GEOTECHNICAL INVESTIGATION

Proposed DALE SHINE XPRESS CAR WASH
105 W. Trenton Road
Edinburg, Texas

PROJECT NO. 19-DG4225

Prepared for:

7B DEVELOPMENT
Lubbock, Texas

Prepared by:

GEOSCIENCE
ENGINEERING & TESTING, INC.
Dallas, Texas

August, 2019

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Project No. 19-DG4225

August 7, 2019

7B Development
5709 104th Street
Lubbock, Texas 79424

Geotechnical Investigation
Proposed DALE SHINE XPRESS CAR WASH
105 W. Trenton Road
Edinburg, Texas

Geoscience Engineering & Testing, Inc. is pleased to submit this geotechnical investigation for the above referenced project located in Edinburg, Texas. This report briefly describes the procedures employed in our subsurface exploration and presents the results of our investigation.

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 Engineering & Testing, Inc.
Firm Reg. #F-11285 DBE # IMDB51637Y121 HUB #113422734310

Shokoofeh Golkhari, MSCE, E.I.T.
Project Manager

8/7/19

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CONTENTS

Pages

ILLUSTRATIONS

Pages

INTRODUCTION

Project Description

This report presents the results of the geotechnical investigation performed at the site of the referenced project located in Edinburg, Texas. Based on the project information provided, it is our understanding that construction will consist of a Dale Shine Xpress Car Wash building and associated paving and parking 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 building will be above surrounding ground surface. Grading plan and other information regarding the referenced project were not provided.

Site Description

The site of the proposed project is located at 105 W. Trenton Road in the City of Edinburg, Texas. At the time of this investigation, the site was developed with an existing building, gravel pavement and native vegetation. We recommend that all the existing development, associated foundation elements and the pavements should be removed prior to the onset of any new construction. 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 the report describe the field and laboratory phases of the study. The remaining sections present our recommendations to guide design and preparation of plans and specifications. Boring logs and laboratory test results are presented in the **Illustrations** section of this report.

FIELD INVESTIGATION

The field portion of this study consisted of drilling and sampling four (4) test borings. Test borings B-1 and B-2 were drilled to a depth of 20 feet in the proposed building pad and test borings B-3 and B-4 were drilled to a depth of 5 feet in the proposed paving area. The approximate locations of the borings are shown on the Boring Location Plan - Plate A. Boring Logs with descriptions of the soils encountered are presented on Plates 1 to 4. 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.

Undisturbed soil samples were obtained using a 2-inch diameter split spoon sampler in conjunction with standard penetration test. A Standard Penetration sampler was used at selected depths to obtain a standard penetration value (N value). An N-value is defined as the number of blows a 140-pound hammer free falling from 30 inches would require to drive a two-inch O.D. sampler one foot into undisturbed soils below the bottom of the bore hole. The N value is an indication of the relative density of non-cohesive soils. The results of the standard penetration tests, expressed as "blows per foot," are tabulated at the respective sample depths on the boring logs.

All soil samples were removed from the samplers in the field, visually classified, and placed in appropriate containers to prevent loss of moisture or disturbance during transfer to the laboratory. The borings were drilled using dry auger procedures to observe the water level (if any) at the time of the exploration. These 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 determinations were performed to develop soil moisture profiles and to aid in evaluating the uniformity of soil conditions at the boring locations. Liquid and Plastic limit tests (collectively termed "Atterberg limits") and the percentage passing the number 200 sieve tests were performed on the selected soil samples from the borings to confirm visual classification and to evaluate soil volume change potentials. The results of these tests are presented on the boring logs.

Review

Descriptions of strata made in the field were modified in accordance with results of laboratory tests 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

Stratigraphy

Based on our interpretations, the overall subsurface stratigraphy at the locations of the test borings drilled for this study consisted of possible fill soils followed by sandy clay deeper by clay.

More specifically, the subsurface stratigraphy at the locations of test borings drilled consisted of brown and tan silty clayey sand (SC-SM) soils intermixed with calcareous nodules and gravel – POSSIBLE FILL SOILS from existing ground surface elevation to a depth of 2 to 2.5 feet in test borings B-1 and B-2. Below possible fill soils in test borings B-1 and B-2 and from existing ground surface elevation in test borings B-3 and B-4, brown/tannish brown SANDY CLAY (CL) soils with calcareous nodules were encountered and remained visible to a depth of 5.5 to 6 feet in test borings B-1 and B-2 and to the completion depth of the shallower test borings B-3 and B-4 drilled. Below 5.5 to 6 feet in test borings B-1 and B-2, brown and tan/tannish brown CLAY (CH) soils with calcareous nodules were encountered and remained visible to the completion depths of test borings B-1 and B-2 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.

Fill Condition & Improvements

As mentioned earlier, possible fill soils were encountered to a depth of 2 to 2.5 feet in the test borings B-1 and B-2 drilled for this study. The possible fill/fill soils contained brown and tan silty clayey sand soils intermixed with calcareous nodules and gravel. It should be noted that variations in the condition, depth and/or contents of fill materials that may be located in other areas of the site may differ from those described herein. *Geoscience* is not responsible for any variations that may exist between the fill materials described herein from the materials encountered at the time of construction. In the absence of any documents regarding the compaction efforts, water contents and methods in which the fill materials were placed, *Geoscience* is considering the fill materials encountered at this site as "*uncontrolled fill*".

As mentioned earlier that the drilling was performed with 3 inches diameter tube and 2-inch diameter split spoon sampler and the fill encountered within the tube and sampler was described in this report however, in order to determine the content of fill on a larger scale we highly suggest that fill/possible fill soils should be evaluated by test pits method or contractor should consider worst case of removal and replacement of fill soils in their bid.

The most positive option for uncontrolled fill soils is to remove all the existing fill soils and place back in controlled lifts under the supervision of a Geoscience representative.

Re-work of fill soils:

For re-working of fill soils and to reduce PVR to ±1 inch, the entire building pad should be undercut to a depth of 4 feet or the entire depth of the fill soils, whichever is greater, below the finished grade. We recommend extending the improvement to an additional 5 feet beyond the building line and including all the areas sensitive to the soil movement. The excavated materials should be stockpiled on site for later re-use in the excavated building pad and elsewhere. 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 surface should be proof- rolled with heavy equipment.

The excavated soils should be placed back in the building pad in 6 to 8 inches loose lifts and mixed thoroughly to form a homogenous consistent soil below finished grade elevation and should be compacted to:

- 93 to 98 percent of the maximum dry density with the minimum moisture content of 4 points of optimum for soils with PI more than 30
- 94 to 98 percent of the maximum dry density with a minimum moisture content of 2 points of optimum for soils with PI between 20 and 30

- 95 and 100 percent of maximum dry density with a moisture content between optimum and 3 points above optimum for PI of less than 20

Any objectionable material(s) and rocks larger than 4 inches in diameter should be handpicked and removed. In the event large amounts of objectionable materials if present within the fill soils we highly recommend that all the fill soils be replaced with select fill soils -or- flex base material.

Select fill soil 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, 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.

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.

By performing the above procedures, not only the PVR will be reduced to 1 inch but also ensures the removal of any objectionable materials that may be present within the existing fill soils.

Subsurface Water Conditions

The borings were advanced using auger drilling methods in order to observe groundwater seepage levels. At the time of this investigation, NO groundwater seepage was encountered at was encountered in any of the test borings drilled for this study. However, it should be noted that the depth to subsurface water will be affected by changes in atmospheric conditions and future construction activities may alter the surface and subsurface drainage characteristics of the site.

With regard to the aforementioned, we recommend that the depth to subsurface water be checked prior to and during construction.

Any changes from the subsurface conditions described in this report should be communicated to this office immediately so that a review of the design recommendations can be made. Based upon short-term observations, it is not possible to accurately predict the magnitude of subsurface water fluctuations that might occur. In addition, it is not uncommon to detect water seepage within the fractures of the soils particularly after periods of heavy rainfall.

ANALYSIS AND RECOMMENDATIONS

Construction Consultation and Monitoring

We recommend that GETI be given the opportunity to review the final design drawings and specifications in order to evaluate if recommendations in this report have been properly interpreted. Wide variations in soil conditions are known to exist between the borings, particularly at this site. Further unanticipated variations in subsurface conditions may become evident during construction.

During excavation and foundation phases of the work, 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) to observe subsurface conditions during construction to verify that the conditions are as anticipated, based on the findings of this investigation.

Soil Movement

The near surface soils encountered at this site exhibited Plasticity Indices of 7 to 26. Based on the plasticity indices, these soils are considered as *low 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 the 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 1.5 to 2 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. Site grading may also increase or decrease the potential for the movement.

Additionally, the fill soils at the referenced site may undergo settlement. Settlement analysis was beyond the scope of the study. As mentioned earlier the fill and subgrade soils should be improved by procedures outlined in **Fill Condition & Improvement** Section of this report by which the potential vertical rise will also be reduced to approximately an inch.

FOUNDATION TYPE

The soils parameters provided in this report are based on the soil samples obtained from the boring accessible to the drill rig. After removal of the existing building and pavement, at the time of construction, the soils should be evaluated. If the soils are different from those encountered at the location of the test boring drilled for this study, then we recommend additional test boring should be drilled.

Shallow Footings

Based on the subsurface stratigraphy encountered at this site the structural load of the proposed building can be supported by shallow foundation/spread footing.

The spread footings should be installed at a minimum depth of 2.5 feet from the finished floor elevation installed within the compacted re-worked soils or density controlled select fill soils or flex base materials. The spread footings can be designed using a net allowable bearing pressure of 2,500 psf for select fill soils or flex base materials (a minimum of 2 feet of select fill soils or flex base materials is required below the spread footing installation depth). A net allowable bearing capacity of 1,800 psf can be used for the re-worked soils. These values include a factor of safety of 2.5 with respect to the un-drained shear strength of the foundation soils.

The bottom of the spread footings should be free of any loose and/or soft materials prior to concrete placement. Any areas at the bottom of the footings where soft spots are noted we recommend a) the bottom of the grade beams either is rolled or compacted by re-working with the optimum moisture with a hand compactor. Each foundation excavation should be evaluated by a geotechnical engineer to ensure that the foundation bears within hard stratum - Or - b) reduce the allowable soil bearing capacity. At the time of such evaluation, it may be necessary to perform compaction testing or hand penetrometer probe test in the base of the foundation excavation to assure that the above recommendations are adhered.

Grade Beam and Floor Slab

A ground- supported grade beam and floor slab may be considered for use at this site provided:

- All the existing developments, slabs, associated foundation elements, pavement, existing vegetation, trees and debris (if any), loose and fill (if any) soils, are removed and disposed of off-site until hard stratum is encountered. Existing utility lines should either be capped on both sides or removed completely.
- The possible fill/fill and subgrade soils are improved by adopting the procedures outlined in the **Fill Condition and Improvement** Section of this report.
- Additional fill soil if required should consist off-site select fill soils.

Grade beams should be structurally connected into the spread footings. The grade beam and slab should be designed to provide sufficient rigidity to the foundation system. The beam should be a minimum of 12 inches wide and 24 inches deep.

Based on the *Terzaghi's* Bearing Capacity theory a net allowable soil bearing pressure 1,500 psf for re-worked soils and 2,000 psf for select fill 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 developments, slabs, associated foundation elements, pavement, existing vegetation, and debris (if any), loose and fill (if any) soils, should be removed until hard stratum is encountered. Existing utility lines should either be capped on both sides or removed completely.

After removal of all referenced items, the fill/possible fill and subgrade soils should be improved by the procedures outlined in **Fill Condition and Improvement** Section of this report. Additional fill soils if required should consist of select fill soils.

Select fill soils should be placed in six (6) to eight (8)-inch loose lifts at moisture contents between optimum and 3 points above optimum. Each lift compacted to between 95 and 100 percent of the maximum dry density as defined in ASTM D 698. 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.

In lieu of select fill soils, flex base material can be used. Flex base should be placed in 6 to 8 inches loose lifts and be compacted to a minimum of 98 percent of maximum dry density per ASTM D698 and the moisture content should be adjusted to -2 to +3 percent points above optimum.

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. Placement and compaction of the select fill should be performed in accordance with the **"Building Pad Preparation"** section of this report. It is preferable to place the select fill above the surrounding ground surface. The provision of a subsurface drainage system will be required in areas where the select fill is placed below the surrounding ground surface.

Flex Base

TxDOT 247 Type 1.

PAVEMENT RECOMENDATION

Pavement Preparation

Prior to placing any fill materials on the pavement areas, all the existing developments, slabs, associated foundation elements, pavement, existing vegetation and debris (if any), loose and fill (if any) soils, trees and tree roots are removed and disposed of off-site until hard stratum is encountered. Existing utility lines should either be capped on both sides or removed completely.

For re-work of the fill soils where encountered, we recommend that the upper 2 feet of the fill soils be excavated and stockpile, the exposed surface should be scarified to a depth of 6 inches water as required and compacted between 95 and 100 percent of maximum dry density as per ASTM D 698 with the moisture content between optimum and 4 points above optimum. The excavated fill soils can be placed back provided no objectionable material is present within the soils in 6 to 8 inches loose soils and compacted to the above specification.

In areas where fill soils are not present after the removal of all the vegetation etc, the exposed surface should then be scarified to 6 inches and be compacted to 95 percent of the maximum dry density. Moisture contents should be between optimum and 4 points above optimum moisture. On-site or off-site low PI soils (PI between 6 and 15) or off-site flex base material can be used if additional fill is required and should be placed as per the procedures outlined in **Building Pad Preparation** section of this report.

Rigid Pavement

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/Re-work of Fill*	6/24*
Heavy Traffic	
Portland Cement Concrete	6
Minimum Lime Stabilized Subgrade	6
Compacted Subgrade Soils/Re-work of Fill*	6/24*

*where fill is encountered

In the event soils with PI of more than 16 are exposed after removal of all above mentioned items, then the upper six inches of subgrade soils should then be stabilized with lime. We estimate approximately 4 to 6 percent of hydrated lime (18 to 26 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 5,000 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 requirements.

Some differential movement in the pavement is anticipated over time due to the swelling of the subgrade clays at this site. Design of the concrete pavement should specify a minimum 28-day concrete compressive strength of 3,000 psi for all the pavement and 3,500 psi for the fire lanes 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 95°F. 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, 24 inches on center should be used.

Asphalt Pavement

Based on the information provided from the client, we have developed the following asphalt pavement design sections for use at this site:

Parking Area	Thickness (inches)
HMAC Type D Surface Course	2.5
Flex Base	6
Compacted Subgrade-Re-work of Fill	6/24*
Driveway Area	**Thickness (inches)**
HMAC Type D Surface Course	3.5
Flex Base	6
Compacted Subgrade/Re-work of Fill*	6/24*

For flexible pavement, flex base material should then be placed and compacted to a minimum of 98 percent of the maximum dry density with the moisture content between -2 to +3 of optimum moisture as per ASTM D 698.

On-site soils can be used if additional fill is required and should be placed as per the procedures outlined in **Pavement Preparation** section of this report. However, the upper 6 inches of material (below asphalt) should consist of Flex base materials and should be placed as per procedure outlined in this report.

The asphalt pavement analyses were performed using the AASHTO design method and the previously stated assumed traffic characteristics. The HMAC should meet the Department of Transportation specifications.

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 buildings and edges of pavements 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 one 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. Downspouts should discharge directly into storm drains or drainage swales, if possible. 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.

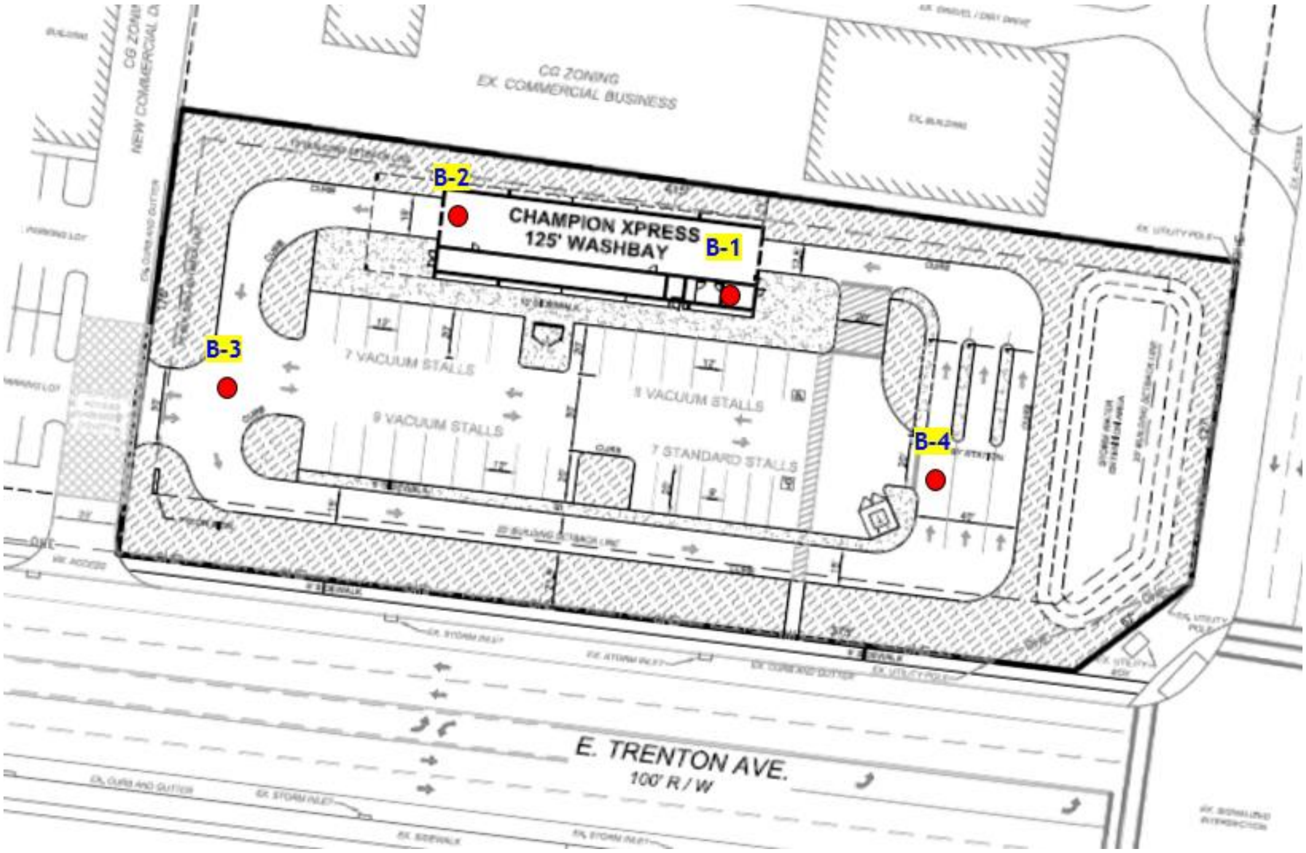
Exterior sidewalks and pavements will be subject to some post construction movement as indicated in this report. These potential movements should be considered during preparation of the grading plan. Flat grades should be avoided. Where concrete pavement is used, joints should be sealed to prevent the infiltration of water. Some post-construction movement of pavement and flatwork may occur. Particular attention should be given to joints around the building. These joints should be periodically inspected and resealed where necessary. It should be noted that due to deeper depth of fill soils some settling of the fill soils may occur in future.

CLOSURE

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

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 Engineering and Testing, Inc.*, 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 *GETI*.

ILLUSTRATIONS



Approximate Boring Location

BORING LOCATION PLAN
Proposed DALE SHINE XPRESS CAR WASH
105 W. Trenton Road
Edinburg, Texas

Plate A

GETI Project No.: 19-DG4225

LOG OF BORING NO. B-1

Proposed "Dale Shine Xpress Car Wash"
105 W. Trenton Road
Edinburg, Texas

Project No. 19-DG4225

Location: See Location Plan
Surface Elevation: Unknown
Drilling Method: CFA
Date Boring Drilled: 07/25/2019
Completion Depth: 20
Groundwater Information:
Seepage Encountered During Drilling: None
Upon Completion: Dry

FIELD DATA			LABORATORY DATA								
DEPTH (ft.)	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)
0–2	N12	2	Brown SILTY CLAYEY SAND (SC-SM) with calcareous nodules and gravel seams - POSSIBLE FILL	7	17	10	7				
2–5.5	N13		Brown SANDY CLAY (CL) with calcareous nodules	7						39	
5	P4.5	5.5		15	45	15	30	108	2.6		
5.5–20	P4.5		Brown and occasional tan CLAY (CH) with calcareous nodules	17							
	P4.5			16							
	P4.5			19	60	24	36			79	
20	P3.5	20		20				106	1.8		

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

REMARKS:

LOG OF BORING NO. B-2

Proposed "Dale Shine Xpress Car Wash"
105 W. Trenton Road
Edinburg, Texas

Project No. 19-DG4225

GeoScience Incorporated

Location: See Location Plan
Surface Elevation: Unknown
Drilling Method: CFA
Date Boring Drilled: 07/25/2019
Completion Depth: 20
Groundwater Information:
Seepage Encountered During Drilling: None
Upon Completion: Dry

DEPTH (ft.)	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	Split-spoon	N16	2.5	Brown SILTY CLAYEY SAND (SC-SM) with calcareous nodules - POSSIBLE FILL	8						53	
	Split-spoon	N17		Brown SANDY CLAY (CL) with calcareous nodules	10							
5	Tube	P4.0	6		14	40	20	20				
	Tube	P4.5		Tannish brown CLAY (CH) with calcareous nodules	19							
	Tube	P4.5			20	57	22	35				
10–15	Tube	P4.5			19							
15–20	Tube	P3.75	20		19	59	23	36	110	2.9		

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

REMARKS:

LOG OF BORING NO. B-3

GeoScience Incorporated

Proposed "Dale Shine Xpress Car Wash"
105 W. Trenton Road
Edinburg, Texas

Project No. 19-DG4225

Location: See Location Plan
Surface Elevation: Unknown
Drilling Method: CFA
Date Boring Drilled: 07/25/2019
Completion Depth: 5
Groundwater Information:
Seepage Encountered During Drilling: None
Upon Completion: Dry

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			N18		Brown SANDY CLAY (CL) with calcareous nodules	6						39	
			N16			6	30	15	15				
5			N20	5		6						41	
10													
15													
20													
25													
30													

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

REMARKS:

LOG OF BORING NO. B-4

Proposed "Dale Shine Xpress Car Wash"
105 W. Trenton Road
Edinburg, Texas
Project No. 19-DG4225

GeoScience Incorporated

Location: See Location Plan
Surface Elevation: Unknown
Drilling Method: CFA
Date Boring Drilled: 07/25/2019
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		Tube			Brown SANDY CLAY (CL) with calcareous nodules	10						53	
		Split-spoon	N17										
		Split-spoon	N20			9	30	15	15				
		Split-spoon	N19	5		12	41	15	26				
5													
10													
15													
20													
25													
30													

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