GEOTECHNICAL ENGINEERING REPORT

Proposed
Trumbo Road Development
23130 Trumbo Road
Bexar County, Texas

PSI Project No. 0312-2311 Rev 1

PREPARED FOR:

Stelsamax, LLC
2900 NE, 7th Avenue, Unit 3304
Miami, FL 33137

October 3, 2022

BY:

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October 3, 2022

Stelsamax, LLC.
2900 NE, 7th Avenue
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Miami, Florida 33137

Attn: Mr. Julian Reynolds

RE: GEOTECHNICAL ENGINEERING REPORT
PROPOSED TRUMBO ROAD DEVELOPMENT
23130 TRUMBO ROAD
BEXAR COUNTY, TEXAS
PSI PROJECT NO. 0312-2311 REV 2

Dear Mr. Reynolds:

Professional Service Industries, Inc. (PSI), an Intertek company, is pleased to submit this revised Geotechnical Engineering Report for the referenced project. This report includes the results from the field and laboratory investigation along with recommendations for use in preparation of the appropriate design and construction documents for this project.

PSI appreciates the opportunity to provide this Geotechnical Engineering Report and looks forward to continuing participation during the design and construction phases of this project. If there are questions pertaining to this report, or if PSI may be of further service, please contact us at your convenience.

PSI also has great interest in providing materials testing and inspection services during the construction of this project.

Respectfully submitted,

PROFESSIONAL SERVICE INDUSTRIES, INC.
Texas Board of Professional Engineers Certificate of Registration # F003307

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1.0 PROJECT INFORMATION

1.1 PROJECT AUTHORIZATION

Professional Service Industries, Inc., (PSI), an Intertek company, has completed a field exploration and geotechnical evaluation for the Proposed Residential Subdivision Streets in Bexar County, Texas. Table 1.1 below provides Project Authorization Information.

TABLE 1.1: PROJECT AUTHORIZATION

Project Name	Trumbo Road Development
Project Location	23130 Trumbo Road, Bexar County, Texas
Authorization Entity	Stelsmax, LLC
Authorization Date	May 3, 2021
PSI Proposal #	341902, dated April 27, 2021«PROPOSAL_NUMBER»
PSI Proposal Contents	Scope of Work, Lump Sum Fee, and PSI's General Conditions

1.2 PROJECT DESCRIPTION

Based on information provided and PSI's review of a site plan titled "Site Plan – Option 1 – 193 Lots", dated January 2021, and prepared by KFW Engineers + Surveyors, a summary of our understanding of the proposed project is provided in the following Project Description table.

TABLE 1.2: GENERAL PROJECT DESCRIPTION

Project Item	Residential Streets
Approximate Length of the Streets	Approximately 12,000 Linear Feet
Anticipated Bexar County Street Types	Flexible Pavement (20-year Design Life): Local Type A streets – 100,000 ESALs Local Type B streets – 2,000,000 ESALs Rigid Pavement (30-year Design Life): Local Type A streets – 100,000 ESALs Local Type B streets – 3,000,000 ESALs

The geotechnical recommendations presented in this report are based on the available project information, structure location, and the subsurface materials described in this report. If the noted information or assumptions made are incorrect, please inform PSI so that the recommendations presented in this report can be amended as necessary. PSI will not be responsible for the implementation of provided recommendations if not notified of changes in the project.

1.3 PURPOSE AND SCOPE OF SERVICES

The purpose of this study is to evaluate the subsurface conditions at the site and develop geotechnical engineering recommendations and guidelines for use in preparing the design and other related construction documents for the proposed project. The scope of services included drilling borings, performing laboratory testing, and preparing this geotechnical engineering report.

This report briefly outlines the available project information, describes the site and subsurface conditions, and presents the following:

- General site development and subgrade preparation recommendations.
- Estimated potential soil movements associated with shrinking and swelling soils and methods to reduce these movements to acceptable levels.
- Recommendations for site excavation, fill compaction, use of on-site and imported fill material under pavements, and
- Recommendations for the design of flexible asphaltic and rigid concrete pavement systems for the proposed streets.

The scope of services for this geotechnical exploration did not include an environmental, mold nor detailed seismic/fault assessment for determining the presence or absence of wetlands, or hazardous or toxic materials in the soil, bedrock, surface water, groundwater, or air on or below, or around this site. Statements in this report or on the boring logs regarding odors, colors, and unusual or suspicious items or conditions are strictly for informational purposes.

2.0 SITE AND SUBSURFACE CONDITIONS

2.1 SITE DESCRIPTION

The following table provides generalized descriptions of the existing site conditions based on visual observations during the field activities and other available information.

TABLE 2.1: SITE DESCRIPTION

Site Address	23130 Trumbo Road, Bexar County, Texas
Existing Site Conditions	Undeveloped Land
Existing Grade/Elevation Changes	Sloping
Existing Site Ground Cover	Grass, Underbrush and Trees
Ground Surface Soil Support Capability	Firm enough to support field equipment when dry
Site Boundaries	North: Hallmark Road East: Undeveloped South: Residential West: Trumbo Road

2.2 FIELD EXPLORATION

The soil conditions were explored by drilling a total of 14 soil borings. Nine (9) of the 14 borings were completed using a hand auger to a depth of 6 feet below existing grade. Five (5) of the 14 borings were drilled using a truck-mounted drill rig and were sampled to a depth of 10 feet below existing grade. The boring locations are shown on the Boring Location Plan provided in the Appendix.

The boring locations were selected by PSI personnel and were located in the field using available landmarks, GPS coordinates, and a recreational-grade GPS unit. Elevations of the ground surface at the boring locations were not available and should be surveyed by others if required. Therefore, the references to elevations of various strata are based on depths below existing grade at the time of drilling.

TABLE 2.2: FIELD EXPLORATION DESCRIPTION

Drilling Equipment	Hand Auger Truck-Mounted Drilling Equipment
Drilling Method	Hand Auger Cuttings Continuous-Flight Auger
Drilling Procedure	Applicable ASTM and PSI Safety Manual
Sampling Procedure	ASTM D1587/1586 Bulk Sampling of Surficial Soils for CBR Testing
Field Testing Procedures	Standard Penetration Test (ASTM D1586)
Frequency of Groundwater Level Measurements	During drilling and after completion of drilling
Boring Backfill Procedures	Soil Cuttings
Sample Preservation and Transportation Procedure	General accordance with ASTM D4220

During field activities, the encountered subsurface conditions were observed, logged, and visually classified (in general accordance with ASTM D2487). Field notes were maintained to summarize soil types and descriptions, water levels, changes in subsurface conditions, and drilling conditions.

2.3 LABORATORY TESTING PROGRAM

PSI supplemented the field exploration with a laboratory testing program to determine additional engineering characteristics of the subsurface soils encountered. The laboratory testing program included:

TABLE 2.3: LABORATORY TESTING PROGRAM

Laboratory Test	Procedure Specification
Moisture Content Tests	ASTM D2216
Atterberg Limits	ASTM D4318
Material Finer than No. 200 Sieve	ASTM D1140
Particle Size Analysis by Hydrometer	ASTM D422
California Bearing Ratio (CBR)	ASTM D1883

The laboratory testing program was conducted in general accordance with applicable ASTM Test Methods. The results of the laboratory tests are provided on the Boring Logs in the Appendix. Portions of samples not altered or consumed by laboratory testing will be discarded 60 days from the date shown on this report.

2.4 SITE GEOLOGY

We reviewed the San Antonio Sheet of the Geologic Atlas of Texas in an effort to determine the geologic setting of the project site and surrounding areas. The Geologic Atlas of Texas was developed by the Bureau of Economic Geology at The University of Texas using aerial photography, data from various oil and gas exploration companies, and very limited ground reconnaissance. Our review indicates that the project site is located in the **Carrizo Sand (Ec)**. The San Antonio Sheet generally describes the Carrizo Sand (Ec) formation as being sandstone that is light yellow to orange and brown in color.

2.5 SUBSURFACE CONDITIONS

The results of the field and laboratory investigation have been used to develop a generalized subsurface profile at the project site. The following subsurface descriptions highlight the major subsurface stratification features and material characteristics.

TABLE 2.4: GENERALIZED SUBSURFACE PROFILE

Depth of Layer (ft)		Soil Type	ω (%)	LL (%)	PI	% Pass. #200
Top	Bot.					
0	10	Clayey Sand	1 – 17	19 - 55	NP(1) - 32(2)	12 - 48

(1) NP – Non-Plastic
(2) Two samples with PI above 20 were collected from 6.5 feet below grade.

Notes:

1. ω – Water Content (%)
2. LL – Liquid Limit (%)
3. PI – Plasticity Index
4. % Pass. #200 – Material Passing the No. 200 Sieve (%)'

The boring logs included in the Appendix should be reviewed for information at the boring locations. The boring logs include soil descriptions, stratifications, locations of the samples, and field and laboratory test data. The stratifications shown on the boring logs only represent the conditions at the specific boring location and represent the approximate boundaries between subsurface materials. The actual transitions between strata may be more gradual or more distinct. Variations will occur and should be expected across the site.

2.5.1 GROUNDWATER INFORMATION

The borings were advanced using dry drilling techniques to their full depths enabling the possibility of detection of the presence of groundwater. Groundwater was not encountered during the field exploration activities.

Groundwater levels fluctuate seasonally as a function of rainfall, proximity to creeks, rivers and lakes, the infiltration rate of the soil, seasonal and climatic variations and land usage. If more detailed water level information is required, observation wells or piezometers could be installed at the site, and water levels could be monitored.

The groundwater levels presented in this report are the levels that were measured at the time of our field activities. The contractor should be prepared to control groundwater, if encountered, during construction activities.

2.5.2 SOIL TEXTURE

Samples were tested to determine their soil texture classification. The table below is a summary of the results.

TABLE 2.5: SOIL TEXTURE CLASSIFICATION

Boring	Depth (ft)	Soil Texture Classification	
B-1	0 to 5	Ib	Sand
B-2	0 to 5	Ib	Sand
B-3	0 to 5	Ib	Loamy Sand
B-4	0 to 5	II	Sandy Loam
B-5	0 to 5	Ib	Loamy Sand
B-6	0 to 5	Ib	Loamy Sand
B-7	0 to 5	II	Sandy Loam
B-8	0 to 5	II	Sandy Loam
B-9	0 to 5	Ib	Sand
B-10	0 to 5	II	Sandy Loam
B-11	0 to 5	II	Sandy Loam
B-12	0 to 5	II	Sandy Loam
B-13	0 to 5	Ib	Sand
B-14	0 to 5	II	Sandy Loam

3.0 GEOTECHNICAL EVALUATION AND RECOMMENDATIONS

3.1 GEOTECHNICAL DISCUSSION

Based upon the information obtained from the soil borings and laboratory testing, the clayey sand soils encountered at some boring locations at this site have a low potential for expansion. Undercutting the on-site expansive clay soils and replacing them with low expansive materials are usually the most efficient mitigation alternative. However, mitigation of expansive soil-related movements for pavements is not often considered economically feasible. Mitigation recommendations using undercutting and replacement are presented in this report.

The following design recommendations have been developed based on the previously described project characteristics and subsurface conditions encountered. If there are changes in the project criteria, PSI should be retained to review the changes and determine if modifications in the recommendations will be required. The findings of such a review would be presented in a supplemental report. Once final design plans and specifications are available, a general review by PSI is recommended to verify that the earthwork and pavement recommendations are properly interpreted and implemented within the construction documents.

3.2 POTENTIAL VERTICAL MOVEMENT (PVM) OF EXPANSIVE SOILS

The soils encountered at the soil boring locations exhibit a moderate potential for volumetric changes, due to fluctuations in soil moisture content. PSI has conducted laboratory testing on the soils to estimate the expansive soil potential with soil moisture variations. These soil moisture variations are based on historical climate change data. Determining the soil potential for shrinking and swelling, combined with historical climate variation, aids the engineer in quantifying the soil movement potential of the soils supporting the pavements. The Texas Department of Transportation (TxDOT) method TEX-124-E was used to estimate the Potential Vertical Movement (PVM) for this location.

3.2.1 SHRINK/SWELL MOVEMENT (PVM) ESTIMATE

Based on laboratory testing results and our analyses, the potential vertical movement within the proposed project area was estimated to be **less than 1 inch**.

4.0 PAVEMENT DESIGN RECOMMENDATIONS

4.1 PAVEMENT DESIGN PARAMETERS

PSI understands that flexible and/or rigid pavements will be considered for this project for the proposed streets. Pavement design recommendations were developed based on assumptions of potential traffic, drive paths or patterns and anticipated soil-support characteristics of pavement subgrades. PSI utilized the "AASHTO Guide for Design of Pavement Structures" published by the American Association of State Highway and Transportation Officials to evaluate the pavement thickness recommendations in this report. This method of design considers pavement performance, traffic, roadbed soil, pavement materials, environment, drainage and reliability. Each of these items is incorporated into the design methodology. PSI is available to provide laboratory testing and engineering evaluation to refine the site-specific design parameters and sections, upon request.

Specific-design traffic types and volumes for this project were based on Bexar County Pavement Design Standards (January 2011). This traffic information is typically used to determine the number of 18-kip Equivalent Single Axle Loads (ESALs) that is applied to the pavement over its design life. Details regarding the basis for this design are presented in the table below.

TABLE 4.1: PAVEMENT DESIGN PARAMETERS AND ASSUMPTIONS (RIGID AND FLEXIBLE)

Bexar County Local Type A Street	
Reliability, percent	70
Initial Serviceability Index, Flexible Pavement	4.2
Initial Serviceability Index, Rigid Pavement	4.5
Terminal Serviceability Index	2.0
Design Traffic Loading, Flexible Pavement	100,000 ESALs
Design Traffic Loading, Rigid Pavement	100,000 ESALs
Standard Deviation, Flexible Pavement	0.45
Standard Deviation, Rigid Pavement	0.35
Concrete Compressive Strength	4,000 psi
Subgrade California Bearing Ratio (CBR)	8.0
Subgrade Modulus of Subgrade Reaction, k in pci	100
Bexar County Local Type B Street	
Reliability, percent	90
Initial Serviceability Index, Flexible Pavement	4.2
Initial Serviceability Index, Rigid Pavement	4.5
Terminal Serviceability Index	2.0
Design Traffic Loading, Flexible Pavement	2,000,000 ESALs
Design Traffic Loading, Rigid Pavement	3,000,000 ESALs

Standard Deviation, Flexible Pavement	0.45
Standard Deviation, Rigid Pavement	0.35
Concrete Compressive Strength	4,400 psi
Subgrade California Bearing Ratio (CBR)	8.0
Subgrade Modulus of Subgrade Reaction, k in pci	100

During the paving life, maintenance to seal surface cracks within concrete or asphalt paving and to reseal joints within concrete pavement should be undertaken to achieve the desired paving life. Perimeter drainage should be controlled to prevent or retard influx of surface water from areas surrounding the paving. Water penetration leads to paving degradation. Water penetration into base or subgrade materials, sometimes due to irrigation or surface water infiltration leads to pre-mature paving degradation. Curbs should be used in conjunction with asphalt paving to reduce potential for infiltration of moisture into the base course. Curbs should extend the full depth of the base course and should extend at least 3 inches into the underlying clayey subgrade. The base layer should be tied into the area inlets to drain water that may collect in the base.

Material specifications, construction considerations, and thickness section recommendations are presented in following sections.

The recommended pavement sections are based on the field and laboratory test results for the project, local pavement design practice, design assumptions presented herein and previous experience with similar projects. The project Civil Engineer should verify that the ESAL and other design values are appropriate for the expected traffic and design life of the project. PSI should be notified in writing if the assumptions or design parameters are incorrect or require modification.

4.2 PAVEMENT SECTION RECOMMENDATIONS

PSI is providing flexible and rigid pavement thickness sections based on experience with similar facilities constructed on similar soil conditions for the design traffic loading anticipated.

4.2.1 FLEXIBLE PAVEMENT

Recommendations for flexible asphaltic concrete pavement are presented below.

FIGURE 4.1: FLEXIBLE PAVEMENT TYPICAL SECTION

TABLE 4.2: FLEXIBLE PAVEMENT SECTION
BEXAR COUNTY LOCAL TYPE A STREET

Material	
Traffic Volume	100,000 ESALs
Hot Mix Asphaltic Concrete	2 inches
Flexible Base	8 inches
Compacted Subgrade[1]	8 inches

1. PI of samples collected at pavement subgrade were less than 20.
2. Lime treatment of subgrade to a depth of 8-inches will be required for subgrade with a PI greater than 20.

TABLE 4.3: FLEXIBLE PAVEMENT SECTION
BEXAR COUNTY LOCAL TYPE B STREET

Material	
Traffic Volume	2,000,000 ESALs
Hot Mix Asphaltic Concrete	3.5 inches
Flexible Base	12 inches
Compacted Subgrade[1]	8 inches

1. PI of samples collected at pavement subgrade were less than 20.
2. Lime treatment of subgrade to a depth of 8-inches will be required for subgrade with a PI greater than 20.

4.2.2 RIGID PAVEMENT

Recommendations for rigid concrete pavement sections are presented below.

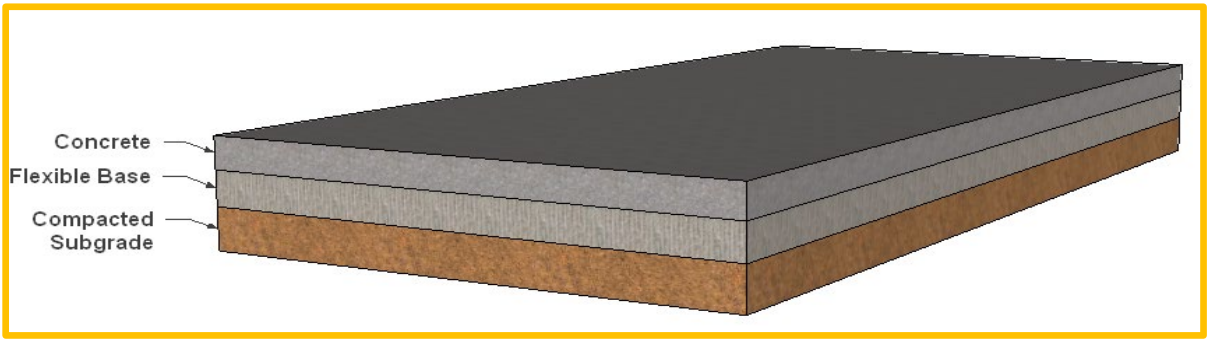


FIGURE 4.2: RIGID PAVEMENT TYPICAL SECTION

TABLE 4.4: RIGID PAVEMENT SECTION
BEXAR COUNTY LOCAL TYPE A STREET

Material	
Traffic Volume	100,000 ESALs
Portland Cement Concrete	6 inches
Flexible Base	6 inches
Compacted Subgrade	8 inches

TABLE 4.5: RIGID PAVEMENT SECTION
BEXAR COUNTY LOCAL TYPE B STREET

Material	
Traffic Volume	3,00,000 ESALs
Portland Cement Concrete	8 inches
Flexible Base	6 inches
Compacted Subgrade	8 inches

4.2.3 GENERAL PAVEMENT DESIGN AND CONSTRUCTION RECOMMENDATIONS

TABLE 4.6: PAVEMENT DESIGN AND CONSTRUCTION RECOMMENDATIONS

Minimum Undercut Depth	6 inches or as needed to remove roots
Reuse Excavated Soils	Free of roots and debris and meet material requirements of intended use
Undercut Extent	2 feet beyond the paving limits
Exposed Subgrade Treatment	Proof-roll with rubber-tired vehicle weighing at least 20 tons. A representative of the Geotechnical Engineer should be present during proof-roll.
Proof-Rolled Pumping and Rutting Areas	Excavate to firmer materials and replace with compacted general or select fill under direction of a representative of the Geotechnical Engineer
General Fill	Materials free of roots, debris, and other deleterious materials with a maximum rock size of 4 inches with a PI of less than 20 and a CBR of at least 8.
Minimum General Fill Thickness	As required to achieve grade
Maximum General Fill Loose Lift Thickness	9 inches
Lime Treatment (if required)	Performed in general accordance with COSA Item 108. Subgrade stabilized with lime should achieve a pH of 12.4 or greater. Estimate 4% by dry weight or 22 lbs per square yard. A lime series test should be performed at the time of construction to determine the lime requirement.
Flexible Base	TxDOT Item 247, Type A, Grade 1-2
Maximum Flexible Base Loose Lift Thickness	9 Inches
Hot Mix Asphaltic Concrete	TxDOT Item 340, Type C or D
Concrete Minimum Recommended Strength	4,400 psi (28-day comp. strength)
Concrete Min. Reinforcement	No. 3 bars 18 inches on-center, each way Located in top half of concrete section Minimum 2 inches cover
Concrete Construction Joint Min. Reinforcement	¾-inch Diameter Dowels 14 inches Long Spaced 12 inches on-center along the joint
Contraction Joint Spacing **(In General Accordance with ACI 330)**	Maximum joint spacing should be less than 30 times the thickness of the concrete pavement or 15 feet, whichever is smaller.

TABLE 4.7: COMPACTION AND TESTING RECOMMENDATIONS FOR PAVEMENT AREAS

Location	Material	Test Method for Density Determination	Percent Compaction	Optimum Moisture Content	Testing Frequency
Pavement Areas	Scarified On-site Soil (Subgrade)	ASTM D698	≥ 95%	0 to +4%	1 per 7,500 SF; min. 3 tests
	General Fill (On-site Material)	ASTM D698	≥ 95%	0 to +4%	1 per 10,000 SF; min. 3 per lift
	Base Material	ASTM D1557 TEX-113-E	≥ 95% ≥ 100%	±3% ±2%	1 per 5,000 SF; min. 3 per lift

5.0 CONSTRUCTION CONSIDERATIONS

PSI should be retained to provide observation and testing of construction activities involved in the earthwork, pavements and related activities of this project. PSI cannot accept responsibilities for conditions which deviate from those described in this report, nor for the performance of the pavements if not engaged to also provide construction observation and materials testing for this project. The PSI geotechnical engineer-of-record should also be retained to provide continuing geotechnical engineering consulting services and construction document review, even if periodic on-call testing is contracted with PSI Construction Services.

5.1 INITIAL SITE PREPARATION CONSIDERATIONS

5.1.1 SUBGRADE PREPARATION FOR SITE WORK OUTSIDE PAVEMENT AREAS

Grade adjustments outside of the pavement areas can be made using select or general fill materials. The excavated on-site soils may also be reused in areas not sensitive to movement.

TABLE 5.1: SUBGRADE PREPARATION FOR NON-STRUCTURAL - GENERAL FILL

Minimum Undercut Depth	6 inches or as needed to remove roots, organic and/or deleterious materials
Exposed Subgrade Treatment	Proof-roll with rubber-tired vehicle weighing at least 20 tons. A representative of the Geotechnical Engineer should be present during proof-roll.
Proof-Rolled Pumping and Rutting Areas	Excavate to firmer materials and replace with compacted general or select fill under direction of a representative of the Geotechnical Engineer
General Fill Type	Materials free of roots, debris and other deleterious material with a maximum particle size of 4 inches
Maximum General Fill Loose Lift Thickness	8 inches

TABLE 5.2: FILL COMPACTION RECOMMENDATIONS OUTSIDE OF PAVEMENT AREAS

Location	Material	Test Method for Density Determination	Plasticity Index	Percent Compaction	Optimum Moisture Content	Testing Frequency
Outside of Pavement Areas	General Fill	ASTM D698	PI ≥ 25	94% to 98%	0 to +4%	1 per 10,000 SF; min. 3 per lift
			PI ≤ 25	≥ 95%	0 to +4%	

5.1.2 EXISTING SITE CONDITIONS

The following table outlines construction considerations in consideration of demolition of existing structures, procedures for abandoning old utility lines and removing trees.

TABLE 5.3: CONSIDERATIONS FOR EXISTING SITE CONDITION

Existing Structures	
Foundations for former structure(s) located below new paving	Cut off at least 3 feet below finished paving grade
Abandoned Utilities	
Utilities of former structure(s) located within footprint of proposed structure(s)	Remove pipe, bedding and backfill and then replace with select fill placed using controlled compaction
Utilities of former structure(s) located outside of footprint of proposed structure(s)	Abandon in place using a grout plug
Tree Removal	
Trees located within proposed roadways and 5 feet off project area	Remove root system for full vertical and lateral extent and extend removal for at least 3 feet beyond presence of root fragments and replace void with compacted general fill or flowable fill

5.2 MOISTURE SENSITIVE SOILS/WEATHER RELATED CONCERNS

Clay soils are sensitive to disturbances caused by construction traffic and changes in moisture content. During wet weather periods, increases in the moisture content of the soil can cause significant reduction in the soil strength and support capabilities. In addition, soils which become wet may be slow to dry and thus significantly retard the progress of grading and compaction activities. It will, therefore, be advantageous to perform earthwork, and construction activities during dry weather.

5.3 EXCAVATION OBSERVATIONS

Excavations should be observed by a representative of PSI prior to continuing construction activities in those areas. PSI needs to assess the encountered materials and confirm that site conditions are consistent with those discussed in this report. This is especially important to identify the condition and acceptability of the exposed subgrades under foundations and other structures that are sensitive to movement. Soft or loose soil zones encountered at the bottom of the excavations should be removed to the level of competent soils as directed by the Geotechnical Engineer or their representative. Cavities formed as a result of excavation of soft or loose soil zones should be backfilled with compacted select fill or lean concrete.

After opening, excavations should be observed, and concrete should be placed as quickly as possible to avoid exposure to wetting and drying. Surface run-off water should be drained away from the excavations and not be allowed to pond. Excavations left open for an extended period of time (greater than 24 hours) should be protected to reduce evaporation or entry of moisture.

5.4 DRAINAGE CONSIDERATIONS

Water should not be allowed to collect in or adjacent to excavations or on prepared subgrades within the construction area either during or after construction. Proper drainage around grade-supported sidewalks and flatwork is also important to reduce potential movements. Excavated areas should be sloped toward one corner to facilitate removal of collected rainwater, groundwater, or surface runoff. Providing rapid, positive drainage away from the pavements will reduce moisture variations within

the underlying soils and will therefore provide a valuable benefit in reducing the magnitude of potential movements.

5.5 EXCAVATIONS AND TRENCHES

Excavation equipment capabilities and field conditions may vary. Geologic processes are erratic and large variations can occur in small vertical and/or lateral distances. Details regarding “means and methods” to accomplish the work (such as excavation equipment and technique selection) are the sole responsibility of the project contractor. The comments contained in this report are based on small diameter borehole observations. The performance of large excavations may differ.

The Occupational Safety and Health Administration (OSHA) Safety and Health Standards (29 CFR Part 1926, Revised October 1989), require that excavations be constructed in accordance with the current OSHA guidelines. Furthermore, the State of Texas requires that detailed plans and specifications meeting OSHA standards be prepared for trench and excavation retention systems used during construction. PSI understands that these regulations are being strictly enforced, and if they are not closely followed, the owner and the contractor could be liable for substantial penalties.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's "responsible person", as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and Federal safety regulations.

PSI is providing this information as a service to the client. PSI does not assume responsibility for construction site safety or the contractor's or other parties’ compliance with local, state, and Federal safety or other regulations. A trench safety plan was beyond the scope of our services for this project.

6.0 REPORT LIMITATIONS

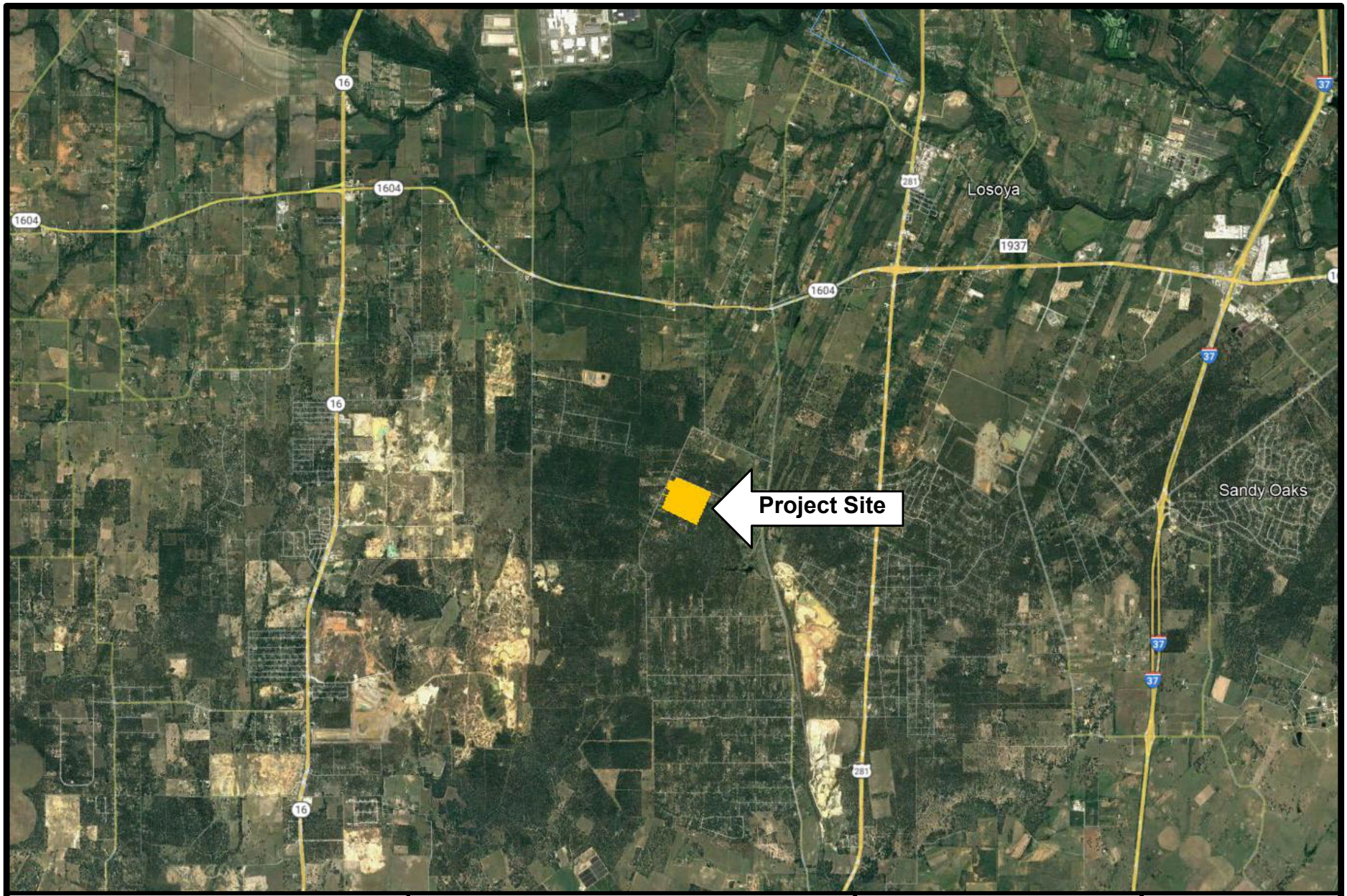
The recommendations submitted in this report are based on the available subsurface information obtained by PSI and design details furnished by the client for the proposed project. If there are revisions to the plans for this project, or if deviations from the subsurface conditions noted in this report are encountered during construction, PSI should be notified immediately to determine if changes in the recommendations are required. If PSI is not notified of such changes, PSI will not be responsible for the impact of those changes on the project.

The Geotechnical Engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with generally accepted professional Geotechnical Engineering practices in the local area. No other warranties are implied or expressed. This report may not be copied without the expressed written permission of PSI.

After the plans and specifications are more complete, the Geotechnical Engineer should be retained and provided the opportunity to review the final design plans and specifications to check that the engineering recommendations have been properly incorporated in the design documents. At this time, it may be necessary to submit supplementary recommendations. If PSI is not retained to perform these functions, PSI will not be responsible for the impact of those conditions on the project.

This report has been prepared for the exclusive use of Stelsamax, LLC for specific application to the Proposed Trumbo Road Development to be constructed at 23130 Trumbo Road in Bexar County, Texas.

APPENDIX



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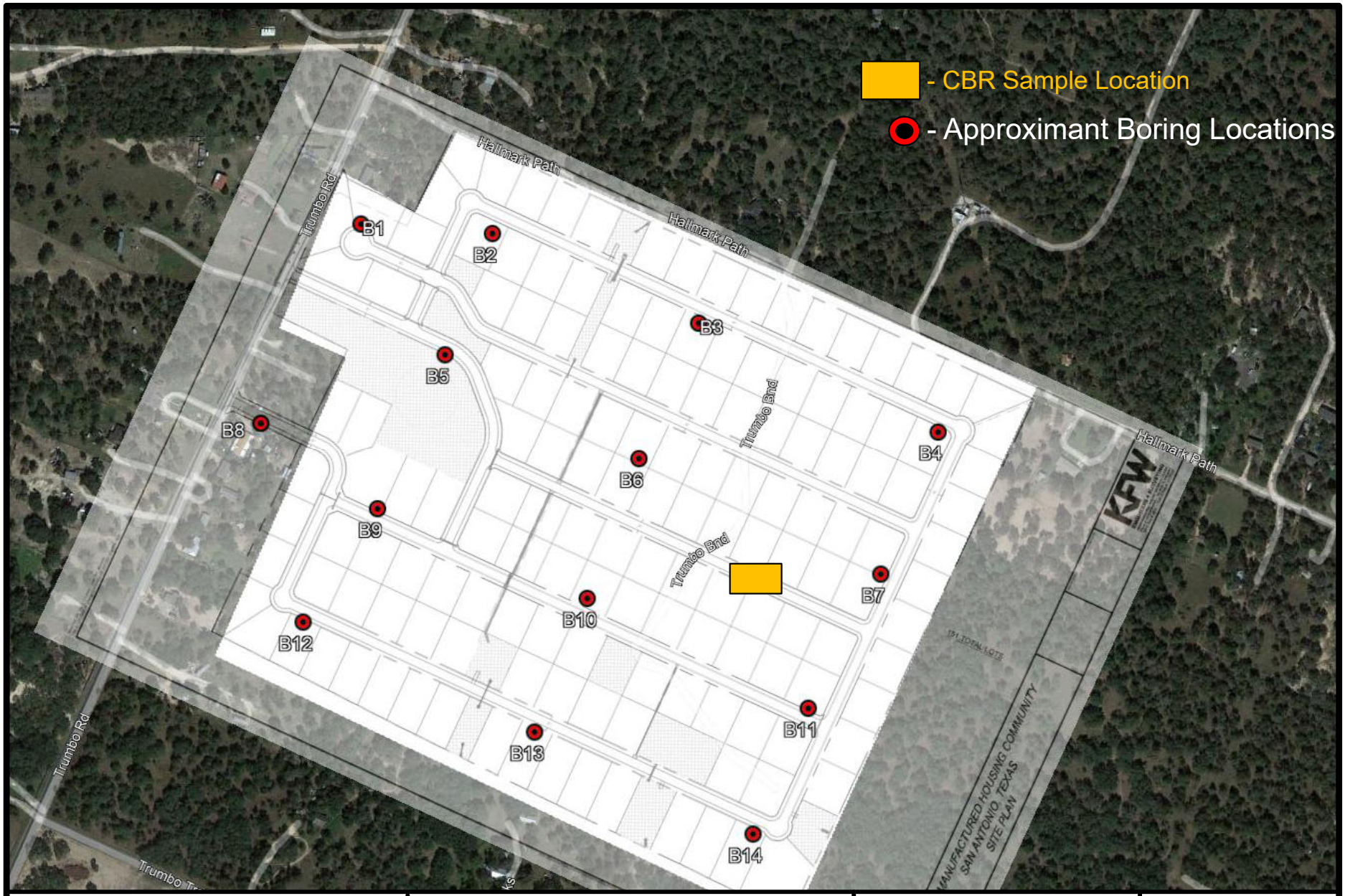
Site Vicinity Map

Trumbo Road Development
23130 Trumbo Road
Bexar County, Texas
PSI Project No.: 0312-2311-2

NOT TO SCALE

N



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Boring Location Plan

Trumbo Road Development
23130 Trumbo Road
Bexar County, Texas
PSI Project No.: 0312-2311-2

NOT TO SCALE

N

Trumbo Road Development
23130 Trumbo Road, Bexar County, Texas
Project No. 0312-2311

BORING B-1

LOCATION: See Boring Location Plan

DEPTH, FT.	SYMBOL	SAMPLES	WATER	SOIL DESCRIPTION	MOISTURE CONTENT	% RETAINED #4	% PASSING #200	SPT (N) & TCP (T) VALUES	% REC	%RQD	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	HAND PEN (TSF) / UNC CMP (TSF) 2.0 4.0 6.0 / PL WC LL 20 40 60	UNCONF. COMP. (TSF)	UNIT DRY WT. (LB/CU FT)
				Elevation:												
				CLAYEY SAND (SC), brown, loose												
					2		12									
					2											
5					17		12									
				Hand auger boring teminated at 6 feet.												
10																

COMPLETION DEPTH: 10.0 Feet
DATE: 6/17/21

DEPTH TO GROUND WATER
SEEPAGE (ft.): NONE ENCOUNTERED
END OF DRILLING (ft.): NONE ENCOUNTERED
DELAYED WATER LEVEL (FT): N/A

GEO TESTS 0312-2311 -- TROMBO ROAD DEVELOPMENT.GPJ RBENNETT GW.GDT 8/6/21

Trumbo Road Development
23130 Trumbo Road, Bexar County, Texas
Project No. 0312-2311

BORING B-2

LOCATION: See Boring Location Plan

DEPTH, FT.	SYMBOL	SAMPLES	WATER	SOIL DESCRIPTION	MOISTURE CONTENT	% RETAINED #4	% PASSING #200	SPT (N) & TCP (T) VALUES	% REC	%RQD	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	HAND PEN (TSF) / UNC CMP (TSF) 2.0 4.0 6.0 / PL WC LL 20 40 60	UNCONF. COMP. (TSF)	UNIT DRY WT. (LB/CU FT)
				Elevation:												
				CLAYEY SAND (SC), brown, loose	1											
					2		12									
5					16											
				Hand auger boring teminated at 6 feet.												
10																

COMPLETION DEPTH: 10.0 Feet
DATE: 6/17/21

DEPTH TO GROUND WATER
SEEPAGE (ft.): NONE ENCOUNTERED
END OF DRILLING (ft.): NONE ENCOUNTERED
DELAYED WATER LEVEL (FT): N/A

GEO TESTS 0312-2311 -- TROMBO ROAD DEVELOPMENT.GPJ RBENNETT GW.GDT 8/6/21

Trumbo Road Development
23130 Trumbo Road, Bexar County, Texas
Project No. 0312-2311

BORING B-3

LOCATION: See Boring Location Plan

DEPTH, FT.	SYMBOL	SAMPLES	WATER	SOIL DESCRIPTION	MOISTURE CONTENT	% RETAINED #4	% PASSING #200	SPT (N) & TCP (T) VALUES	% REC	%RQD	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	HAND PEN (TSF) / UNC CMP (TSF) 2.0 4.0 6.0 / PL WC LL 20 40 60	UNCONF. COMP. (TSF)	UNIT DRY WT. (LB/CU FT)
				Elevation:												
				CLAYEY SAND (SC), brown, loose	5		17									
					8											
5					8											
				Hand auger boring teminated at 6 feet.												
10																

COMPLETION DEPTH: 10.0 Feet
DATE: 7/22/21

DEPTH TO GROUND WATER
SEEPAGE (ft.): NONE ENCOUNTERED
END OF DRILLING (ft.): NONE ENCOUNTERED
DELAYED WATER LEVEL (FT): N/A

GEO TESTS 0312-2311 -- TROMBO ROAD DEVELOPMENT.GPJ RBENNETT GW.GDT 8/6/21

Trumbo Road Development
23130 Trumbo Road, Bexar County, Texas
Project No. 0312-2311

BORING B-4

LOCATION: See Boring Location Plan

DEPTH, FT.	SYMBOL	SAMPLES	WATER	SOIL DESCRIPTION	MOISTURE CONTENT	% RETAINED #4	% PASSING #200	SPT (N) & TCP (T) VALUES	% REC	%RQD	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	HAND PEN (TSF) / UNC CMP (TSF) 2.0 4.0 6.0 / PL WC LL 20 40 60	UNCONF. COMP. (TSF)	UNIT DRY WT. (LB/CU FT)
				Elevation:												
				CLAYEY SAND (SC), brown, loose	4											
					8		28									
5					7											
				Hand auger boring teminated at 6 feet.												
10																

COMPLETION DEPTH: 10.0 Feet
DATE: 7/22/21

DEPTH TO GROUND WATER
SEEPAGE (ft.): NONE ENCOUNTERED
END OF DRILLING (ft.): NONE ENCOUNTERED
DELAYED WATER LEVEL (FT): N/A

GEO TESTS 0312-2311 -- TROMBO ROAD DEVELOPMENT.GPJ RBENNETT GW.GDT 8/6/21

Trumbo Road Development
23130 Trumbo Road, Bexar County, Texas
Project No. 0312-2311

BORING B-5

LOCATION: See Boring Location Plan

DEPTH, FT.	SYMBOL	SAMPLES	WATER	SOIL DESCRIPTION	MOISTURE CONTENT	% RETAINED #4	% PASSING #200	SPT (N) & TCP (T) VALUES	% REC	%RQD	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	HAND PEN (TSF) / UNC CMP (TSF) 2.0 4.0 6.0 / PL WC LL 20 40 60	UNCONF. COMP. (TSF)	UNIT DRY WT. (LB/CU FT)
				Elevation:												
				CLAYEY SAND (SC), brown, very loose to dense	4			2								
					6			3								
5					12		25	12			19	11	8			
				- grades to reddish brown at 6.5 feet	8			23								
					6			39								
10				Boring teminated at 10 feet.												

COMPLETION DEPTH: 10.0 Feet
DATE: 7/21/21

DEPTH TO GROUND WATER
SEEPAGE (ft.): NONE ENCOUNTERED
END OF DRILLING (ft.): NONE ENCOUNTERED
DELAYED WATER LEVEL (FT): N/A

GEO TESTS 0312-2311 -- TROMBO ROAD DEVELOPMENT.GPJ RBENNETT GW.GDT 8/6/21

Trumbo Road Development
23130 Trumbo Road, Bexar County, Texas
Project No. 0312-2311

BORING B-6

LOCATION: See Boring Location Plan

DEPTH, FT.	SYMBOL	SAMPLES	WATER	SOIL DESCRIPTION	MOISTURE CONTENT	% RETAINED #4	% PASSING #200	SPT (N) & TCP (T) VALUES	% REC	%RQD	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	HAND PEN (TSF) / UNC CMP (TSF) 2.0 4.0 6.0 / PL WC LL 20 40 60	UNCONF. COMP. (TSF)	UNIT DRY WT. (LB/CU FT)
				Elevation:												
				CLAYEY SAND (SC), brown, loose	8		15				N.P.					
					8											
5					7											
				Hand auger boring teminated at 6 feet.												
10																

COMPLETION DEPTH: 10.0 Feet
DATE: 7/22/21

DEPTH TO GROUND WATER
SEEPAGE (ft.): NONE ENCOUNTERED
END OF DRILLING (ft.): NONE ENCOUNTERED
DELAYED WATER LEVEL (FT): N/A

GEO TESTS 0312-2311 -- TROMBO ROAD DEVELOPMENT.GPJ RBENNETT GW.GDT 8/6/21

Trumbo Road Development
23130 Trumbo Road, Bexar County, Texas
Project No. 0312-2311

BORING B-7

LOCATION: See Boring Location Plan

DEPTH, FT.	SYMBOL	SAMPLES	WATER	SOIL DESCRIPTION	MOISTURE CONTENT	% RETAINED #4	% PASSING #200	SPT (N) & TCP (T) VALUES	% REC	%RQD	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	HAND PEN (TSF) / UNC CMP (TSF) 2.0 4.0 6.0 / PL WC LL 20 40 60	UNCONF. COMP. (TSF)	UNIT DRY WT. (LB/CU FT)
				Elevation:												
				CLAYEY SAND (SC), brown, loose	8											
					8		26				20	12	8			
5					7											
				Hand auger boring teminated at 6 feet.												
10																

COMPLETION DEPTH: 10.0 Feet
DATE: 7/22/21

DEPTH TO GROUND WATER
SEEPAGE (ft.): NONE ENCOUNTERED
END OF DRILLING (ft.): NONE ENCOUNTERED
DELAYED WATER LEVEL (FT): N/A

GEO TESTS 0312-2311 -- TROMBO ROAD DEVELOPMENT.GPJ RBENNETT GW.GDT 8/6/21

Trumbo Road Development
23130 Trumbo Road, Bexar County, Texas
Project No. 0312-2311

BORING B-8

LOCATION: See Boring Location Plan

DEPTH, FT.	SYMBOL	SAMPLES	WATER	SOIL DESCRIPTION	MOISTURE CONTENT	% RETAINED #4	% PASSING #200	SPT (N) & TCP (T) VALUES	% REC	%RQD	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	HAND PEN (TSF) / UNC CMP (TSF) 2.0 4.0 6.0 PL 20 WC 40 LL 60	UNCONF. COMP. (TSF)	UNIT DRY WT. (LB/CU FT)
				Elevation:												
				CLAYEY SAND (SC), brown, loose to very dense	4		12	3								
					4			3								
5					4			5								
				- grades to reddish brown at 6.5 feet	10		34	51			52	20	32			
					6			50/4"								
10				Boring teminated at 10 feet.												

COMPLETION DEPTH: 10.0 Feet
DATE: 7/21/21

DEPTH TO GROUND WATER
SEEPAGE (ft.): NONE ENCOUNTERED
END OF DRILLING (ft.): NONE ENCOUNTERED
DELAYED WATER LEVEL (FT): N/A

GEO TESTS 0312-2311 -- TROMBO ROAD DEVELOPMENT.GPJ RBENNETT GW.GDT 8/6/21

Trumbo Road Development
23130 Trumbo Road, Bexar County, Texas
Project No. 0312-2311

BORING B-9

LOCATION: See Boring Location Plan

DEPTH, FT.	SYMBOL	SAMPLES	WATER	SOIL DESCRIPTION	MOISTURE CONTENT	% RETAINED #4	% PASSING #200	SPT (N) & TCP (T) VALUES	% REC	%RQD	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	HAND PEN (TSF) / UNC CMP (TSF) 2.0 4.0 6.0 PL 20 WC 40 LL 60	UNCONF. COMP. (TSF)	UNIT DRY WT. (LB/CU FT)
				Elevation:												
				CLAYEY SAND (SC), brown, loose to very dense	4			2								
					6		12	2			N.P.					
5					7			6								
				- grades to reddish brown at 6.5 feet	8		28	66			55	22	35			
					7			50/4"								
10				Boring teminated at 10 feet.												

GEO TESTS 0312-2311 -- TROMBO ROAD DEVELOPMENT.GPJ RBENNETT GW.GDT 8/6/21

COMPLETION DEPTH: 10.0 Feet
DATE: 7/21/21

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DEPTH TO GROUND WATER
SEEPAGE (ft.): NONE ENCOUNTERED
END OF DRILLING (ft.): NONE ENCOUNTERED
DELAYED WATER LEVEL (FT): N/A

Trumbo Road Development
23130 Trumbo Road, Bexar County, Texas
Project No. 0312-2311

BORING B-10

LOCATION: See Boring Location Plan

DEPTH, FT.	SYMBOL	SAMPLES	WATER	SOIL DESCRIPTION	MOISTURE CONTENT	% RETAINED #4	% PASSING #200	SPT (N) & TCP (T) VALUES	% REC	%RQD	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	HAND PEN (TSF) / UNC CMP (TSF) 2.0 4.0 6.0 / PL WC LL 20 40 60	UNCONF. COMP. (TSF)	UNIT DRY WT. (LB/CU FT)
				Elevation:												
				CLAYEY SAND (SC), brown, loose	8		36									
					8											
5					8											
				Hand auger boring teminated at 6 feet.												
10																

COMPLETION DEPTH: 10.0 Feet
DATE: 7/22/21

DEPTH TO GROUND WATER
SEEPAGE (ft.): NONE ENCOUNTERED
END OF DRILLING (ft.): NONE ENCOUNTERED
DELAYED WATER LEVEL (FT): N/A

GEO TESTS 0312-2311 -- TROMBO ROAD DEVELOPMENT.GPJ RBENNETT GW.GDT 8/6/21

Trumbo Road Development
23130 Trumbo Road, Bexar County, Texas
Project No. 0312-2311

BORING B-11

LOCATION: See Boring Location Plan

DEPTH, FT.	SYMBOL	SAMPLES	WATER	SOIL DESCRIPTION	MOISTURE CONTENT	% RETAINED #4	% PASSING #200	SPT (N) & TCP (T) VALUES	% REC	%RQD	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	HAND PEN (TSF) / UNC CMP (TSF) 2.0 4.0 6.0 / PL WC LL 20 40 60	UNCONF. COMP. (TSF)	UNIT DRY WT. (LB/CU FT)
				Elevation:												
				CLAYEY SAND (SC), brown, loose	7											
					8											
5					7		36									
				Hand auger boring teminated at 6 feet.												
10																

COMPLETION DEPTH: 10.0 Feet
DATE: 7/22/21

DEPTH TO GROUND WATER
SEEPAGE (ft.): NONE ENCOUNTERED
END OF DRILLING (ft.): NONE ENCOUNTERED
DELAYED WATER LEVEL (FT): N/A

GEO TESTS 0312-2311 -- TROMBO ROAD DEVELOPMENT.GPJ RBENNETT GW.GDT 8/6/21

Trumbo Road Development
23130 Trumbo Road, Bexar County, Texas
Project No. 0312-2311

BORING B-12

LOCATION: See Boring Location Plan

DEPTH, FT.	SYMBOL	SAMPLES	WATER	SOIL DESCRIPTION	MOISTURE CONTENT	% RETAINED #4	% PASSING #200	SPT (N) & TCP (T) VALUES	% REC	%RQD	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	HAND PEN (TSF) / UNC CMP (TSF) 2.0 4.0 6.0 / PL WC LL 20 40 60	UNCONF. COMP. (TSF)	UNIT DRY WT. (LB/CU FT)
				Elevation:												
				CLAYEY SAND (SC), brown, loose to very dense	4			2								
					8		36	4								
5					11			8								
				- grades to reddish brown at 6.5 feet	9			50/3"								
					10		37	50/4"			34	22	12			
10				Boring teminated at 10 feet.												

COMPLETION DEPTH: 10.0 Feet
DATE: 7/21/21

DEPTH TO GROUND WATER
SEEPAGE (ft.): NONE ENCOUNTERED
END OF DRILLING (ft.): NONE ENCOUNTERED
DELAYED WATER LEVEL (FT): N/A

GEO TESTS 0312-2311 -- TROMBO ROAD DEVELOPMENT.GPJ RBENNETT GW.GDT 8/6/21

Trumbo Road Development
23130 Trumbo Road, Bexar County, Texas
Project No. 0312-2311

BORING B-13

LOCATION: See Boring Location Plan

DEPTH, FT.	SYMBOL	SAMPLES	WATER	SOIL DESCRIPTION	MOISTURE CONTENT	% RETAINED #4	% PASSING #200	SPT (N) & TCP (T) VALUES	% REC	%RQD	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	HAND PEN (TSF) / UNC CMP (TSF) 2.0 4.0 6.0 / PL WC LL 20 40 60	UNCONF. COMP. (TSF)	UNIT DRY WT. (LB/CU FT)
				Elevation:												
				CLAYEY SAND (SC), brown, loose to very dense	3			2								
					4		12	3								
5					13			9								
					11		48	50/2"			33	17	16			
					10			50/4"								
10				Boring teminated at 10 feet.												

COMPLETION DEPTH: 10.0 Feet
DATE: 7/21/21

DEPTH TO GROUND WATER
SEEPAGE (ft.): NONE ENCOUNTERED
END OF DRILLING (ft.): NONE ENCOUNTERED
DELAYED WATER LEVEL (FT): N/A

GEO TESTS 0312-2311 -- TROMBO ROAD DEVELOPMENT.GPJ RBENNETT GW.GDT 8/6/21

Trumbo Road Development
23130 Trumbo Road, Bexar County, Texas
Project No. 0312-2311

BORING B-14

LOCATION: See Boring Location Plan

DEPTH, FT.	SYMBOL	SAMPLES	WATER	SOIL DESCRIPTION	MOISTURE CONTENT	% RETAINED #4	% PASSING #200	SPT (N) & TCP (T) VALUES	% REC	%RQD	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	HAND PEN (TSF) / UNC CMP (TSF) 2.0 4.0 6.0 / PL WC LL 20 40 60	UNCONF. COMP. (TSF)	UNIT DRY WT. (LB/CU FT)
				Elevation:												
				CLAYEY SAND (SC), brown, loose	7											
					8											
5					7		36									
				Hand auger boring teminated at 6 feet.												
10																

COMPLETION DEPTH: 10.0 Feet
DATE: 7/22/21

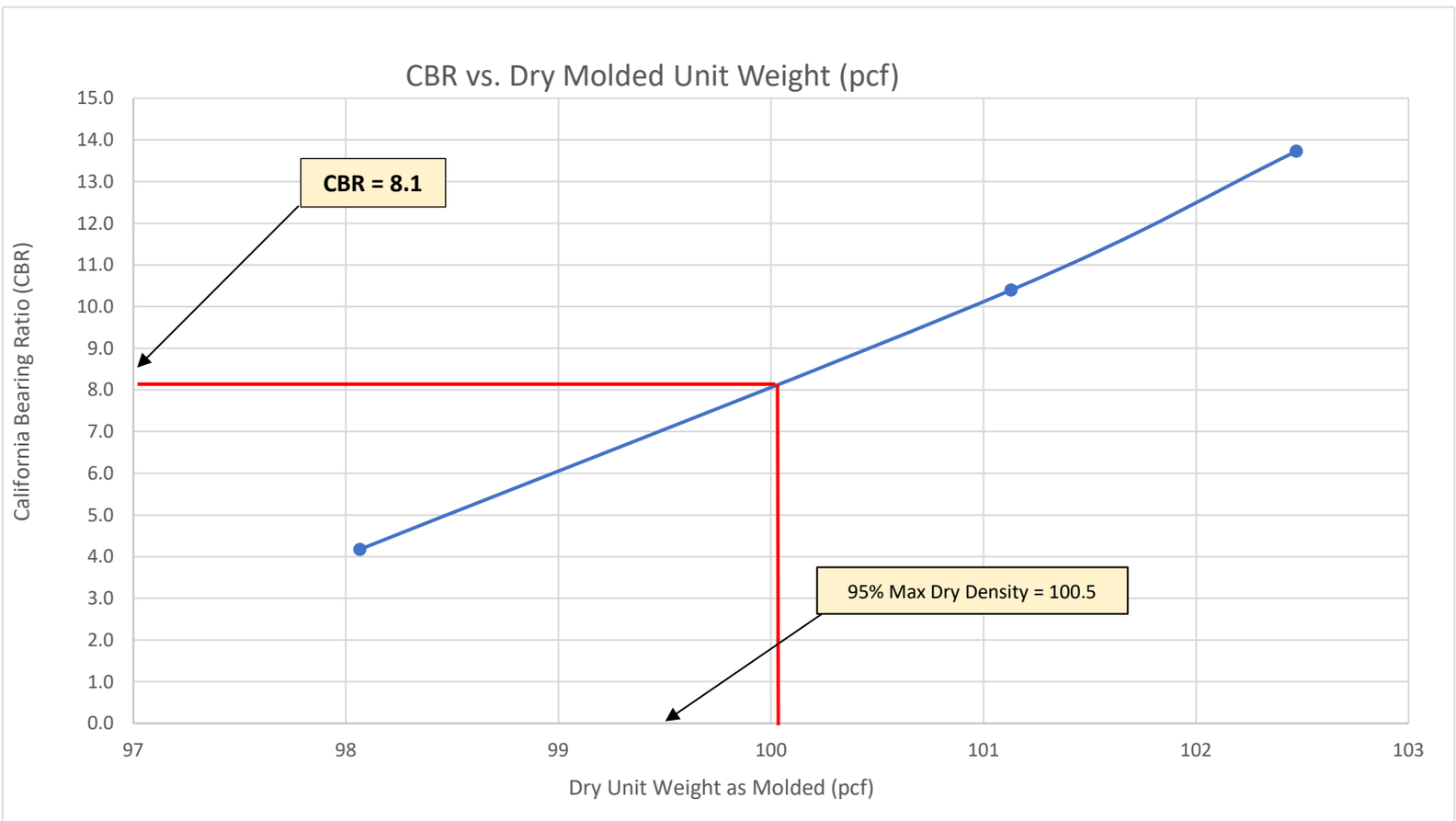
DEPTH TO GROUND WATER
SEEPAGE (ft.): NONE ENCOUNTERED
END OF DRILLING (ft.): NONE ENCOUNTERED
DELAYED WATER LEVEL (FT): N/A

GEO TESTS 0312-2311 -- TROMBO ROAD DEVELOPMENT.GPJ RBENNETT GW.GDT 8/6/21

Test No.	Blows/lift	Dry Unit Weight	% Compact.	Water Content %	CBR at 0.1 in	CBR at 0.2 in
1	10	98.07	93%	18.5	4.2	5.5
2	20	101.13	96%	17.9	10.4	11.5
3	30	102.47	97%	16.1	13.7	15.4

Approximate location of CBR sample shown on Boring Location Plan.

95% Max Dry Density (pcf)	100.5	Selected CBR Value	8.0	CLAYEY SAND (SC)



Trumbo Road Development
Bexar County Texas

PSI Project No. 0312-2311

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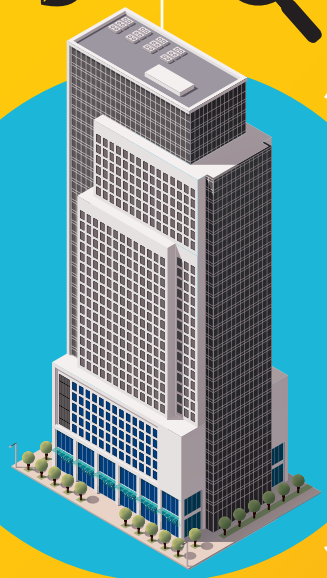

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Assessing a building or facility for a variety of sources (air, asbestos, lead, mold) to minimize the risk of factors adverse to human health.

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As a leader in providing comprehensive solutions to industries around the globe, Intertek-PSI prides itself on bringing the expertise and services necessary for our clients to meet all of their needs across their entire operation. **Our Assurance, Testing, Inspection, and Certification (A.T.I.C.)** suite of services ensures that whatever your needs may be – assurance, testing, inspection, certification, or all of the above, that those needs will be met by Intertek-PSI.

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