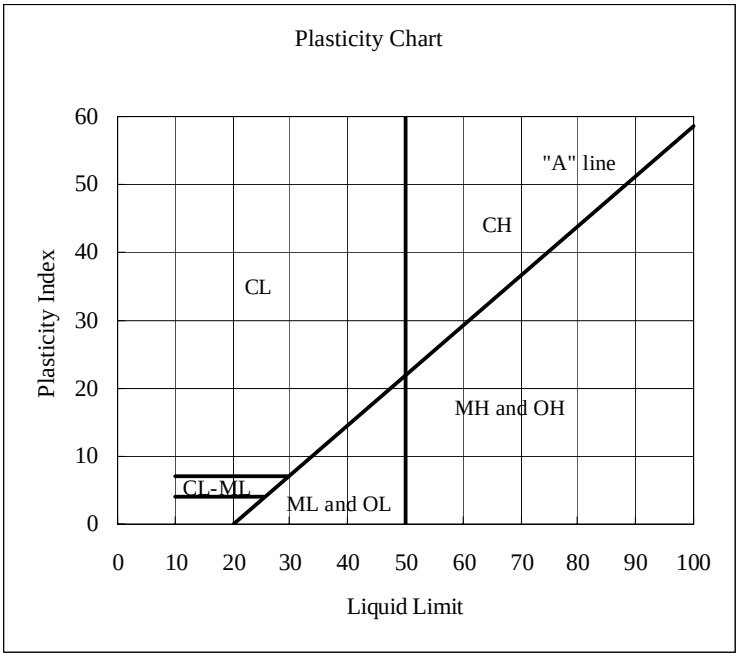
UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2487)

Major Divisions			Group Symbols		Typical Names	Laboratory Classification Criteria		
Coarse-grained soils (More than half of material is larger than No. 200 Sieve size)	Gravels (More than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (Little or no fines)	GW		Well-graded gravels, gravel-sand mixtures, little or no fines	Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows: Less than 5 percent GW, GP, SW, SP; More than 12 percent GM, GC, SM, SC; 5 to 12 percent Borderline cases requiring dual symbols [b]	$C_u = D_{60}/D_{10}$ greater than 4; $C_c = (D_{30})^2/(D_{10}xD_{60})$ between 1 and 3	
			GP		Poorly graded gravels, gravel-sand mixtures, little or no fines		Not meeting all gradation requirements for GW	
		Gravels with fines (Appreciable amount of fines)	GM [a]	d	Silty gravels, gravel-sand mixtures		Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
				u				
			GC		Clayey gravels, gravel-sand-clay mixtures		Atterberg limits below "A" line or P.I. less than 7	
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (Little or no fines)	SW		Well-graded sands, gravelly sands, little or no fines		$C_u = D_{60}/D_{10}$ greater than 6; $C_c = (D_{30})^2/(D_{10}xD_{60})$ between 1 and 3	
			SP		Poorly graded sands, gravelly sands, little or no fines		Not meeting all gradation requirements for SW	
		Sands with fines (Appreciable amount of fines)	SM [a]	d	Silty sands, sand-silt mixtures		Atterberg limits above "A" line or P.I. less than 4	Limits plotting in CL-ML zone with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
				u				
			SC		Clayey sands, sand-clay mixtures		Atterberg limits above "A" line with P.I. greater than 7	
Fine-grained soils (More than half material is smaller than No. 200 Sieve)	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			
	Silts and clays (Liquid limit greater than 50)		MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts			
			CH		Inorganic clays of high plasticity, fat clays			
			OH		Organic clays of medium to high plasticity, organic silts			
	Highly Organic soils		Pt		Peat and other highly organic soils			

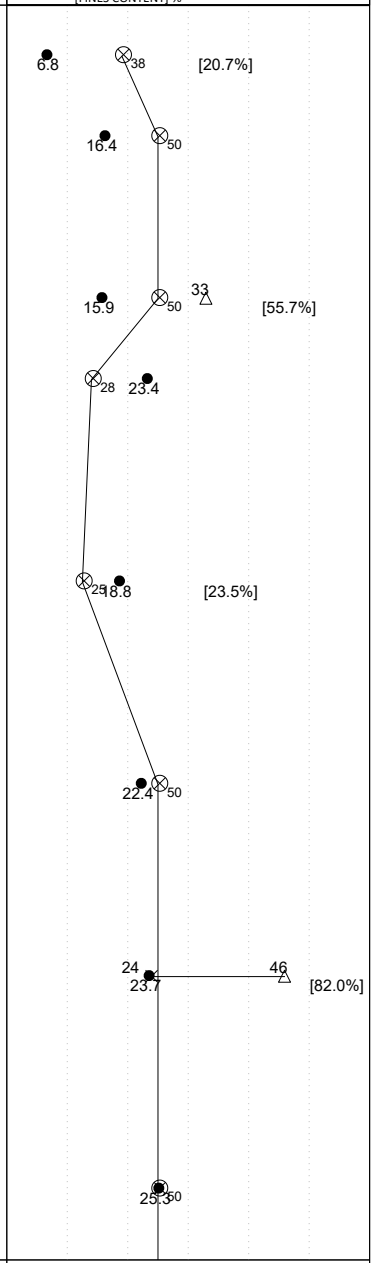


[a] Division of GM and SM groups into subdivisions of d and u are for roads and airfields only. Subdivision is based on Atterberg limits; suffix d used when L.L. is 28 or less and the P.I. is 6 or less; the suffix u used when L.L. is greater than 28.

[b] Borderline classifications, used for soils possessing characteristics of two groups, are designated by combinations of group symbols. For example: GW-GC,well-graded gravel-sand mixture with clay binder. (From Table 2.16 - Winterkorn and Fang, 1975)

CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
North Louisiana Economic Development Partnership	**65:1120**	**B-01**	**1 of 2**
PROJECT NAME:	DRILLER/CONTRACTOR:		
Kitcho Ryans Way	**ECS**		
SITE LOCATION:			LOSS OF CIRCULATION
Industrial Drive and Ryan's Way, Minden, Louisiana 71055			
LATITUDE:	LONGITUDE:	STATION:	SURFACE ELEVATION:
32.586870°	**-93.256029°**		**283.0**

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
					Topsoil Thickness[6.00"]			
	S-01	SS	18	18	(SC) CLAYEY SAND, orangish brown, moist, dense to very dense			15-17-21 (38)
	S-02	SS	18	18				50/6" (50)
5							278	
	S-03	SS	18	18	(ML) SANDY SILT WITH GRAVEL, orangish, moist, very hard			18-21-29 (50)
	S-04	SS	18	18	(CL) LEAN CLAY, orangish brown, moist, firm			10-11-17 (28)
10							273	
	S-05	SS	18	18	(SC) CLAYEY SAND, tan and orangish, moist, medium dense to very dense			11-12-13 (25)
15							268	
	S-06	SS	18	18				18-50/9" (50)
20							263	
	S-07	ST	24	24	(CL) LEAN CLAY WITH SAND, orangish tan, moist, stiff			
25							258	
	S-08	SS	18	18	(SC) CLAYEY SAND, dark brown and dark gray, moist, very dense			12-30-20 (50)
30							253	



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THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

▽ WL (First Encountered)	BORING STARTED: **Nov 16 2021**		CAVE IN DEPTH:
▼ WL (Completion)	BORING COMPLETED: **Nov 16 2021**		HAMMER TYPE: **Manual**
▼ WL (Seasonal High Water)	EQUIPMENT: **Track**	LOGGED BY: **RB6**	DRILLING METHOD: **Wet Rotary**
▽ WL (Stabilized)			

GEOTECHNICAL BOREHOLE LOG

CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
North Louisiana Economic Development Partnership	**65:1120**	**B-01**	**2 of 2**
PROJECT NAME:	DRILLER/CONTRACTOR:		
Kitcho Ryans Way	**ECS**		
SITE LOCATION:			LOSS OF CIRCULATION
Industrial Drive and Ryan's Way, Minden, Louisiana 71055			
LATITUDE:	LONGITUDE:	STATION:	SURFACE ELEVATION:
32.586870°	**-93.256029°**		**283.0**

BOTTOM OF CASING

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
					(SC) CLAYEY SAND, dark brown and dark gray, moist, very dense			
35	S-09	SS	18	18	(CL) SANDY LEAN CLAY, dark brown and gray, moist, very hard		248	22-50/4" (50)
40	S-10	SS	18	18	(SC) CLAYEY SAND, dark brown and dark gray, moist, very dense		243	15-25-25 (50)
45	S-11	SS	18	18	(SM) SILTY SAND, trace gravel, dark gray, moist, very dense		238	50/5" (50)
50	S-12	SS	18	18	(CL) SANDY LEAN CLAY, dark gray, moist, very hard		233	20-30-20 (50)
					END OF DRILLING AT 50.0 FT			
55							228	
60							223	

Plastic Limit Water Content Liquid Limit

X———●———△

⊗ STANDARD PENETRATION BLOWS/FT

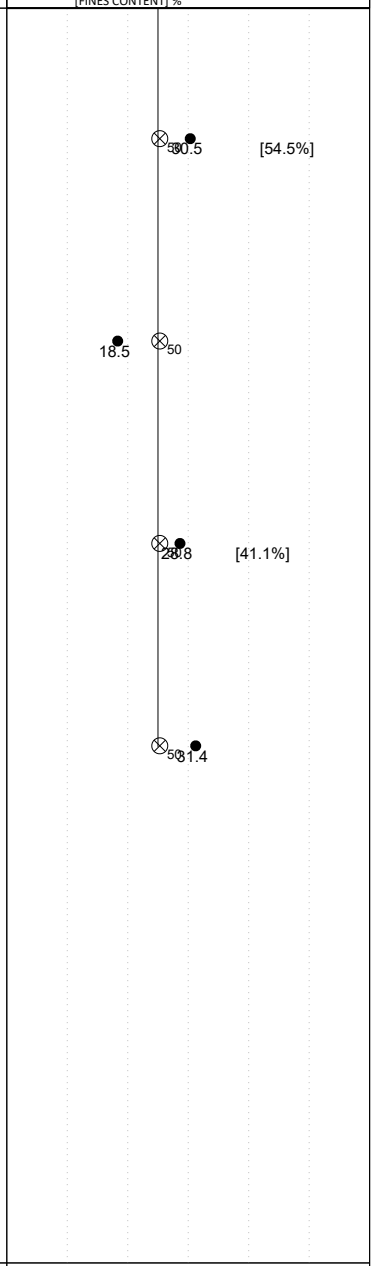
ROCK QUALITY DESIGNATION & RECOVERY

RQD

REC

○ CALIBRATED PENETROMETER TON/SF

[FINES CONTENT] %



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

▽ WL (First Encountered)

▼ WL (Completion)

▼ WL (Seasonal High Water)

▽ WL (Stabilized)

BORING STARTED: **Nov 16 2021**	CAVE IN DEPTH:
BORING COMPLETED: **Nov 16 2021**	HAMMER TYPE: **Manual**
EQUIPMENT: **Track** / LOGGED BY: **RB6**	DRILLING METHOD: **Wet Rotary**

GEOTECHNICAL BOREHOLE LOG

CLIENT:	PROJECT NO.:	BORING NO.:	SHEET:
North Louisiana Economic Development Partnership	**65:1120**	**B-02**	**1 of 1**
PROJECT NAME:	DRILLER/CONTRACTOR:		
Kitcho Ryans Way	**ECS**		
SITE LOCATION:			LOSS OF CIRCULATION
Industrial Drive and Ryan's Way, Minden, Louisiana 71055			
LATITUDE:	LONGITUDE:	STATION:	SURFACE ELEVATION:
32.588515°	**-93.255566°**		**275.0**

DEPTH (FT)	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE DIST. (IN)	RECOVERY (IN)	DESCRIPTION OF MATERIAL	WATER LEVELS	ELEVATION (FT)	BLOWS/6"
					Topsoil Thickness[6.00"]			
	S-01	SS	18	18	(SC) CLAYEY SAND, trace organics, trace gravel, brown, moist, dense			9-15-19 (34)
	S-02	SS	18	18	(SC) CLAYEY SAND, trace organics, reddish tan, moist, dense			11-21-22 (43)
5	S-03	SS	18	18	(SC) CLAYEY SAND, reddish orange and tan, moist, very dense		270	9-6-44 (50)
	S-04	SS	18	18				26-50/2" (50)
	S-05	SS	18	18				31-50/2" (50)
10							265	
	S-06	SS	18	18				15-25-25 (50)
15							260	
	S-07	SS	18	18				12-20-30 (50)
20							255	
	S-08	SS	18	18	(CL) SANDY LEAN CLAY, dark gray, moist, very hard			22-50/6" (50)
25							250	
	S-09	SS	18	18				15-22-28 (50)
30					**END OF DRILLING AT 30.0 FT**		245	

Plastic Limit Water Content Liquid Limit

STANDARD PENETRATION BLOWS/FT

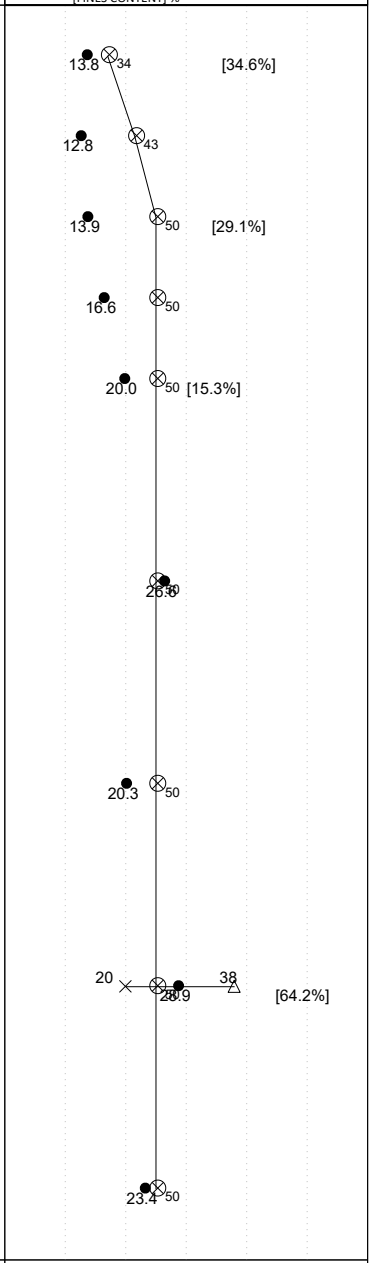
ROCK QUALITY DESIGNATION & RECOVERY

RQD

REC

CALIBRATED PENETROMETER TON/SF

[FINES CONTENT] %



THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN-SITU THE TRANSITION MAY BE GRADUAL

▽ WL (First Encountered)	BORING STARTED: **Nov 16 2021**		CAVE IN DEPTH:
▼ WL (Completion)	BORING COMPLETED: **Nov 16 2021**		HAMMER TYPE: **Manual**
▼ WL (Seasonal High Water)	EQUIPMENT: **Track**	LOGGED BY: **RB6**	DRILLING METHOD: **Wet Rotary**
▽ WL (Stabilized)			

GEOTECHNICAL BOREHOLE LOG

APPENDIX C – Laboratory Testing

Laboratory Test Results Summary

Laboratory Testing Summary

Sample Location	Sample Number	Depth (feet)	^MC (%)	Soil Type	Atterberg Limits			**Percent Passing No. 200 Sieve	Moisture - Density		CBR (%)		#Organic Content (%)
					LL	PL	PI		<Maximum Density (pcf)	<Optimum Moisture (%)	0.1 in.	0.2 in.	
B-01	S-01	0.5-2	6.8					20.7					
B-01	S-02	2.5-4	16.4										
B-01	S-03	6.5-8	15.9	ML	33	NP	NP	55.7					
B-01	S-04	8.5-10	23.4										
B-01	S-05	13.5-15	18.8					23.5					
B-01	S-06	18.5-20	22.4										
B-01	S-07	23-25	23.7	CL	46	24	22	82.0					
B-01	S-08	28.5-30	25.3										
B-01	S-09	33.5-35	30.5					54.5					
B-01	S-10	38.5-40	18.5										

Notes: See test reports for test method, ^ASTM D2216-19, *ASTM D2488, **ASTM D1140-17, #ASTM D2974-20e1 < See test report for D4718 corrected values

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content

Project: Kitcho Ryans Way
Client: North Louisiana Economic Development Partnership

Project No.: 65:1120
Date Reported:

Office / Lab	Address	Office Number / Fax
ECS Southeast LLP - Baton Rouge	11115 Industriplex Blvd Suite 200 Baton Rouge, LA 70809	(225)224-2583 (225)612-7062

Tested by	Checked by	Approved by	Date Received
jmlayton	nburke	jcobena	12/20/21

Laboratory Testing Summary

Sample Location	Sample Number	Depth (feet)	^MC (%)	Soil Type	Atterberg Limits			**Percent Passing No. 200 Sieve	Moisture - Density		CBR (%)		#Organic Content (%)
					LL	PL	PI		<Maximum Density (pcf)	<Optimum Moisture (%)	0.1 in.	0.2 in.	
B-01	S-11	43.5-45	28.8	SM				40.9					
B-01	S-12	48.5-50	31.4										
B-02	S-01	0.5-2	13.8					34.6					
B-02	S-02	2.5-4	12.8										
B-02	S-03	4.5-6	13.9					29.1					
B-02	S-04	6.5-8	16.6										
B-02	S-05	8.5-10	20					15.3					
B-02	S-06	13.5-15	26.6										
B-02	S-07	18.5-20	20.3										
B-02	S-08	23.5-25	28.9	CL	38	20	18	64.2					

Notes: See test reports for test method, ^ASTM D2216-19, *ASTM D2488, **ASTM D1140-17, #ASTM D2974-20e1 < See test report for D4718 corrected values

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content

Project: Kitcho Ryans Way
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ECS Southeast LLP - Baton Rouge	11115 Industriplex Blvd Suite 200 Baton Rouge, LA 70809	(225)224-2583 (225)612-7062

Tested by	Checked by	Approved by	Date Received
jmlayton	nburke	jcobena	12/20/21

Laboratory Testing Summary

Sample Location	Sample Number	Depth (feet)	^MC (%)	Soil Type	Atterberg Limits			**Percent Passing No. 200 Sieve	Moisture - Density		CBR (%)		#Organic Content (%)
					LL	PL	PI		<Maximum Density (pcf)	<Optimum Moisture (%)	0.1 in.	0.2 in.	
B-02	S-09	28.5-30	23.4										

Notes: See test reports for test method, ^ASTM D2216-19, *ASTM D2488, **ASTM D1140-17, #ASTM D2974-20e1 < See test report for D4718 corrected values

Definitions: MC: Moisture Content, Soil Type: USCS (Unified Soil Classification System), LL: Liquid Limit, PL: Plastic Limit, PI: Plasticity Index, CBR: California Bearing Ratio, OC: Organic Content

Project: Kitcho Ryans Way
Client: North Louisiana Economic Development Partnership

Project No.: 65:1120
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Office / Lab	Address	Office Number / Fax
ECS Southeast LLP - Baton Rouge	11115 Industriplex Blvd Suite 200 Baton Rouge, LA 70809	(225)224-2583 (225)612-7062

Tested by	Checked by	Approved by	Date Received
jmlayton	nburke	jcobena	12/20/21

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled*. No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.