September 9, 2021

Corpus Christi Regional Economic Development Corporation
800 N. Shoreline Blvd., Suite 1300 S.
Corpus Christi, Texas 78401

Attention: Mr. Tommy J. Kurtz, CEcD, MPA

SUBJECT: **GEOTECHNICAL DESKTOP STUDY**
104-Acre Site
Highway 181
Taft, Texas
RETL Job No. – G121459

Dear Mr. Kurtz,

In accordance with our agreement, Rock Engineering and Testing Laboratory, Inc. (RETL) has conducted a geotechnical desktop study for the above referenced site. The results of this study are presented in this report, an electronic copy of which is being transmitted herewith.

Authorization

The work for this project was performed in accordance with RETL proposal number CGP090221A dated September 2, 2021. The scope of work and fee was approved by Mr. Mike Culbertson, Chief Operating Officer representing Corpus Christi Regional Economic Development Corporation (CCREDC) by the signing of our proposal on September 3, 2021. The signed proposal was sent to RETL via email transmission on September 3, 2021.

Purpose and Scope

The purpose of this geotechnical desktop study was to obtain preliminary information regarding the subsurface soil and groundwater conditions in the general site area based upon RETL's reference materials, historical data and previous geotechnical studies performed in the vicinity of the site in order to provide an estimate of the subsurface conditions that are likely to be present at the site.

As requested by our client, the scope of services did not include actual soil borings at the specific site location; therefore, the information provided in this report should only be considered an estimate based on available and reviewed information.

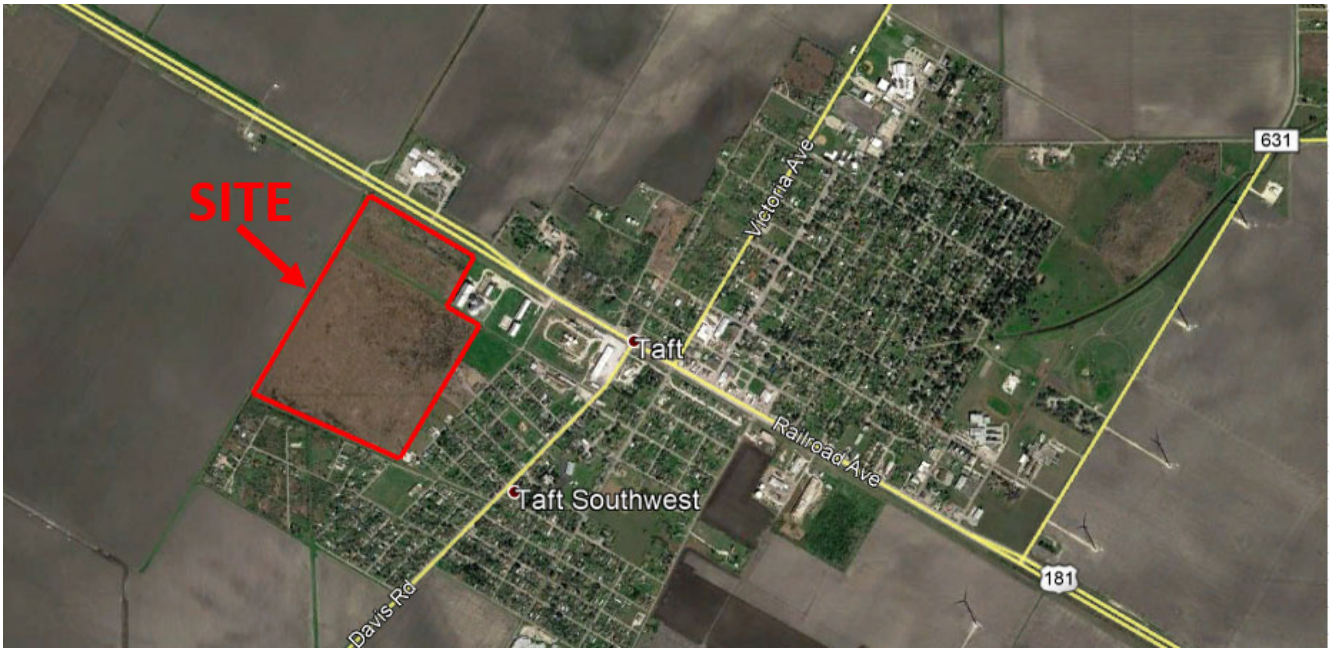
This report has been prepared for the exclusive use of CCREDC for the specific application of estimating soil conditions at the 104-acre site located off Highway 181 in Taft, Texas.

Site Location and Description

The 104-acre site is located off Highway 181 in Taft, Texas. Specifically, the site is situated along the south side of Highway 181, approximately 0.4 miles west of its intersection with Davis Road. The site is relatively flat and level and is currently undeveloped. Overhead utilities exist along the western side of the site, as well as traversing diagonally through the central portion of the site. A Site Vicinity Plan and a Site Location Plan are provided below.

SITE VICINITY PLAN

SITE LOCATION PLAN



Regional Geology

The Geologic Atlas of Texas, prepared by The University of Texas at Austin Bureau of Economic Geology, provides geologic mapping for the state of Texas. The 104-acre site is mapped as being located within the Beaumont Clay Formation (Qb). The Site Geology Map is provided below.

SITE GEOLOGY MAP

The Beaumont Formation (Qb) is a sedimentary non-marine Pleistocene period deposit. The Beaumont Formation generally is a heterogeneous geologic formation containing relatively thick interbedded layers of clays, sands, silts and interbedded clay/sand soil strata. These soils were deposited as fluvio-deltaic sediments by the ancestral equivalents of the Nueces River, augmented by strong run-off during interglacial periods.

The clay portion of the Beaumont formation primarily consists of montmorillonite, illite, kaolinite and finely ground quartz. The clays have been pre-consolidated by the process of desiccation (over-consolidated clays). In addition, there have been numerous wetting and drying cycles over time, which have generated a network of randomly oriented joints. The joints are normally closely spaced and are sometimes slickensided; the latter denotes existing fracture and failure planes within the soil stratigraphy.

Clays within the Beaumont Formation typically exhibit low permeability, high water-holding capacity, high compressibility, high to very high shrink-swell potential, high plasticity and low shear strength.

The sands and silts of the Beaumont formation vary in density and compactness from very loose to medium dense and very dense. These soils are composed of quartz, feldspars and relatively large particles of kaolinite, calcite and occasional hornblende.

Review of Nearby Soil Borings

RETL maintains records of previous geotechnical studies performed in and around the South Texas area. Historical soil borings and geotechnical reports in the general vicinity of the 104-acre site were reviewed for this geotechnical desktop study. A total of 6 geotechnical projects, including 33 borings, were reviewed. The locations of the reviewed soil borings are indicted in the following Soil Borings Location Plan.

SOIL BORINGS LOCATION PLAN

Estimated Soil and Groundwater Conditions

Based upon review of the geologic formation and the RETL soil borings performed in the vicinity of the 104-acre site, the soil profile at the site is estimated consist of expansive fat and/or lean clay soils from the surface and extending to depths of approximately 10 to 15 feet. Below the upper expansive fat and/or lean clay soils, alternating layers of typically lower plasticity fat/lean clay or sandy lean clay is present and extends to depths of approximately 20 to 25 feet. Clayey sand and/or silty sand soils are typically present below the intermediate depth lower plasticity clays and extend to depths of 35 to 40 feet. At some locations, a lower fat clay stratum is present below approximately 25 feet and extends to at least 40 feet.

Groundwater within soil borings near the site was present at depths between approximately 12 and 17 feet below the existing grade elevations, with a typical and average groundwater depth of approximately 15 feet.

Estimated Design and Construction Considerations

Based upon review of the RETL calculated soil properties and the associated soil-related design and construction recommendations provided for the reviewed projects in the vicinity of the 104-acre site, the following table has been prepared to represent the generally expected requirements and considerations for design and construction at the site.

Typical Design Considerations	Range of Researched Values for Nearby Sites	Typical Researched Value for Nearby Sites
Approximate Potential Vertical Rise (PVR)	1½ inches – 3¾ inches	3 inches
Undercut Depth and Select Fill Thickness to Achieve a PVR of Approximately 1 Inch	2 feet – 4½ feet	4 feet
Shallow Grade-Beam Bearing Depths	2 feet – 2½ feet	2 feet
Shallow Grade-Beam Allowable Bearing Capacity Values	2,000 psf	2,000 psf
Underreamed Drilled Pier Founding Depths	11 - 15	13
Underreamed Drilled Pier Allowable Bearing Capacity Values	4,000 psf – 7,000 psf	5,500 psf
Straight Shaft Drilled Pier Allowable Skin Friction Resistance (5' to 25')	250 psf – 400 psf	300 psf
Straight Shaft Drilled Pier Allowable Skin Friction Resistance (25' to 40')	400 psf – 900 psf	600 psf

The range of values provided in the above table generally represent the spectrum of reviewed information from the nearby sites, while the typical value represents the most common condition for the reviewed project sites. The values are not specific to the 104-acre site and should only be considered in estimating the conditions that may be present on the site. In no case should the information or values provided be relied upon or used for design purposes.

Limitations

As previously stated, the purpose of this geotechnical desktop study was to obtain preliminary information regarding the subsurface soil and groundwater conditions in the general site area based upon RETL's reference materials, historical data and previous geotechnical studies performed in the vicinity of the site. The information obtained from our review of this data is intended to provide a reasonable estimate of the probable subsurface conditions that are likely to be present at the site. However, the geologic process is erratic, and variations can occur across relatively small distances. Accordingly, the estimated information provided herein may or may not represent the actual conditions on the project site. If it is desired to obtain actual soil and groundwater information at the site, RETL should be contacted and soil borings at the specific site location can be performed.

Closing

RETL appreciates the opportunity to assist you by performing this Desktop Geotechnical Study. If you have any questions pertaining to this report, or if we can be of further assistance, please contact us at (361) 883-4555.

Sincerely,

James P. Bauer, P.E.
Corpus Christi Branch Manager

Darren W. Lantz, P.E.
Senior Geotechnical Engineer