

Geotechnical Solutions

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 Firm Registration No.: F-19672

Owner/s
c/o: Mr. Carlos Melick
 Carlosmelick@icloud.com

February 3, 2023
 Report No.: 23-044 (Page 1 of 5)

RE: Geotechnical Study (Proposed 40' x 100' Metal Building)
 Jourdanton Avenue at Ernst Road (28.9286600, -98.5432380)
 Jourdanton, Texas 78026

Sir / Ma'am:

Pursuant to your request, a representative of our field exploration crew, traveled to the above referenced property on Jan. 23, 2022, to obtain soil samples for the purposes of determining the Atterberg Limits, soil classification/s, allowable bearing capacities and potential soil vertical movement estimates, and to provide WRI-BRAB and PTI foundation design parameters for a proposed warehouse/office space building. The laboratory test results and design criteria are summarized herein. **Representative Site Photos are attached.**

Boring Locations: (2) within the proposed building envelope.

Typical Stratigraphy and Atterberg Limits (PI)

Depth / Interval	Soil Classification	Symbol	LL, %	PL, %	PI
1/2"	Tan, Clayey-Silt, with some sand, moist, compact to dense to very dense <i>(Atterberg Limits tests on samples from depths: 0.8', 3.8' and 8.4')</i>		38	12	26
4.3'			24	9	15
8.6'			14	7	7

Overall Effective PI: 16 - 18 ; PVR/PVM: -1-3/4" to +1-1/2" (At soil surface)

Allowable Qa at minimum depth of 12" below existing grade: 1800 psf

Allowable Qa between 3 and 5-foot-deep interval: 2600 psf

Proposed Residence: 40' x 100' Metal Building

Reinforced Beam-and-Slab-on-Grade Foundation

A slab-on-grade foundation may be considered for the proposed building. Geotechnical and pertinent PTI design parameters, based on general design analysis methods in Chapters 3 and 4 PTI - 2004 Edition, along with the 2008 Supplement, were evaluated and are summarized in the following table. **BRAB-WRI** parameters are also provided.

(OPTION 1 – Select Fill Method)

CRITERIA BASED ON PVR/PVM OF APPROX.: -3/4" to +1"

(Design PI: 25)

Thornthwaite Moisture Index	-16 to -15
Allowable Bearing Capacity	3300 psf
BRAB-WRI: C _w and Climatic Rating Factor:	0.88 ; 0.12
Edge Moisture Variation Distance (E _m)	5.9' (c)
	2.8' (e)
Differential Vertical Soil Movement (Y _m)	0.90" (c)
	1.20" (e)
Site Slope Correction Coefficient, C _s	Slope to Grade
Minimum Perimeter Grade Beam Penetration into Compacted Granular Fill Soil:	12 in.
Minimum (") Native Soil to Remove and Replace with Granular Select Fill:	1-3/4 ft.

The above design parameters assume that the granular select fill has a PI range of (7 – 22); and that subgrade clay-soil will be scarified to a depth of 8 inches and moistened within optimal soil-moisture range, prior to densely compacting; and that the moist-condition granular select fill will be introduced in loose lifts (not thicker than 9") prior to compacting. Compaction Method ASTM D698 is recommended to verify in-place density of subgrade clay-soil and compacted select fill.

OPTION 2: As Is (Beam-and-Slab-on Grade)

CRITERIA BASED ON PVR/PVM OF APPROX.: -1-3/4" to +1-1/2"

(Design PI: 27)

Thornthwaite Moisture Index	-16 to -15
Allowable Bearing Capacity	2000 psf
Edge Moisture Variation Distance (Em)	6.5' (center)
	3.5' (edge)
Differential Vertical Soil Movement (Ym)	1.45" (center)
	1.98" (edge)
BRAB-WRI: Cw and Climatic Rating Factor:	0.87 ; 0.13
Minimum Perimeter Grade Beam Penetration into Existing Soil:	18"

The above design parameters assume that vertical moisture barrier (perimeter beam) is designed to extend to the recommended embedment depth and that subgrade soil / fill soil and excavated grade beam trenches/footing excavations are free of roots and loose soil and should be in a **moist and dense / well-compacted condition, prior to concrete placement / discharge. Voids created by the removal of trees or previously existing flatwork/structures**, should be **backfilled** with moistened, low PI, sandy/gravelly soil and densely compacted. Final design parameters are commonly at the discretion of the project structural engineer.

The PTI method of predicting soil movement is mostly applicable when site moisture conditions are controlled by climatic conditions. Of course, foundation performance can be significantly influenced by adding perimeter pavement/s, yard drainage and yard maintenance, flower beds adjacent to foundation, rain gutters, utility line leaks, trees before and after construction, post construction subsurface or surface alterations near the foundation perimeter; and exceptional dry/wet prolonged conditions. The above criterion also assumes that proper irrigation methods and drainage **will be maintained after construction. If proper drainage / irrigation is not maintained, potential vertical movements greater than that anticipated may occur.**

The use of **sacked fill** between the beams should be at the discretion of the structural engineer. In this case, the structural engineer should provide anticipated foundation performance information if sacked fill is incorporated in the overall foundation specifications/details.

LIMITATIONS OF GEOTECHNICAL STUDY
Proposed 40' x 100' Metal Building
Jourdanton Ave. @ Ernst Road
Jourdanton, Texas 78026

The analysis and recommendations contained in this report were based on the data from two (2) borings, the laboratory test results, the observations associated with this site and our experience in the area. This report may not reflect precise variations of the soil conditions across the site. If different subsurface conditions are encountered at the time of construction/excavations, we should be contacted to evaluate the conditions encountered.

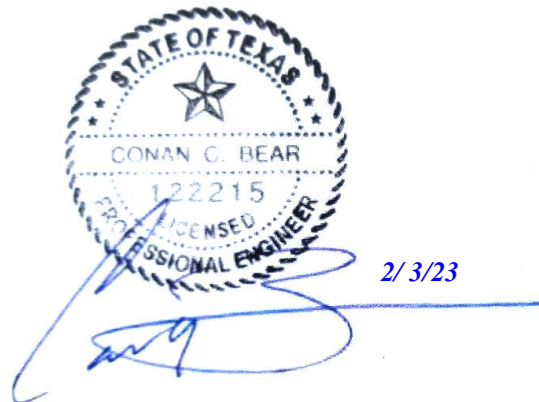
This report was prepared for this project exclusively for the use of *the owners, Mr. Carlos Melick, and the design team and the builder / foundation contractor.*

Again, thank you for the opportunity to be of service.

Respectfully,
Geotechnical Solutions (F-19672)

Alan J. Vasquez
Alan J. Vasquez
Geotechnical Consultant

Conan C. Bear, P.E.
Engineering Consultant



**Representative Site Photos
(Jourdanton Ave. @ Ernst Road)**

