Tom Green County

OFFICE OF THE COUNTY AUDITOR

July 13, 2018

RFB 18-022: Natural Gas Line Installation

ADDENDUM 1 – Geotechnical Report and Excess Soil Removal

Below are the responses to the Requests for Information. Please incorporate any clarifications into your bid response and pricing.

Question # 1 – Is there a geotechnical report for this project, or perhaps for the construction of the jail?

- The detention center report is posted as an exhibit below. No report for the specific area of the gas line is available.

Question # 2 – Does the county have an area to dump the soil?

- Yes, excess soil may be dumped north of the detention center at the Sheriff's new firing range.

Please include this signed addendum with your Response.

Sincerely,

Chad Cook

Chad Cook
Assistant Auditor

_____ _____
Company Date

_____ _____
Signature Please Print Name and Title

113 West Beauregard Ave, San Angelo, TX 76903 • Phone (325) 659-6500 • Fax (325) 658-6703

EXHIBIT A - GEOTECHNICAL REPORT

113 West Beauregard Ave, San Angelo, TX 76903 ● Phone (325) 659-6500 ● Fax (325) 658-6703

SKG ENGINEERING, LLC

Geotechnical Report

Proposed Tom Green County

Detention Facility

North US Highway 277

Tom Green County, Texas

2/24/16
SKG Engineering, LLC
F-7608

PREPARED FOR:
Honorable Judge Floyd
Tom Green County Judge
122 West Beauregard
San Angelo, Texas 76903

January 2016

15-E-1560

SKG
ENGINEERING, LLC
FIRM REGISTRATION NUMBER F-7608
SURVEYING ♦ ENVIRONMENTAL ♦ LAB/CMT

706 SOUTH ABE STREET
SAN ANGELO, TEXAS 76903

PHONE: 325.655.1288
FAX: 325.657.8189

February 24, 2016 15-E-1560

Honorable Judge Floyd
Tom Green County Judge
122 West Beauregard
San Angelo, Texas 76903

Subject: Final Geotechnical Report, Proposed Tom Green County Detention Facility, North US Highway 277, Tom Green County, Texas

Honorable Judge Floyd,

In accordance with your authorization, SKG Engineering has completed its geotechnical investigation at the referenced site. The work was done in accordance with the proposal dated the 19th day of November, 2015. The data and results are included in the attached report.

If you have any questions or comments, or if we can be of any more service to you, please do not hesitate to contact us at (325) 655-1288.

Sincerely,
SKG Engineering, LLC

Jason Clinton, P.E.

SKG Engineering, LLC
F-7608

Attachments - Geotechnical Report

CC: File

\\SKG-SBS\Shared\Engineering\2015\15E1560 KFA Architects - Tom Green Co Jail Site\Final Geotechnical Investigation\Geotechnical Report.doc

Table of Contents

Attachments

1.0 Introduction

1.1 Overview

The purpose of this exploration was to determine subsurface materials and conditions and to establish the characteristics of these materials in order to recommend the criteria by which to establish foundation and pavement recommendations for the proposed single story detention facility. A summary of field conditions is included in Attachment A.

2.0 Exploration

2.1 Soil Borings

The subsurface explorations were conducted on this site in January and February 2016. The site generally slopes from the northwest to south and east. The adjacent sites appear to generally slope the same direction, with the exception of Highway 67 to the north of the site. The site was grubbed and cleared for this project. The grubbing left the site rough with holes from excavated trees present at the site. The site was accessible, but maneuverability across the site was hindered due to the site clearing. The boreholes were drilled to a maximum depth of 25', and the logs of these boreholes are included in this report. The drilling was performed with a truck mounted air rotary drill rig. The drilling activities were performed in accordance with accepted methods and procedures. The boreholes were conducted within the limits of the proposed building and parking areas. A location map showing the approximate borehole locations is included in Attachment B. This report was conducted after a preliminary geotechnical report, dated the 15th day of December, 2015, was performed. The boreholes conducted in the preliminary investigation were a part of the proposed final geotechnical investigation. The building was relocated approximately 100' after the preliminary geotechnical investigation was performed. The site soils are similar and this report should replace the preliminary geotechnical report in its entirety. Therefore, boreholes B1, B6, B11, B17 and B22 were all conducted in the preliminary report and will not be included in this report. B38 and B39 were not accessible at the time of this report and have been excluded.

Material samples were recovered at various depths for testing. The primary means of extracting subsurface soil samples was by the use of a 3" Shelby-tube and/or a 2" O.D. split barrel sampler. Split spoon sampling procedures were performed in accordance with ASTM D 1586 and Shelby tube samples were obtained in accordance with ASTM D 1587. The samples were extruded or removed in the field and placed in moisture tight bags and labeled. The samples were then transported to the laboratory for testing and visual evaluation by geotechnical personnel. The Unified Soil Classification System was utilized in accordance with ASTM D 2487 to verify field classifications. Refer to the logs of borings located in Attachment C for lithology, sample locations and quantities.

2.2 Laboratory Tests

Tests were performed to determine engineering characteristics of the subsurface materials encountered including, but not limited to, soil moisture content (ASTM D 2216), Atterberg Limits (ASTM D 4318) and sieve analysis. The test results can be found in Attachment D. Samples not tested in the laboratory will be retained for a maximum of 60 days and then discarded unless otherwise notified in writing prior to disposal of the samples.

3.0 Subsurface Investigation

3.1 Site Geology

Based on the location of the site on geological maps, it is our opinion that the predominate soil is the Angelo Series, Angelo clay loam (Ana). These particular soils are indicative of nearly level to gently sloping topography on smooth outwashed plains. These soils are well drained and have slow surface runoff. Shrink-swell potential and soil corrosivity to uncoated steel are moderate. Based on the location of the site and soil conditions we do not foresee any adverse issues related to elevated sulfate concentrations.

3.2 Subsurface Materials and Conditions

The specific subsurface stratum encountered in each borehole is described in the logs of boreholes included in Attachment C. The strata encountered at the boreholes conducted at the site can be divided into three major strata. The first stratum is a layer of lean clay that extends from a depth of 0' to 7'. The second soil stratum consists of clayey sand that extends from a depth of 7' to 18'. The third stratum consists of lean clay that extends from 18' to the depth of the boreholes.

The subsurface stratum varies from those stated above as follows:

B2 – Silty sand encountered at a depth of 7 feet;
B3 - Clayey sand encountered at a depth of 3 feet;
B3 – Silty sand encountered at a depth of 13 feet to the depth of the borehole;
B4 – Clayey sand with gravel encountered at the surface;
B4 – Silty sand with gravel encountered at a depth 7 feet;
B5 – Cemented clayey sand with gravel encountered at a depth of 2 feet to a depth of 4 feet;
B5 – Silty sand encountered at a depth of 8 feet;
B7 – Silt with sand was encountered at the surface;
B7 – Clayey sand encountered at a depth of 3 feet;
B8 – Silty with sand was encountered at the surface;
B9 – Silty sand with gravel encountered at a depth of 8 feet:
B9 – Lean clay encountered at a depth of 13 feet;
B10 – Silt with sand encountered at the surface;
B10 – Silty sand encountered at a depth of 12 feet to the depth of the borehole;
B12 – Fat clay encountered at 18 feet;
B14 – Clayey sand encountered at the surface;
B14 – Lean clay encountered at a depth of 13 feet;
B16 – Clayey sand was encountered at a depth of 3 feet;
B18 – Clayey sand with gravel was encountered at the surface;
B18 – Sand with gravel encountered at a depth of 22 feet to the depth of the borehole;
B19 – Clayey sand with gravel was encountered at the surface;
B19 – Sand with gravel encountered at a depth of 23 feet to the depth of the borehole;
B20 – Clayey sand with gravel was encountered at a depth of 2 feet to the depth of the borehole;
B21 – Fat clay encountered at a depth of 13 feet;
B23 – Silty sand encountered at a depth of 8 feet;
B25 – Silty sand encountered at a depth of 2 feet;
B26 – Silt with sand encountered at the surface to the depth of the borehole;
B27 – Silty sand with gravel encountered at the surface to the depth of the borehole;
B29 – Clayey sand with gravel encountered at the surface to the depth of the borehole;
B30 – Clayey sand with gravel encountered at the surface to the depth of the borehole;

B31 – Sandy silt encountered at a depth of 2 feet;
B32 – Clayey sand encountered at the surface to the depth of the borehole;
B34 – Fat clay encountered at the surface to a depth of 3 feet;
B34 – Silty sand encountered at a depth of 3 feet to the depth of the borehole;
B35 – Clayey sand with gravel encountered at a depth of 2 feet to the depth of the borehole;
B37 – Silty sand with gravel encountered at the surface to the depth of the borehole.

3.3 Subsurface Water

There was no groundwater noted in any of the boreholes at the time of the investigation. The absence of groundwater noted does not express or imply a groundwater study was performed, which is beyond the scope of this report. It should be noted that groundwater levels are subject to change based on seasonal and climatic conditions.

4.0 Site and Design Considerations

4.1 Basic Considerations

The properties of in-situ soils, site characteristics, and the level of tolerable deflection should be carefully considered during the design phase. A foundation should economically meet the functional requirements of the structure and minimize differential movement of the structure that could cause damage.

There are existing grubbed tree roots and organics at the site. The tree roots and organics are in the area of the proposed building and pavement areas. The tree roots and organics should be removed in their entirety and site soils should be used to fill the excavated areas. The fill should be placed and compacted in accordance with the SITE PREPARATION section of this report.

The depth and hardness of the subsurface cemented soil strata present varies across the site. The seams of cemented soils noted will hinder proposed excavation activities at the site. The cemented seams were in layers and were not considered rock at the borehole locations. The variations should be noted by the engineer and contractor for all aspects of design and construction.

We have recommended a slab on grade foundation system with spread footings to support concentrated loads. The soils beneath the foundation system will have to be modified to accommodate the PVR at the site. We prefer the slab on grade foundation system to avoid bearing piers into different soil strata, which has more potential for differential settlement.

Routing of drainage should be addressed in the design phase of the project to ensure drainage is routed away and around proposed foundation systems and erosive conditions on the moderate slopes are avoided.

4.2 Subsurface Moisture

Water, in the form of a liquid, can rise upward through subsurface soils by capillary action, absorption or gravitational pull well above the water table. Water changes from a liquid to a vapor as it evaporates. Water vapor will move from areas of high vapor pressure to a lower vapor pressure through diffusion. Diffusion is how water vapor distributes itself above the water table and occurs in both soils and concrete.

It is generally recognized that the relative humidity in the soils below a foundation will be close to 100%. Such a high relative humidity is reached even when the moisture content in the material below the

foundation is found to be low. Without a capillary break or vapor barrier below the foundation, a high relative humidity or water source below a foundation can contribute moisture to the concrete. This can cause soluble alkalis in the concrete to enter into solution thus raising the pH. Moisture induced pH levels in concrete can be on the range of 10 to 12 while normal cured levels can be on the range of 7 to 9.

The impact of subsurface moisture can be reduced by the use of a vapor barrier or capillary break. A vapor barrier below the foundation is recommended when floor coverings or adhesives are sensitive to moisture or alkaline conditions. A vapor barrier can be in the form of poly vinyl sheets and a capillary break can be a sand or granular base. Verification of the vapor emission limitations from the foundation is vital to the selection of the proper vapor barrier system.

4.3 Shrink/Swell Considerations

Shrink/swell movements of the in-situ soils with changes in the soil moisture content are anticipated to be medium at the site. The Potential Vertical Rise(PVR) was calculated to be on the order of 1-1/2" using the McDowell PVR Method. The PVR was approximated using the McDowell's initial dry soil condition and a potential active zone to fifteen feet below grade. The intent of this section is to provide for a soil removal and replacement for the depths noted below. No finished floor elevations were provided at the time of this report and consideration of specific elevations would have to be reviewed when additional information is available.

The PVR can be reduced to be on the order of 1" by providing a 3' layer of engineered fill below the foundation. The PVR can be reduced to be on the order of ½" by providing a 10' layer of engineered fill below the foundation. When engineered fill is utilized to reduce the PVR, the continuous footings have to bear at the same depth as the depth of the engineered fill or engineered fill should be placed below the grade beam to accomplish the required depth. Refer to the ENGINEERED FILL section for placement and specifications.

The PVR and moreover foundation movement is effected by many factors that influence its magnitude and rate of change. Factors include: seasonal variations in the moisture content between the interior and perimeter of the foundation, topographic relief, vegetative cover, confining pressures, fluctuating and shallow water tables, and the composition of underlying soils. In-situ clays can expand with the introduction of moisture and shrink with decreases in moisture.

4.4 Foundation System and Recommendations

We recommend an adequately reinforced slab on grade foundation system with grade beams placed as determined by the structural engineer with spread footings to support concentrated point loads and provide lateral stability where necessary. Pier parameters are provided herein, if the structural engineer chooses to utilize a foundation supported by piers. We recommend to utilize a soil removal and replacement as specified in the section below to accommodate the architect's requirements for a maximum of 1" PVR.

4.4.1 Grade Supported Foundation

We recommend a vapor barrier in the form of a poly vinyl sheet directly beneath the foundation with a minimum 8" thick layer of granular base beneath the vapor barrier and a minimum 3' layer of engineered fill beneath the base or as required to bring the finished floor elevation to design grade. Footings shall bear to a depth of 3' below existing grade or engineered fill shall be provided below the perimeter grade beams to a depth of 3' below existing grade to accommodate the soil modification plan. A depth of 12" shall be utilized for the design frost depth. We recommend the poly vinyl vapor barrier to be a minimum

10 ml thickness. The placement of these materials shall be in accordance with the SITE PREPARATION section of this report. We recommend for the poly vinyl to be installed over a sand bed of approximately 1" thick to minimize tears in the vinyl experienced when installed over a granular base. We recommend installing the vapor barrier in a manner to minimize tears and abrasions to the vinyl. We recommend doing a pre-pour inspection to verify that the vinyl is not torn and if so, that it is taped up and sealed, prior to placement of concrete.

We recommend grade beams not supported by piers to be a minimum of 15" wide, the dimensions of spread footings should be a minimum of 30" on all sides, and all footings properly reinforced for the anticipated design loads to minimize the possibility of a local bearing capacity failure.

Shallow continuous footings used for any portion of the foundation system should be structurally tied to the grade beams, spread footings, piers or other structural elements. We recommend bearing the footings a minimum of 1' below finished grade. The allowable bearing pressure exerted by the grade beams or spread footings on the in-situ soils from a depth of 1' to 2' is 2,100 psf and from a depth of 2' to 4' is 2,900 psf. The value of 125 pci for subgrade modulus may be used for design purposes. The value of 28 degrees may be utilized for the internal friction angle of the clayey soils for design purposes. The value of 0.35 for the ultimate lateral sliding resistance coefficient may be utilized for design in regard to the foundation on an engineered fill. The allowable bearing pressure exerted by grade beams bearing into an engineered fill, placed in accordance with the specifications in SITE PREPARATION of this report, is 3,500 psf.

4.4.2 Drilled Piers

Floor slabs that have a high performance criteria and a low tolerance for movement should be structurally suspended on piers. Void cartons should be utilized under grade beams and the slab. The void cartons should be a minimum of 10" thick. If a crawlspace is provided, it should be graded to drain so that water is not permitted to accumulate beneath the floor slab. We recommend to install a vapor barrier for the proposed crawl spaces. We recommend the poly vinyl vapor barrier to be a minimum 10 ml thickness. We do not recommend the use of trapezoidal void forms, due to the varied results of concrete placement typically experienced. Walls loads should be transmitted to the drilled piers by grade beams and the grade beam should be structurally connected to the piers.

Straight shaft or belled piers can be used for foundation support where column loads are less than 150 kips. The piers should bear a minimum of 18' up to 22' below existing grade, bearing into the firm clay. The piers should be located below the active zone and founded on a firm, stable stratum. We recommend foregoing utilizing side shear resistance for the allowable bearing capacity of the piers between 0 and 10 feet of depth. The piers can be designed with an allowable side shear resistance of 450 psf for the portion of shaft extending from a depth of 10' to the depth of the borehole, in addition to the allowable end bearing pressure stated below. An allowable side shear resistance of 350 psf for the portion of shaft extending from a depth of 10' to the depth of the borehole may be utilized for uplift resistance. The allowable lateral bearing of the piers on the clayey soils may be taken as 150 psf/f. Field adjustments to some shafts depths may be required due to the variation in the site elevations and varied soils encountered. The allowable end bearing pressure exerted by the piers on the soils 18' to 22' below existing grade is 10,500 psf.

We recommend a minimum and maximum shaft diameter of 24" and 42", respectively for piers. The bell to shaft diameter ratio should not exceed 3.0. It should also be noted that bells in excess of 60" in iameter may become more difficult to construct due to the potential of caving or sloughing. The maximum slope

angle of the underreamed bell should not exceed 45 degrees. Adjacent piers should maintain a minimum center to center spacing of 3 times the end bearing diameter. Piers spaced as specified do not require a reduction in the load carrying capacity of the individual piers due to group action.

Settlement of properly constructed piers are estimated to be less than ½" for loads of 150 kips or less. Additional settlement may occur if the load exceeds 150 kips.

Piers should be inspected for proper size, depth and reinforcement placement prior to the placement of any concrete. It is essential that the bearing stratum of the piers be identified by the engineer or his representative. A representative from SKG Engineering should be present during drilling activities to approve the bearing strata. Each pier excavation should be completed and concrete placed within one day. In no instance should any pier excavation be left open overnight. We recommend alternating the drilling and placement of concrete for shafts in groups. Foundation concrete should be placed in clean, dry holes. Bottoms of pier excavation should be cleared of loose debris prior to the placement of concrete.

We anticipate temporary pier casing will have to be used to prevent caving or sloughing of the hole during pier drilling operations, due to the subsurface stratum.

4.4.3 Uplift Loads

The piers could experience tensile loads as a result of post construction heave of the clay soils. The shafts must contain sufficient reinforcing steel for the length of the shaft to accommodate the net tensile loads. There are several factors affecting the magnitude of the loads, such as; shaft diameter, soil parameters and in-situ moisture levels during and after construction. However, due to subsurface conditions, any soil induced uplift pressures will be offset by the dead load of the pier itself; therefore, vertical tension reinforcement steel is not required.

4.5 Seismic Design Criteria

We have provided the seismic criteria for use in the structural design phase of the project. The seismic criteria is based on the 2012 International Building Code. The stratum referenced in this section refer to those described in the section SUBSURFACE MATERIALS AND CONDITIONS of this report. Please refer to the following table for seismic design parameters.

Mapped Spectral Response Acceleration					
Description	Site Class	Short Periods (S_s)	1 Second Period (S_1)	Site Coefficients	
				F_a	F_v
Stratum I&II	D	0.09g	0.04g	1.6	2.4
Stratum III	C	0.09g	0.04g	1.2	1.7

The International Building Code (IBC) requires a site soil profile determination extending a depth of 100 feet for seismic site classification. The scope of our geotechnical services requested does not include the 100 foot soil profile determination. Additional services can be performed if requested or required, since our scope terminated the boreholes at a depth of 30 feet. We would recommend utilizing a Seismic Site Classification of C for this site, based on the soil conditions to a depth of 30 feet.

4.6 Lateral Design Criteria

Retaining walls that are sensitive to movements on the order of 1-½" should be supported by piers bearing a minimum of 15' below existing grade in a firm stable stratum. We recommend that wall footings bear a minimum of 2' below finished grade and be designed to withstand the lateral forces applied by earth pressures described below. The footings should not exceed the allowable bearing capacity of the soil on which it bears. The allowable passive earth pressure is 298 psf/ft of the depth, to a maximum of 1,500 psf.

Lateral earth pressures acting on the retaining walls will depend on several parameters such as; backfill used, drainage conditions and loads of adjacent structures. Recommended lateral earth pressures expressed as equivalent fluid pressures are presented below. The pressures below are assuming positive drainage is provided to prevent hydrostatic pressures.

Equivalent Fluid Pressures		
Material	At Rest (psf/ft)	Active (psf/ft)
Stratum I,II&III	100	60
Engineered Fill	55	35

4.7 Backfill Material and Compaction

Retaining walls should be backfilled with a 12" width of pea gravel for the height of the wall. Backfill behind the pea gravel should be a non-expansive fill material with a maximum particle size of 4" nominal diameter three quarters of the wall height and a clay cap on the top quarter of the wall height. We recommend providing weep holes along the bottom of the retaining wall height at 10' on center maximum spacing for the length of the wall. We recommend placing fill in maximum 8" loose lifts and compacted to between 93% to 97% of the Standard Proctor Density. Compaction tests should be performed on each lift.

4.8 Drainage

Positive drainage away from the foundation must be provided and maintained to reduce subsurface moisture variations. The minimum recommended slope away from the foundation is 5% for the first 10 feet for areas not covered by a sidewalk or pavement. Water shall not be permitted to pond on the finished site.

Due to the presence of in-situ clays, we recommend through the design and construction phase an emphasis on maintaining a stable moisture content in the soils beneath and adjacent to the foundation be a major priority. Temporary and permanent control measures should be properly designed and installed to ensure positive drainage away from the foundation to maintain a quasi stable soil moisture content. The measures include, but are not limited to gutters, sprinkler systems, and a site grading plan.

4.9 Underground Utilities

The backfill material used for underground utility trenches should be on-site materials or imported clayey materials. We recommend not using a granular material to avoid the possibility of water migration through the trenches and possibly under foundation systems at the site.

4.10 Exterior Flatwork Considerations

Engineered fill shall be used as needed to bring the flatwork to grade. Control joints should be cut at a maximum spacing of 6' for the length of the flatwork and expansion joints at a maximum spacing of 50'. We recommend installing flatwork as not to impound water adjacent to structural foundations.

4.11 Trenching and Excavation Requirements

The guidelines specified by Occupational Safety and Health Administration (OSHA) should be followed for all excavation activities. The OSHA Standards (29 CFR Part 1926 revised, 1989) require all trenches that exceed 5' in depth to be shored or benched appropriately unless the soil stratum is "solid" rock.

The OSHA standards should be strictly adhered to for all excavation activities. The classification of the soils encountered at the site are Type C soils. The soil classifications are based on soils encountered in the boreholes conducted at the site. Refer to the following OSHA Table B-1 for slope requirements for excavations that are less than 20 feet in depth. Trenches in excess of 20 feet in depth should be designed by a registered professional engineer.

Maximum Allowable Slopes		
Stratum	Horizontal	Vertical
Stable Rock	Vertical	1
Type A	3/4	1
Type B	1	1
Type C	1-1/2	1

The above information is provided for temporary excavations. We recommend that any permanent trenches proposed for the site should have a minimum of 4:1 side slopes. Any permanent trenches or channels should be lined with erosion control measures.

5.0 Site Preparation

5.1 Subgrade

Remove the top 6" of surface soils, any deleterious material, and in-situ soils as necessary to bring the finished floor elevation to design grade. The top 6" of material should then be scarified, moisture conditioned, and compacted to at least 95% of the Standard Proctor Density within 2% points of the optimum moisture content. Any soft or pumping areas are to be excavated and an engineered fill shall be used as backfill. Where existing slopes exceed ten horizontal to one vertical, the cross slope should be benched to provide a minimum of 6' bench width.

5.2 Engineered Fill

An approved select fill shall be used to bring the foundation system to grade. It shall be a non-granular, cohesive soil, free of deleterious material, have a liquid limit of less than 40, and a plasticity index between 6 and 14. The select fill shall meet the following percent retained on sieve requirements: 2-1/2": 0-5%, No. 4: 40-80%, and No. 40: 50-85% or obtain approval from the geotechnical engineer. The fill should be installed in maximum eight inch loose lifts and compacted to at least 95% of the Standard Proctor Density within 3% points of the optimum moisture content. Base consisting of TxDOT Type A, Grade 2 limestone will be accepted as engineered fill. Blended materials utilized for engineered fill will have to meet the specifications herein and be approved by the geotechnical engineer. If a blended material is approved, the contractor shall blend the material and have one stockpile for the entire project. Continuous blending of material throughout the duration of the project is not acceptable.

5.3 Flexible Base Material

Provide compacted base consisting of Type A, Grade 2, limestone material below the foundation. Compact to 96% of the Standard Proctor Density within 2% points of the optimum moisture content.

Material shall be placed in lifts not to exceed 8". Alternative flexible base materials provided by a local suppliers which do not meet theses specifications shall be approved by the Engineer of record.

5.4 Testing

Test results of the engineered fill shall be submitted to the engineer of record for approval prior to incorporating into the work. Arrange for a testing agency to verify flexible base, engineered fill, and subgrade compaction and moisture content. To confirm the compaction of the subgrade, engineered fill, and base we recommend the more stringent of three density test for each lift placed or one density test for every 2,000 square feet of foundation area for each lift placed. The Standard Proctor Density shall be determined in accordance with ASTM D698.

6.0 Pavement Design and Criteria

6.1 Considerations

Concrete or asphalt paving may be used to surface the area for access and parking. Concrete paving is recommended at entrances and areas that will be subject to truck and dumpster traffic. The pavements may be subject to slight differential movement due to underlying clays. Pavement grades should be greater than 1.0% and curb and gutter grades should be greater than 0.4%. Positive drainage shall be provided to prevent water from ponding.

"Light and Medium Duty" pavement is intended for parking areas and other lightly traveled areas. "Heavy Duty" pavement is intended for drives, loading areas, and highly used areas subject to heavier traffic loads. Light, medium, and heavy duty pavement sections were evaluated using procedures from the AASHTO Guide for Design of Pavement Structures. Assumptions used in the design include: a serviceability loss of 2.5, a 90% reliability, a standard deviation of 0.40%, and a soil resilient modulus of 6,000 psi. Traffic design values used for this report are: 50,000 ESALs for light duty, 100,000 ESALs for medium duty, and 200,000 ESALs for heavy duty pavement. In the event site specific traffic conditions vary from these design values, contact the engineer of record for supplemental pavement designs.

6.2 Asphalt Pavement

Areas to receive asphalt pavement should have the top 6" of surface soils and any deleterious material removed, cut to subgrade elevation, and then proof rolled. Any soft spots found during the proof rolling should be removed and filled back to grade. The top six inches of subgrade should be scarified and compacted to at least 95% Standard Proctor Density within 2% points of the optimum moisture content. At the contractor's option, 6% to 12% lime may be added to the subgrade during the scarifying process to stabilize soil and possibly achieve compaction with less effort and pumping of the clayey soils. Where additional fill is required, an engineered fill placed in accordance with the ENGINEERED FILL section of this report may be used. The flexible base shall be compacted to at least 97% Standard Proctor Density. The Hot Mix Asphalt Concrete (HMAC) shall be Type D or C dense graded hot-mix asphalt meeting the requirements of TxDOT Item 341. HMAC base shall be Type A or B dense graded hot-mix asphalt meeting the requirements of TxDOT Item 341. The pavement schedule below provides options for the pavement sections based on different ESAL levels.

HMAC over Granular Base			
Pavement Component	Traffic Design ESALs		
	50,000	100,000	200,000
	Thickness (inches)		
HMAC (A_1=0.44)	2.00	2.25	2.50
Crushed Stone Base (A_2=0.18)	7.50	8.50	9.00
Compacted Subgrade	6.00	6.00	6.00

Full Depth HMAC			
Pavement Component	Traffic Design ESALs		
	50,000	100,000	200,000
	Thickness (inches)		
HMAC (A_1=0.44)	2.00	2.25	2.25
HMAC Base (A_2=0.35)	4.00	4.50	5.00
Compacted Subgrade	6.00	6.00	6.00

6.3 Concrete Pavement

Areas to receive concrete paving should have the top 6" of surface soil, any deleterious material removed, cut to subgrade elevation, and then proof rolled. Any soft spots found during the proof rolling should be removed and filled back to grade. The top six inches of subgrade should be scarified and compacted to at least 95% Standard Proctor Density. At the contractor's option, 6% to 12% lime may be added to the subgrade during the scarifying process to stabilize soil and possibly achieve compaction with less effort and pumping of the clayey soils. Where additional fill is required, an engineered fill placed in accordance with the ENGINEERED FILL section of this report may be used. The concrete shall have a minimum 28 day compressive strength of 3,000 psi and an air content between 3 and 6%. Light and Medium duty concrete pavement shall be reinforced with #4 bars at 24" centers each way, at a minimum. Heavy duty concrete pavement shall be reinforced with a minimum #4 bars at 18" centers each way. It is recommended that #4 bars at 12" centers each way be used in the area where the front wheels of the trash truck stop in front of the dumpster that may be located on the site. Saw cut control joints to one fourth of the total depth at a spacing not to exceed 15' each direction. Provide expansion/contraction joints at a spacing not to exceed 60' each direction.

Concrete over Subgrade			
Pavement Component	Traffic Design ESALs		
	50,000	100,000	200,000
	Thickness (inches)		
Concrete	4.50	5.00	6.00
Compacted Subgrade	6.00	6.00	6.00

6.4 Flexible Base Material

Base materials to be utilized within the paved areas should be a crushed limestone meeting the requirements of TxDOT Item 247, Type A, Grade 2, thus having a Plasticity Index less than or equal to 12 and a Liquid Limit less than or equal to 40. The base materials should be placed in loose lifts with a compacted thickness not to exceed 8 inches per lift. Alternative flexible base materials provided by a local suppliers which do not meet theses specifications shall be approved by the Engineer of record.

7.0 Limitations

The recommendations presented in this report are based upon the information obtained from the borings performed at the site and from other information discussed in this report. This report is based upon the findings from the borings made and may not identify all subsurface variations which exist across the site. The nature and extent of such variations may not become evident until construction. If significant variations appear, contact SKG Engineering to further access the design criteria and the recommendations contained within this report.

The scope of services for this project does not include either specifically or by implication any environmental assessment of the site or identification of contaminated or hazardous materials or conditions. If the owner is concerned about the potential for such conditions, the appropriate investigations should be performed.

No warranties, either expressed or implied, are intended or made. In the event that changes in the nature, design, or location of the project as outlined in this report are made, the recommendations contained in this report shall not be considered valid unless SKG Engineering reviews the changes and either verifies or modifies the conclusions of this report in writing.

Attachment A

Field Conditions

Summary of Field Conditions

The following field conditions were observed during the field exploration activities.

1. The site is currently undeveloped with native trees and vegetation present at the site.

2. The surface soil conditions on the site are generally clay that is considered a soft soil material. The soil conditions will probably prove to hinder mobilization of some types of construction equipment during rain events that saturate the soils.

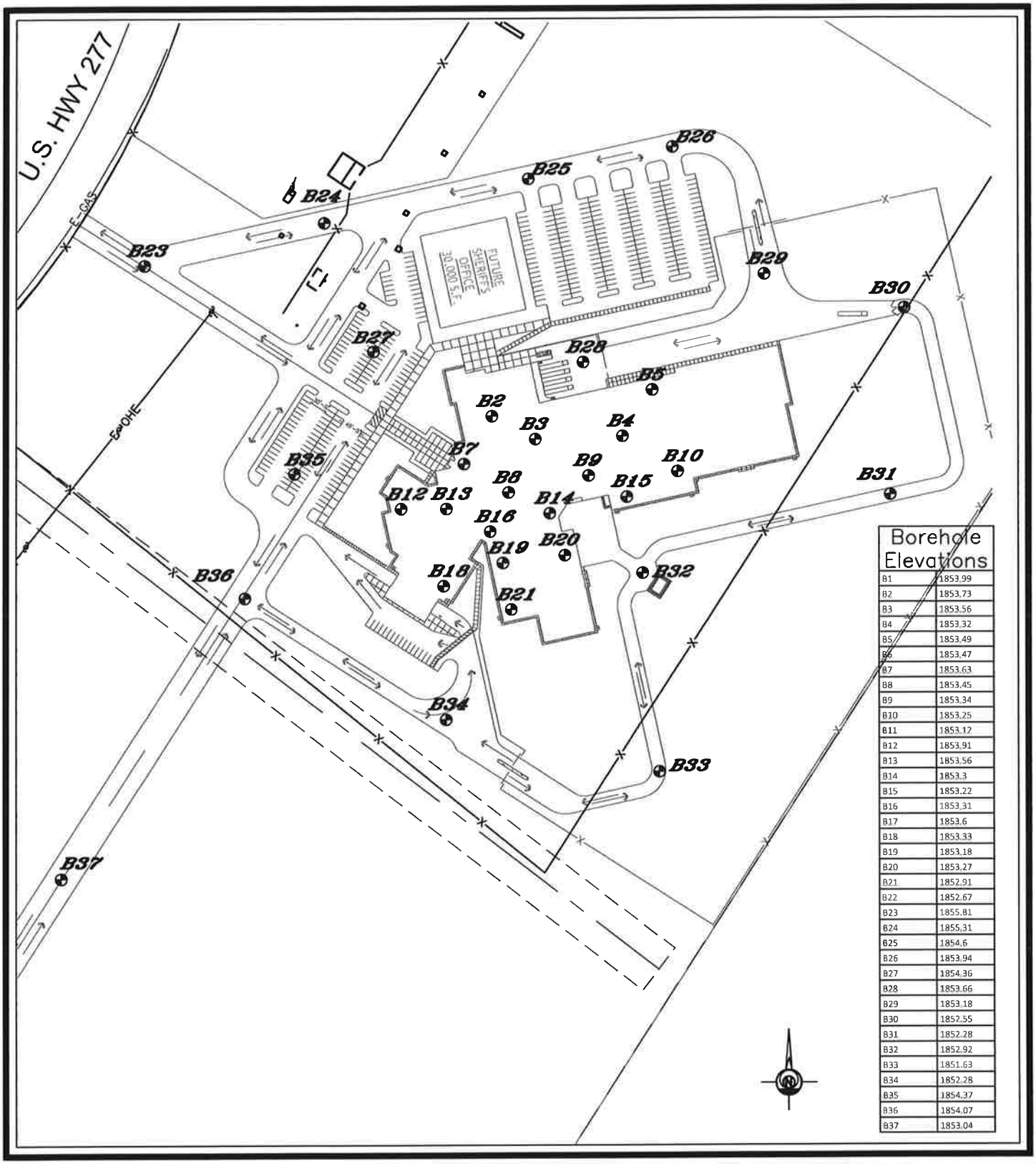
3. Groundwater was not present at the time of drilling activities in any of the boreholes.

4. No solid rock seams were encountered in any of the boreholes conducted at the site.

5. Site soils may be of quality to be used for engineered fill material under the foundation systems if it conforms to the specifications for engineered fill and installed in accordance with the SITE PREPARATION section of this report. Rubble, debris and deleterious material should be removed from the site soils if used under foundation systems.

Attachment B

Borehole Location Map



Borehole	Elevations
B1	1853.99
B2	1853.73
B3	1853.56
B4	1853.32
B5	1853.49
B6	1853.47
B7	1853.63
B8	1853.45
B9	1853.34
B10	1853.25
B11	1853.17
B12	1853.91
B13	1853.56
B14	1853.3
B15	1853.22
B16	1853.31
B17	1853.6
B18	1853.33
B19	1853.18
B20	1853.27
B21	1852.91
B22	1852.67
B23	1855.81
B24	1855.31
B25	1854.6
B26	1853.94
B27	1854.36
B28	1853.66
B29	1853.18
B30	1852.55
B31	1852.28
B32	1852.92
B33	1851.63
B34	1852.28
B35	1854.37
B36	1854.07
B37	1853.04

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PROPOSED TOM GREEN COUNTY DETENTION FACILITY SAN ANGELO, TEXAS

BOREHOLE LOCATION MAP

DWG BY: DLH	DWG. DATE: 02.24.2016
JOB NO. 15-E-1560	SHEET NO. BH1
SCALE: 1"=250'	

Attachment C

Logs of Boreholes

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISION			GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COURSE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE.	GRAVEL AND GRAVELLY SOILS — MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL GRADED GRAVELS, GRAVEL–SAND MIXTURES, LITTLE OR NO FINES.
				GP	POORLY GRADED GRAVELS OR GRAVEL–SAND MIXTURES, LITTLE OR NO FINES.
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL–SAND–SILT MIXTURES.
				GC	CLAYEY GRAVELS, GRAVEL–SAND–SILT MIXTURES.
	SILTS AND CLAYS — MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	CLEAN SAND (LITTLE OR NO FINES)		SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES.
				SP	POORLY GRADED SANDS OR GRAVELLY SANDS, LITTLE OR NO FINES.
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND–SILT MIXTURES.
				SC	CLAYEY SANDS, SAND–CLAY MIXTURES.
FINE GRAINED SOILS — MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE.	SILTS AND CLAYS — LIQUID LIMIT LESS THAN 50.			ML	INORGANIC SILTS AND VERY FINE SANDS, FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS AND WITH SLIGHT PLASTICITY.
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS.
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY.
	SILTS AND CLAYS — LIQUID LIMIT GREATER THAN 50.			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS.
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS.
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS.
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS.

SAMPLER TYPE

SOIL TERMS	DESCRIPTION
BLOCKY	CONTAINS CRACKS OR FAILURE PLANES RESULTING IN ROUGH CUBES OF MATERIAL.
CALCAREOUS	CONTAINS APPRECIABLE QUANTITIES OF CALCIUM CARBONATE.
FISSURED	CONTAINS SHRINKAGE CRACKS, WHICH ARE FREQUENTLY FILLED WITH FINE SAND OR SILT. THE FISSURES ARE USUALLY NEAR VERTICAL IN ORIENTATION.
INTERBEDDED	COMPOSED OF ALTERNATING LAYERS OF DIFFERENT SOIL TYPES.
LAMINATED	COMPOSED OF THIN LAYERS OF VARYING COLOR AND TEXTURE.
NODULES	SECONDARY INCLUSIONS THAT APPEAR AS SMALL LUMPS ABOUT 0.1 TO 0.3 INCH IN DIAMETER.
PARTINGS	INCLUSION OF DIFFERENT MATERIAL LESS THAN ⅛ INCH THICK EXTENDING THROUGH THE SAMPLE.
POCKETS	INCLUSION OF DIFFERENT MATERIAL THAT IS SMALLER THAN THE DIAMETER OF THE SAMPLE.
SEAMS	INCLUSION OF DIFFERENT MATERIAL BETWEEN ⅛ AND 3 INCHES THICK, AND EXTENDS THROUGH THE SAMPLE.
SLICKENSIDED	HAS INCLINED PLANES OF WEAKNESS THAT ARE SLICK AND GLOSSY IN APPEARANCE. SLICKENSIDES ARE COMMONLY THOUGHT TO BE RANDOMLY ORIENTED.
STREAKS OR STAINS	STAINS OF LIMITED EXTENT THAT APPEAR AS SHORT STRIPES, SPOTS OR BLOTCHES.

ROCK TERMS	
BEDDING PLANE	A SURFACE PARALLEL TO THE SURFACE OF DEPOSITION, GENERALLY MARKED BY CHANGES IN COLOR OR GRAIN SIZE.
FRACTURE	A NATURAL BREAK IN ROCK ALONG WHICH NO DISPLACEMENT HAS OCCURED.
JOINT	A NATURAL BREAK ALONG WHICH NO DISPLACEMENT HAS OCCURED, WHICH GENERALLY INTERSECTS PRIMARY SURFACES.
% RECOVERY	THE RATIO OF TOTAL LENGTH OF RECOVERY TO THE TOTAL LENGTH OF CORE RUN, EXPRESSED AS A PERCENTAGE.
RQD - ROCK QUALITY DESIGNATION	THE RATIO OF TOTAL RECOVERED LENGTH OF FRAGMENTS LONGER THAN 4 INCHES TO THE TOTAL RUN LENGTH, EXPRESSED AS A PERCENTAGE.
WEATHERING	THE PROCESS BY WHICH ROCK IS BROKEN DOWN AND DECOMPOSED.

MOISTURE CONTENT

DRY	ABSENCE OF MOISTURE, DUSTY, DRY TO THE TOUCH.
DAMP	SOME PERCEPTIBLE MOISTURE; BELOW OPTIMUM.
MOIST	NO VISIBLE WATER; NEAR OPTIMUM MOISTURE CONTENT.
WET	VISIBLE FREE WATER, USUALLY SOIL IS BELOW WATER TABLE.

CONSISTENCY OF COHESIVE SOILS

CONSISTENCY	POCKET PENETROMETER READING IN TONS/FT2	N-VALUE (BLOWS/FOOT)
VERY SOFT	0 TO 0.25	<2
SOFT	0.25 TO 0.5	2 TO 4
FIRM	0.5 TO 1.0	4 TO 8
STIFF	1.0 TO 2.0	8 TO 15
VERY STIFF	2.0 TO 4.0	15 TO 30
HARD	>4.0 OR 4.5+	>30

CLAY	SILT	SAND			GRAVEL		COBBLES	BOULDERS
		FINE	MEDIUM	COARSE	FINE	COARSE		
0.005mm		No.200	No.40	No.10	No.4	¾"	3"	12"

U.S. STANDARD SIEVE SIZE

RELATIVE DENSITY-GRANULAR SOILS

CONSISTENCY	N-VALUE (BLOWS/FOOT)
VERY LOOSE	0 TO 4
LOOSE	5 TO 10
MEDIUM DENSE	11 TO 30
DENSE	31 TO 50
VERY DENSE	>50 OR 50+

REFERENCE: THE UNIFIED SOIL CLASSIFICATION SYSTEM, CORPS OF ENGINEERS, U.S. ARMY TECHNICAL MEMORANDUM NO. 3–357, VOL. 1 MARCH, 1953 (REVISED APRIL, 1960)

KEY
TO SYMBOLS AND TERMS

SKG
ENGINEERING

Date: 2/25/2016 File: \\SKG-SBS\Shared\Engineering\2015\15E1560 KFA Architects - Tom Green Co Jail Site\Final Geotechnical Investigation\Borehole logs.log SuperLog CiviTech Software, USA www.civiltech.com

Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-2

Boring Location: Refer to the borehole location map

Project Engineer -JC
Driller - LC
Elevation - 1853.7

Date Started: January 28, 2016 | **Date Finished: January 28, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler

Surface Elevation:

Depth (feet)	Lith-ology	Material Description	Samples: Number	Samples: Type	Samples: SPT	Laboratory: M%	Laboratory: PI	Laboratory: Pen (tsf)
0		lean CLAY (CL); brown			3/5/9	15.9	17	
		cemented layers from 2' to 3'			50-6"			
5		GWT not encountered			50-2"			
		silty SAND (SM); tan with few gravel			50-0"	10.7	24	
10								
15					50-1"			
		lean CLAY (CL); red			50-0"			
20								
25		Boring completed at a depth of 25'. Groundwater was not present at the time of drilling activities.			50-1"			
30								
35								

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15-E-1560

Plate A-1

Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-3

Boring Location: Refer to the borehole location map

Date Started: February 8, 2016 | **Date Finished: February 8, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler

Project Engineer - JC
Driller - LC
Elevation - 1853.6

Surface Elevation:

Depth (feet)	Lith-ology	Material Description	Samples Number	Samples Type	Samples SPT	Laboratory M%	Laboratory PI	Laboratory Pen (tsf)
0		lean CLAY (CL); brown			3/5/4			
					5/8/10			
		clayey SAND (SC); tan with few gravel			50-1"	8.1	14	
5								
					50-1"			
10								
		silty SAND (SM); red			50-2"	16.6	25	
15								
					50-3"			
20								
					50-1"			
25		Boring completed at a depth of 25'. Groundwater was not present at the time of drilling activities.						
30								
35								

GWT not encountered

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Plate A- 2

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Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-4

Boring Location: Refer to the borehole location map

Date Started: February 8, 2016 | **Date Finished: February 8, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler

Project Engineer - JC
Driller - LC
Elevation - 1853.3

Surface Elevation:

Depth (feet)	Lith-ology	Material Description	Samples Number	Samples Type	Samples SPT	Laboratory M%	Laboratory PI	Laboratory Pen (tsf)
0		clayey SAND (SC); tan with cemented layers and few gravel			50-0"	10.3	13	
					50-1"			
5		GWT not encountered			50-0"			
		silty SAND (SM); tan with gravel						
10					18/25/25	14.5	17	
15					50-1"			
		lean CLAY (CL); red						
20					50-2"			
25		Boring completed at a depth of 25'. Groundwater was not present at the time of drilling activities.			50-3"			
30								
35								

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Plate A- 3

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Project: Proposed Tom Green County Detention Center
Tom Green County, Texas

B-5

Boring Location: Refer to the borehole location map

Date Started: February 8, 2016 **Date Finished:** February 8, 2016

Drilling Method: Air rotary

Hammer Weight: 140 lbs **Drop:** 30 inches

Sampler: Shelby tube/2" split barrel sampler

Project Engineer - JC
Driller - LC
Elevation - 1853.5

Surface Elevation:

Depth (feet)	Lith-ology	Material Description	Samples Number	Samples Type	Samples SPT	Laboratory M%	Laboratory PI	Laboratory Pen (tsf)
0		clayey SAND (SC); brown with gravel and cemented layers from 2' to 4'			8/6/7			
					50-0"			
5		GWT not encountered			50-0"			
		silty SAND (SM); tan			50-1"	11.2	22	
10								
					50-0"			
15								
		lean CLAY (CL); red			50-0"			
20								
					50-1"			
25		Boring completed at a depth of 25'. Groundwater was not present at the time of drilling activities.						
30								
35								

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Plate A- 4

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Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-7

Boring Location: Refer to the borehole location map

Project Engineer - JC
Driller - LC
Elevation - 1853.6

Date Started: January 27, 2016 | **Date Finished: January 27, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler

Depth (feet)	Lith-ology	Material Description	Samples: Number	Samples: Type	Samples: SPT	Laboratory: M%	Laboratory: PI	Laboratory: Pen (tsf)
		Surface Elevation:						
0		silty SAND (SM); tan			2/6/10	9.1	18	
					50-0"			
		clayey SAND (SC); brown with gravel			3/3/2			
5		GWT not encountered						
					50-0"			
10								
					50-1"			
15								
		lean CLAY (CL); red			50-0"			
20								
					50-1"	18.4	28	
25		Boring completed at a depth of 25'. Groundwater was not present at the time of drilling activities.						
30								
35								

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Plate A- 5

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Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-8

Boring Location: Refer to the borehole location map

Project Engineer - JC
Driller - LC
Elevation - 1853.5

Date Started: January 28, 2016 | **Date Finished: January 28, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler

Depth (feet)	Lith-ology	Material Description	Samples: Number	Samples: Type	Samples: SPT	Laboratory: M%	Laboratory: PI	Laboratory: Pen (tsf)
		Surface Elevation:						
0		silty SAND (SM); brown			3/4/6	19.7	15	
					14/15/13			
5					15/25/25			
		clayey SAND (SC); tan with gravel						
10					50-0"			
15					50-0"	11.2	21	
		lean CLAY (CL); red						
20					50-1"			
					50-2"			
25		Boring completed at a depth of 25'. Groundwater was not present at the time of drilling activities.						
30								
35								

GWT not encountered

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15-E-1560

Plate A- 6

Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-9

Boring Location: Refer to the borehole location map

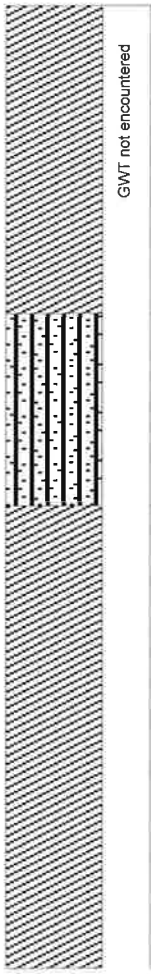
Project Engineer - JC
Driller - LC
Elevation - 1853.3

Date Started: February 8, 2016 | **Date Finished: February 8, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler



Depth (feet)	Lith-ology	Material Description	Samples: Number	Samples: Type	Samples: SPT	Laboratory: M%	Laboratory: PI	Laboratory: Pen (tsf)
		Surface Elevation:						
0		lean CLAY (CL); brown			3/5/7			
					50-0"			
5					18/25/50	8.0	12	
		silty SAND (SM); tan with gravel			9/11/25	13.2	20	
10								
		lean CLAY (CL); red			50-1"			
15								
					50-0"			
20								
					50-1"			
25		Boring completed at a depth of 25'. Groundwater was not present at the time of drilling activities.						
30								
35								

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Plate A- 7

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Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-10

Boring Location: Refer to the borehole location map

Date Started: February 8, 2016 | **Date Finished: February 8, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler

Project Engineer - JC
Driller - LC
Elevation - 1853.3

Surface Elevation:

Depth (feet)	Lith-ology	Material Description	Samples Number	Samples Type	Samples SPT	Laboratory M%	Laboratory PI	Laboratory Pen (tsf)
0		SILT (ML); brown with sand			3/7/9			
					10/15/20	16.2	20	
5		GWT not encountered			5/10/12			
10					7/10/8			
		silty SAND (SM); tan with few gravel			50-1"	15.1	32	
15								
20					50-0"			
25		Boring completed at a depth of 25'. Groundwater was not present at the time of drilling activities.			50-0"			
30								
35								

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15-E-1560

Plate A- 8

Date: 2/25/2016 File: \\SKG-SBS\Shared\Engineering\2015\15E1560 KFA Architects - Tom Green Co Jail Site\Final Geotechnical Investigation\Borehole logs.log SuperLog CivilTech Software, USA www.civiltech.com

Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-12

Boring Location: Refer to the borehole location map

Date Started: January 28, 2016 | **Date Finished: January 28, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler

Project Engineer - JC
Driller - LC
Elevation - 1853.9

Surface Elevation:

Depth (feet)	Lith-ology	Material Description	Samples Number	Samples Type	Samples SPT	Laboratory M%	Laboratory PI	Laboratory Pen (tsf)
0		lean CLAY (CL); brown			4/5/6			
					9/12/10			
5		GWT not encountered			8/13/17	8.0	14	
		clayey SAND (SC); tan						
10					14/25/25			
15					14/20/25			
		fat CLAY (CH); red						
20					13/25/50	20.3	48	
25		Boring completed at a depth of 25'. Groundwater was not present at the time of drilling activities.			50-1"			
30								
35								

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15-E-1560

Plate A- 9

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Project: Proposed Tom Green County Detention Center
Tom Green County, Texas

B-13

Boring Location: Refer to the borehole location map

Date Started: January 28, 2016 **Date Finished:** January 28, 2016

Drilling Method: Air rotary

Hammer Weight: 140 lbs **Drop:** 30 inches

Sampler: Shelby tube/2" split barrel sampler

Project Engineer - JC
Driller - LC
Elevation - 1853.6

Surface Elevation:

GWT not encountered

Depth (feet)	Lithology	Material Description	Samples: Number	Samples: Type	Samples: SPT	Laboratory: M%	Laboratory: PI	Laboratory: Pen (tsf)
0		lean CLAY (CL); brown			4/5/8			
					12/13/12	9.5	21	
5					10/13/15			
		clayey SAND (SC); tan with few gravel						
10					16/25/50	11.8	27	
15					50-0"			
		lean CLAY (CL); tan						
20					50-1"			
25		Boring completed at a depth of 25'. Groundwater was not present at the time of drilling activities.			50-0"	10.1	22	
30								
35								

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15-E-1560

Plate A- *10*

Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-14

Boring Location: Refer to the borehole location map

Project Engineer - JC
Driller - LC
Elevation - 1853.3

Date Started: February 8, 2016 | **Date Finished: February 8, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler

Depth (feet)	Lith-ology	Material Description	Samples: Number	Samples: Type	Samples: SPT	Laboratory: M%	Laboratory: PI	Laboratory: Pen (tsf)
		Surface Elevation:						
0		clayey SAND (SC); brown			3/3/5			
					50-0"	5.1	12	
		GWT not encountered			50-2"			
5								
					50-1"	6.8	13	
10								
		lean CLAY (CL); red			50-1"			
15								
					50-2"			
20								
					50-0"			
25		Boring completed at a depth of 25'. Groundwater was not present at the time of drilling activities.						
30								
35								

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15-E-1560

Plate A- *11*

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Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-15

Boring Location: Refer to the borehole location map

Date Started: February 8, 2016 | **Date Finished: February 8, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler

Project Engineer - JC
Driller - LC
Elevation - 1853.2

Depth (feet)	Lith-ology	Material Description	Samples: Number	Samples: Type	Samples: SPT	Laboratory: M%	Laboratory: PI	Laboratory: Pen (tsf)
		Surface Elevation:						
0		lean CLAY (CL); brown			4/6/25			
					50-0"			
5		GWT not encountered			50-2"			
		clayey SAND (SC); tan with few gravel						
10					12/25/25			
15					8/7/7			
		lean CLAY (CL); tan						
20					50-0"			
25		Boring completed at a depth of 25'. Groundwater was not present at the time of drilling activities.			50-1"	6.9	17	
30								
35								

SKG Engineering, LLC

15-E-1560

Plate A- *12*

Date: 2/25/2016
SuperLog CivilTech Software, USA www.civiltech.com File: \\SKG-SBS\Shared\Engineering\2015\15E1560 KFA Architects - Tom Green Co Jail Site\Final Geotechnical Investigation\Borehole logs.log

Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-16

Boring Location: Refer to the borehole location map

Date Started: January 28, 2016 | **Date Finished: January 28, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler

Project Engineer - JC
Driller - LC
Elevation - 1853.3

Surface Elevation:

Depth (feet)	Lithology	Material Description	Samples: Number	Samples: Type	Samples: SPT	Laboratory: M%	Laboratory: PI	Laboratory: Pen (tsf)
0		lean CLAY (CL); brown			4/5/5			
					6/8/7			
		clayey SAND (SC); tan			50-0"	6.4	18	
5		GWT not encountered						
					50-0"			
10								
					50-1"			
15								
		lean CLAY (CL); red			50-1"			
20								
					50-1"			
25		Boring completed at a depth of 25'. Groundwater was not present at the time of drilling activities.						
30								
35								

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15-E-1560

Plate A- *13*

SuperLog CivilTech Software, USA www.civiltech.com File: \\SKG-SBS\Shared\Engineering\2015\15E1560 KFA Architects - Tom Green Co Jail Site\Final Geotechnical Investigation\Borehole logs.log Date: 2/25/2016

Project: Proposed Tom Green County Detention Center
Tom Green County, Texas

B-18

Boring Location: Refer to the borehole location map

Date Started: January 28, 2016 **Date Finished:** January 28, 2016

Drilling Method: Air rotary

Hammer Weight: 140 lbs **Drop:** 30 inches

Sampler: Shelby tube/2" split barrel sampler

Project Engineer - JC
Driller - LC
Elevation - 1853.3

Surface Elevation:

Depth (feet)	Lith-ology	Material Description	Samples Number	Samples Type	Samples SPT	Laboratory M%	Laboratory PI	Laboratory Pen (tsf)
0		clayey SAND (SC); brown			9/7/6	10.0	15	
					6/7/10			
5		GWT not encountered			10/18/18	7.3	18	
10					50-0"			
15					50-1"	12.0	31	
20		lean CLAY (CL); tan			50-1"			
25		SAND (SP); tan with few gravel			50-0"			
		Boring completed at a depth of 25'. Groundwater was not present at the time of drilling activities.						
30								
35								

SKG Engineering, LLC

15-E-1560

Plate A- *14*

Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-19

Boring Location: Refer to the borehole location map

Date Started: January 28, 2016 | **Date Finished: January 28, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler

Project Engineer - JC
Driller - LC
Elevation - 1853.2

Depth (feet)	Lith-ology	Material Description	Samples			Laboratory		
			Number	Type	SPT	M%	PI	Pen (tsf)
		Surface Elevation:						
0		clayey SAND (SC); brown			3/4/6			
					6/16/14			
5					8/6/13			
10					6/8/10	13.8	25	
15					18/25/50			
		lean CLAY (CL); tan			50-0"			
20								
		SAND (SP); tan with few gravel			50-1"			
25		Boring completed at a depth of 25'. Groundwater was not present at the time of drilling activities.						
30								
35								

GWT not encountered

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15-E-1560

Plate A- ***15***

Date: 2/25/2016 File: \\SKG-SBS\Shared\Engineering\2015\15E1560 KFA Architects - Tom Green Co Jail Site\Final Geotechnical Investigation\Borehole logs.log
SuperLog CivilTech Software, USA www.civiltech.com

Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-20

Boring Location: Refer to the borehole location map

Project Engineer - JC
Driller - LC
Elevation - 1853.3

Date Started: February 8, 2016 | **Date Finished: February 8, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler

Surface Elevation:

Depth (feet)	Lith-ology	Material Description	Samples: Number	Samples: Type	Samples: SPT	Laboratory: M%	Laboratory: PI	Laboratory: Pen (tsf)
0		lean CLAY (CL); brown			3/5/9	20.7	20	
		clayey SAND (SC); tan with gravel			50-1"			
5		GWT not encountered			50-3"			
10					50-1"			
15					50-0"			
20					50-1"	12.1	28	
25		Boring completed at a depth of 25'. Groundwater was not present at the time of drilling activities.			50-0"			
30								
35								

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15-E-1560

Plate A- *16*

SuperLog CivilTech Software, USA www.civiltech.com File: \\SKG-SBS\Shared\Engineering\2015\15E1560 KFA Architects - Tom Green Co Jail Site\Final Geotechnical Investigation\Borehole logs.log Date: 2/25/2016

SuperLog CivilTech Software, USA www.civiltech.com File: \\SKG-SBS\Shared\Engineering\2015\15E1560 KFA Architects - Tom Green Co Jail Site\Final Geotechnical Investigation\Borehole logs.log Date: 2/25/2016

Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-21

Boring Location: Refer to the borehole location map

Date Started: January 28, 2016 | **Date Finished: January 28, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler

Project Engineer - JC
Driller - LC
Elevation - 1852.9

Depth (feet)	Lith-ology	Material Description	Samples Number	Samples Type	Samples SPT	Laboratory M%	Laboratory PI	Laboratory Pen (tsf)
		Surface Elevation:						
0		lean CLAY (CL); brown			4/5/15	15.4	20	
					50-0"			
5					50-1"			
		clayey SAND (SC); tan with few gravel						
10					50-0"			
		fat CLAY (CH); red						
15					50-1"	19.0	481	
20					50-1"			
		clayey SAND (SC); tan with few gravel						
25					50-0"			
		Boring completed at a depth of 25'. Groundwater was not present at the time of drilling activities.						
30								
35								

GWT not encountered

SKG Engineering, LLC

15-E-1560

Plate A- 17

SuperLog CivilTech Software, USA www.civiltech.com File: \\SKG-SBS\Shared\Engineering\2015\15E1560 KFA Architects - Tom Green Co Jail Site\Final Geotechnical Investigation\Borehole logs.log Date: 2/25/2016

Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-23

Boring Location: Refer to the borehole location map

Date Started: January 26, 2016 | **Date Finished: January 26, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler

Project Engineer - JC
Driller - LC
Elevation - 1855.8

Surface Elevation:

Depth (feet)	Lith-ology	Material Description	Samples Number	Samples Type	SPT	Laboratory M%	Laboratory PI	Laboratory Pen (tsf)
0		lean CLAY (CL); brown			3/4/4	14.9	13	
					7/12/28			
5		GWT not encountered			50-1"			
		silty SAND (SM); tan with gravel			50-0"	10.8	15	
10		Boring completed at a depth of 10'. Groundwater was not present at the time of drilling activities.						
15								
20								
25								
30								
35								

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Plate A- *18*

SuperLog CivilTech Software, USA www.civiltech.com File: \\SKG-SBS\Shared\Engineering\2015\15E1560 KFA Architects - Tom Green Co Jail Site\Final Geotechnical Investigation\Borehole logs.log Date: 2/25/2016

Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-24

Boring Location: Refer to the borehole location map

Date Started: January 26, 2016 | **Date Finished: January 26, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler

Project Engineer - JC
Driller - LC
Elevation - 1855.3

Depth (feet)	Lith-ology	Material Description	Samples Number	Samples Type	Samples SPT	Laboratory M%	Laboratory PI	Laboratory Pen (tsf)
		Surface Elevation:						
0		lean CLAY (CL); brown			3/5/5			
					4/5/6	11.4	13	
5					50-1"			
		clayey SAND (SC); tan with gravel						
10					50-0"			
		Boring completed at a depth of 10'. Groundwater was not present at the time of drilling activities.						
15								
20								
25								
30								
35								

GWT not encountered

SKG Engineering, LLC

15-E-1560

Plate A- *19*

SuperLog CivilTech Software, USA www.civiltech.com File: \\SKG-SBS\Shared\Engineering\2015\15E1560 KFA Architects - Tom Green Co Jail Site\Final Geotechnical Investigation\Borehole logs.log Date: 2/25/2016

Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-25

Boring Location: Refer to the borehole location map

Project Engineer - JC
Driller - LC
Elevation - 1854.6

Date Started: January 19, 2016 | **Date Finished: January 19, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler

Depth (feet)	Lith-ology	Material Description	Samples: Number	Samples: Type	Samples: SPT	Laboratory: M%	Laboratory: PI	Laboratory: Pen (tsf)
		Surface Elevation:						
0		lean CLAY (CL); brown			2/5/5			
		silty SAND (SC); tan			4/7/15			
5		GWT not encountered			50-1"			
10		Boring completed at a depth of 10'. Groundwater was not present at the time of drilling activities.			50-0"	14.6	17	
15								
20								
25								
30								
35								

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15-E-1560

Plate A- *20*

SuperLog CiviTech Software, USA www.civiltech.com File: \\SKG-SBS\Shared\Engineering\2015\15E1560 KFA Architects - Tom Green Co Jail Site\Final Geotechnical Investigation\Borehole logs.log Date: 2/25/2016

Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-26

Boring Location: Refer to the borehole location map

Date Started: January 19, 2016 | **Date Finished: January 19, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler

Project Engineer - JC
Driller - LC
Elevation - 1853.9

Surface Elevation:

Depth (feet)	Lith-ology	Material Description	Samples Number	Samples Type	Samples SPT	Laboratory M%	Laboratory PI	Laboratory Pen (tsf)
0		SILT (ML); brown with sand			3/3/4	19.5	18	
					5/7/8			
5		GWT not encountered			13/20/20	15.1	15	
10		Boring completed at a depth of 10'. Groundwater was not present at the time of drilling activities.			50-0"			
15								
20								
25								
30								
35								

SKG Engineering, LLC

15-E-1560

Plate A- *21*

Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-27

Boring Location: Refer to the borehole location map

Project Engineer - JC
Driller - LC
Elevation - 1854.4

Date Started: January 19, 2016 | **Date Finished: January 19, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler

Depth (feet)	Lith-ology	Material Description	Samples			Laboratory		
			Number	Type	SPT	M%	PI	Pen (tsf)
		Surface Elevation:						
0		silty SAND (SM); tan			3/5/4			
		GWT not encountered			50-0"	6.3	15	
5					50-1"			
10		Boring completed at a depth of 10'. Groundwater was not present at the time of drilling activities.			50-0"			
15								
20								
25								
30								
35								

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15-E-1560

Plate A- 22

SuperLog CivilTech Software, USA www.civiltech.com File: \\SKG-SBS\Shared\Engineering\2015\15E1560 KFA Architects - Tom Green Co Jail Site\Final Geotechnical Investigation\Borehole logs.log Date: 2/25/2016

Date: 2/25/2016
File: \\SKG-SBS\Shared\Engineering\2015\15E1560 KFA Architects - Tom Green Co Jail Site\Final Geotechnical Investigation\Borehole logs.log
SuperLog CivilTech Software, USA www.civiltech.com

Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-28

Boring Location: Refer to the borehole location map

Project Engineer - JC
Driller - LC
Elevation - 1853.7

Date Started: January 28, 2016 | **Date Finished: January 28, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler

Depth (feet)	Lith-ology	Material Description	Samples: Number	Samples: Type	Samples: SPT	Laboratory: M%	Laboratory: PI	Laboratory: Pen (tsf)
		Surface Elevation:						
0		lean CLAY (CL); brown			7/8/10	14.9	17	
					50-0"			
5					50-0"			
		clayey SAND (SC); tan						
10					50-1"			
		Boring completed at a depth of 10'. Groundwater was not present at the time of drilling activities.						
15								
20								
25								
30								
35								

GWT not encountered

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15-E-1560

Plate A- *23*

Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-29

Boring Location: Refer to the borehole location map

Project Engineer - JC
Driller - LC
Elevation - 1853.2

Date Started: January 22, 2016 | **Date Finished: January 22, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler

Depth (feet)	Lith-ology	Material Description	Samples: Number	Samples: Type	Samples: SPT	Laboratory: M%	Laboratory: PI	Laboratory: Pen (tsf)
		Surface Elevation:						
0		clayey SAND (SC); tan with few gravel			3/4/5			
					8/10/11			
5		GWT not encountered			11/25/31	8.3	12	
10					50-3"			
		Boring completed at a depth of 10'. Groundwater was not present at the time of drilling activities.						
15								
20								
25								
30								
35								

SKG Engineering, LLC

15-E-1560

Plate A- *24*

SuperLog CivilTech Software, USA www.civiltech.com File: \\SKG-SBS\Shared\Engineering\2015\15E1560 KFA Architects - Tom Green Co Jail Site\Final Geotechnical Investigation\Borehole logs.log Date: 2/25/2016

Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-30

Boring Location: Refer to the borehole location map

Project Engineer - JC
Driller - LC
Elevation - 1852.6

Date Started: January 22, 2016 | **Date Finished: January 22, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler

Depth (feet)	Lith-ology	Material Description	Samples: Number	Samples: Type	Samples: SPT	Laboratory: M%	Laboratory: PI	Laboratory: Pen (tsf)
		Surface Elevation:						
0		clayey SAND (SC); tan with few gravel			3/3/4			
					16/18/25	12.7	18	
5		GWT not encountered			50-1"			
10					50-0"			
		Boring completed at a depth of 10'. Groundwater was not present at the time of drilling activities.						
15								
20								
25								
30								
35								

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15-E-1560

Plate A- 25

SuperLog CivilTech Software, USA www.civiltech.com File: \\SKG-SBS\Shared\Engineering\2015\15E1560 KFA Architects - Tom Green Co Jail Site\Final Geotechnical Investigation\Borehole logs.log Date: 2/25/2016

Date: 2/25/2016 SuperLog CivilTech Software, USA www.civiltech.com File: \\SKG-SBS\Shared\Engineering\2015\15E1560 KFA Architects - Tom Green Co Jail Site\Final Geotechnical Investigation\Borehole logs.log

Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-31

Boring Location: Refer to the borehole location map

Date Started: January 26, 2016 | **Date Finished: January 26, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler

Project Engineer - JC
Driller - LC
Elevation - 1852.3

Depth (feet)	Lith-ology	Material Description	Samples: Number	Samples: Type	Samples: SPT	Laboratory: M%	Laboratory: PI	Laboratory: Pen (tsf)
		Surface Elevation:						
0		lean CLAY (CL); tan			50-1"	11.4	16	
		sandy SILT (ML); tan			50-0"			
5		GWT not encountered			50-1"	11.1	8	
10		Boring completed at a depth of 10'. Groundwater was not present at the time of drilling activities.			50-0"			
15								
20								
25								
30								
35								

SKG Engineering, LLC

15-E-1560

Plate A- *26*

SuperLog CivilTech Software, USA www.civiltech.com File: \\SKG-SBS\Shared\Engineering\2015\15E1560 KFA Architects - Tom Green Co Jail Site\Final Geotechnical Investigation\Borehole logs.log Date: 2/25/2016

Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-32

Boring Location: Refer to the borehole location map

Project Engineer - JC
Driller - LC
Elevation - 1852.9

Date Started: January 22, 2016 | **Date Finished: January 22, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler

Depth (feet)	Lith-ology	Material Description	Samples			Laboratory		
			Number	Type	SPT	M%	PI	Pen (tsf)
		Surface Elevation:						
0		clayey SAND (SC); tan with few gravel			4/15/25			
		GWT not encountered			50-1"	5.2	31	
5					50-1"			
10					50-3"			
		Boring completed at a depth of 10'. Groundwater was not present at the time of drilling activities.						
15								
20								
25								
30								
35								

SKG Engineering, LLC

15-E-1560

Plate A- 27

Project: Proposed Tom Green County Detention Center
Tom Green County, Texas

B-33

Boring Location: Refer to the borehole location map

Date Started: January 26, 2016 | **Date Finished:** January 26, 2016

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop:** 30 inches

Sampler: Shelby tube/2" split barrel sampler

Project Engineer - JC
Driller - LC
Elevation - 1851.6

Depth (feet)	Lith-ology	Material Description	Samples: Number	Samples: Type	Samples: SPT	Laboratory: M%	Laboratory: PI	Laboratory: Pen (tsf)
		Surface Elevation:						
0		lean CLAY (CL); brown			2/6/8	16.7	17	
					8/9/10			
5					50-1"			
		clayey SAND (SC); tan with few gravel			50-2"			
10		Boring completed at a depth of 10'. Groundwater was not present at the time of drilling activities.						
15								
20								
25								
30								
35								

GWT not encountered

SKG Engineering, LLC | 15-E-1560 | Plate A- *28*

SuperLog CivilTech Software, USA www.civiltech.com File: \\SKG-SBS\Shared\Engineering\2015\15E1560 KFA Architects - Tom Green Co Jail Site\Final Geotechnical Investigation\Borehole logs.log Date: 2/25/2016

Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-34

Boring Location: Refer to the borehole location map

Date Started: January 26, 2016 | **Date Finished: January 26, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler

Project Engineer - JC
Driller - LC
Elevation - 1852.3

Surface Elevation:

Depth (feet)	Lith-ology	Material Description	Samples Number	Samples Type	Samples SPT	Laboratory M%	Laboratory PI	Laboratory Pen (tsf)
0		fat CLAY (CL); brown			5/6/6			
					8/12/10	15.2	24	
		silty SAND (SM); tan			18/25/50			
5		GWT not encountered						
10					50-2"			
		Boring completed at a depth of 10'. Groundwater was not present at the time of drilling activities.						
15								
20								
25								
30								
35								

SKG Engineering, LLC

15-E-1560

Plate A- 29

SuperLog CivilTech Software, USA www.civiltech.com File: \\SKG-SBS\Shared\Engineering\2015\15E1560 KFA Architects - Tom Green Co Jail Site\Final Geotechnical Investigation\Borehole logs.log Date: 2/25/2016

Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-35

Boring Location: Refer to the borehole location map

Project Engineer - JC
Driller - LC
Elevation - 1854.4

Date Started: January 26, 2016 | **Date Finished: January 26, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler

Depth (feet)	Lith-ology	Material Description	Samples: Number	Samples: Type	Samples: SPT	Laboratory: M%	Laboratory: PI	Laboratory: Pen (tsf)
		Surface Elevation:						
0		lean CLAY (CL); brown			4/3/5			
		clayey SAND (SC); tan with few gravel			50-1"	5.1	14	
5		GWT not encountered			50-2"			
10		Boring completed at a depth of 10'. Groundwater was not present at the time of drilling activities.			50-0"			
15								
20								
25								
30								
35								

SKG Engineering, LLC | 15-E-1560 | Plate A- *30*

Date: 2/25/2016 File: \\SKG-SBS\Shared\Engineering\2015\15E1560 KFA Architects - Tom Green Co Jail Site\Final Geotechnical Investigation\Borehole logs.log SuperLog CivilTech Software, USA www.civiltech.com

Project: **Proposed Tom Green County Detention Center**
Tom Green County, Texas

B-36

Boring Location: Refer to the borehole location map

Project Engineer - JC
Driller - LC
Elevation - 1854.1

Date Started: January 22, 2016 | **Date Finished: January 22, 2016**

Drilling Method: Air rotary

Hammer Weight: 140 lbs | **Drop: 30 inches**

Sampler: Shelby tube/2" split barrel sampler

Depth (feet)	Lith-ology	Material Description	Samples: Number	Samples: Type	Samples: SPT	Laboratory: M%	Laboratory: PI	Laboratory: Pen (tsf)
		Surface Elevation:						
0		lean CLAY (CL); brown			3/5/10			
					8/15/20			
5		GWT not encountered			50-1"	8.6	12	
		clayey SAND (SC); tan with few gravel						
10					50-2"			
		Boring completed at a depth of 10'. Groundwater was not present at the time of drilling activities.						
15								
20								
25								
30								
35								

SKG Engineering, LLC

15-E-1560

Plate A- *31*

SuperLog CivilTech Software, USA www.civiltech.com File: \\SKG-SBS\Shared\Engineering\2015\15E1560 KFA Architects - Tom Green Co Jail Site\Final Geotechnical Investigation\Borehole logs.log Date: 2/25/2016

Project: Proposed Tom Green County Detention Center
Tom Green County, Texas

B-37

Boring Location: Refer to the borehole location map

Date Started: February 8, 2016 | Date Finished: February 8, 2016

Drilling Method: Air rotary

Hammer Weight: 140 lbs | Drop: 30 inches

Sampler: Shelby tube/2" split barrel sampler

Project Engineer - JC
Driller - LC
Elevation - 1853.0

Depth (feet)	Lith-ology	Material Description	Samples: Number	Samples: Type	Samples: SPT	Laboratory: M%	Laboratory: PI	Laboratory: Pen (tsf)
		Surface Elevation:						
0		silty SAND (SM); tan with gravel			50-0"			
					50-1"			
5					18/23/28	12.6	12	
10					50-1"			
		Boring completed at a depth of 10'. Groundwater was not present at the time of drilling activities.						
15								
20								
25								
30								
35								

GWT not encountered

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15-E-1560

Plate A- 32

SuperLog CivilTech Software, USA www.civiltech.com File: \\SKG-SBS\Shared\Engineering\2015\15E1560 KFA Architects - Tom Green Co Jail Site\Final Geotechnical Investigation\Borehole logs.log Date: 2/25/2016

Attachment D

Laboratory Results

SKG
ENGINEERING, LLC
SURVEYING • ENVIRONMENTAL • LAB/CMT

706 SOUTH ABE STREET
SAN ANGELO, TEXAS 76903

PHONE: 325.655.1288
FAX: 325.657.8189

ANALYSIS RESULTS

CLIENT: Kye Franke-Kinney Franke Architects
PROJECT: Tom Green Jail
PROJECT #: 15-E-1560
DATE: 2/10/2016

Lab No.	Description	Plastic Limit (%) *	Liquid Limit (%)*	Plasticity Index *	Moisture (%) *	Pass # 4 Sieve (%)*	Pass # 40 Sieve (%)*	Pass # 200 Sieve (%)*
16-0231	B2 0' 1.5'	28	45	17	15.9	99.8	99.4	79.6
16-0232	B2 8.5' 10'	34	58	24	10.7	89.0	54.1	46.5
16-0233	B7 0' 1.5'	29	47	18	9.1	94.6	98.8	77.0
16-0234	B7 23.5' 25'	27	55	28	18.4	99.4	77.8	71.6
16-0235	B8 0' 1.5'	28	43	15	19.7	100.0	99.8	75.8
16-0236	B8 13.5' 15'	26	47	21	11.2	99.1	47.7	41.0
16-0237	B10 1.5' 3'	30	50	20	16.2	99.9	98.8	83.0
16-0238	B10 13.5' 15'	41	73	32	15.1	86.4	37.7	30.2
16-0239	B12 3.5' 5'	19	33	14	8.0	92.3	78.0	65.5
16-0240	B12 18.5' 20'	20	68	48	20.3	96.3	89.1	89.1
16-0241	B13 1.5' 3'	17	38	21	9.5	96.0	89.3	75.0
16-0242	B13 8.5' 10'	21	48	27	11.8	87.7	35.7	21.4
16-0243	B13 23.5' 25'	15	37	22	10.1	97.7	67.7	55.5
16-0244	B16 3.5' 5'	12	30	18	6.4	78.0	50.3	37.3
16-0245	B18 0' 1.5'	15	30	15	10.0	68.3	41.2	26.4
16-0246	B18 3.5' 5'	16	34	18	7.3	83.7	45.6	28.3
16-0247	B18 13.5' 15'	23	54	31	12.0	75.2	41.2	34.6
16-0248	B19 8.5' 10'	28	53	25	13.8	71.1	43.6	27.9
16-0249	B21 0' 1.5'	16	36	20	15.4	87.5	61.7	42.0
16-0250	B21 13.5' 15'	30	78	48	19.0	81.1	35.2	28.9
16-0251	B28 0' 1.5'	16	33	17	14.9	98.0	94.0	65.8

Average PL	23
Average LL	47
Average PI	24
Average % Clay	52.5

Stephanie Cheatheam

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Lab/CMT Manager

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ANALYSIS RESULTS

CLIENT: Kinney Franke Architects AIA
PROJECT: Tom Green County Jail
PROJECT #: 15-E-1560
DATE: 2/15/2016

Lab No.	Description	Plastic Limit (%) *	Liquid Limit (%)*	Plasticity Index *	Moisture (%) *	Pass # 4 Sieve (%)*	Pass # 40 Sieve (%)*	Pass # 200 Sieve (%)*
16-0266	B3 3.5' 5'	22	36	14	8.1	84.3	52.8	40.1
16-0267	B3 13.5' 15'	34	59	25	16.6	93.5	41.7	35.0
16-0268	B4 0' 1.5'	22	35	13	10.3	64.6	39.2	28.2
16-0269	B4 8.5' 10'	37	54	17	14.5	80.9	24.9	19.4
16-0270	B5 8.5' 10'	29	51	22	11.2	88.2	38.4	30.7
16-0271	B9 3.5 5'	21	33	12	8.0	93.4	63.6	52.1
16-0272	B9 8.5' 10'	38	58	20	13.2	62.7	34.9	27.9
16-0273	B14 1.5' 3'	18	30	12	5.1	90.9	30.0	16.2
16-0274	B14 8.5' 10'	23	36	13	6.8	91.8	26.5	20.7
16-0275	B15 23.5' 25'	16	33	17	6.9	98.1	56.3	50.7
16-0276	B20 0' 1.5'	27	47	20	20.7	89.9	84.4	64.2
16-0277	B20 18.5' 20'	30	58	28	12.1	86.2	38.7	34.0
16-0278	B37 0' 1.5	25	37	12	12.6	64.9	40.8	32.6

Average PL	26
Average LL	44
Average PI	17
Average % Clay	34.8

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ANALYSIS RESULTS

CLIENT: Kye Franke-Kinney Franke Architects
PROJECT: Tom Green Jail
PROJECT #: 15-E-1560
DATE: 2/6/2016

Lab No.	Description	Plastic Limit (%) *	Liquid Limit (%)*	Plasticity Index *	Moisture (%) *	Pass # 4 Sieve (%)*	Pass # 40 Sieve (%)*	Pass # 200 Sieve (%)*
16-0176	B23 0' 1.5'	21	34	13	14.9	97.2	91.9	64.4
16-0177	B23 8.5' 10'	29	44	15	10.8	91.5	31.6	15.8
16-0178	B24 1.5' 3'	22	35	13	11.4	98.9	93.7	60.0
16-0179	B25 8.5' 10'	33	50	17	14.6	94.7	37.6	31.6
16-0180	B26 0' 1.5'	30	48	18	19.5	100.0	99.6	81.7
16-0181	B26 3.5' 5'	30	45	15	15.1	97.9	83.0	69.7
16-0182	B27 1.5' 3'	26	41	15	6.3	74.6	47.3	37.9
16-0183	B30 1.5' 3'	22	40	18	12.7	80.8	62.1	45.9
16-0184	B31 0' 1.5'	22	38	16	11.4	92.1	78.1	51.6
16-0185	B31 3.5' 5'	26	34	8	11.1	90.5	74.5	54.9
16-0186	B32 1.5' 3'	20	51	31	5.2	90.3	52.0	33.3
16-0187	B33 0' 1.5'	24	41	17	16.7	99.4	95.9	67.1
16-0188	B34 1.5' 3'	28	52	24	15.2	99.3	98.5	88.7
16-0189	B35 1.5' 3'	21	35	14	5.1	66.8	40.1	26.5
16-0190	B36 3.5' 5'	20	32	12	8.6	92.1	86.1	62.0
16-0191	B29 3.5' 5'	21	33	12	8.3	90.9	80.6	66.1

Average PL	25
Average LL	41
Average PI	16
Average % Clay	53.6

Stephanie Cheatheam

Stephanie Cheatheam
Lab/CMT Manager