GEOTECHNICAL INVESTIGATION

Proposed Community Center
802 Old Mill Rd
Cedar Park, Texas

Project No. 22-DG3152

Prepared for:

URC FOUNDATION
Cedar Park, Texas

Prepared by:

GEOSCIENCE ENGINEERS, LLC
Dallas, Texas

August 2022

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GeoScience

Project No. 22-DG3152

August 2, 2022

URC FOUNDATION
802 Old Mill Rd
Cedar Park, Texas

Proposed Community Center
802 Old Mill Rd
Cedar Park, Texas

Geoscience Engineers, LLC. is pleased to submit this geotechnical investigation for the above referenced project located in Cedar Park, Texas. This report briefly describes the procedures employed in our subsurface exploration and presents the results of our investigation.

Our Construction Materials Testing Division can provide the materials testing services that will be required during the construction phase of this project. We will be pleased to discuss a scope of work and submit a proposal for these services upon request.

We appreciate the opportunity to be of assistance on this project. Please feel free to contact us if you have any questions or if we can be of further service.

Respectfully,

Geoscience Engineers LLC.
Firm Reg # F-11285

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Project Manager

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INTRODUCTION

Project Description

This report presents the results of the geotechnical investigation performed at the site of the referenced project located in Cedar Park, Texas. Based on the information provided, it is our understanding that construction will consist of a community center building associate with paving area. Information regarding structural loads was not available at the time of this investigation; however, we anticipate the loads will be light. It is expected that the finished floor elevation of the proposed structure will be above surrounding ground surface. At the time of this investigation, site plan, grading plan and other information regarding the referenced project were not provided.

Site Description

The site of the referenced project is located at 802 Old Mill Road in the City of Cedar Park, Texas. At the time of this investigation the site was undeveloped covered with native vegetation. based on historic aerial map data collected, construction activity can be seen in and around the subject property between the years 2016 and 2018. The general location and orientation of the site is shown in the **Illustrations** section of this report.

Purposes and Scope of Work

The principal purposes of this investigation were:

1). Developing subsurface soil and rock stratigraphy at the boring locations.

2). Evaluating soil swell potential and alternatives to reduce the soil movement.

3). Providing recommendations for foundation design parameters.

4). Providing pavement recommendations and

5). Providing site preparation recommendations.

Report Format

The first sections of this report describe the field and laboratory phases of the study. The remaining sections present our engineering analyses and geotechnical parameters for the type

of foundation system proposed for use at this site. Boring logs and laboratory test results are presented in the **Illustrations** section of this report.

FIELD INVESTIGATION

The field investigation of this study involved drilling and sampling a total of eight (8) test borings, test borings B-1 to B-5 were drilled to a depth of 13 to 15 feet in the proposed building and test borings B- 6 to B-8 were drilled to a depth of 5 feet in the proposed paving area below ground surface and area accessible to the drill rig. The approximate locations of the borings are shown on the Boring Location Plan Plate A. Logs of the borings with descriptions of the soils sampled are presented on Plates 1 to 8. Soil strata boundaries shown on the boring logs are approximate.

The borings were advanced using continuous flight auger techniques. Undisturbed surface cohesive soil samples were obtained using a 3-inch diameter thin-walled tube sampler pushed into the soil. The un-drained compressive strength of cohesive soils was estimated in the field using a calibrated pocket penetrometer.

To evaluate the relative density and consistency of harder formations, Texas Department of Transportation Cone Penetrometer tests were performed at selected locations. The actual test consists of driving a three-inch diameter cone with a 170-pound hammer freely falling 24 inches. In relatively soft materials, the penetrometer cone is driven one foot and the number of blows required for each six-inch penetration is tabulated at respective test depths, as blows per six inches on the boring log. In hard materials, the penetrometer cone is driven with the resulting penetrations, in inches, accurately recorded for the first and second 50 blows for a total of 100 blows. The penetration for the total 100 blows is recorded at the respective testing depths on the boring log.

All soil samples were extruded from the samplers in the field, visually classified and wrapped in plastic bags to prevent loss of moisture or disturbance during transfer to the laboratory. The borings were drilled using dry auger procedures to observe water level at the time of the exploration. Water level observations are recorded on the boring logs.

LABORATORY TESTING

Engineering properties of the foundation soils were evaluated in the laboratory by tests performed on representative soil samples. A series of moisture content was performed to

develop soil moisture profiles and to aid in evaluating the uniformity of soil conditions at this location. Liquid and Plastic limit tests (Atterberg limits) and the free swell test were performed on selected soil samples to confirm visual classification and evaluate soil volume change potentials. All tests were performed using ASTM procedures by experienced technicians working under the direction of an engineer.

Review

Descriptions of strata made in the field were modified in accordance with laboratory tests results and visual examination in the laboratory. All recovered soil samples were examined, classified and described in accordance with ASTM D 2487, ASTM D 2488 and Unified Soil Classification procedures. Classifications of the soils and finalized descriptions of soil strata are shown on the attached boring logs.

GENERAL SUBSURFACE CONDITIONS

Localized Subsurface Stratigraphy

Based on our interpretation of the borings drilled for this investigation, the subsurface stratigraphy encountered at the location of test borings consisted of dark brown clay/sandy clay with limestone fragments from existing ground surface elevation and remained visible to a depth of 1 to 6 feet of test borings drilled below which is tan weathered limestone with calcareous clay seams was encountered and remained visible to the completion depths of the test borings drilled.

Detailed descriptions of the subsurface stratigraphy encountered at the locations of the test borings drilled for this study are included in the **Illustrations** section of this report.

Subsurface Water Conditions

The borings were advanced using auger drilling method in order to observe groundwater seepage levels. NO Groundwater seepage was encountered in the test borings drilled at the time of this investigation. It should be noted future construction activities may alter the surface and subsurface drainage characteristics of the site. Therefore, the depth to groundwater should be verified during construction. If there is a noticeable change from the conditions reported herein, this office should be notified immediately to review the effect that it may have on the

design recommendations. Based upon short-term observations, it is not possible to accurately predict the magnitude of subsurface water fluctuations that might occur.

ANALYSIS AND RECOMMENDATIONS

Construction Consultation and Monitoring

We recommend that *Geoscience* be given an opportunity to review the final design drawings and specifications to ensure that the recommendations provided in this report have been properly interpreted. Wide variations in soil conditions are known to exist between the boring locations. Furthermore, unanticipated variations in subsurface conditions may become evident during construction. During the excavation and foundation phases of the project, we recommend that a reputable Geotechnical Engineering firm be retained to provide construction surveillance services in order to 1) observe compliance with the geotechnical design concepts, specifications, and recommendations, and 2) observe subsurface conditions during construction to verify that the subsurface conditions are as anticipated, based on the borings drilled for this investigation.

Soil Movement

The near surface soils encountered at this site exhibited Plasticity Indices of 27 to 40. Based on the plasticity indices, these soils are considered as *moderate to highly expansive* in nature and prone to vertical movement as changes occur in soil moisture conditions. The magnitude of the moisture induced vertical movement was calculated using the Department of Transportation method in conjunction with current moisture content and dry soil condition and using the laboratory data from the results of swell tests performed on the selected samples. Based on aforementioned methods the estimated moisture induced Potential vertical movement of the soils at the time of this investigation is at the location of the test borings drilled is on the order of 3 to 4.5 inches.

Considerably more movement will occur in areas where water ponding is allowed to occur during and/or after construction –or- fill soils other than select fill soils are planned for use –or- if the thickness of the clay soils is greater than that encountered in the test borings. Site grading may also increase or decrease the potential for the movement.

To reduce the soil potential vertical movement (PVR) to one inch, we recommend the subgrade soils should be improved by adopting one of the following methods:

- *Placement of select fill soils:*

The potential vertical movement can be reduced to less than one to 1.5 inches by removing subgrade soils to a depth of 4.5 feet or to top the tan limestone whichever encountered first below finished grade and replace with select fill soils. The bottom of the select fill soil (i.e., top of subgrade soils) should be scarified to a depth of 6 inches where clay soils encountered and watered to bind the reciving fill soils. Placement of expansive soils on the building pad will increase the potential for vertical movement; therefore, we recommend the use of select fill soils (specifications of which are outlined in the **Select Fill** Section of this report). The select fill soils should be placed as per the procedure outlined page 6 of this report.

The placement of select fill soils should extend 3 feet beyond the building line and should include all the areas sensitive to soil vertical movement. It should be noted that the upper two feet or the depth of grade beam whichever is greater of the select fill soils should not extend beyond the building line however should be capped with on-site high plasticity index clay soils to retard the migration of moisture into the subgrade soils.

In lieu of select fill soils, flex base materials can be used. Flex base materials should be placed in 6 to 8 inches loose lifts compacted to a minimum of 98 percent of maximum dry density as per ASTM D-698 and the moisture content should be between -2 to +3 percent points above optimum.

Field density tests should be taken at the rate of at least one test per each 2,500 square feet or minimum of three per lift, in the area of all compacted fill. For areas where hand tamping is required, the testing frequency should be increased to approximately one test per lift, per 100 linear feet of area.

OR-

- *Moisture conditioning method:*

Remove the subgrade soils to top of the tan limestone below the finished grade elevation and stockpile. The exposed subgrade should be sloped to the edges and corners of the excavation

to provide a positive gravity flow of groundwater seepage, if encountered. The exposed limestone should be verified by Geotechnical engineer. The surface should be watered to bind the reciving fill soils then the previously removed soils should be placed back in the building pad area in 6 to 8 inches loose lifts and mixed to form homogenous material to a depth of one foot below finished grade elevation. Moisture contents should be a minimum of 4 points above optimum and compacted to between 93 and 98 percent of maximum dry density as per ASTM D-698. Any objectionable material(s) and rocks larger than 4 inches in diameter should be handpicked and removed.

The upper one foot of the soils should consist of select fill soils –or- flex base materials -or- onsite limes stabilized soils.

In the event that select fill soil is planned to be used as a cap, then it should be placed in 6 to 8 inches loose lifts and compacted between 95 and 100 percent of the maximum dry density as per ASTM D 698 with moisture contents within three points of optimum moisture as per ASTM D 698. We recommend select fill soils not be extended beyond the building line; however, the perimeter outside the grade beam should be capped with high plasticity index clay soils in order to retard any water seepage underneath the foundation.

If the flex base is used as a cap atop of moisture conditioned soils, then the flex base should be placed in 6 to 8 inches loose lifts compacted to a minimum of 98 percent of maximum dry density as per ASTM D-698 and the moisture content should be between -2 to +3 percent points above optimum.

In the event that lime stabilization to the existing subgrade is planned as a cap, then it should be stabilized with a minimum of 36 pounds per square yard of lime for 6-inch-thick soil (lime series test is required).

We recommend that during moisture conditioning the swell tests should be performed to ensure that the percent swell tested on the sample is less than 1%. During moisture conditioning process, full time testing will be required and a certification from the testing laboratory should be obtained to ensure that the swell potential of the soils has been adequately reduced for the design of the slab foundation.

Field density tests should be taken at the rate of at least one test per each 2,500 square feet, per lift, in the area of all compacted fill. For areas where hand tamping is required, the testing frequency should be increased to approximately one test per lift, per 100 linear feet of area.

Construction of the building slab should start shortly upon completion of the subgrade improvement process. Moisture loss of the improved soils should not be allowed to occur between the time the improvement procedures are completed and the start of the construction.

FOUNDATION DESIGN CRITERIA

The foundation recommendations provided in the report are based on the soil information obtained from the test borings drilled for this site. During construction if the soils at the other location of building are found to be different than encountered at the location of the test borings then, our recommendations provided in this report will not valid and additional drilling of the test borings will be required.

A. Straight Shaft Pier Foundation Systems

The structural loads can be supported by auger excavated straight-sided, cast-in-place, reinforced concrete piers. The piers should be founded minimum 5 feet within weathered limestone encountered at depth of one to 6 feet of test borings drilled. It should be noted that the depth to the limestone may vary in other area of the site. The net allowable end bearing capacity of 15,000 psf can be used with the skin friction of 2500 psf in compression and in tension. The skin friction component should only be applied to the portion of the shaft located in the pier-bearing stratum below the recommended minimum penetration. We recommend that our firm should monitor the pier drilling operation in order to assure that the pier has been installed within the limestone stratum and recommended depths. It should be noted that no pier should be less than in any case.

Soil Induced Uplift Loads

The piers should be provided with enough steel reinforcement to resist the uplift pressures that will be exhibited by the near surface soils. Based on the test boring drilled the limestone was encountered at a shallow depth as such minor uplift pressure due to soils is anticipated however, we recommend the uplift pressures be approximated on the order of 1600 psf over the shaft

perimeter of 7 feet or top of the limestone whichever encounter first. The shaft must contain sufficient continuous vertical reinforcement to the full depth of the pier.

Foundation piers designed and constructed in accordance with the information provided in this report will have a factor of safety in excess of 2.5 against shear type failure and will experience minimal settlement (less than one inch).

Pier Installation

The construction of all piers should be observed by experienced geotechnical personnel during construction to ensure compliance with design assumptions and to verify: (1) the bearing stratum; (2) the minimum penetration; (3) the removal of all smear zones and cuttings; (4) that groundwater seepage is correctly handled; and (5) that the shafts are vertical and within acceptable tolerance levels. Our firm is available to provide these services upon request.

Reinforcing steel and concrete should be placed immediately after the excavation has been completed and observed. In no event should a pier excavation be allowed to remain open for more than 8 hours. Concrete should be placed in such a manner to prevent segregation of the aggregates.

Based on subsurface water condition, a temporary casing of the piers will not be required. It should be noted that prior to the placement of concrete, any water in the pier hole should be removed using a pump.

Grade beams

The Grade beams should be structurally connected into the top of the piers. If a ground-supported slab is used, then the subgrade soils should be improved by moisture conditioning method or placement of select fill soils as outlined in later sections of this report. The grade beam should be a minimum of 2 feet deep and 15 inches wide. Some difficulty may require during trenching due to presence of limestone.

Alternatively, the grade beam can be suspended. A minimum void space of 6 inches should be provided beneath the beams in conjunction with pier type of foundation system. This void space allows movement of the soils below the grade beams without distressing the structural system. Structural cardboard forms are typically used to provide the void beneath grade

beams. Cardboard forms used must have sufficient strength to support the concrete during construction.

Our experiences indicate that major distress in grade beams will occur if the integrity of the void box is not maintained during construction. The excavation in which the void box lays must remain dry. Cardboard cartons can easily collapse during concrete placement if the cardboard becomes wet. Backfill material must not be allowed to enter the carton area below grade beams as this reduces the void space that underlying soils need to swell.

Floor Systems

In conjunction with piers and spread footings, two types of floor systems may be considered for use at this site:

i) Suspended Slab in conjunction with pier type of foundation system - The most positive floor system for pier type foundation systems in areas with expansive soils consists of a suspended floor system. The floor system of the proposed buildings should be structurally supported on the foundation piers and a minimum void space of 6 inches provided between the bottom of the slab and underlying soils.

ii) Ground Supported Slab - In conjunction with piers and spared footings, a ground-supported slab may be considered for use at this site, provided the risk of some post-construction movement is acceptable. A ground-supported slab, if used, then subgrade soils should be improved by moisture conditioning or placement of select fill soils as per the procedures outlined in previous sections of this report.

Based on the *Terzaghi's* Bearing Capacity theory a net allowable soil bearing pressure of 2,000 psf can be used for select fill soils and 1,500 psf for the moisture conditioned soils. These bearing pressures include a factor of safety of 2.5 with respect to shear failure. Grade beams and floor slabs should be adequately reinforced to minimize any future cracking as normal movements occur in the foundation soils. Also, a moisture barrier of polyethylene sheeting or similar material should be placed between the slab and the subgrade soils to retard moisture migration through the slab. It should be understood that a soil-supported foundation system will experience some movement over time.

Building Pad Preparation

Prior to placing any additional fill material, all the existing vegetation, debris (if any), loose and fill (if any) soils, should be removed until hard stratum is encountered.

For a suspended floor system - After removal of all above referenced items, all exposed surfaces should then be scarified to a depth of 6 inches watered as required and compacted to between 95 and 100 percent of the maximum dry density as defined by ASTM D 698 (Standard Proctor Test) at a moisture content between the optimum moisture value and 4 points above optimum. Additional fill, if is required, should consist of clean soils compacted to resist the initial concrete loads. Placement of select fill soils or improvement of existing soils is note required for suspended floor system.

For ground supported floor system - after removal of all referenced items, the subgrade soils should be improved by moisture conditioning method or placement of select fill soils as outlined in previous sections of this report. Additional fill soils if required should consist of select fill soils which should be placed and compacted as per the procedure outlined on page 5 of this report.

In lieu of select fill soils, flex base can be used which should be placed and compacted as per the procedure outlined on page 5 of this report.

Field density tests should be taken at the rate of one test per every 2,500 square feet per lift, or a minimum of 3 tests per lift in the area of all compacted fill. For areas where hand tamping is required, the testing frequency should be increased to approximately one test per lift, per 100 linear feet of area.

Select Fill

"Select fill," as referred to in this report, should consist of clayey sands free of organic materials with a Plasticity Index between 6 and 16, a Liquid Limit of 38 or less, and between 15 and 45 percent passing a No. 200 sieve.

Flex Base

TxDOT 247 Type 1.

PAVEMENT RECOMMENDATION

General

Specific wheel loading and traffic volume characteristics were not available at the time of this investigation. However, we have assumed that light passenger vehicle traffic will be most predominant in the parking areas and the relatively heavier fire truck traffic will occur in the drive areas area around and behind the structure, and in the fire lane. Based on assumed loading conditions, we have developed the following Portland Cement concrete pavement design sections for use at this site.

	Minimum Thickness (inches)
Light Traffic	
Portland Cement Concrete	5
Minimum Lime Stabilized Subgrade	6
Compacted Subgrade Soils	6
Heavy Traffic	
Portland Cement Concrete	6
Minimum Lime Stabilized Subgrade	6
Compacted Subgrade Soils	6

Prior to the placement of any fill in the pavement area, we recommend all the existing vegetation, debris (if any), loose and fill (if any) soils, should be removed until hard stratum is encountered. Existing utility lines (if any) should either be capped on both sides or removed completely.

The exposed surface should be proof rolled with heavy equipment. After the passing of proof rolling the exposed subgrade should be scarified to a depth of 6 inches water as required and compacted to 95 and 100 percent of maximum dry density as defined by ASTM D 698 (Standard Proctor Test), at moisture content between optimum and 4 points above optimum.

The upper six inches of subgrade soils should then be stabilized with lime. We estimate approximately 6 to 8 percent of hydrated lime (30 to 36 lbs/yard for 6-inch-thick-soil) will be required to stabilize the subgrade soils (to reduce the plasticity index to 15 or less). It should be

noted that after the final grade is complete, the actual amount of lime required should be calculated by lime series test in the laboratory.

The lime stabilized soils should be compacted to a minimum of 95 percent of maximum dry density with the moisture content between optimum and 4 points above optimum. Field density tests should be taken at the rate of one test per every 2500 square feet per lift.

In the event that lime stabilization of the subgrade soils is not economically feasible, then the thickness of the concrete can be increased by an additional one inch or city standards as an alternative.

In the event limestone is exposed after grading, then lime stabilization is not required. The exposed surface should be watered and all the disturbed areas of the utility lines (utility trenches) should be backfilled filled with 8 inches of compacted flex base as and compacted as per the specifications outlined on page 5 of this report.

Design of the concrete pavement should specify a minimum 28-day concrete compressive strength of 3,600 psi with 4 percent to 6 percent entrained air. The concrete should be placed within one and one-half hours of batching. During hot weather, the concrete placement should follow ACI 311 Hot Weather concreting and in no case should the concrete temperature be allowed to exceed 95ºF. To avoid excessive heat periods, consideration should be given to limiting concrete placement to a time of day that will minimize large differences in the ambient and concrete temperature.

Past experience indicates that pavements with sealed joints on 15 to 20-foot spacings, cut to a depth of at least one-quarter of the pavement thickness, generally exhibit less uncontrolled post-construction cracking than pavements with wider spacings. As a minimum, expansion joints should be used wherever the pavement abut a structural element subject to a different magnitude of movement, e.g., light poles, retaining walls, existing pavement, building walls, or manholes. After construction, the construction and expansion joints should be inspected periodically and resealed, if necessary. The pavement should be reinforced using at least No. 3 bars, 18 inches on center should be used.

SITE GRADING and DRAINAGE

All grading should provide positive drainage away from the proposed structures and should prevent water from collecting or discharging near the foundations. Water must not be permitted to pond adjacent to the structures during or after construction.

Surface drainage gradients should be designed to divert surface water away from the building and towards suitable collection and discharge facilities. Unpaved areas and permeable surfaces should be provided with steeper gradients than paved areas. Pavement drainage gradients within 5 feet of buildings should be constructed with a minimum slope of 1/4 inch per foot to prevent negative drainage gradients (ponding water conditions) from developing due to differential upward pavement movements. Sidewalk drainage gradients should be along maximum slopes allowed by local codes.

Roofs should be provided with gutters and downspouts to prevent the discharge of rainwater directly onto the ground adjacent to the building foundations. Downspouts should not discharge into any landscaped bed near the foundations. Roof downspouts and surface drain outlets should discharge into erosion-resistant areas, such as paving or rock riprap. Recessed landscaped areas filled with pervious sandy loam or organic soil should not be used near the foundation. Landscaped beds should be elevated above a compacted and well-graded clay surface. Sealed planters are preferred. All trees should be a minimum of one-half their mature height away from the building or pavement edges to reduce potential moisture losses. Water permitted to pond in planters, open areas, or areas with unsealed joints next to structures can result in on-grade slab or pavement movements, which exceed those, indicated in this report.

LANDSCAPING

Trees will remove water from the soil and, as a result, may cause the soil to shrink; therefore, in areas where pavement is planned, trees should either:

a). not be planted closer than the mature tree height from the building.

b). have a controlled irrigation system, or

c). be planted in containers.

Excess water ponding on or beside roadways, sidewalks and structural slabs may cause an unacceptable heave to these structures. To reduce this potential heave, good surface drainage should be established, and sprinkler systems should be designed and operated to minimize saturation of soil adjacent to these structures. Sprinkler mains next to buildings are not recommended.

Bedding soils for plants may collect and direct water underneath the buildings and pavements; therefore, care should be taken to ensure that water entering the bedding soils drains away from these structures. If positive drainage away from these structures cannot be achieved, an impermeable synthetic membrane should be considered to reduce the risk of water migrating beneath the buildings and pavements. An 18-inch-deep vertical water barrier along the pavement edge fronting landscaped areas may be desirable to help prevent irrigation water from having ready access to the soils beneath the pavement. Special attention should be given to provide good drainage from plantings inside the building courtyards and planter boxes.

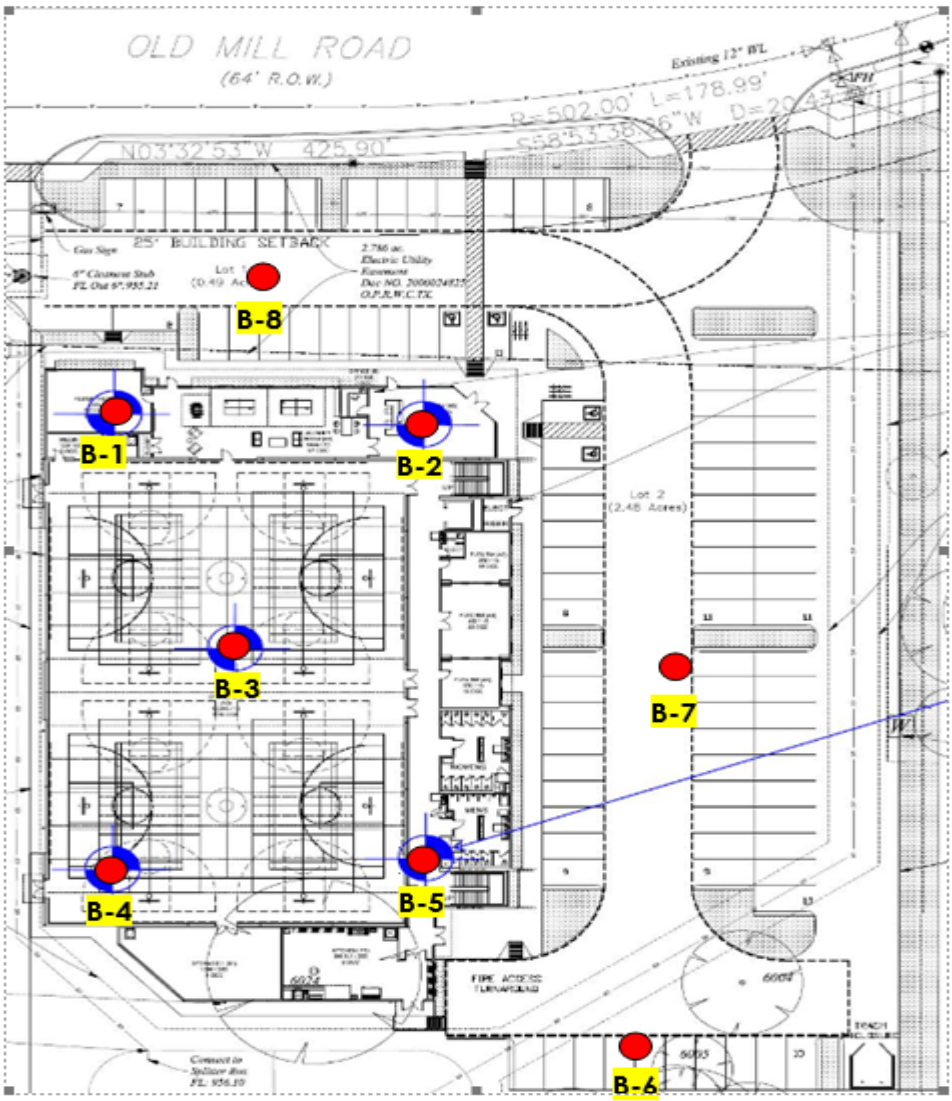
The completed landscaping should be carefully inspected to verify that plantings properly drain. Soil in plantings may settle, which will tend to pond water, or plantings may block entrances to surface drains. Therefore, maintaining positive drainage from landscape irrigation will be an ongoing concern.

CLOSURE

It should be noted that some variations in soil and moisture conditions may exist between different parts of the site. Statements in this report as to subsurface variations over given areas are intended as estimations only, based upon the data obtained from specific borings location.

The results, conclusions, and recommendations contained in this report are directed at, and intended to be utilized within the scope of work outlined in this report. The report is not intended for use in any other manner. *Geoscience Engineers, LLC*. makes no claim or representation concerning any activity or condition falling outside the specified purposes for which this report is directed; said purposes being specifically limited to the scope of work as defined herein. Inquiries regarding scope of work, activities and/or conditions not specifically outlined herein, should be directed to *Geoscience Engineers, LLC*.

ILLUSTRATIONS



Approximate Boring Location

BORING LOCATION PLAN

Proposed Commercial Development
802 Old Mill Road
Cedar Park, Texas

Project No.: 22-DG3152

Plate A

GeoScience Incorporated

LOG OF BORING NO. B-1

Proposed "Commercial Development"
802 Old Mill Rd.
Cedar Park, Texas

Project No. 22-DG3152

Location: See Location Plan
Surface Elevation: Unknown
Drilling Method: CFA
Date Boring Drilled: 06/29/2022
Completion Depth: 15
Groundwater Information:
Seepage Encountered During Drilling: None
Upon Completion: Dry

FIELD DATA						LABORATORY DATA							
DEPTH (ft.)	SOIL & ROCK SYMBOL	SAMPLE TYPE	P: HAND PEN., TSF T: THD, BLOWS/FT. N: SPT, BLOWS/FT.	STRATUM DEPTH (FT.)	DESCRIPTION OF STRATUM	WATER CONTENT, %	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	UNIT DRY WEIGHT (PCF)	UNCONFINED STRENGTH (TSF)	% PASSING NO. 200 SIEVE	SOIL SUCTION TEST (TOTAL CM. OF WATER)
0			P4.5		Dark brown CLAY (CH) with limestone fragments	17							
			P4.5	3.5		17	61	22	39	103	2.5	72	
5			T100/ 4.0"		Alternate Tan CALCAREOUS CLAY (CL)/ weathered LIMESTONE -tan, orange tan below 6'	5							
10			T100/ 4.0"	14.0		6							
15			T100/ 4.5"	15.0	Tan weathered LIMESTONE	7							
20													
25													
30													

TUBE SAMPLE	AUGER SAMPLE	SPLIT-SPOON	ROCK CORE	THD CONE PEN.	NO RECOVERY

REMARKS:

GeoScience Incorporated

LOG OF BORING NO. B-2

Proposed "Commercial Development"
802 Old Mill Rd.
Cedar Park, Texas

Project No. 22-DG3152

Location: See Location Plan
Surface Elevation: Unknown
Drilling Method: CFA
Date Boring Drilled: 06/29/2022
Completion Depth: 15
Groundwater Information:
Seepage Encountered During Drilling: None
Upon Completion: Dry

FIELD DATA						LABORATORY DATA							
DEPTH (ft.)	SOIL & ROCK SYMBOL	SAMPLE TYPE	P: HAND PEN., TSF T: THD, BLOWS/FT. N: SPT, BLOWS/FT.	STRATUM DEPTH (FT.)	DESCRIPTION OF STRATUM	WATER CONTENT, %	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	UNIT DRY WEIGHT (PCF)	UNCONFINED STRENGTH (TSF)	% PASSING NO. 200 SIEVE	SOIL SUCTION TEST (TOTAL CM. OF WATER)
0			P4.5	1.5	Dark brown CLAY (CH) with limestone fragments	11	54	21	33			63	
					Tan weathered LIMESTONE with calcareous clay interbeddings								
5			T100/ 4.0"			6							
10			T100/ 4.5"			7							
15			T100/ 4.0"	15.0		5							
20													
25													
30													

TUBE SAMPLE	AUGER SAMPLE	SPLIT-SPOON	ROCK CORE	THD CONE PEN.	NO RECOVERY

REMARKS:

GeoScience Incorporated

LOG OF BORING NO. B-3

Proposed "Commercial Development"
802 Old Mill Rd.
Cedar Park, Texas

Project No. 22-DG3152

Location: See Location Plan
Surface Elevation: Unknown
Drilling Method: CFA
Date Boring Drilled: 06/29/2022
Completion Depth: 14
Groundwater Information:
Seepage Encountered During Drilling: None
Upon Completion: Dry

FIELD DATA						LABORATORY DATA							
DEPTH (ft.)	SOIL & ROCK SYMBOL	SAMPLE TYPE	P: HAND PEN., TSF T: THD, BLOWS/FT. N: SPT, BLOWS/FT.	STRATUM DEPTH (FT.)	DESCRIPTION OF STRATUM	WATER CONTENT, %	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	UNIT DRY WEIGHT (PCF)	UNCONFINED STRENGTH (TSF)	% PASSING NO. 200 SIEVE	SOIL SUCTION TEST (TOTAL CM. OF WATER)
0			P4.5+		Dark brown CLAY (CH) with calcareous nodules	15							
			P4.5+			12	58	22	36				
5			P4.5+	6.0	-with orage tan below 4'	21							
					Tan weathered LIMESTONE								
10			T100/ 3.5"			7							
			T100/ 3.5"	14		9							
15													
20													
25													
30													

TUBE SAMPLE	AUGER SAMPLE	SPLIT-SPOON	ROCK CORE	THD CONE PEN.	NO RECOVERY

REMARKS:

GeoScience Incorporated

LOG OF BORING NO. B-4

Proposed "Commercial Development"
802 Old Mill Rd.
Cedar Park, Texas

Project No. 22-DG3152

Location: See Location Plan
Surface Elevation: Unknown
Drilling Method: CFA
Date Boring Drilled: 07/06/2022
Completion Depth: 13
Groundwater Information:
Seepage Encountered During Drilling: None
Upon Completion: Dry

FIELD DATA					LABORATORY DATA							
DEPTH (ft.)	SOIL & ROCK SYMBOL	SAMPLE TYPE	P: HAND PEN., TSF T: THD, BLOWS/FT. N: SPT, BLOWS/FT.	STRATUM DEPTH (FT.)	DESCRIPTION OF STRATUM	WATER CONTENT, %	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	UNIT DRY WEIGHT (PCF)	UNCONFINED STRENGTH (TSF)	% PASSING NO. 200 SIEVE	SOIL SUCTION TEST (TOTAL CM. OF WATER)
0					Dark brown CLAY (CH) with limestone fragments	7							
			P4.5+			20	61	22	39	101	1.8	73	
5				6.0		13							
			T100/ 3.5"		Tan weathered LIMESTONE with calcareous clay seams	7							
10						7							
			T100/ 4.5"	13.0		7							
15					Auger refusal at 13'								
20													
25													
30													

TUBE SAMPLE	AUGER SAMPLE	SPLIT-SPOON	ROCK CORE	THD CONE PEN.	NO RECOVERY

REMARKS:

GeoScience Incorporated

LOG OF BORING NO. B-5

Proposed "Commercial Development"
802 Old Mill Rd.
Cedar Park, Texas

Project No. 22-DG3152

Location: See Location Plan
Surface Elevation: Unknown
Drilling Method: CFA
Date Boring Drilled: 07/06/2022
Completion Depth: 14
Groundwater Information:
Seepage Encountered During Drilling: None
Upon Completion: Dry

FIELD DATA						LABORATORY DATA							
DEPTH (ft.)	SOIL & ROCK SYMBOL	SAMPLE TYPE	P: HAND PEN., TSF T: THD, BLOWS/FT. N: SPT, BLOWS/FT.	STRATUM DEPTH (FT.)	DESCRIPTION OF STRATUM	WATER CONTENT, %	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	UNIT DRY WEIGHT (PCF)	UNCONFINED STRENGTH (TSF)	% PASSING NO. 200 SIEVE	SOIL SUCTION TEST (TOTAL CM. OF WATER)
0			P4.5+		Dark brown CLAY (CH) with calcareous nodules	16						71	
			P4.5+	3.5		18	63	23	40	102			
5			T100/ 3.5"		Tan weathered LIMESTONE -calcareous clay interbeddings 6' to 7'	6							
10			T100/ 3.5"			8							
			T100/ 5.0"	14.0	-dark tan below 12'	9							
15					Auger refusal at 14'								
20													
25													
30													

TUBE SAMPLE	AUGER SAMPLE	SPLIT-SPOON	ROCK CORE	THD CONE PEN.	NO RECOVERY

REMARKS:

GeoScience Incorporated

LOG OF BORING NO. B-6

Proposed "Commercial Development"
802 Old Mill Rd.
Cedar Park, Texas

Project No. 22-DG3152

Location: See Location Plan
Surface Elevation: Unknown
Drilling Method: CFA
Date Boring Drilled: 06/29/2022
Completion Depth: 5
Groundwater Information:
Seepage Encountered During Drilling: None
Upon Completion: Dry

FIELD DATA						LABORATORY DATA							
DEPTH (ft.)	SOIL & ROCK SYMBOL	SAMPLE TYPE	P: HAND PEN., TSF T: THD, BLOWS/FT. N: SPT, BLOWS/FT.	STRATUM DEPTH (FT.)	DESCRIPTION OF STRATUM	WATER CONTENT, %	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	UNIT DRY WEIGHT (PCF)	UNCONFINED STRENGTH (TSF)	% PASSING NO. 200 SIEVE	SOIL SUCTION TEST (TOTAL CM. OF WATER)
0			P4.5+	1.5	Dark brown CLAY (CH) with limestone fragments	12							
					Tan weathered LIMESTONE								
5			T100/ 3.0"	5.0		8							
10													
15													
20													
25													
30													

TUBE SAMPLE	AUGER SAMPLE	SPLIT-SPOON	ROCK CORE	THD CONE PEN.	NO RECOVERY

REMARKS:

GeoScience Incorporated

LOG OF BORING NO. B-7

Proposed "Commercial Development"
802 Old Mill Rd.
Cedar Park, Texas

Project No. 22-DG3152

Location: See Location Plan
Surface Elevation: Unknown
Drilling Method: CFA
Date Boring Drilled: 06/29/2022
Completion Depth: 5
Groundwater Information:
Seepage Encountered During Drilling: None
Upon Completion: Dry

FIELD DATA					LABORATORY DATA							
DEPTH (ft.)	SOIL & ROCK SYMBOL	SAMPLE TYPE	P: HAND PEN., TSF T: THD, BLOWS/FT. N: SPT, BLOWS/FT.	STRATUM DEPTH (FT.)	DESCRIPTION OF STRATUM	WATER CONTENT, %	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	UNIT DRY WEIGHT (PCF)	UNCONFINED STRENGTH (TSF)	% PASSING NO. 200 SIEVE	SOIL SUCTION TEST (TOTAL CM. OF WATER)
0			P4.5+	2.0	Dark brown CLAY (CH) with limestone fragments	14						61	
					Tan weathered LIMESTONE with calcareous clay interbeddings								
5			T100/ 5.0"	5.0		9							
10													
15													
20													
25													
30													

TUBE SAMPLE	AUGER SAMPLE	SPLIT-SPOON	ROCK CORE	THD CONE PEN.	NO RECOVERY

REMARKS:

GeoScience Incorporated

LOG OF BORING NO. B-8

Proposed "Commercial Development"
802 Old Mill Rd.
Cedar Park, Texas

Project No. 22-DG3152

Location: See Location Plan
Surface Elevation: Unknown
Drilling Method: CFA
Date Boring Drilled: 06/29/2022
Completion Depth: 5
Groundwater Information:
Seepage Encountered During Drilling: None
Upon Completion: Dry

FIELD DATA					LABORATORY DATA							
DEPTH (ft.)	SOIL & ROCK SYMBOL	SAMPLE TYPE	P: HAND PEN., TSF T: THD, BLOWS/FT. N: SPT, BLOWS/FT.	STRATUM DEPTH (FT.)	DESCRIPTION OF STRATUM	WATER CONTENT, %	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	UNIT DRY WEIGHT (PCF)	UNCONFINED STRENGTH (TSF)	% PASSING NO. 200 SIEVE	SOIL SUCTION TEST (TOTAL CM. OF WATER)
0			P4.5+	1.0	Dark brown CLAY/SANDY CLAY (CH/CL) with limestone fragments	15	45	18	27			59	
					Tan weathered LIMESTONE with calcareous clay interbeddings								
5			T100/ 3.5"	5.0		3							
10													
15													
20													
25													
30													

TUBE SAMPLE	AUGER SAMPLE	SPLIT-SPOON	ROCK CORE	THD CONE PEN.	NO RECOVERY

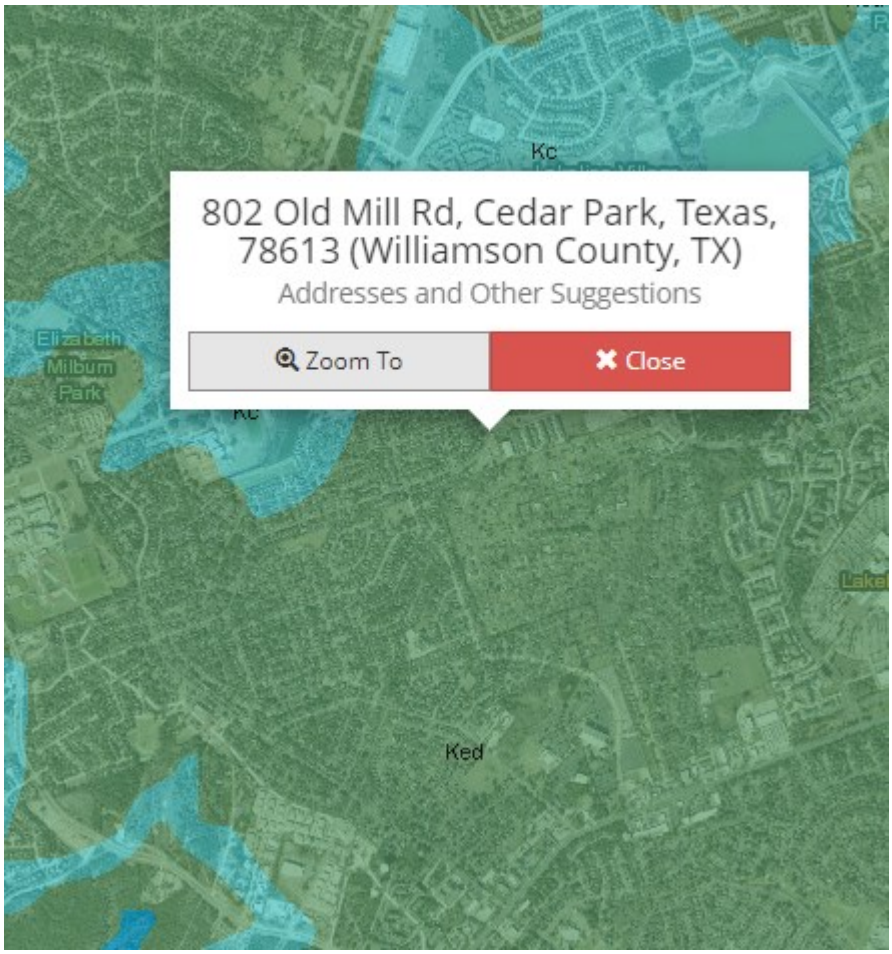
REMARKS:

Proposed Community Center
802 Old Mill Road
Cedar Park, Texas

SUMMARY OF FREE SWELL TESTS	
Boring Number	B-4
Sample Depth (ft.)	1.5-3
Initial Moisture Content (%)	20
Final Moisture Content (%)	28
Applied Surcharge Pressure (psf)	375
Vertical Swell (%)	9.1
Liquid Limit	61
Plastic Limit	22
Plasticity Index	39

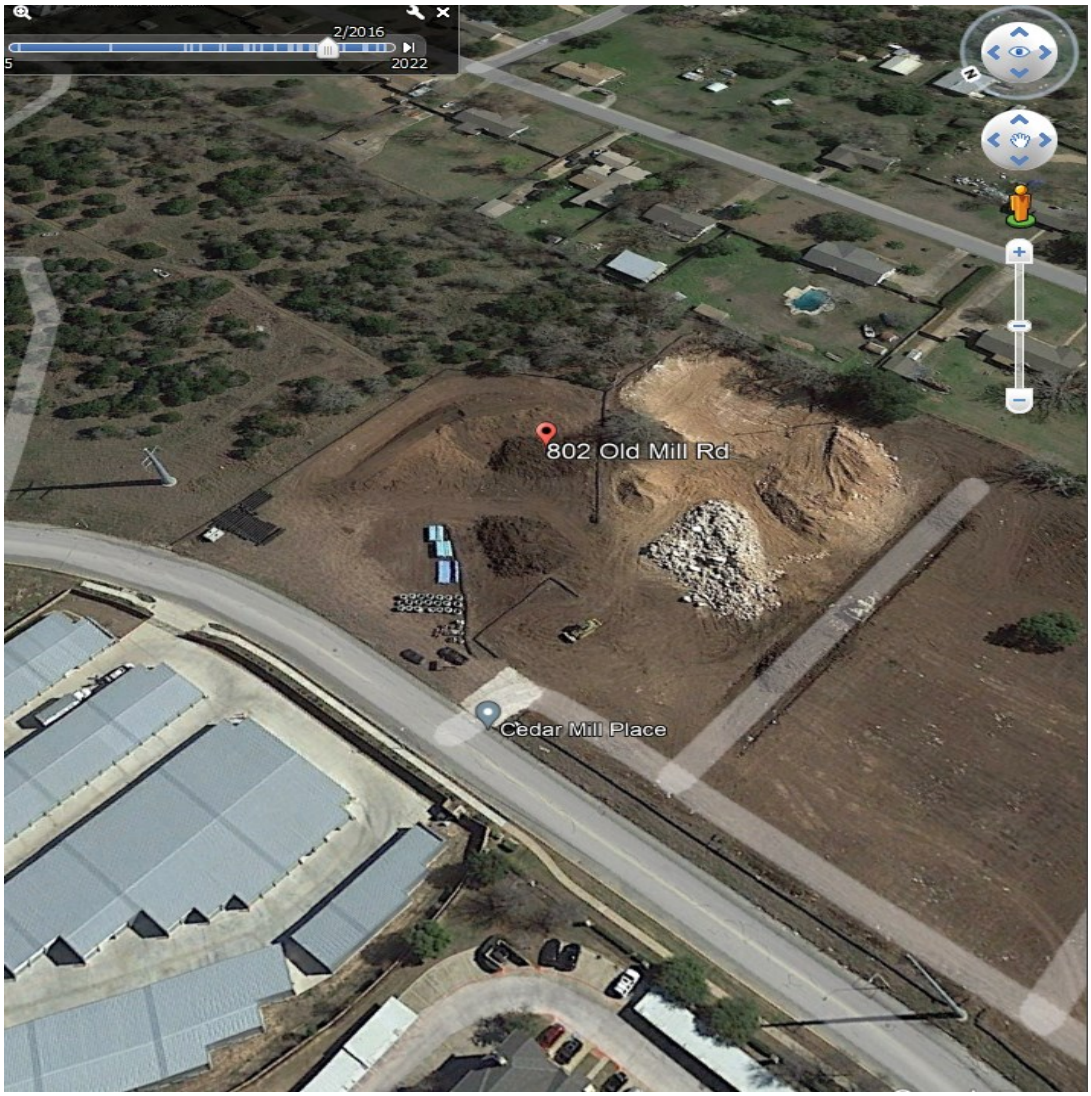
Plate 9

Geology Map



Ked: Edward Limestone formation

Aerial Map 2016



Aerial Map 2018