October 28, 2022

ADDENDUM NO. 1
SABINE RIVER AUTHORITY OF TEXAS
AGO Maintenance Building & ESD Metal Canopies RFB# 23-0101

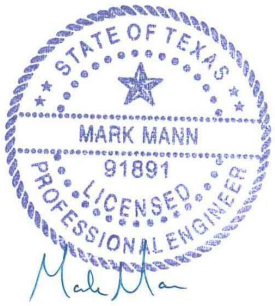
THIS ADDENDUM IS ISSUED FOR THE PURPOSE OF AMENDING THE CONTRACT DOCUMENTS FOR THE SABINE RIVER AUTHORITY OF TEXAS, AS FOLLOWS:

Specifications

- Item Precast Concrete Box Culverts (2 pages attached) is hereby added to the contract documents.
- Item Doors, Frames, and Hardware (4 pages attached) is hereby added to the contract documents.
- Special Provision No. 1 has been revised. Replace in it's entirety with attached.
- Geotechnical Report prepared by Science Engineering, LTD (#20221) is hereby attached. This report was prepared for the new ESD Lab building constructed on site in 2021-2022. The report recommends removal of approximately 12" of existing top soil and installation select fill material to meet proposed final grade.

Clarifications

- Scope of Work – The intent of this contract is to provide for installation of the site work, foundation, metal building, box culvert room, and limited rough in plumbing below the slab and to extent outside of slab as shown on the plans. **All other interior wood framing, finish out, finish plumbing, electrical, shall be performed by SRA in future work.**
- Metal Building Weather Tightness – The intent is for the contractor to provide a building system that is water tight, and provide for no leaks during the 12 month warranty period. A separate weather tightness guaranty is not required.
- Precast vs Cast in Place Box Culvert – Contractor may provide a cast in place box culvert in-lieu of precast culvert sections. The contractor will be responsible for providing an engineering design, signed and sealed by a Texas Professional Engineer, for the culverts for review and approval by the Owner.



10/28/2022

END

PRECAST CONCRETE BOX CULVERT

01 - GENERAL

Furnish precast concrete box culverts and structures of size(s) shown on PLANS. This item governs materials, fittings and incidentals required for the joining and bedding of box type for use in gravity storm sewers, or for use as shown on the plans.

02 - MATERIALS

1 Culverts. Culverts shall meet the following specifications, and each joint of pipe to be checked at plant, ship only joints of pipe meeting these Technical Specifications:

- ASTM C789/AASTHOM259- Precast Reinforced Concrete Box Section for Culverts, storm drains, and sewers.
- ASTM C850/AASHTO M273 - Precast Reinforced Concrete Box Section for Culverts, storm drains, and sewers (less than 2ft of cover)
- ASTM C1433 - Precast Reinforced Concrete Box Section for Culverts
- ASTM C1577 – Standard Specification for precast monolithic box culvert sections for culverts (AASHTO LRFD Design Methods)

2. Joints. Preformed Plastic Gasket: Use RAM-NEK Preformed Plastic Gasket meeting requirements of Federal Specifications SS-S-210A-7-2-84, "Sealing Compound Preformed Plastic for Pipe Joints, "Type 1, Rope Form. Use sealing compound produced from blends of refined hydrocarbon resins and plasticizing compounds reinforced with inert mineral filler containing no solvents, irritating fumes, or obnoxious odor. Use no compound depending on oxidizing, evaporating, or chemical action for its adhesive or cohesive strength. Supply sealing compound in extruded rope-form of suitable cross-section and of such sizes as to seal joint space when the pipes are laid. Protect sealing compound by a suitable removable two-piece wrapper. Design two-piece wrapper so that one-half may be removed longitudinally without disturbing the other half to facilitate application of sealing compound.

3. Manufactures. Culverts shall be manufactured by Ameritex, Rinker, Old Castle, or prior approved equivalent.

03 - INSTALLATION

1. Trenching. To be in accordance with applicable underground piping technical specification contained herein.

2. Pipe Zone Bedding. Class A, Class B, Class C or Class D bedding as illustrated by this specification and as specified on the PLANS or by SPECIAL PROVISION to this specification.

3. Backfill Above Pipe Zone. To be in accordance with applicable underground piping technical specification contained herein.

4. Joint Construction. Brush-apply suitable primer of type recommended by manufacturer of gasket joint sealer to joint surfaces and end surfaces and allow to dry and harden before jointing. Clean and dry surface before primer is applied. Before laying pipe in trench, attach

plastic sealer around tapered tongue or spigot end of each pipe joint. Remove paper wrapper from one side only of the two-piece wrapper on gasket and press it firmly to clean, dry, pipe joint surface. Do not remove outside wrapper until immediately before pushing pipe into final position.

When pipe is correctly aligned, remove outside wrapper on gasket and pull or push pipe "home" with sufficient force to cause evidence of squeeze-out of gasket material on inside or outside around complete joint perimeter. Remove joint material pushed out into interior that would tend to obstruct flow. (Culvert to be pushed or pulled "home" in a straight line with all parts of pipe on line and grade at all times.)

When atmospheric temperature is below 60 degrees Fahrenheit, warm plastic joint seal gasket to above 70 degrees Fahrenheit. Apply gasket immediately to pipe joint prior to placing pipe in trench, followed by connecting to previously laid pipe.

04 - MEASUREMENT AND PAYMENT

No separate payment.

DOORS, FRAMES, AND HARDWARE

01 - SCOPE

Provide all doors, frames, and hardware for the buildings as shown on the plans and/or specified herein.

02 - DOORS AND FRAMES

1. Hollow Metal Doors. Doors shall be of the type, swing, and size as shown on the plans or indicated herein. All hollow metal doors shall be 1 3/4" thick doors as manufactured by the Ceco Corp., Chicago, IL; Allied Steel, Miami, FL; or prior approved equivalent. Doors shall be shop primed and field painted. Field painting of doors and frames shall be accomplished prior to installation of hardware. Door types shall be as follows:

   A. Doors shall be constructed to two (2) 18-gauge steel seamless face sheets with mechanically interlocked edges. Provide vertical stiffeners alternating on opposite face sheet at 6 inch on centers. Top and bottom channels shall be 18-gauge steel. Interior of doors shall be completely filled with rigid polystyrene core foamed in place and chemically bonded to all interior surfaces of the door. Doors shall be prepared for all hardware.

   B. All doors shall be mortised, drilled, tapped, and reinforced for all hardware. Doors shall be of type and sizes as shown on the plans or in the door schedule.

   C. Manufacturer to specify door to frame attachment capable of withstanding 42 psf wide load.

2. Hollow Metal Door Frames. Door frames shall be of 16-gauge steel with all angles, returns, and miters neatly welded and ground smooth. Frames shall be reinforced and prepared for all hardware and provided with grout/plaster guards. Frames shall be rigidly attached to masonry. Manufacture to specify frame to wall attachment designed to withstand 42 psf wind load acting inward or outward. Provide rubber door silencers on strike jamb. Frames shall be shop primed and field painted prior to installation of hardware. Frames shall be as manufactured by the Republic; or prior approved equivalent.

3. Plastic Doors:

   A. Door faces shall be minimum .050” high pressure plastic laminate, General Purpose grade complying with NEMA Standard LD-3, with edging from same material.
   B. Stile edges of doors shall have plastic laminate edges applied prior to faces so as to avoid black line effect.
   C. All doors, before leaving the factory, shall have top and bottom rails sealed against moisture penetration.
   D. Stiles to be a minimum 1-3/8” wide, made of hardwood species, glue bonded to core.
   E. Rails to be a minimum 1-18” wide, made of hardwood species, glue bonded to core.
   F. The door core to be particleboard of 32 lb. density, complying with ANSI-A208.1 particleboard standard.

4. Interior Door Frame:
   A. Provide features as follows:
      1) Heat-treated clips for casing attachment.
      2) Oval alignment slots for tool insertion for frame alignment.
      3) Pre-drilled holes in frame perimeter for fasteners.
      4) 14 gage hinge reinforcement plat with pierced screw holes for minimum of 3/16" thread penetration depth.
      5) Corner aligners for casing.
      6) Adjustable strike (for cylindrical locks).
      7) Standard steel casings.
   B. Frames shall be supplied with pressure applied rubber silencers, (3) per strike jamb and (2) per head for field application after finish painting.
   C. Frames shall have 9 gauge steel universal hinge top plate projections welded with provisions for 4-1/2" x 4-1/2" template type hinges and 14 gauge steel strike reinforcement plate, extruded and formed to the equivalent of 10 gauge projection welded with provision for Universal ANSI, A115.1 or ANSI A115.2 strike.
   D. Reinforcement for surface closer shall be 12 gauge steel and proper reinforcement shall be provided for other hardware where scheduled.
   E. Casing trim to be applied.
   F. Frames to be mortised, drilled and tapped. Hardware supplier will furnish templates and the manufacturer will fabricate frames to fit hardware.
   G. Provide polyester paint finish factory applied to steel in coils to ensure even coverage and maximum flexibility for impact resistance. Provide aerosol cans for field touch-up of factory finished frames.
   H. All frames to be manufactured by Timely Industries, or approved equal.

03 - HARDWARE

1. Hinges. Hinges shall be Hager BB 1279 4 x 4 USID B or prior approved equal.

2. Panic Hardware. Panic hardware shall be as manufactured by Yale, Von Duprin, or prior approved equivalent.

3. Thresholds. Thresholds shall be as manufactured by NGP, or prior approved equivalent. Thresholds for exterior doors shall be provided with weather-stripping and installed in a bed of caulk.

4. Weather-stripping. Weather-stripping shall be as manufactured by Quality or prior approved equivalent. Weather-stripping shall be installed on all exterior doors.

5. Automatic Door Closers. Closers shall be as manufactured by Norton; Reading; LCN; or prior approved equivalent. Closers shall be installed on all exterior doors.

6. Floor Stop. A 2 inch diameter x 1 " inch high chrome floor step.

7. Locksets. Locksets shall be Russwin L3400 or prior approved equivalent.

8. Keying. Grand master all locks to a new Grand Master Key. Key locks alike or in groups as directed. Furnish four (4) Master Keys per group and three (3) keys per lock.

9. Packing and Marking. All finish hardware shall be properly packed and marked for the opening for which it is intended. Furnish all necessary attachments, fastenings, and installations instructions.

10. Hardware Packages.

Hardware Package 1

3 hinges
Panic hardware exit
Rim or Mortise Lockset
Closer
Threshold
Weather-stripping
Door stop (floor)
Kickplate
Door Bottom
ANSI Safety Glass, ¼" thick tempered sunglass bronze tinted glass with shading coefficient of 0.66 or greater.

Hardware Package 2

3 hinges
Entrance Lock
Wall Stop
¼" thick tempered clear glass

Hardware Package 3

3 hinges
Sound Seal
Wall Stop
Kickplate
Closer
Door Latch
Deadbolt

Hardware Package 4

3 hinges
Door Latch

DOOR AND HARDWARE SCHEDULE

No.	Location	Type	Size	Hardware Package
1	Entrance	HM	3’0” x 6’8”	1
2	Safe Room	HM	3’0’” x 6’8”	1

Door Types:

HM - Hollow Metal Door & Steel Frame
P - Plastic Laminate Door & Steel Frame

11. Installation. All items to be in conformance with and installed in accordance with Texas Accessibility Standard.

SPECIAL PROVISION NO. 1
TO
PRE-ENGINEERED METAL BUILDINGS

01.2 Description – The Structure Span shall be revised as follows:

Furnish and install a 40 ft x 50 ft metal building with 16 ft eve height, a 22 ft x 205 ft and 22 ft x 73'-9" open metal canopies with 12 ft eve height. Structure span will have a total of twenty feet (20 ft) with structural column members at not greater than 25'-0" on center.

01.5 Manufacturers – Revise this section as follows:

The building for this project shall be manufactured by Mueller; Tyler Building; Metallic Buildings; Star Buildings, Alliance Buildings, Steel Building Supply Inc. (Center Texas); Pinnacle Structures; Metal Depot; Whirlwind; Red Dot Buildings; Schulte Buildings or prior approved equivalent.

03.10 Painting – Revise this section as follows:

ALL STRUCTURAL FRAMING MEMBERS SHALL BE GALVANIZED.

04 – Roof and Wall Coverings – Revise this section as follows:

1. General

a) The roof and wall panels shall be a minimum of 24 gauge steel panels.

c) The manufacturer shall provide for a water tight roofing system with zero leakage.

10. Painted Finish

Add subsection "e" as follows:

e) Color to be selected by OWNER from manufacturer's standard color selection chart.

06 – Door and Window Schedule – Add the following section.

The following items are to be provided with the building per this specification and as scheduled on the drawings. Products to meet the load performance requirements per 2015 International Building, with Texas Revisions for wind rating of 135 mph, Inland Area II. Reference to dimensions, including thickness, are minimums.

1. Passage Doors

a. Nominal Dimension: 3'0" x 6'8".

b. Door Leaf: 1-3/4" thick Hollow Metal Doors. Doors shall include 16" x 16" tempered glass windows on all interior and exterior locations. Provide door closures and all emergency exit

style latch hardware for on all doors.

c. Door Frame: To be steel or aluminum.
d. Leaf/Frame Finish: Thoroughly cleaned, prime coated and top coated with smooth durable finish capable of passing 200 hour salt spray in accordance with ASTM B-117 and 500 hour humidity in accordance with ASTM D2247.
e. Hardware: Rim Panic Device with exterior lever handle with key entry to unlock lever. Surface applied door closer. Three non-removable pin template hinges. Threshold to be saddle type with aluminum mill finish. Weather strip shall be kerf, factory installed to jamb and header stops.

2. Overhead Door(s)

a. Nominal Dimension: 20'-0" x 12-0", one (1) each.
b. Curtain: Flat, type slat from minimum 22 gage galvanized steel.
c. Mounting: Frame mounted to building structure.
d. Operation: Manual chain hoist
e. Weatherseal: Bottom bar astragal.
f. Hood: 24 gage galvanized steel
g. Lock: NA
h. Finish: Powder-coat paint finish.

SCIENCE ENGINEERING, LTD.

GEOTECHNICAL, ENVIRONMENTAL, MATERIALS TESTING

GEOTECHNICAL INVESTIGATION

FOR

PROPOSED LAB BUILDING FOR SABINE RIVER AUTHORITY

IN

ORANGE, TEXAS

REPORT NUMBER 20221

REPORTED TO:

ARCHITECTS, INC.
704 TEXAS AVENUE
BRIDGE CITY, TEXAS 77611

OCTOBER 2020

PREPARED BY:
SCIENCE ENGINEERING, LTD.

P.O. Box 2048 / Nederland, Texas 77627 / Tel.: (409) 982-0686 or (409) 727-2218
Fax: (409) 982-0619 / e-mail: yousef@science-engineer.com

GEOTECHNICAL INVESTIGATION
Proposed Lab Building
Orange, Texas

INTRODUCTION

The study reported herein is an investigation of subsurface conditions for proposed Lab Building for Sabine River Authority in Orange, Texas.

AUTHORIZATION

This investigation was authorized by Mr. Clay Richards, A.I.A., by telephone on October 20, 2020.

SUBSURFACE EXPLORATION

The subsurface exploration at the site was accomplished by means of three (3) undisturbed sample core borings drilled to depths varying from five to twenty (5-20) feet below existing ground surface. Approximate boring locations are shown on the attached boring plan.

SUBSURFACE INVESTIGATION

The subsurface investigation consisted of drilling three-inch nominal diameter core borings. Undisturbed samples of the cohesive soils were obtained from the borings by means of thin-wall, seamless steel Shelby tube samplers, in accordance with the ASTM D–1587 method. The shear strength of the cohesive soil samples was estimated by hand pentrometer in the field.

All undisturbed samples were extracted mechanically from the core barrels in the field, classified, wrapped in aluminum foil, and sealed in airtight plastic bags to prevent moisture loss and disturbance. The samples were transported to our laboratory for testing and further study.

LABORATORY INVESTIGATIONS

All samples from borings were examined and classified in the laboratory by a soil engineer, according to procedures outlined in ASTM D-2488. Laboratory tests were performed on selected soil samples in order to evaluate the engineering properties of the soil in accordance with the indicated standard procedures.

LABORATORY TESTS	STANDARD TESTS
Atterberg Limits (L.L., P. L., P.I.)	ASTM D-4318
Soil Moisture Content	ASTM D-2216
Unconfined Compressive Strength	ASTM D-2266
Soils Classification	ASTM D-2487

Undrained shear strength of selective cohesive soils was determined by unconfined compression tests. Water content and dry unit weight of the foundation soils were determined as routine parts of the unconfined compression tests. Atterberg limits tests were performed on the appropriate cohesive samples. The results of these tests are shown on attached boring logs.

SUBSURFACE CONDITIONS

Specific types and depths of subsurface strata encountered on the site are shown on the attached boring logs. Review of the boring logs indicates that generalized stratography is approximately as follows:

Stratum No.	Average Depth, feet	Description of Strata
I	0.00 - 2.00	Tan and Gray SANDY CLAY (CL) and CLAYEY SAND (SC)
II	2.00 - 5.00	Gray and Tan SANDY CLAY (CL) with ferrous nodules
III	5.00 - 11.00	Tan and Gray CLAY (CH) with ferrous nodules
IV	11.00 - 20.00	Tan and Gray SANDY CLAY (CL) with ferrous nodules

The near surface soils are "CL-CH" type soils when classified by the unified soils classification system. This type soil normally exhibits moderate to high swell potential during seasonal moisture variations.

Hydrostatic water was encountered at the time of drilling, as shown on the attached boring plan.

CONSTRUCTION VARIATIONS

The information contained in this report summarizes conditions found on the date that the borings was drilled. The depth to the static water table may be expected to vary with the environmental variations, such as frequency and magnitude of precipitation and the time of year that construction begins.

DESIGN ANALYSIS AND RECOMMENDATIONS

Information available to this office indicates that the proposed construction at the site will consist of a new Lab building and related parking.

FOUNDATION RECOMMENDATIONS (BELL BOTTOM PIERS)

From analysis of the boring logs and laboratory test results, structural loads can be transmitted to the foundation soils by use of drilled and underreamed type footings. Footings should extend to a depth of eight (8) feet below existing ground surface to be located in Tan and Gray Clay. Utilizing a minimum factor of safety of three for dead load, or a minimum factor of two for total load, the allowable bearing capacity of the foundation soils for circular type footings is as follows: **2,600** PSF for dead load, plus long term live loads, and **3,900** PSF for total load. Whichever is critical should be used. The allowable loads given can be increased by thirty (30) percent for wind or temporary lateral loading.

Due to sand seams type soil at the recommended depth, we suggest that the bell to shaft ratio for the footings be limited to one to two (1:2).

There is a potential for upward movement of the plastic clays in contact with the sides of the piers; the pier shafts should be well reinforced throughout their length resist tensional force.

STRUCTURE FOUNDATION

Each footing excavation should be inspected by the project's Engineer, Architect or Owner's representative prior to placing concrete to insure that (a) the footing has been constructed at the correct depth and the correct formation established by previously mentioned criteria, (b) the footing is concentric with the pier shaft or column, and (c) excessive cuttings, build-up or any soft-compressible material(s) have been removed from the bottom of the excavation.

Placement of concrete should be accomplished as soon as possible to prevent changes in the state of stress and the caving of the foundation soils. No footings should be poured without the prior approval of the projects' Engineer, Architect or Owner's representative.

FLOOR SLABS AND GRADE BEAMS

Review of the Atterberg Limits determinations indicates that the surface soils are "CL-CH" type soils, with moderate to high plasticity, which may exhibit

expansion during seasonal wetting and drying cycles. We believe that conventional "slab-on-fill" construction may be used for the interior portion of the structures built at the site. Select fill, an additional twenty-four (24) inches thickness should be used to bring the structure to grade.

Prior to placement of select fill, strip site sufficiently to remove all topsoil, existing vegetation, and roots larger than ½" in diameter to an approximate depth of twelve (12) inches. Then scarify the subgrade, add moisture, if necessary, and re-compact to 95% of the maximum dry density as determined by ASTM D-698 (Standard Proctor). The moisture content at the time of compaction of subgrade soils should be within +3% of the proctor optimum value.

Select fill should then be placed, under laboratory control, in no greater than eight-inch (8") loose layers, and compacted to a minimum of 95% of the maximum dry unit weight, as obtained in the laboratory by means ASTM D-698 procedure. Moisture content of ±2% optimum should be maintained during placement of the select fill material. A vapor barrier consisting of six (6) mil Polyethylene shall be placed between the select fill and concrete slab.

The material used as select fill should consist of a non-active sandy clay or clayey sand type substance, having a Liquid Limit of 36 or less and Plasticity Index (P.I.) varying from 10 to 20.

FOUNDATION SETTLEMENT

A detailed settlement analysis was not within the scope of this study. It is anticipated that the footings designed, using the recommended allowable bearing pressures, will experience small settlements that will be well within the tolerable limit for the proposed structure.

PARKING AND DRIVEWAYS

Parking may be constructed using a Portland Cement Reinforced Concrete Pavement. A five-inch (5") minimum thickness should be used. For entrances and driveways, a seven-inch (7") minimum thickness should be considered.

Subgrade preparation should consist of removing all existing top soil and roots larger than ½-inch in diameter to a depth of about twelve (12) inches. Then scarify the subgrade, add moisture, if necessary, and re-compact to 95% of the maximum dry density as determined by ASTM D-698 (Standard Proctor). The moisture content at the time of compaction of subgrade soils should be within +3% of the proctor optimum value.

SITE PREPARATION

In order to remedy construction problems, which may develop if attempts are made to work the surface materials following prolonged periods of rainfall which are common to this area, it is recommended that prior to starting any work at the site that proper construction drainage is to be provided to maintain a relatively dry construction site. (Use a minimum slope of 5% within 10 feet of the foundation).

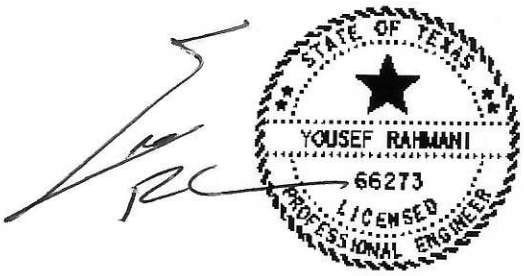
LIMITATIONS

The conclusions and recommendations given in this report are based on the analysis of the data collected for this project. Additive conclusions or recommendations made from this data by others are their responsibility.

Our study is based on the data obtained from soil borings made at the locations shown on borings plan. The nature and extent of variations between borings may become evident during construction. We should be requested to observe exposed conditions. After making these observations, and noting the engineering significance of variations, we will advise you of any changes in recommendations believed appropriate.

We appreciate this opportunity to provide our services to this project. Please let us know if you require additional information. Thank you.

Respectfully submitted for the firm,
TBPE Registration No. 4060



Yousef Rahmani, P.E.
President

Encl.: Boring Plan
Boring Logs 1 – 3
Geotechnical Chart/Symbols

Copies: 2 – Client
1 – SEL File 20221

YR/nb

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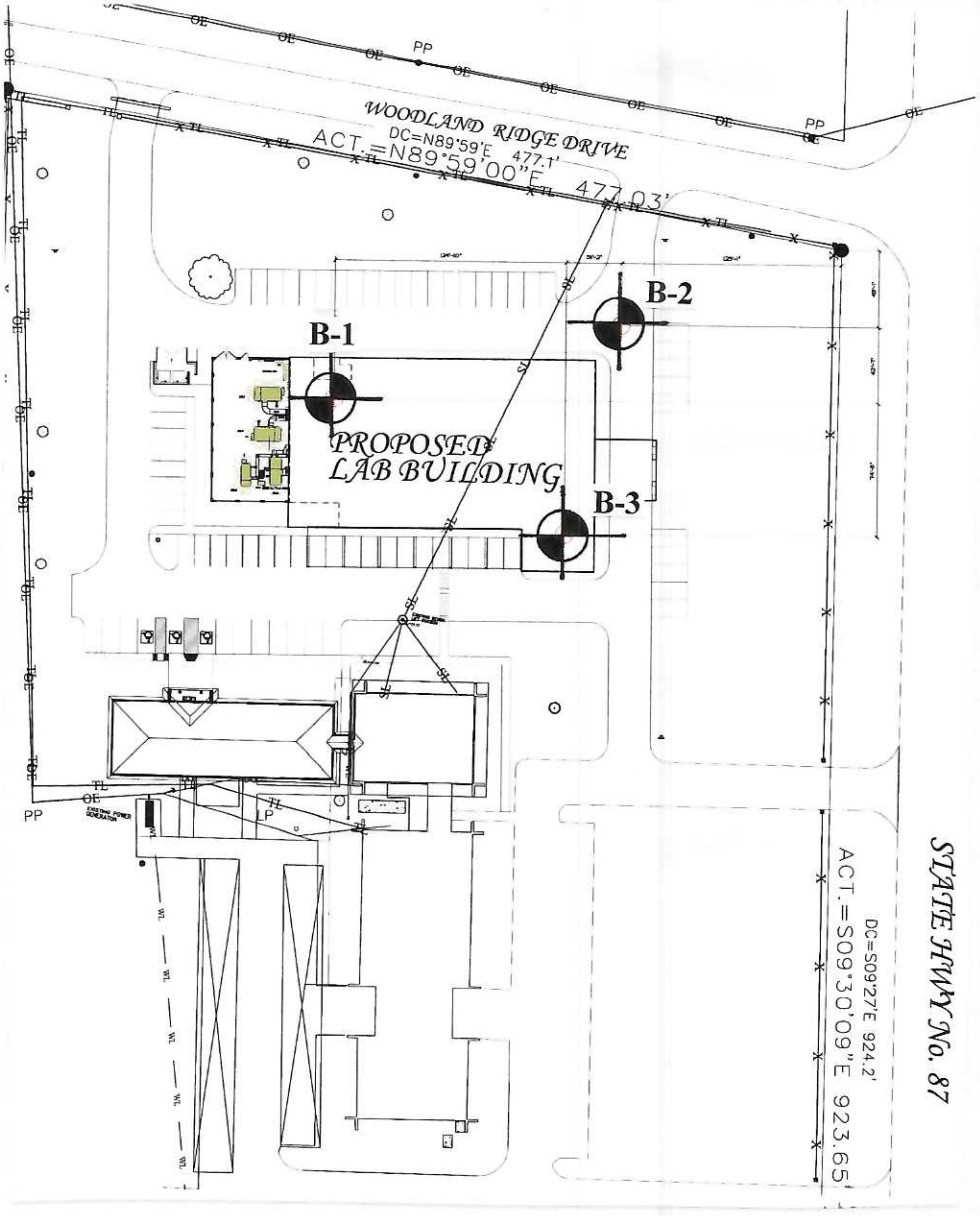
GEOTECHNICAL, ENVIRONMENTAL, MATERIALS TESTING

Report Number 20221



PROPOSED LAB BUILDING FOR SABINE RIVER AUTHORITY
ORANGE, TEXAS

BORING PLAN

OCTOBER 2020

NOT TO SCALE

P.O. Box 2048 / Nederland, Texas 77627 / Tel.: (409) 982-0686 or (409) 727-2218
Fax: (409) 982-0619 / e-mail: yousef@science-engineer.com

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GEOTECHNICAL, ENVIRONMENTAL, MATERIALS TESTING

LOG OF BORING

Project: Proposed Lab Building for Sabine River Authority
Orange, Texas

Boring Number: B-1
Location: See Boring Plan
Dry Auger: 0 to 20 Feet

Project No: 20221
Date of Report: 10/28/2020
Date of Boring: 10/24/2020
Authorization: Mr. Clay Richards, A.I.A.

DEPTH, FEET	SYMBOL	SAMPLE	BLOWS PER FOOT	STRATUM DESCRIPTION	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX (PI)	PERCENT PASSING NO. 200 SIEVE	SHEAR STRENGTH: POCKET PENETROMETER (TSF)	SHEAR STRENGTH: UNCONFINED COMPRESSIVE STRENGTH (TSF)
				Tan CLAYEY SAND; Fill								
				SC			28	21	7			
				Tan and Gray SANDY CLAY								
				CL							0.50	
				Tan, Red, and Gray CLAY								
5				with ferrous nodules	27	93	86	27	59		0.75	0.54
				CH							0.75	
				Tan and Gray SANDY CLAY								
				with ferrous noudules	23	101	42	19	23		0.75	0.56
10					22	103	41	20	21		1.00	0.55
					20	106	38	18	20		1.25	0.44
15												
				CL	25	94	42	20	22		0.25	0.26
20				Bottom at 20 feet								

1. Water was encountered at 18 feet during drilling.
2. Water lever was at 11' - 5" after 10 minutes.

P.O. Box 2048 / Nederland, Texas 77627 / Tel.: (409) 982-0686 or (409) 727-2218
Fax: (409) 982-0619 / e-mail: yousef@science-engineer.com

SCIENCE ENGINEERING, LTD.

GEOTECHNICAL, ENVIRONMENTAL, MATERIALS TESTING

LOG OF BORING

Project: Proposed Lab Building for Sabine River Authority
Orange, Texas

Boring Number: B-2
Location: See Boring Plan
Dry Auger: 0 to 5 Feet

Project No: 20221
Date of Report: 10/28/2020
Date of Boring: 10/24/2020
Authorization: Mr. Clay Richards, A.I.A.

DEPTH, FEET	SYMBOL	SAMPLE	BLOWS PER FOOT	STRATUM DESCRIPTION	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX (PI)	PERCENT PASSING NO. 200 SIEVE	SHEAR STRENGTH: POCKET PENETROMETER (TSF)	SHEAR STRENGTH: UNCONFINED COMPRESSIVE STRENGTH (TSF)
				Tan and Gray SANDY CLAY with sand layers; Fill CL			38	20	18			
				Tan and Gray CLAY with sand seams CH	20	101	60	22	38		0.50	0.43
											0.50	
5				Bottom at 5 feet								

1. Water was not encountered during drilling.
2. Bore hole dry upon completion.

P.O. Box 2048 / Nederland, Texas 77627 / Tel.: (409) 982-0686 or (409) 727-2218
Fax: (409) 982-0619 / e-mail: yousef@science-engineer.com

SCIENCE ENGINEERING, LTD.

GEOTECHNICAL, ENVIRONMENTAL, MATERIALS TESTING

LOG OF BORING

Project: Proposed Lab Building for Sabine River Authority
Orange, Texas

Boring Number: B-3
Location: See Boring Plan
Dry Auger: 0 to 15 Feet

Project No: 20221
Date of Report: 10/28/2020
Date of Boring: 10/24/2020
Authorization: Mr. Clay Richards, A.I.A.

DEPTH, FEET	SYMBOL	SAMPLE	BLOWS PER FOOT	STRATUM DESCRIPTION	WATER CONTENT (%)	DRY DENSITY (PCF)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX (PI)	PERCENT PASSING NO. 200 SIEVE	SHEAR STRENGTH: POCKET PENETROMETER (TSF)	SHEAR STRENGTH: UNCONFINED COMPRESSIVE STRENGTH (TSF)
				Tan and Gray SANDY CLAY; Fill								
				CL								
				Gray and Tan CLAY with								
				sand seams	22	100	40	21	19		0.50	0.52
5				CH							0.75	
				Tan and Gray CLAY with								
				sand seams	22	101	58	23	35		0.75	0.76
					22	102	54	21	33		0.85	0.82
10												
				_ sand seams								
				CH	23	97	72	24	48		1.00	0.64
15												
				Bottom at 15 feet								
				1. Water was not encountered during drilling.								
				2. Bore hole dry upon completion.								

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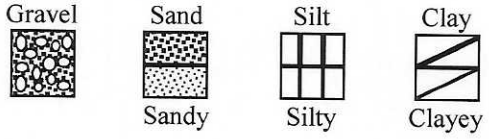
Fax: (409) 982-0619 / e-mail: yousef@science-engineer.com

SCIENCE ENGINEERING, LTD.

GEOTECHNICAL, ENVIRONMENTAL, MATERIALS TESTING

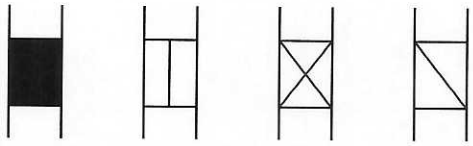
KEY TO SOIL CLASSIFICATION AND SYMBOLS

SOIL TYPE



Predominant type shown heavy

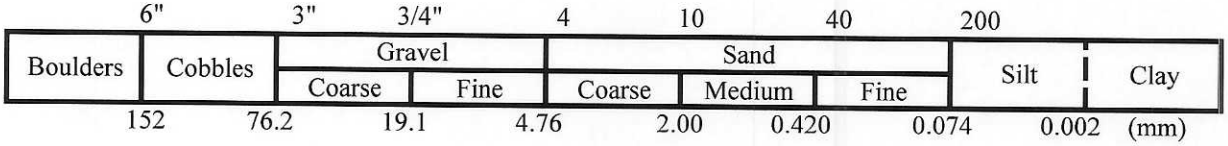
SAMPLE TYPE



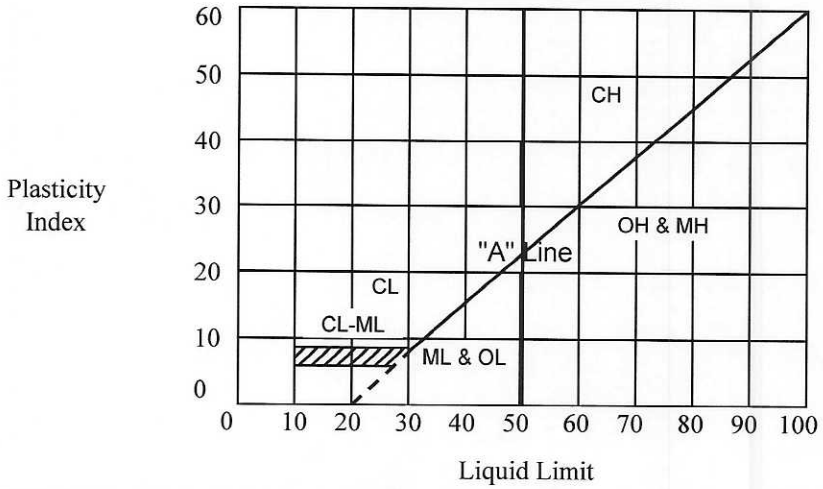
Un-Disturbed | Rock Core | Split Spoon | No Recovery

SOIL GRAIN SIZE

U.S. Standard Sieve



PLASTICITY CHART



CONSISTENCY OF COHESIVE SOILS

Penetration Resistance, blows per foot	Consistency	Cohesion TSF	Plasticity Index	Degree of Plasticity
0 - 2	Very Soft	0 - 0.125	0 - 5	None
2 - 4	Soft	0.125 - 0.25	5 - 10	Low
4 - 8	Firm	0.25 - 0.5	10 - 20	Moderate
8 - 15	Stiff	0.5 - 1.0	20 - 40	Plastic
15 -30	Very Stiff	1.0 - 2.0	> 40	Highly Plastic
> 30	Hard	> 2.0		

RELATIVE DENSITY OF COHESIONLESS SOILS

Penetration Resistance, blows per foot	Relative Density
0 - 4	Very Loose
4 - 10	Loose
10 - 30	Medium Dense
30 - 50	Dense
> 50	Very Dense

P.O. Box 2048 / Nederland, Texas 77627 / Tel.: (409) 982-0686 or (409) 727-2218

Fax: (409) 982-0619 / e-mail: yousef@science-engineer.com